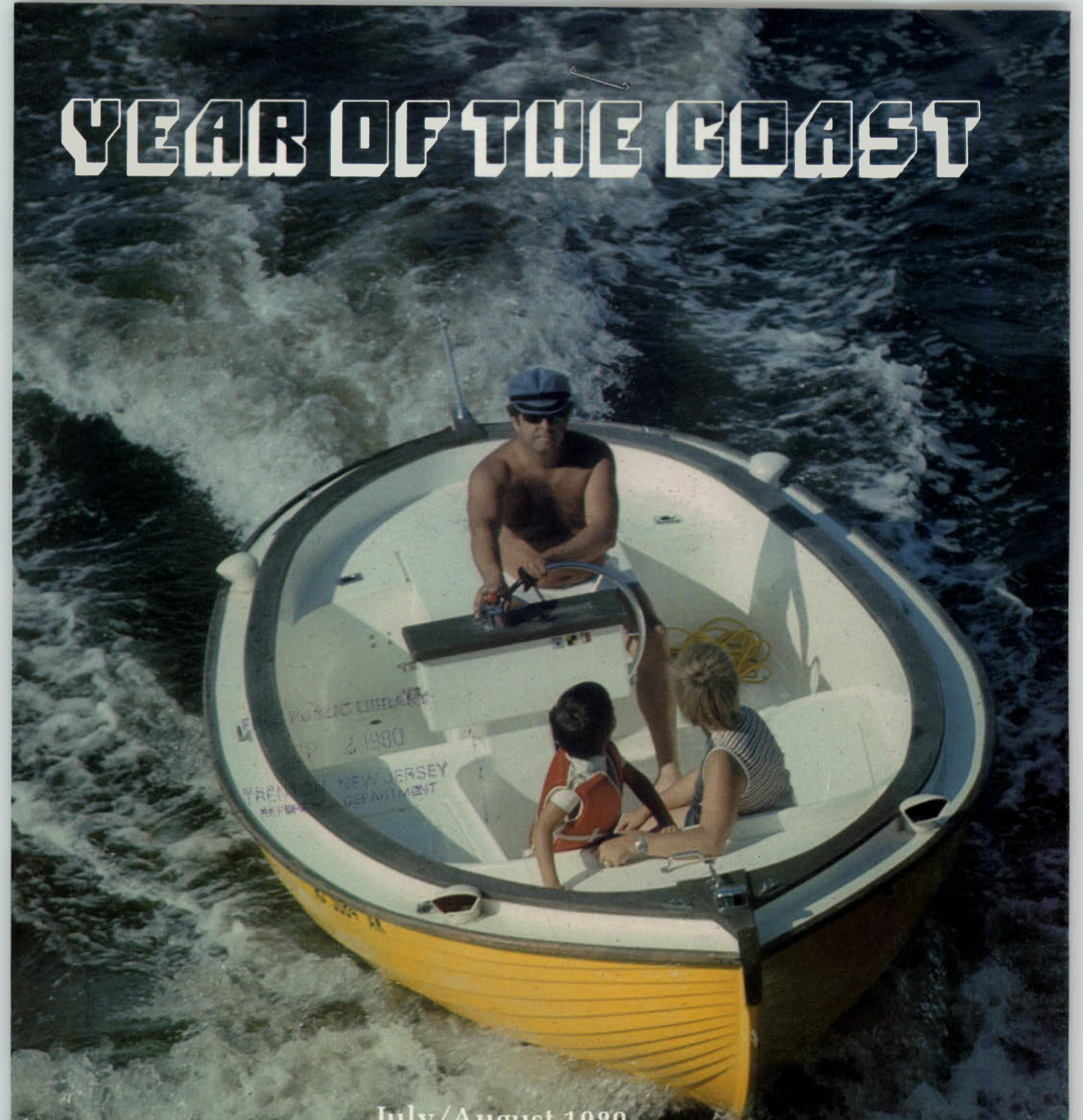
YEAR OF THE COAST



July/August 1980

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 1980
VOL. 7. No. 4

New Jersey OUTDOORS

from the editor

A NEW POLL OF CONSERVATIONISTS

More than 43,000 members of the *National Wildlife Federation,* the largest conservation group in the United States, responded to a poll in the February/March issue of *National Wildlife* magazine. The readers were asked to rank three energy options and five key environmental issues. Responses are listed below:

ENERGY ISSUES

1. Develop Alternate Sources (53%)
2. Conserve More Energy (37%)
3. Produce More Fossil Fuel (10%)

ENVIRONMENTAL ISSUES

1. Save Wildlife (25%)
2. Curb Population Growth (24%)
3. Clean Up and Conserve Water (23%)
4. Control Land Use (18%)
5. Curb Air Pollution (10%)

Comparing the responses concerning environmental issues received in a *New Jersey Outdoors* poll two years ago to the responses above, we find our regional concerns are similar to the national poll responses:

NEW JERSEY OUTDOORS POLL

1. Water Pollution/Ocean Pollution (33%)
2. Land Use (unrestricted development) (21%)
3. Disappearing Wildlife Habitat (11%)
4. Preservation of the Pine Barrens (8%)
5. Air Pollution (8%)
6. Population Explosion (7%)
7. Litter on Our Countryside (5%)
8. Law Enforcement (5%)

The *National Wildife Federation* poll also asked questions (including the reader (%) responses) on four issues: Inflation, Pollution, Wildlife and Nuclear Power which are printed below:

INFLATION

This is generally considered the nation's No. 1 problem. One study found that environmental regulations contribute one-half of one percent annually to the rate of inflation. To protect our environment, should we spend:
MORE: 65 percent
ABOUT THE SAME AS NOW: 28 percent
LESS: 7 percent

POLLUTION

Do you believe pollution can be cleaned up while preserving jobs and maintaining our present standard of living?
YES: 81 percent
NO: 12 percent
DON'T KNOW: 7 percent

WILDLIFE

Some people favor a hands-off, "let nature take its course" policy for wildlife. Others favor spending more federal and state money on management, habitat improvement, and research. Which do you favor?
HANDS-OFF: 9 percent
SPEND MORE: 85 percent
NO OPINION: 5 percent

NUCLEAR POWER

Taking into account all you have heard or read, how do you feel about nuclear power plants?
FAVORABLE: 40 percent
UNFAVORABLE: 51 percent
NO OPINION: 9 percent

According to the *National Wildlife Federation,* their membership, over a two year period, "has shifted from a position favoring nuclear power plants to an anti-nuclear position." □

IN THIS ISSUE:

As promised in the May/June issue, we have *More on New Jersey's Saltwater Fish and Shellfish.* The species included in this issue are tilefish, Atlantic croaker, striped bass, and hard clam.

Continuing in our *Year of the Coast* theme, we have included a blue fishing article, *Belting the Blues,* by Henry Summers, a first time contributor to our pages. Illustrations for this article were provided by Tony Hillman. Mr. Summers is the author of a weekly feature, *Economy Cut,* which appears in *The Hudson Dispatch* and *The Paterson News.*

Another new author, Richard C. Fusick, writes about the New Jersey Youth Conservation Corps in *YCC—A Natural Experience.* Author Fusick, a science teacher, served as assistant director of the Lebanon State Forest YCC.

More on our marine resource—*New Jersey Offshore,* by still another new author, Ferd DiPalma. This article is about big-game sports fishing in the far offshore waters of the Hudson Canyon and the continental shelf.

Two articles about New Jersey plant life—*New Jersey's Famous Little Fern,* by Richard Radis; and *Plants of Prey—Our Local Carnivores,* by Frank W. Knight, Jr., a new author. Mr. Knight is Director of the Verplanck—Stony Kill Environmental Education Center in Duchess County, New York.

For a change of pace, we've included an outdoor education ex-

Continued on page 32

MORE ON NEW JERSEY'S SALTWATER FISH & SHELLFISH

TILEFISH

BIOLOGY

Common names: Tilefish
Scientific name: *Lopholatilus chamaeleonticeps*
Range: Tilefish stay along the outer edge of the continental shelf between New England and Chesapeake Bay.
Size: Tilefish average about 35 lbs., although they can reach a weight of 50 lbs. and 3-1/2 feet.
Food: Feed mostly on bottom dwelling invertebrates.
Habitat: Distinctly a groundfish, tilefish seldom, if ever, rise to the surface. Tilefish have a small temperature range of 47° to 57° F.
Spawning: Spawning occurs during the month of July; eggs are buoyant and hatch in 40 to 60 hours.

The tilefish is odd in that it is restricted to a very narrow range of habitat. This area is a limited strip along a continental shelf where the temperature range is favorable. In 1882, a large tilefish kill was attributed to a sharp decline in water temperature.

RECREATIONAL & COMMERCIAL IMPORTANCE

Although tilefish have been taken incidentally for many years by trawlers, a specialized longline fishery was developed in the early 1970's. This new technique and high market demand (tilefish is delicious and often termed "poor man's lobster") were responsible for recent increases in harvest. The fishing grounds are located along the continental shelf, particularly the Hudson Canyon, in 400 to 600 feet of water. Tilefish are taken on longlines, 10 to 20 miles in length, rigged with thousands of baited hooks. Most of the catch is landed in Barnegat Light, the "tilefish capital of the world".

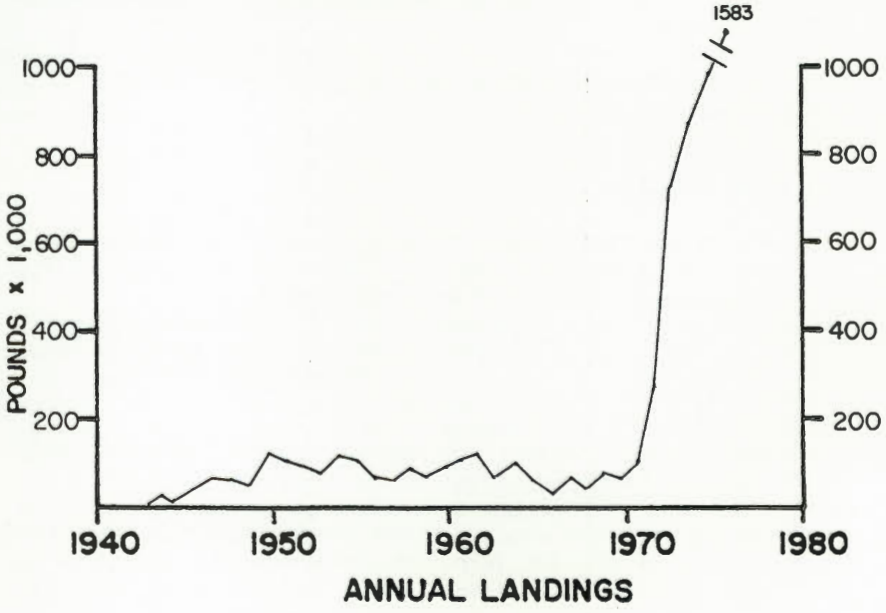
The tilefish is of minor importance as a gamefish in New Jersey because it lives well offshore and requires expensive tackle to reach its deepwater lairs.

FISHING FACTS & TECHNIQUES

Anglers looking for tilefish must make lengthy trips to New Jersey's offshore canyons. For this reason, the species has been traditionally taken on party and charter boats, although more and more private boats fishing the canyons for tuna and marlin are also devoting some of their time to tilefishing. Tilefish live and feed on the bottom of waters 400 to 600 feet deep. Such deep water fishing requires special gear and techniques. A large conventional reel with at least 300 or 400 yards of heavy line is essential. A two- to five-pound weight is needed to keep the bait on the bottom while the boat is drifting. Most fishermen use a snap-off rig which releases the weight when the fish is hooked. Baits include squid, herring, small butterfish and mackerel, sometimes rigged with a rubber skirt ahead. Electric reels can be used to retrieve the lengthy line needed to hit bottom. Best catches are made between dawn and 2 p.m. Weather is an important factor for tilefishing, for rough seas make deep water bottom fishing difficult. For this reason, the sportfishing season is restricted to the fair weather months, spring through early fall.

ACKNOWLEDGEMENTS AND REFERENCES

Anthony Hillman (art), Barry Preim (graphs), John Larson, Bigelow and Schroeder (1953), Hildebrand and Schroeder (1972), Freeman and Turner (1977), Goode (1977), McHugh (1977), Breder (1948).



STRIPED BASS

BIOLOGY

Common names: Striped bass, rockfish

Scientific name: *Morone saxatilis*

Range: Gulf of St. Lawrence to Florida, most common between Cape Cod and Cape Hatteras.

Size: Female striped bass are generally larger than the males. A bass weighing more than 30 lbs. is probably a female. Age/weight relationship: 7 years = 20 lbs., 10-11 years = 30 lbs., 14 years = 40 lbs. Striped bass can attain a weight of 125 lbs.

Food: Stripers are voracious, feeding on various fish and larger crustaceans including crabs and lobsters.

Migration: Young stripers spend their first few years in the estuary where they were spawned; after which, they migrate northward and eastward along the shore in the spring and return westward and southward in the fall.

Habitat: Stripers are strictly a coastal fish, seldom caught more than four or five miles offshore. They are found wherever food is available, frequenting sandy beaches, rocky areas and mouths of estuaries where the current is the strongest. Stripers are very strong swimmers and are often found feeding in the surf. Depths they inhabit are dictated by tides; in shallow bays, they are frequently found in areas that are exposed during low water.

Spawning: Stripers spawn between April and June. Stripers are anadromous, meaning they live in saltwater and spawn in freshwater. A large female may produce as many as 2,200,000 eggs. Hatching takes place within 48 hours. Spawning occurs in current turbulent enough so the eggs will not settle to the bottom.

Being an anadromous species and vulnerable to damage from domestic over-fishing, pollution, habitat destruction and the failure of efforts to manage coastal fisheries it is remarkable that the striped bass has survived and flourished at all.

RECREATIONAL & COMMERCIAL IMPORTANCE

The striped bass is one of New Jersey's most prized gamefishes. It is the primary species sought in several annual surf fishing contests held along the shore. On the Atlantic coast, surveys indicate that sportsmen land 17 times more striped bass than commercial fishermen. Recently, however, striped bass populations, for unknown reasons, have declined tremendously.

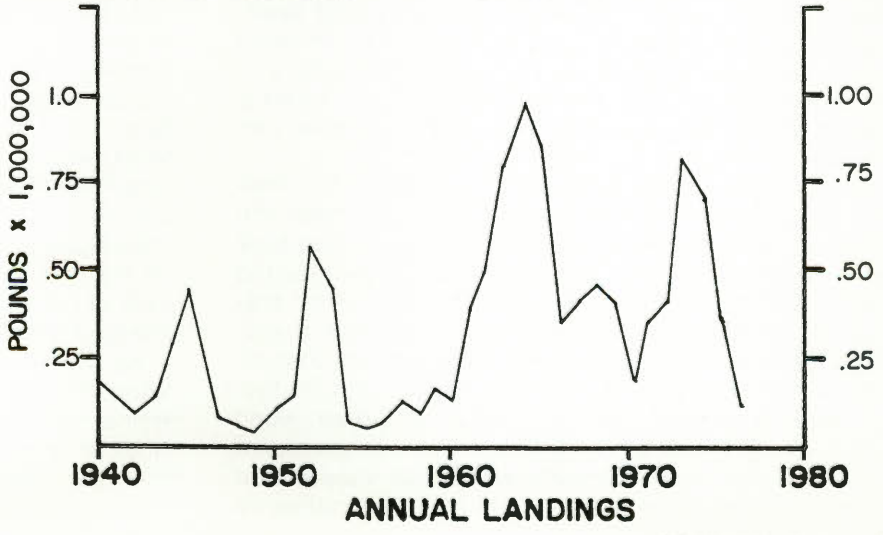
Because of its excellent flavor, the striped bass has a high market value. Most of the catch is taken offshore in the winter by otter trawl. To protect this important gamefish, laws prohibiting the netting of stripers within three miles of the beach were enacted. Enforcement has been inadequate, however, and certain draggers have exploited inshore schools of bass during the night. It is legal to keep stripers caught in shad nets in Delaware Bay, but the overall landings from this fishery have been small.

SPORTFISHING FACTS AND TECHNIQUES

One of the most prized catches for New Jersey anglers is the elusive striped bass. There are many hours spent casting and patiently waiting for every striper landed. The striped bass is present in New Jersey waters all year (although the season is closed during January and February) and can be found in nearshore ocean waters, surf, bays and rivers. They frequent underwater structures, jetties, rocky bottoms, drop-offs and channels. Most productive times are at dawn, dusk or night, especially after a fall moon or a mild northeast storm. Depending on the place and the time, rigs, methods and baits vary greatly. In the surf, live-lining with bunker, herring, eels or calico crabs is effective during the spring, summer and fall; during the summer, night fishing is essential. Other good surf baits include sand and blood worms, cut mackerel, bunker and surf clams. Actively feeding bass can be taken with small floating-swimming plugs, poppers, metal squids and large bucktails with pork rind. During the fall while fishing from a boat in the ocean, anglers have two basic options, trolling or drifting. Trolling is done at slow speeds using deep diving lures such as bunker spoons, umbrella rigs, tube lures and large plugs. While drifting, fish live or cut baits on the bottom, jig with bucktails or cast plugs and spoons.

ACKNOWLEDGMENTS AND REFERENCES

Anthony Hillman (art), Barry Preim (graph), Pete Barrett, Breder (1948), Bigelow and Schroeder (1953), Hildebrand and Schroeder (1972), Nichols, Miller, Sykes, and Alperin (1966), McHugh (1977), Smith & Wells (1977), compiled by Bill Figley and Ray Townsend.



Continued on page 30

Belting the Blues

BY HENRY SUMMERS © 1979

Bluefishing in New Jersey coastal waters isn't like chasing a little white ball across a manicured lawn. Bluefishing is exercise, chum. Each summer, millions of men, women, and children, tourist and native, take to the party boats in pursuit of the atavistic, arm-busting thrills that only tying into a hungry Jersey chopper can provide.

You struggle off the boat with a couple of hundred pounds of blues on ice. In triumph, you meet the ferocious gaze of the lethally shaped, gunmetal-blue clones, and, recalling stories of downed pilots during World War II, you realize how eagerly and dispassionately they would have made a meal out of you. Weary to the marrow, and smelling like a chum bucket, you consider going to sleep in the back of the Dodge. But your Jersey sportsman's sense of honor won't permit you to forget all the freezers that you promised to fill between Point Pleasant and a hot shower and clean sheets. When one friend after the other makes up fishy stories about never-to-be-repeated supermarket specials on frozen peas and carrots taking up every available inch of freezer space, reality slaps you in the face: Neither you, nor the fish in your trunk, are getting any younger; and you aren't particularly fond of bluefish, either.

Dark-meated fish is even less popular than the dark meat on the Thanksgiving bird, which usually winds up as hash, or in the soup. Fast-food chains always stress the point in their advertising that they "serve only light, mild fillet." Their fishy-eyed demographics experts have been accurate in assessing the taste of the American masses: we don't like fish that tastes like fish. A trip to the fish market is revealing. Creamy colored bay and sea scallops; shocking pink-orange salmon steaks; mild, light fillets of flounder and sole (not, incidently, what the chains serve); and medium-sized, defrosted shrimp all hover around $5.49 to $5.98 a pound. Swordfish, a great personal favorite, ranges up to $6.49. Lobster we won't even discuss. In the light of beef prices, it could be worse. With the exception of the shrimp, the articles under consideration contain little to no waste. And a given-sized portion of fish is more satisfying than an equivalent serving of boneless beef. But for most families, the difference is that between murder, and mere highway robbery.

Reposing in the next display case, we observe curious specimens of crustacea; unspeakable, tentacled horrors; dark-meated fish; and other orphans of the American dinner table, all begging for a home, at hamburger prices and below.

Last summer, at a friend's backyard barbecue, we were surprised by the arrival of two more guests, their trunk brimming over with a good-sized haul of Jersey blues, which they had filleted on the boat. Moments later, the aroma of fresh-caught bluefish grilling over charcoal made everyone forget the countless hotdogs and hamburgers they had just consumed, and belly up to the barbeque. The feeding frenzy lasted until day, and the last fillet, were done. Afterwards, a friend remarked to me that, while he didn't ordinarily eat fish, he makes an exception with blues, because "they don't taste fishy." But far oftener, dabblers in flounder and sole reject bluefish, on the grounds that "they taste too fishy." This shows that there is no universal meaning attached to the phrase "fishy tasting," save, "tasting not to my liking," or still more probably, "something I would not like to be tasting."

Last week, I was dining out in the company of friends. Brian, a three-year-old gourmand, expressed an interest in the superb mussels in white wine that I was noisily imbibing. Just as I was about to show him how to eat his first mussel, a cry came from across the table: "don't give him that! He won't like it!" Brian, who dotes on the most blazing Szechuan specialties, cast a pitying look at the children's food critic opposite him, and was initiated into the Order of Mussel Lovers.

As that food-wise three year old told me, "you can't know if you don't like something until you try it." In trying the following recipes, you will be richer for it, both in the pocketbook, and the belly. Always remember that overcooking is the ruination of any fish. The object in cooking fish is merely to warm it through,

ILLUSTRATIONS BY TONY HILLMAN

and blend its flavor with the other ingredients; not to break down tough fiber, as if it were a potroast.

Bluefish a la Grandma Angela Gonzalez

While any fish can be prepared in this manner, the style is especially *simpatico* with the assertively flavored, meaty character of bluefish, mackerel, and other dark-fleshed varieties. Canned boiled potatoes reduce preparation and cooking time to roughly that for a frozen family TV dinner. In this case, however, you will not have to switch on the 6:00 News to divert their attention from what they are eating. Do not attempt to economize by substituting something cheaper for the olive oil. In this recipe, it is not just a frying medium, but an essential flavoring agent, as well. Bluefish is cheap and plentiful all year 'round in New Jersey markets, particularly during the summer, when they invade our coastline in hungry pursuit of smaller species, such as bunker and alewife, on which they may triple in size in one season.

2 pounds fresh bluefish fillets, cut into serving sized pieces (Note: when the fish is cooked whole, the bones impart a stronger flavor to the flesh.)

1/2 pound onions, peeled and cut crosswise, and separated into rings

1/2 pound green peppers, seeded and coarsely chopped

3-4 large cloves of garlic, chopped fairly fine

1/2 cup fresh parsley, chopped fairly fine (Note: the Italian variety, recognizable by its flat leaves, is the more flavorful.)

2 dried bay leaves

1 teaspoon dried thyme

1 teaspoon dried basil

1 can crushed tomatoes

1 can small white potatoes, drained

olive oil

salt and pepper

Preheat oven to 350 degrees. Pour olive oil into an oven-proof baking dish, to a depth of 1/8 inch. Scatter onion rings, peppers, garlic, parsley, bay leaves, thyme and basil over the bottom, season with salt and pepper, and toss ingredients until they glisten with oil. Place dish on middle rack, stirring from time to time, until the peppers are softened, and the onions golden. Pour the crushed tomatoes and potatoes over all, stirring to combine, and to dislodge bits of vegetables stuck to the dish. Season the fillets with salt and pepper, arrange in the dish, and cover with sauce. Return dish to oven, basting fish with sauce every few minutes, testing fish for doneness after 20 minutes. When the fish falls into flakes, it is time to fall into fish. Serve from baking dish, garnished with plenty of fresh sliced lemons. A simple green salad, lightly dressed with oil and fresh lemon juice or vinegar, completes the meal. Be sure to have plenty of crusty bread warming in the oven, to sop up every savory drop!

Note: This is an excellent way of dealing with frozen fish and fillets, which need not be defrosted before cooking. The cooking time is only slightly increased, so be careful not to overcook. □

Completion of playground climbing equipment at Rockingham Picnic Area.

YCC *a natural experience*

RICHARD C. FUSICK

The New Jersey Youth Conservation Corps has been established to offer job opportunities to youths between the ages of 15 and 18. The idea is to have young people work in an outdoor setting while learning concepts of conservation and gaining an insight into human relationships.

As a science teacher, I became interested in the program and introduced to its principles at an orientation meeting of directors and staff members held at Stokes State Forest. I was hired as an assistant director of the Lebanon State Forest YCC and at Stokes I met Tim Dunne, the director of the Lebanon program. Tim was a recent graduate of Cook College with a degree in wildlife biology. His enthusiasm and knowledge of wildlife impressed me.

Our objective was to take twelve young people of various backgrounds and try to help improve and maintain Lebanon State Forest. In the process we were to teach various environmental concepts and, furthermore, develop a sense of unity within the group. The latter became a task which soon caused me to become skeptical about some of the YCC ideals.

A computerized selection of youths came to us in as diversified a manner as can be imagined. Differences that existed in the group included race, religion, socio-economic backgrounds, sex and, of course, a variety of different individual temperaments.

The greatest difference seemed to be in their own self-image of being either a "jock" or a "burn-out." These terms permeated most of the conversations among the twelve enrollees. It presented a barrier that was difficult to break through.

We began work on park improvement projects and within a few weeks completed two privies (a sophisticated term for out-house), began timber stand improvement in a white cedar swamp and initiated work on a natural playground equipment project. Within this time it became very apparent that our so-called "burn-outs" were not burned out at all. A number of them showed a high degree of creativity and imagination, while two others proved to have probably the greatest mechanical reasoning ability of any of the enrollees. They were just as industrious and capable as the "jocks," but the barrier between the two groups remained.

The YCC program allotted ten hours of environmental education for every forty-hour work week. After half of the summer was over we accumulated enough extra E.E. time to take a full-day trip to Belleplain, another N.J. state forest. Before getting to Belleplain we toured Brigatine Wildlife Refuge as part of the day's educational activities. Once we arrived at Belleplain we toured the forest and visited their YCC group.

One nice aspect of environmental education is that you can interpret its meaning in a very broad sense. We were challenged to a softball game by the Belleplain YCC and accepted the challenge. We chalked it up to environmental appreciation. It would be difficult to argue the fact that without adequate open space softball and many other forms of recreation would be impossible. Besides, part of the YCC's purpose is to improve human relationships.

The softball game took place within a very friendly atmosphere. To make a long game short, our adversary, Belleplain, was up in the bottom of the seventh and final inning. The score was 3 to 3. The final play of the game was a play at home in which a "burn-out" catcher tagged "out" the runner. The game ended in a tie and everyone was happy. Exuberance can best describe the feelings at the end of the game and as might be expected the term "burn-out" literally started to burn out. Numerous examples of similar happenings started to occur from that point on. To my amazement, I watched barriers collapse.

Ever so gradually, the group became closer and closer. By the end of the summer a strong alliance developed between the YCC enrollees, and, God help the outsider who might attack any individual member. He would quickly find himself engulfed by eleven other YCC members and thrown in the middle of

PHOTOS BY AUTHOR

Cargo net playground structure completed by the YCC at Pakim Pond.

Working on a parking lot entrance to the Batona Trail.

Pakim Pond or some other local body of water.

The YCC became a very rewarding experience for me. I watched ideals become realities. Young people learned about nature by touching and become part of it. Significant work was accomplished in areas of timber stand improvement, recreational facilities, and general park maintenance. Human relationships were improved simply because the job always required cooperation among individual.

Many worthwhile interactions also occurred outside of the group. These included meeting other YCC groups, dealing with the general public and working in cooperation with the entire park staff at Lebanon. All such encounters were friendly and educational.

It is worth mentioning that without the cooperation of the Lebanon State Forest superintendent and his staff our job would have been far more difficult. As an avid camper I have always been impressed with the physical conditions and quality of personnel in New Jersey state forests. My YCC experiences have only acted to verify these past impressions.

Since the park was well maintained and a high degree of cooperation existed between the staff and YCC members, an enjoyable working atmosphere was created. In many areas YCC enrollees learned the value of social harmony. Environmental education was not considered a separate entity, but instead, woven into the entire scheme.

The New Jersey Youth Conservation Corp is far more than just a job opportunity for young people. It is a human experience that deals with all of life's intricate relationships. □

TREEFROG T-shirt

Endangered and Nongame Species Project

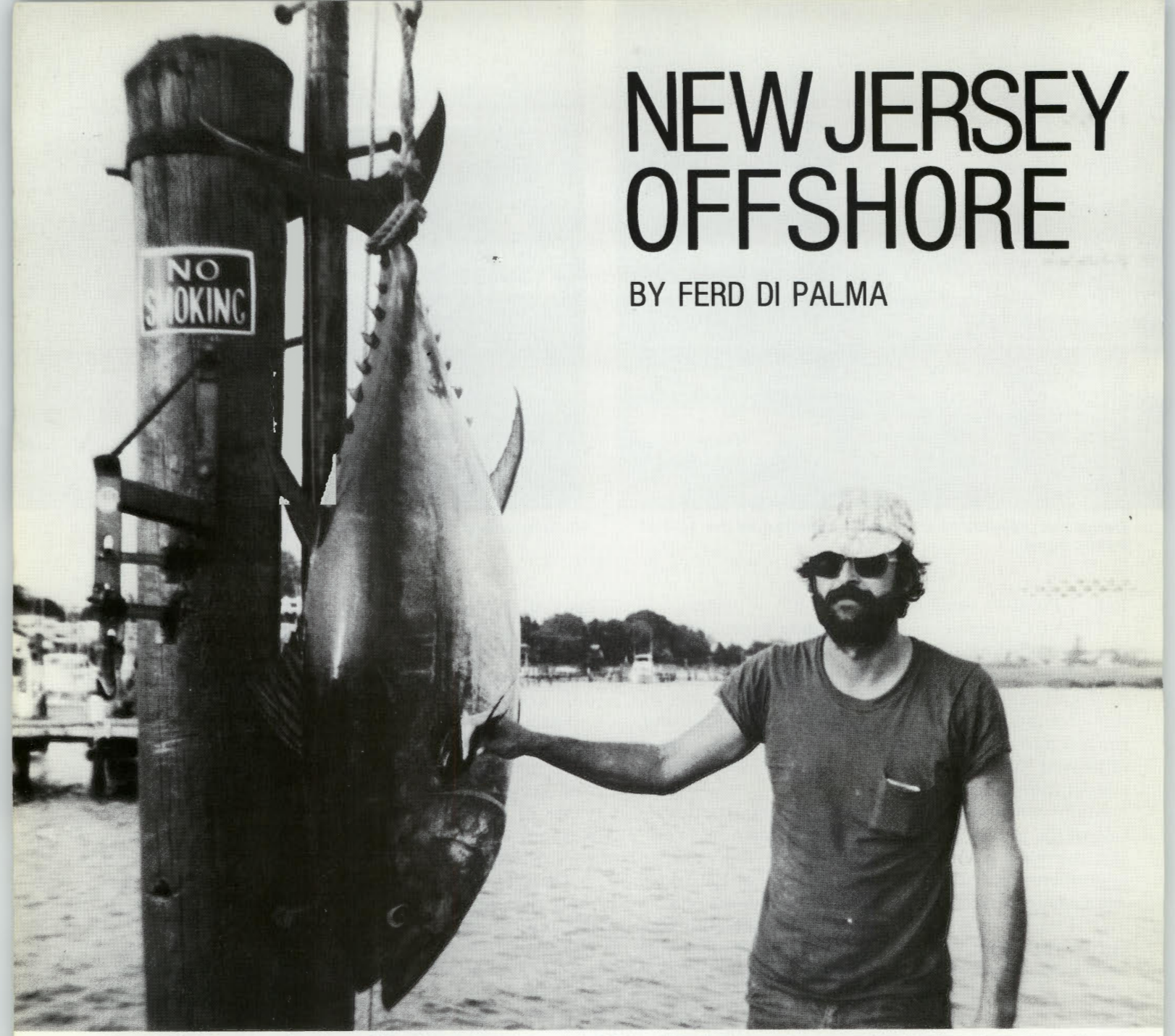
The Endangered and Nongame Species Project is proud to announce a new T-shirt featuring the endangered pine barrens treefrog posed on a blueberry bush. All proceeds from the sale of these cotton T-shirts will be directed towards the protection of New Jersey's endangered wildlife.

The T-shirts are pale yellow with blue lettering and can be obtained by submitting your name and address, and size (S M L XL) with a check/money order for $5.50/shirt plus $0.65 for first class postage and handling (add $0.50 for each additional shirt ordered) to the Project office:

Endangered and Nongame Species Project
Division of Fish, Game and Wildlife
P.O. Box 1809
Trenton, New Jersey 08625

NEW JERSEY OFFSHORE

BY FERD DI PALMA



It took Rich Rand two hours and 15 minutes to subdue this 220-lb. Atlantic bigeye tuna from the fighting chair of the 28-foot Bertram *Sabre*.

For the past decade a lively big-game sports fishery has been developing in New Jersey's far offshore waters of the Hudson canyon and the continental shelf. This area, where the sunwashed surface of the sea takes on glints of cobalt blue as if to reflect its nearness to the adjacent Gulf Stream, need yield to no other section of the East coast in the variety of gamefish it offers.

It was some 10 years ago that a couple of party-boat operators out of Barnegat Light made a few exploratory trips to these far offshore waters—journeys that ranged from 70 to some 100 miles east and southeast of the home port. The original quarry sought was the tilefish, a large, multicolored species suddenly plentiful after many years of decline. It was not long before sport anglers realized that dragging heavy sinkers and 12-0 hooks baited with whole squid along the deepwater recesses of the continental shelf was not the only game in town. The rims of the Hudson canyon, a deepwater trench formed over immense periods of time by the currents of the Hudson's river outflow, are home to the white marlin, a particularly popular gamefish much sought after because of the spectacular nature of its flight, which is conducted on the surface of the water with plenty of leaping and greyhounding. A marlin will sometimes leave the water in a shower of spray and spume as it pounces on a lure, only to come up with the enticing artificial crosswise in its mouth. Then like a

PHOTOS BY AUTHOR

thrashing wraith, it is gone. At the present time most of these splendid sportfish, which weigh about 50 to 70 pounds, are tagged and released. The angler who wants to keep the trophy for mounting would be well advised to investigate the cost of good taxidermy service first. He may then opt for tag and release and be quite content with a picture of his gamefish.

Blue marlin, weighing a quarter-ton, are by no means strangers to New Jersey's offshore waters, but their incidence can only be considered a minor part of the total sportfishing scene.

Not so the tuna: The depletion of the bluefins notwithstanding, there still remain a variety of battling members of this large and popular family of fishes.

Largest of the more plentiful species is the Atlantic bigeye, sometimes called the Allison tuna. These 200-lb. and 300-lb. deepwater battlers give an excellent account of themselves when taken on 50-pound-test tackle. Their close relatives the yellowfin tuna are not far behind. Yellowfins usually weigh 50 to 90 pounds with some going to 100 and more. Last but not least of the New Jersey tuna is the albacore, or longfin tuna. The albacore is valued as the true white-meat tuna packed extensively for supermarket shelves. These fish range from about 25 to 45 or 50 pounds. If they are known to be present in quantity it would be a good idea to scale down equipment to the 30-pound-test level. All the marlins and the tunas will respond to trolled lures such as green machines, kona heads, clones, and jetheads. But New Jersey's bigtime angling does not end there. Other deepwater gamefish can be taken at night. More and more frequently charter captains and private sportsmen take their vessels to the canyon, troll until dark, then settle in for an all-night drift. Two rigs are drifted deep, 12-0 hooks baited with whole rigged squid. Attached a few feet away from the hook is a cyalume lightstick, a plastic cylinder about 12 inches long. The lightstick is divided into two separate compartments, each of which contains a chemical. When the separating seal is broken and the chemicals mixed, the cylinder glows with a luminous intensity which has proven to be an attraction for broadbill swordfish and mako sharks. Some say that the light itself excites the curiosity of the large gamesters. It is also possible that the luminous glow attracts lesser fish like moths to the flame and that these, in turn bring up their heavyweight predators.

The mako is recognized as a great gamefish by the International Game Fish Association. Its spectacular leaps, its completely savage fighting instinct and its reputation as a clear and present danger to any angler ready to tangle with it on a one-to-one basis make this fish a greatly sought-after prize. Add to this the facts that the jaws, with their inwardly curved teeth, make a fine mount, and that the flesh, properly prepared, is a gustatory treat, and you have the ultimate in angling thrills.

The ultimate? Not quite. That accolade is reserved for the broadbill swordfish. The absolute top. Although these comparative rareties have plenty of fight and are equally as good on the table as the mako, they present no real danger to the angler beyond that of any large gamefish throwing its weight around.

An 80-lb. yellowfin tuna gives Edd Kluth a lively time in an all-out fight from the heaving deck of the 30-foot Sea Ray *Sea-Deuce*.

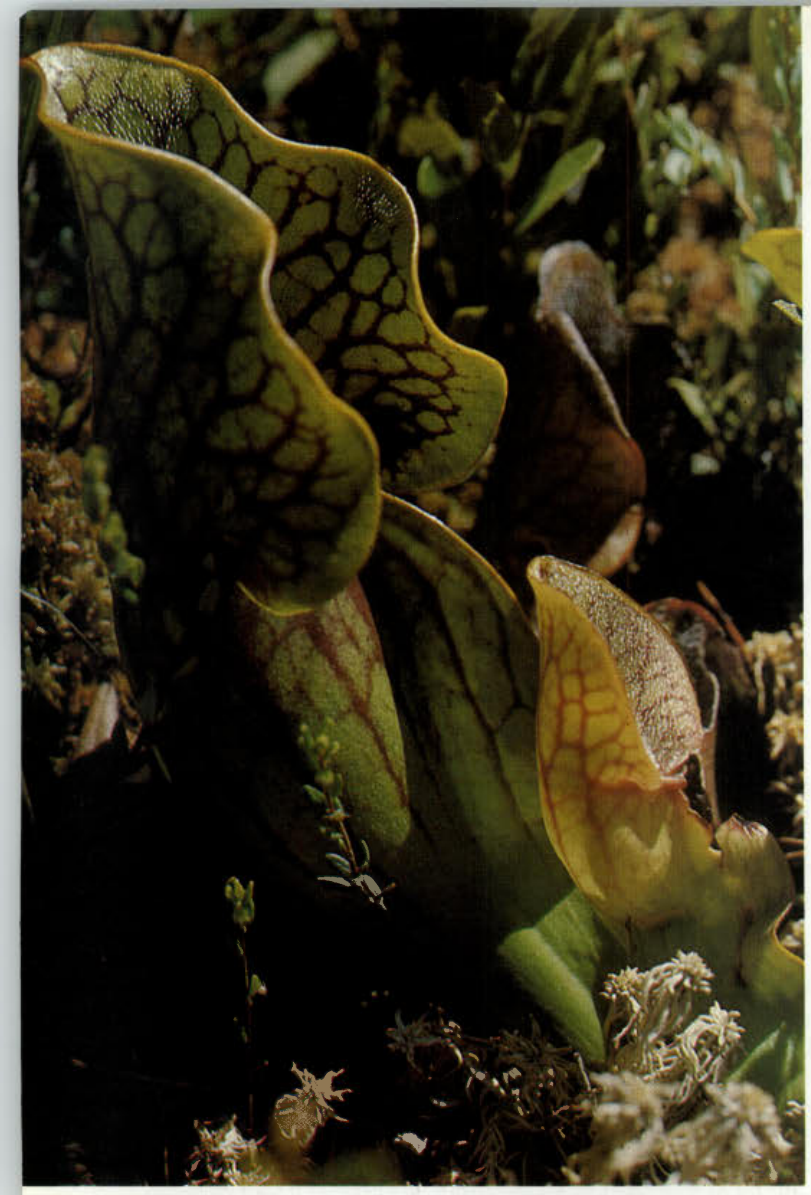
There are purists around who insist that the use of the lightstick is not a sporting method in the taking of the broadbill, but the fact remains that very few swords are baited successfully while lolling about on the surface. If the truth were known the majority of these "sunning" fish succumbed to the harpoon.

Tourism is New Jersey's second-largest industry, and sportfishing represents an important segment of this economic bonanza. There is ample evidence that the far offshore scene is also a fast-growing portion of the total recreational angling picture. While of growing importance in an economic sense this activity is not extensive enough to threaten either the migratory fish stocks or the environment. Anglers are well aware that self-discipline and careful attention to conservation and environmental quality can lead only to continued benefits and improvement in our sport fishery.

The charter captains who make the one- and two-day trips to the canyon are a knowledgeable, cooperative, and courteous group. The shelf area is big water and the vessels, whether professional or private, are always in communication with each other. Radio chatter invariably features phrases such as "Come on over to the west rim—we're doing just great on yellowfins." Then follows a reading of Loran C coordinate numbers so that the captain invited can surely find his friend.

It was the Loran C finder system that enabled the owners of private craft to join the professionals at this offshore fishery. A system of coordinate numbers appearing on the Loran screen translates into a position on the Loran C charts. When properly used the system can make a navigator out the most confirmed landlubber.

Even so, most vessels proceed with extreme caution and will not venture out unless a group of two, three, or more boats make the trip together. These vessels maintain radio contact and keep a sharp ear attuned to weather stations. Should a few depart because their commitment is for a single day rather than the two-day stint, the standard radio message from the others is: Have a safe trip home. □



The Pitcher Plant's downward-pointing hairs and red veins lead insects to their watery end.

PLANTS OF PREY— Our Local Carnivores

BY FRANK W. KNIGHT, JR.

PHOTOS BY AUTHOR

To Charles Darwin, the Venus Fly Trap was the "most wonderful plant in the world." This "miracle of nature," as Linnaeus described it, can today be purchased at many garden centers and even at supermarkets. Some contemporary botanists nominate the Bladderwort for "most wonderful" honors. Both are carnivorous plants —fascinating to both botanists and laymen because they have turned the tables on animals and beat them at their own game by developing features which enable them to capture and digest small animals.

Worldwide there are some 450 species of carnivorous flowering plants in 15 genera and 6 families, plus more than 20 species of carnivorous fungi. Within two hours' drive of New York City, the careful searcher can locate 17 species of flowering carnivores. Appropriate footwear for wading in mud is a must for such a quest since all our species and the vast majority around the world are inhabitants of quiet pools, swamps, or bogs. The seemingly rich black ooze of these wet locations is deceiving. Bogs are highly acidic, and acid leaches out many minerals. The cold acid water inhibits decay so that minerals are locked up in undecayed plants and animals. As a result, the fertile-looking soil is largely sand colored with chemically sterile carbon material. In order to prosper in such environments, some plants have evolved carnivory to supplement essential nutrients, especially nitrogen.

The best place to find carnivorous plants is in New Jersey's Pine Barrens and there are two approaches: on foot or by canoe. The simplest way is to pick any of several State Forests in the Pine Barrens—Lebanon, Wharton, Penn, and Bass River State Forests are four —and once there, follow a trail down to a lake or river. You will find carnivorous plants in the water, at its edge, and on the low wet boggy land on the shore. You can find the state lands with any good roadmap, or even better, get a more detailed map from the New Jersey Department of Environmental Protection, John Fitch Plaza, Trenton 08608. When you arrive at the park you choose, get a detailed map at the park office.

The more adventurous approach is to begin in the water and then go ashore in search of plants. For an easy four-hour trip, begin at Oswego Lake and canoe down the East Branch of the Wading River to the Harrisville Dam. Add additional time to stop for a picnic lunch and botanizing. To find carnivorous plants, explore the river's quiet backwaters and along the shore as the river begins to widen out at the approach to the dam. You may rent a canoe for under $15 including transportation from Mick's Canoe Rental (609-726-1380) or Pine Barrens Canoe Rental (609-726-1515). Both have the same mailing address: Rt. 563 (Jenkins), P.O. Chatsworth, NJ 08019.

When you have decided where and how to explore, it will be helpful to have a clear idea of what you are looking for. Look up the plants described here in a wildflower field guide. Among the best are *Field Guide to Wildflowers* by Roger T. Peterson & Margaret McKenny, published by Houghton-Mifflin, and *Newcomb's Wildflower Guide* by Lawrence Newcomb, published by Little.

You won't find America's most famous carnivorous plant, the Venus Fly Trap, in New Jersey since its natural habitat is restricted to a small area in the Carolinas, but you will find all the other North American families represented. Our most common and widely distributed carnivore is the Pitcher Plant, *Sarracenia purpurea.* One of nine American species, it is the only one growing in the North. Composed of a rosette of deep red leaves, each a cornucopia curving in a single plane, the Pitcher Plant has both grace and beauty. The leaf trap functions as a passive pitfall. Insects are attracted to the pitchers by their color and by the odor of violets secreted from nectar glands. Downward- and

Bright Bladderwort flowers belie the deadly traps hidden in the ooze below.

A Sundew in bloom attracting insect pollinators above and insect food below.

A prey's eye view of Sundew which offers the odor of fungus as bait.

Stalked glands of the Round-leaved Sundew arch over a tiny insect to begin its digestion.

inward-pointing hairs lead the unsuspecting prey on a one-way trip into the interior where a greased slide delivers them into the pitcher's watery depths. There a wetting agent prevents escape and digestive enzymes begin the process that will provide the plant with mineral nutrients.

Just as a little fish darts among the tentacles of the sea anemone immune to its paralyzing sting, a number of creatures thrive within Pitcher Plant traps. A mosquito and a gnat spend their larval life in the fluid. A fly maggot feeds on insect remains in the pitchers, and three closely related moths feed on leaves, flowers, and fruit after putting the traps out of business by collapsing their mouths.

Colorful names are given this common bog dweller: Sidesaddle Plant, Huntsman's Cap, and Frog's Britches. Natives of New Jersey's Pine Barrens, noting that the persistent side-facing flower parts resemble a timepiece without hands, call it Dumb Clock. These flower heads sticking up amongst the other vegetation help me locate the Pitcher Plant on the shore as I drift along in my canoe.

Sundews in the genus *Drosera* go about their sticky business as living, moving flypaper. Stalked glands or tentacles arise from the margins and upper surfaces of the leaf blades. These complex structures receive and transmit stimuli; secrete mucilage, odor, and water; and absorb the products of digestion. Tiny insects attracted to the red, glistening glands smelling of fungus get caught in the mucilage. Slowly, the adjoining tentacles bend over to touch the prey and in time the entire leaf blade closes on itself to cover the food source. The three species in our area are named for their leaf shapes: Round-leaved, Intermediate-leaved, and Thread-leaved Sundew.

I sometimes have to search on hands and knees for the Round-leaved Sundew at or near the water's edge, since young plants are often no larger than a thumbnail. The Thread-leaved is the easiest to spot since it stands up with the size and height of a grass blade glistening in the sunlight.

Despite the fact that there are 275 species of Bladderwort, more than half of the known plant carnivores, this is truly the world's most remarkable plant. Entirely rootless, with little distinction between stem and leaf, *Utricularia* occurs as a free floating or anchored aquatic or is terrestrial in wet or moist sandy soil. What makes it so remarkable are its tiny bladders, only 0.3 mm to 5 mm in length, which function like supersophisticated mousetraps. These flattened pear-shaped hollow bodies are unique, with no analogous structures occurring anywhere else in the plant kingdom. Their tiny size thwarted early investigators in attempts to understand their operation. Darwin and others thought that small animals simply "open the door and walk in." Actually, each trap when set is under negative pressure with concave sides. When an animal attracted to sugar secreted by the trap disturbs stiff bristles attached to the door, its seal is broken. The door opens inward, water rushes into the partially evacuated trap carrying the prey in with it, and the door snaps shut again—all within 1/33 of a second. Animals so trapped are digested within 48 hours. Besides ostracods like *Daphnia* and *Cyclops,* other prey include mosquito larvae, tadpoles, and tiny fish fry. Most of the 13 Bladderwort species in our area have yellow flowers borne on a leafless stem above the water's surface. If the flowers remind you of those of a pea or bean plant, they are probably Bladderwort. A few species have purple flowers, and one with white flowers, *Utircularia olivacea,* has the added distinction of being the smallest by weight of any flowering plant in the world.

A word about collecting carnivorous plants from the wild that applies to other native wildflowers as well: *Don't.* Increasing human population and resulting decreasing plant habitats make conservation the watchword of all plant enthusiasts. Growing carnivores as house plants has become popular and challenging hobby. Fortunately there are a number of commercial dealers who supply greenhouse-grown specimens. A good way to begin this hobby is to read *Carnivorous Plants of the U.S. and Canada,* a beautifully illustrated book by Donald E. Schnell, published by J.F. Blair, which provides tips on carnivore culture, how to subscribe to a carnivorous plant newsletter, and sources of plants. □

Washing before breakfast at the washrack lashed by campers.

Inner-City Children in the Out-Of-Doors

By Chris Chaapel

What happens to a 12 year-old child when she leaves her New York City home to spend four weeks camping in New Jersey's Kittatinny Mountains? Each summer more than 300 city children find out firsthand what it's like to make that dramatic change. They discover how it feels to wake up with the dawn to the sound of birdsong; wooded paths in sunlight, storm, and moonlight; sing softly around a flickering campfire; and fall asleep to the sound of a gentle rain on the canvas above them. Most importantly they learn how to depend upon the natural world for almost all their daily needs. Does the experience affect the children? Do they return to the city with a new awareness of themselves and their surroundings?

During one summer I had the opportunity to work with inner-city children at the Trail Blazer Camps, Inc., property in High Point State Park. As part of my graduate study in Environmental Education I designed a research project to examine the effects of a primitive camping experience on city children's perceptions of the natural environment. Following is a description of the camp program, and the results of my study.

The Trail Blazer Camps (adjoining girls' and boys' camps) are located in the northwest corner of the state on a 1000-acre tract of private land surrounding Lake Mashipacong in High Point. The Camp's philosophy is simply to get city children into the out-of-doors where they can learn by direct experience about human dependence on the natural world. As their buses travel from downtown Manhattan to rural Sussex County, the complexities of everyday city living fade away. Crowded buildings, busy streets, and noisy traffic disappear, and for the next month life is reduced to the simple affairs of living in the woods.

The children live in small decentralized camps of eight girls and two co-counselors. The youngest campers sleep in canvas "longhouses" with wooden floors; older girls may live in authentic Indian tipis or floorless, arched "round-to's" open on three sides. The girls in my small camp slept under the outstretched canvas slide flaps of two old Contestoga wagons. Cots are provided with mosquito-netting canopies.

The comforts of home are simple. A narrow pipeline brings cold water across the forest floor to each small camp. This is the only source of water for cooking, drinking, and washing. There is a wood-framed pit toilet, but, of course, no electricity. Staples such as flour, oatmeal, peanut butter, and molasses are stored in a wooden food box lashed out of mess wagon. Perishables are stored for short periods in damp underground caches. For those meals which are prepared away from the central dining hall (usually one or two a day), each small camp has a set of dishes and utensils. A primitive stone fireplace is built and overlain by a metal grate. Iron frying pans, griddle, and dutch oven are provided, as well as an old washboiler "oven" for baking. There are wooden racks lashed from saplings for washing and storing the dishes. Two tables—one in the open, the other under a canvas fly for wet weather-consist of heavy boards laid across sections of large tree trunks.

The washing area consists of another lashed rack. Each child is given a basin, cup, towel, and washcloth. Two rock-filled drains carry the water away into the ground. An evening campfire circle, a tool rack, a small collection of books, and three kerosene lanterns complete the small-camp conveniences. All in all, it is quite a change in lifestyle for these city-bred children!

During the four-week stay, each small group chooses and conducts its own program. Much of the day's activity centers around the simple affairs of living. For those meals prepared in the small campsite, the children plan their own menus, order and pick up food from the central camp store, and compute food costs. The campers prepare and cook the meal themselves, often adapting a favorite recipe from home. Dishes are washed in water heated over the fire and then sterilized in a boiling water bath. Many of the camp's vegetables are grown in a large community garden, which the children weed and harvest themselves. (Former campers have made a trip from the city to the mountains in May to plant the garden.) Often, a meal will include something from the wild: elderflower fritters, black birch tea, wild blueberries for pancakes or muffins, or wild leek and potato soup. A dawn fishing trip may yield fresh sunfish or bass for breakfast. What better way for children to learn that food comes first from the good

PHOTOS PROVIDED BY AUTHOR

Evening campfire is a time for story-telling, singing, and talking about tomorrow's plans.

earth, rather than from cans, boxes, and frozen-food trays?

There is work to be done around the campsite, and each girl does her part. One day she may be head cook, the next day she may be responsible for setting and clearing the table. Of course there are always dishes to wash, and a fire to tend. If she's "handyman" it's her job to clean and refill the lanterns in the morning, disinfect the latrine and toss down some wood ashes, lay the evening campfire, and keep the water jug filled. The woodpile is kept high, the tinderbox full, and the tools sharpened.

Lashing is a necessary skill to be learned, so that kitchen or washbasin racks can be repaired or rebuilt. Saplings are chosen and selectively cut for this purpose. The sawed-off stumps are covered over with damp leaf litter to hasten the decay and recycling process. There is firewood to gather, cut, and split, and safe handling of the boxsaw and ax is stressed. Children who formerly took electric or gas cooking for granted must suddenly learn to find fuel that will burn down to hot coals for cooking. They learn that dry blueberry twigs and birch bark make excellent tinder, and that sassafras will burn when it's wet. This knowledge may not be vital for life back in the city, but it certainly opens children's eyes to their dependence on the natural world, and gives them a taste for life in simpler times.

Swimming is an almost daily part of the program, and so are hot, quick showers in the central bathhouse. Apart from the daily routine, the group may plan a day hike on the property and take along a wildflower field guide. Or, they may want to learn how to saddle and bridle the donkeys and take turns riding. Rowboats are available for exploring the lake's bog area, picking blueberries from the shoreline, or just plain relaxing.

Maybe a fishing trip has been planned for early evening, in which case a worm-hunting expedition is in order. Looking for worms uncovers countless other wonders hidden beneath rocks and logs: a busy ant colony, a brightly-colored salamander, a sprouting acorn, the tiny and beautiful ring-necked snake. Nothing is harmed or taken from its natural environment. The lesson is clear that everything has a home, and while a red eft may look lovely in the forest, it would not survive a bus ride back to Queens!

Crafts are usually history or nature-oriented. Dry laurel branches may be cut into thin sections and whittled into rings. Natural clay may be dug and used for handmade pottery. A group of campers may ask the cook to save all the meat drippings for a week, and then make tallow candles or homemade soap.

The girls absorb an effortless history lesson while they are having fun.

Once during the four-week stay the girls plan a two-night "vagabond" away from their campsite. Our group decided to take along two of the donkeys as pack animals, adding to the adventure. Of course, a "home away from home" has to be built from scratch, and all traces carefully removed before leaving.

Life is not all high adventure, though, and a sleepy Saturday morning can be spent just relaxing, reading, or "housecleaning" in the small campsite. Every other Sunday afternoon there is an all-camp concert on the lawn, featuring whatever musical talents the staff brings. Most of the selections are classical.

Exactly what kind of children are these who come to Trail Blazers? They range in age from seven to sixteen. They come from the relatively disadvantaged neighborhoods of New York City, referred by a variety of social-service agencies. They are of varied racial and cultural backgrounds. Their feelings at the start of the month range from excited anticipation to apprehension and real fear.

My research was designed to find out whether an extended primitive camping experience would affect these children's views of the natural environment. Difficult as it may be to measure feelings and perceptions with "pencil-and-paper" techniques, I used three such instruments in my study. The primary instrument was an environmental perceptions inventory—a series of 25 statements for which the children would mark either "agree" or "disagree." Two secondary instruments were also used: a listing exercise entitled "Ten Things I Love to Do," and a drawing and writing exercise entitled "Favorite Places." In addition, on the way to camp a questionnaire each child completed indicating how much previous out-of-doors experience she had had.

The three instruments were administered to the children by their counselors during the first three days of camp. The environmental perceptions inventory was readministered as a post-test two days before camp ended. The papers were later scored and analyzed statistically. Sixty-four girls participated in the study (two youngest groups, aged seven and eight, did not).

The perceptions inventory was intended to find out whether a child had a positive or negative perception of the natural environment. For example, if a child agreed with the statement "I like to go for hikes in the

Continued on page 17

Curly Grass Fern *(Schizaea pusilla)* PHOTOS BY THEO ROBINSON© 1978

New Jersey's Famous Little Fern

BY RICHARD RADIS

It may seem strange to call a tiny, inconspicuous, unfernlike fern famous. Redwoods, ancient bristlecone pines, or historic old oaks might be popularly thought notable, but obviously not a small fern. And yet, for more than 150 years, the Curly Grass Fern (*Schizaea pusilla*) has drawn botanists and amateur naturalists to the bogs of New Jersey's Pine Barrens. Until recently, southern New Jersey was the only place in the United States where the fern could be found, and it was in the Pine Barrens that the species was first discovered.

The casual observer would probably not recognize Curly Grass as a fern, since it does not resemble its lacy-cut, larger relatives. Moreover, it is a minute plant, no more than three or four inches tall, and is often virtually indistinguishable from the grasses and low growth surrounding it. Its sterile leaves, present year-round, most resemble leaves of grass—hence the name Curly Grass—while the spore-producing fertile leaf, which comes up during the summer, is shaped somewhat like a small hand and is borne upon a slender stalk a few inches tall. In New Jersey, Curly Grass can be found only in the acid bogs of the Pine Barrens, growing in association with Thread-leaved and Spatulate-leaved sundews, Bog and Carolina clubmosses. It frequently grows at the base of the White-Cedar, concealed by surrounding plants, and a meticulous search on hands and knees is often required to detect its presence.

The plant has a long and well-documented history. It was first discovered in 1805 at Quaker Bridge by a party of naturalists consisting of Dr. C. W. Eddy, J. Le Conte, Frederick Pursh, and C. Whitlow. Although Pursh received credit, in print, for the plant's discovery, he neglected to mention the others in his party, and some contemporaries claimed that Dr. Eddy was actually the discoverer. Even botany has its disputes. The naturalist Rafinesque (Constantine Samuel Rafinesque Schmaltz, 1783–1840), no stranger to controversy himself, claimed that Pursh had not personally found any specimens and had published his information without the permission of the true discoverer. In any case, the discovery created considerable excitement, and the Curly Grass Fern became one of the main attractions of the Pine Barrens for visiting naturalists.*

At that time Quaker Bridge had an inn where it was customary to stop over during trips to or from the coast, and the place gradually achieved fame among botanists as the location of many rare or previously unknown plants. Curly Grass was rediscovered at Quaker Bridge by the well-known botanist John Torrey in 1818. Thereafter, with more and more of the Pine Barrens being explored by

*Witmer Stone, *Plants of Southern New Jersey*, 1911.

Grass Pink *(Calopogon pulchellus)*

Thread-leaved Sundew *(Drosera filiformis)*

Spatulate-leaved Sundew *(Drosera intermedia)*

botanists, the fern was found to be generally distributed throughout the area in acid bogs.

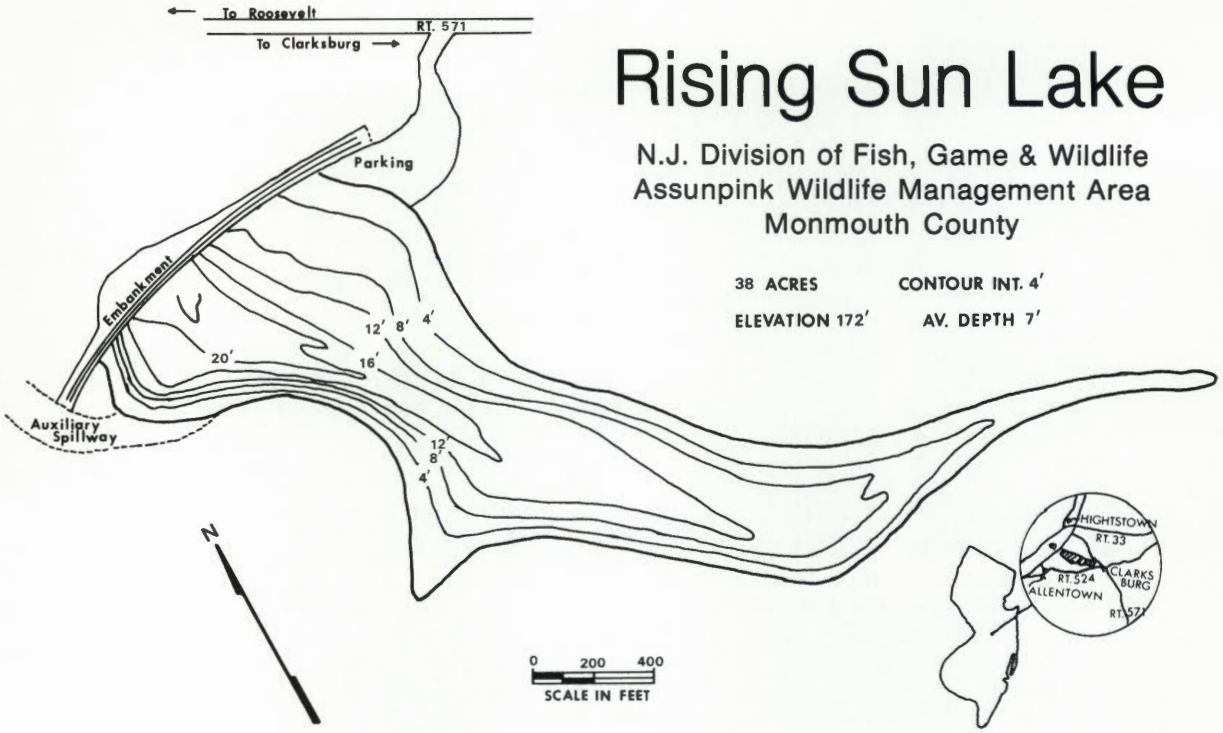
I recently visited Quaker Bridge, driving north from Batsto Village along sandy roads. The trip would be ill-advised in a conventional car, as the ruts are deep and treacherous. Better to hike the few miles from Batsto or to canoe along the Batsto River. A small bridge still crosses the river at Quaker Bridge, but all traces of the old inn have disappeared and it is now a lonely spot, the silence punctuated occasionally by the songs of Towhees, and of Pine and Hooded warblers. An unusual thing in New Jersey, to have a feeling of such isolation, and probably rare enough even here, judging from the tire tracks and beer cans. Best to come on a weekday and retain the illusion.

I looked for Curly Grass for several hours without much luck. Thread-leaved and Spatulate-leaved sundews were in bloom, and there was a solitary and very late flower of Grass Pink, one of the state's more common orchids. Massachusetts and Virginia Chain ferns were growing along the edges of the bog. Finally, while bending down to get a closer look at a sundew, I noticed two very tiny fertile fronds of Curly Grass barely rising above the surrounding plants at the base of a White-Cedar. Further searching produced about 30 plants, all very tiny, much smaller than specimens I'd seen earlier in the day at a bog further north. Interestingly, the location coincided almost exactly with Torrey's description from 1818: ". . . about forty-five yards from the west end of the bridge on the left side as you approach Philadelphia, and about twelve feet from the road."*

There is a curious charm in rediscovering for oneself old botanical stations. This is due in part, I'm sure, to finding that a few places remain untouched in an age when all open land seems in danger of being bulldozed and "developed." So many of the old spots no longer exist, or have been so altered that their floras have become pauperized. With this comes a heightened appreciation of the special value of New Jersey's remaining bogs: botanical museums of plants which can be found nowhere else or only far to the north or south—another of the many reasons for preserving the Pine Barrens before it is too late.

But there is also a more lyrical side to this visiting of old location, for it is a way of recapturing a time long gone, when the continent was still fresh and its plants largely unknown, when every exploration brought some new species to light. Standing at Quaker Bridge that day, I imagined myself in the party along with Eddy, Le Conte, Pursh, and Whitlow. My own discovery of the Curly Grass Fern took on a depth and excitement beyond that of simple plant-hunting. I examined that singular plant with the eye of one who had never seen or heard of it before, and learned more than if I had simply read its description from a botany text. It was a journey of many years back to the main road. □

*Stone, 1911.



Rising Sun Lake

N.J. Division of Fish, Game & Wildlife
Assunpink Wildlife Management Area
Monmouth County

38 ACRES CONTOUR INT. 4'
ELEVATION 172' AV. DEPTH 7'

Rising Sun Lake is the product of the joint efforts of the U.S. Soil Conservation Service, the New Jersey Division of Fish, Game and Wildlife, the Federal Aid to Sport Fish Restoration Program administered by the U.S. Fish and Wildlife Service and the New Jersey Green Acres Program. It was built to provide flood protection for the Assunpink Creek drainage as well as fish and wildlife habitat and recreational opportunity. It was designed to enable the application of established fisheries management techniques and was first filled in 1971. Rising Sun Lake has a maximum depth of 26 feet and a surface area of 38 acres.

The fisheries management program here is directed toward a warmwater fishery based upon largemouth bass as the major predator.

Parking facilities and a boat launching site for both car top and trailer boats are available at the lake's primary access off the Roosevelt-Clarksburg Road. Only electric motors are permitted. The majority of the impoundment's shoreline is easily accessible to bank fishermen.

During the fall the lake is a popular resting spot for migratory waterfowl and this makes it popular with duck hunters.

Location:

Northeast corner of the Assunpink Wildlife Management Area, approximately mid-way between Roosevelt and Clarksburg on the south side of Rising Sun Tavern (Roosevelt-Clarksburg) Road.

Chemical Features:

pH: Slightly acidic, generally about 6.4.

Dissolved Oxygen: Adequate for fish life at all depths except in summer when it is generally adequate only between the surface and a depth of 10 to 12 feet.

A variable level water release capability is a feature of the dam. It benefits the fish production capabilities of both the impoundment and the stream below. Cold oxygenated water is maintained in the stream below and the volume of lake water capable of supporting fish is increased by the drawing off of a portion of the deep oxygen-depleted waters present during the summer.

Productivity: Moderate

Biological Features:

Aquatic Vegetation: Limited to the extreme eastern end of the pond and shallow perimeter waters, where moderate stands of submergents are found.

Water Color: Normally a slight brownish tint.

Fish and Fishing:

Largemouth bass: Good. Population checks have invariably found a number of bass in the two to three pound class. Reproductive success has not been sufficient to maintain year class strength in some years and in these instances supplemental stockings of yearling bass have been made.

Sunfish: Both bluegill and pumpkinseed are present, with the pumpkinseed more numerous. The growth rates of the sunfishes, especially the pumpkinseed, are below average. It is recommended that this species be actively harvested to encourage better growth, as the majority of the sunfish are less than five inches in length.

Chain pickerel: A limited population is present, with a few large fish being caught each year.

Channel catfish: Good. Periodic stockings of this species have been made since 1975 and individuals up to twenty inches have already been caught.

Brown bullhead: Abundant, with excellent size fish taken, many fish over 10 inches in length have been caught.

Other Species: The following have been verified: Creek chubsucker
Golden shiner
Banded killifish □

Environmental News

HARRY GROSCH

TROUT FISHING ON THE FLATBROOK. Opening day trout came up sunny and look who's fishing— DEP Commissioner Jerry English, Governor Brendan Byrne, Jim Stabile, Public Information Officer, Department of Corrections, netting the Governor's strike, and Robert Mulcahy, Executive Director, N.J. Sports and Exposition Authority.

Cabana Club acquired

MORE FUN OPPORTUNITIES AT LIBERTY STATE PARK ON TAP FOR NEXT SEASON

The recent state acquisition of the Skyline Cabana Club, a private recreational facility adjacent to Liberty State Park on the Jersey City waterfront in Hudson County, will provide a dramatic increase in leisure-time activities for users of the park. Plans call for the 15-acre addition to Liberty State Park to be open for the 1981 season. The $1.8 million needed for this purchase will come from the 1974 Green Acres Bond Issue Funds.

The cabana club, a multi-recreational facility located off the entry drive to the park, includes a major swimming and diving pool with spacious surrounding grass areas; 8 all-weather tennis courts; 4 all-weather handball courts; a day care complex with wading pool and training pool; a covered outdoor amphitheater with a capacity of 250-300 persons; a baseball field; basketball, volleyball, and shuffleboard courts. The large building can house 1,000 people for stage and cultural activities such as concerts and shows. The cafeteria complex can provide "quick lunches" for day users, with the kitchen providing food services for 1,000 persons. There is a parking area.

DEP Commissioner English remarked, "We are excited about this opportunity to have a recreational facility ready to open next season. The Skyline Cabana Club offers DEP the opportunity to provide recreational activities recommended in the Liberty State Park Commission findings, not only to day-use visitors, but also to the children and youth of Jersey City and other nearby urban areas." (Purchase of the Skyline Cabana Club will permit DEP to meet its commitment to Jersey City to provide for the relocation of Camp Liberty, a summer day camp run by the municipality. Land and facilities at the club will be adequate for the day camp.)

Commissioner English said, "The facilities are not only immediately available, but also are being provided at a fraction of what it would cost to duplicate them today. A very close look at the conditions of the structures and pools show that many future years of service can be anticipated. We are fortunate that the facilities already constructed can be converted into public use without extensive delay or exorbitant costs due to inflation." □

Coastal planning

GRANTS OK'D FOR SEVEN LOCAL SHORE PROJECTS

Governor Byrne in late April announced the approval of seven grants totaling $121,000 to local governments for planning waterfront projects including dune protection, improved beach access and park expansion. DEP's Division of Coastal Resources administers this grant program which is funded by the U.S. Department of Commerce, through its National Oceanic and Atmospheric Administration (NOAA) under terms of the federal Coastal Zone Act.

DEP Commissioner English explained that under the program DEP provides local governments 100 percent funding to plan projects which help further state coastal objectives, such as public access to the waterfront and creation of waterfront parks; revitalization of underused waterfront districts; solution of dredging and dredge spoil disposal problems; mitigation of coastal hazards; and wise planning for the optimum use of limited waterfront lands. The plans are intended to be used as the basis for seeking additional funding from other sources for project implementation.

The seven grant approvals: To *Ocean City* (Cape May County), $11,000 to conduct a dune protection demonstration project relying on citizen volunteers; *Greenwich Township* (Gloucester), $15,000 to develop plans for a waterfront park on the Delaware River; *Hudson County,* $20,000 to plan for the redevelopment of the western half of Lincoln Park on the Hackensack River in Jersey City; *City of New Brunswick and Borough of Highland Park* (Middlesex), $15,000 to plan for expansion of and improved access to Boyd Park and Donaldson Park on the Raritan River; *Old Bridge Township* (Middlesex), $20,000 to plan for improved recreational opportunities along the township's two-mile Raritan Bay waterfront; *Deal Lake Commission*—a municipal corporation comprised of the towns of Allenhurst, Asbury Park, Interlaken, Lock Arbour, Neptune and Ocean Township (Monmouth), $20,000 to study alternative solutions to the lake's siltation problem, and develop a recreation plan

Continued on page 16G

English on the Environment

Some say the world will end in fire,
Some say in ice . . .
I hold with those who favor fire . . .
But . . . for destruction ice
Is also great
And would suffice

When the American poet Robert Frost wrote those lines in the early 1900's even Doomsday was simpler, with fire and ice symbolizing the leading possibilities. But now many scientists and ecologists are nominating pollution, warning that society's quest for better living pays unwanted dividends of dangerous wastes which might do us in.

We find that as our technology flourishes, our wastes often grow more dangerous in quantity and quality. Safe disposal of wastes is now a serious problem. Some wastes can be buried in a landfill, burned or even discharged into streams, lakes or the seas—but only if we are sure they are harmless to us and other living things. Breaking that rule results in pollution of air, land and water.

Wastes placed on or in the ground will be carried to surface waters or underground water-bearing formations along with rain and melting snow. Raw wastes were once released directly into streams and other surface waters, but the volumes and growing toxicity now surpass the natural ability of the waters to purify —thus, the need for regulations on water pollution control, wastewater treatment and sewerage facilities.

Open burning of wastes causes air pollution, as does inadequate incineration. Aside from the direct threats of air pollution, it eventually comes down with rain and snow to damage land and water.

Safe waste disposal is one of the biggest challenges we face. (It is, in fact, a world-wide environmental problem—solutions are being sought in many lands.) Much experimentation is underway to safely convert solid waste to energy, building materials and fertilizer, and to recycle or recapture valuable ingredients of waste. Economic as well as environmental aspects are important here. For example, New Jersey has one of the first composting plants in the nation—the facility in Camden transforms sewage sludge into a safe, odorless nutrient-rich compost which can be used for lawns and the like.

Dear Ms. English,

The Somerset County Federation of Sportsmens clubs wishes to extend its deep appreciation to you for your efforts in securing the Pequest fish hatchery. Without your help the sportsmen of New Jersey would have been deprived of the additional recreation which it will provide. Again many thanks.

Sincerely yours,
Thomas Sleph, Secretary

Waste is any kind of household, agricultural or industrial refuse, whether liquid or solid. Many are in the "hazardous" category. These substances are actually or potentially life-threatening: radioactive; corrosive; flammable; toxic (poisonous); or likely to cause birth defects or genetic damage. Management of hazardous substances is of such importance and interest that my next column will be devoted entirely to this subject.

The Department of Environmental Protection enforces statewide regulations controlling open burning, incinerators; construction of sanitary landfills and licensing landfills for operation; wastewater treatment and sewerage facility construction and operation. These regulations are updated by DEP to keep them current with the latest technology.

If you would like information about recycling or other aspects of solid waste management, please write to DEP, Solid Waste Administration, 32 E. Hanover Street, Trenton 08625. We in DEP consider an informed citizenry our strongest ally for preserving and improving New Jersey's environment. Together, LET'S PROTECT OUR EARTH. □

THE FIRE AT CHEMICAL CONTROL

BY JAMES M. STAPLES

Workers in protective clothing remove burnt out drums from Chemical Control after the April 21 fire.

A terrifying chapter in the cleanup of the Chemical Control Corporation's illegal collection of hazardous wastes came late on the night of April 21 as fire, punctuated by countless strong explosions, tore through the property on the Elizabeth waterfront. The Department of Environmental Protection was in the midst of a cleanup of the site.

"We are all thankful that the cool professionalism of firemen and police from Elizabeth and neighboring communities kept the fire from assuming even more devastating proportions," DEP Commissioner Jerry Fitzgerald English said later. "If there's an even slightly beneficial aspect to such an awful event, it's the graphic evidence it gives us in support of creating a federal 'superfund' to finance faster cleanups of such threats all through the country."

DEP had moved onto the three-acre site between Front Street and the Elizabeth River a year before the fire, in April, 1979. This came after DEP pleas to the Courts resulted in a legal green light for the cleanup. Progress was slow at first, because of the need for extreme care in identifying and handling explosives and toxics found in many of the estimated 35,000 drums jamming the site.

Three factors kept the fire and explosions from being as bad as many had feared:

Among materials DEP had been able to remove before the fire were more than 500 pounds of various high explosives plus another 24 gallons of liquid explosives, more than seven pounds of radioactive materials and 83 pressurized gas cylinders, the contents of many of which were explosive, poisonous or both.

That was a result of the carefully planned "defusing program" described in the November/December 1979 issue

Continued on next page

of New Jersey Outdoors. Defusing meant following strict priorities in removing stored hazardous wastes, first seeking out those most likely to trigger a fire or explosion, or to raise the relative danger level in either event.

The other two things are that the fire burned hot and long, providing the same kind of incineration recommended for many of the wastes stored on the site. And, favorable weather conditions permitted the hot cloud of smoke to rise high and disperse gradually over a wide area, so that no single neighborhood received excessive amounts of pollution.

Efficiency of that incineration came to light when a helicopter crew risked the unknown by flying through the smoke to gather air samples from inside the plume. Analysis showed a general lack of pollutants in dangerous concentrations.

As NJO went to press rough estimates were that from 10,000 to 15,000 drums and their contents remained intact to occupy DEP cleanup crews after fire effects were overcome. Although upper layers of drums were visibly destroyed, their removal was necessary before an exact count could be made of intact drums.

The cleanup remained under the direction of Paul Giardina, Director of DEP's Hazard Management Program, and Karl Birns, Chief of the Office of Hazardous Substances Control.

Their records show that, by the date of the fire, a total of 8,668 waste-filled drums had been taken away from Chemical Control, plus 1,800 gallons of bulk liquid wastes and 55,400 pounds of bulk solid wastes. Of that total, 7,896 drums and the solid and liquid bulk wastes were voluntarily reclaimed by companies which had originally consigned them to Chemical Control for disposal. The companies then followed approved modes of redisposing of their wastes.

These companies, represented by the Chemical Industry Council of New Jersey, had agreed to aid DEP at their own expense in the cleanup shortly after it was organized. Voluntary help of this kind meant faster action than could be expected from any other course, especially in view of the limited funds available for the cleanup.

A different kind of cleanup became necessary after the fire. Before orderly removal of drums could resume, the area had to be cleansed of chemically-laced water and thousands of burned out drums.

Moving into action while smoke still drifted upward from a few "hot spots," workmen directed by DEP began moving intact drums onto property of the Loizeaux Builders' Supply Co., across Front Street from Chemical Control. An

Continued on page 16E

ENERGY AND NEW JERSEY

By Kemble Widmer

The energy-industry relationship that has contributed to New Jersey's development as an industrial and transportation center came about largely because of the state's geological makeup and geographical location. State Geologist Kemble Widmer in the following article traces this relationship from New Jersey's importation of Pennsylvania coal in the 1800's to the current exploration for oil and gas on the Outer Continental Shelf off New Jersey's coast. Dr. Widmer is Chief of DEP's Bureau of Geology and Topography.

PRIOR TO THE FIRST commercial applications of coal-fired steam (1800-30) to power pumps in the English coal mines and later, the railway locomotive, the energy requirements of work to be done depended upon manpower, animals, sailboats, windmills, or water wheels. Although it was recognized earlier in the Eighteenth Century that coal was a more effective source of heat than either wood or charcoal, it was the discovery of anthracite coal deposits in eastern Pennsylvania in the late 1700's which had a profound effect upon New Jersey's emergence as a transportation and industrial center. Canals were built, and in the early 1800's carried coal from the Scranton and Reading areas to cities in Pennsylvania, New Jersey and New York. John Stevens' "steam carriage" experiment of 1825 inspired the construction of railroads which soon proved superior to canals in the transport of goods, coal, and people to Philadelphia, New York and points between. Thus, from about 1830 until 1900, the Industrial Revolution, so successful in New Jersey's development, was dependent upon coal which is not found in the state.

DRAKE'S DISCOVERY OF OIL at Titusville, PA, in 1860 at first was meeting the needs for lubricants for industrial machines and illuminating oil (kerosene). This market became so large that New Jersey became the terminal for one of the early pipelines from the Pennsylvania oil fields, in this case, to the vicinity of High Bridge (Hunterdon County) where oil was transferred to railroad cars for shipment to refineries in the Jersey City area. At the turn of the century development of the internal combusion engine and effective electric motors to drive industrial machinery became a serious threat to steam as a source of power for industry and transportation. At this period much natural gas and, water gas manufactured from coal were both used for illumination and heat. New Jersey refineries were developed to produce gasoline for the infant automobile industry. The State's role of transporter and refiner was established. But, as with coal, New Jersey in spite of several searches had no promise of its own oil or natural gas.

THE ENERGY BASE FOR New Jersey rapidly changed after World War I because of the electric motor, and the development of the gasoline powered motor truck as a means of transport. From the first oil pipeline laid across New Jersey in 1860 the state became the home of the second largest refinery complex in the nation and the refining of petroleum products is the second largest industry in the state. As oil from Pennsylvania became less available, the geographical location of New Jersey refineries on the Atlantic Coast permitted the quick substitution of imports of oil from South America and the Middle East.

WITH RESPECT TO ELECTRIC power New Jersey does not have sufficient water or favorable sites to support large hydroelectric systems. The need for electricity, however, particularly in the metallurgical industry, has seen the development of generating stations using coal, oil, and most recently, nuclear power. The first commercial generating station in the nation—the Oyster Creek plant in Lacey Township, Ocean County—began operating in December 1969. Generating stations are now assisted, for peak electrical loads, by many small jet turbine facilities located close to areas of high demand. Currently under consideration is the restoring to service of one of the very early hydroelectric systems at Great Falls in Paterson (Passaic county).

OIL AND GAS EXPLORATION on land and evidence from waterwells indicates that the part of the Continental Shelf which forms New Jersey's land has geologic formations which are too permeable and have too uniform a dip to develop the structure traps needed for the commercial accumulation of gas or oil. Although the New Jersey Geological Survey has over 100,000 well records, there is nothing to suggest the presence of oil or gas in the Coastal Plain sediments.

THAT PART OF THE Continental Shelf found under the sea is very different. The geologic conditions for this Outer Continental Shelf in the so-called Baltimore Canyon—off New Jersey's coast in the Atlantic Ocean—has possibilities for oil or gas accumulations because of the greater thickness of sediments and other probable geologic structures in which oil or gas structures may be trapped some

Continued on page 16F

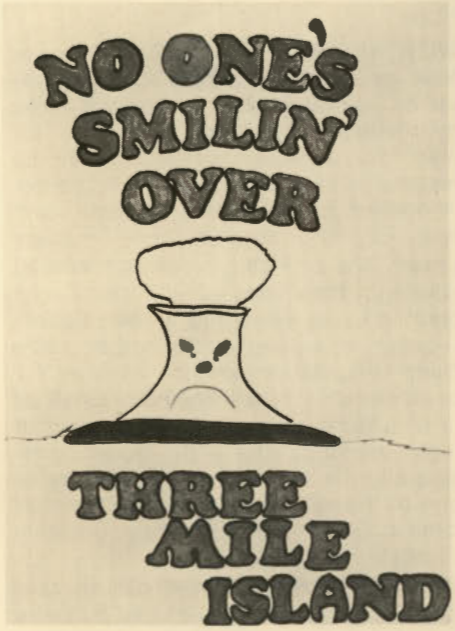
WINNING ENTRIES IN STUDENT POSTER/ESSAY CONTEST COMMEMORATING DEP'S 10th ANNIVERSARY/EARTH DAY

Students in schools throughout New Jersey participated in a poster and essay contest with "Environmental Problems and Solutions" as the theme during the dual celebration of DEP's 10th anniversary and the 10th national Earth Day observance. The team of judges from public and private educational and enrivonmental organizations had a difficult time choosing winners from the hundreds of thoughtful, imaginative and well-executed entries. One thing was proved—the realization that a clean environment means a better quality of life is apparent to even our youngest citizens!

All participants were commended by Governor Byrne during the April 20 ceremony in which he presented plaques and U.S. Savings Bonds to the first, second and third prize winners.

JORGI ROSKY

PROUD MOMENT. "The young people who are honored this evening are those who through art and words have best exemplified their feelings about preserving the world in which they live," said Governor Bryne at the awards presentation to winners of DEP's poster/essay contest. Governor Byrne and DEP Commissioner English are shown with first prize winners (from left) Joann Bialoblocki (High School, Poster); Jacquelin Callejas (High School, essay); Maureen Gallagher (Intermediate, Poster). Standing, front: Andy Hudson (Elementary, Poster). Steve Frame, winner of the Junior High poster division, was unable to attend. The ceremony was held at a reception prior to the April 20 performance of the Trenton Symphony Orchestra in the War Memorial Building in Trenton.



Junior High Division
1st Prize:
To: Steve Frame, 7th grader
Middle Township P.S. #4, Cape May Court House

POSTER WINNERS

Elementary Division: 2nd prize—Kristin Schaefer
2nd grader, Grandview School, North Caldwell.
"Keep the World Clean."

3rd prize—Lara Conley
2nd grader, Richmond Ave. School, Atlantic City.
"Help Clean Our Country."

Intermediate Division: 2nd prize—Melissa Ratner
6th grader, Johnson School, Cherry Hill.
"Mr. Problem/Mr. Solution."

3rd prize—Ellen Oostdyk
6th grader, School #1, Clifton.
"Don't Dump on Us."

Junior High Division: 2nd prize—Mark Figueroa
8th grader, Shull School, Perth Amboy.
"Let's Clean Up Our World."

3rd prize—Lisa Kaplan
8th grader, C.A. Tighe School, Margate.
"We Can't Clown."

High School Division: 2nd prize—Mary Chang
12th grader, John P. Stevens High School, Edison.
"Technology."

3rd prize—Kathy Zabosky
12th grader, John P. Stevens High School, Edison.
"Time Runs Out."

ESSAY WINNERS

1st prize: Jacquelin Callejas
12th grader, St. Ceclia High School, Englewood. The theme of her essay, "Fairy Tales Won't Save Us," is that hoping the energy problem will be solved by a miracle idea or by conservation of fossil-fuels is unrealistic, and for the time being nuclear energy is the answer—but nuclear plants must be better designed and better sited for public safety and the public should be willing to bear a share of the cost involved.

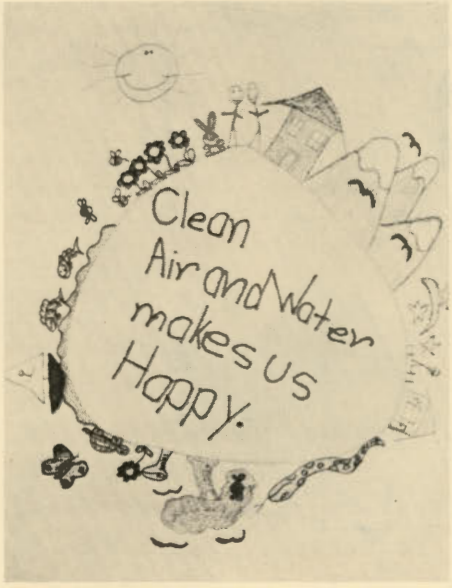
2nd prize: Roy Schlische
11th grader, Wood-Ridge High School, Wood-Ridge.
"The Price of Oil Thirstiness."

3rd prize: Jennifer Colasso
9th grader, Columbus Junior High School, Clifton.
"The Vanishing Wolf."

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

Intermediate Division
1st prize:
To: Maureen Gallagher, 5th grader
Haddonfield Friends School, Haddonfield

High School Division
1st prize:
To: Joann Bialoblocki, 11th grader
Perth Amboy High School, Perth Amboy



Elementary Division
1st prize:
To: Andy Hudson, 2nd grader
Ellison Elementary School, Vineland

Pinelands purchase

DOUBLE TROUBLE PARK GROWS BY 261 ACRES

The recent state acquisition of 261 acres on the Factory Branch of Cedar Creek in Lacey Township (Ocean County) is the first phase of a proposed 1,500-acre addition to Double Trouble State Park. Cedar Creek, which is included in DEP's Wild and Scenic Rivers Program, is noted as one of the purest of all free-flowing waters in the state. The total cost of the acquisition, $840,000, will be shared equally by state Green Acres and federal Land and Water Conservation funds.

Continued from page 16C

CHEMICAL CONTROL

emergency proclamation by Acting Governor Christopher Jackman made it possible to quickly occupy the Loizeaux property for urgently needed work space. By late May the Loizeaux site had been decontaminated so that the company was able to resume limited operations while sharing its space with the Chemical Control cleanup activities.

Recovery from the fire involved many integrated operations: Using a trailer-mounted drum crusher to reduce empty drums to flat metal pancakes, building a dike around the fire site to halt runoff of polluted water to the Elizabeth River, wrecking the tall brick smokestack and the upper portion of the surviving Chemical Control building, both of which were weakened by the fire, and using a crane to transfer drums from the Elizabeth River bank to a barge, so that they wouldn't topple into the river from the water-weakened embankment.

The post-fire cleanup had as its ultimate goal decontamination of the ground and exposed surfaces on and near the Chemical Control site. Buildings, vehicles, machinery and unburned drums were scrubbed with detergents and rinsed off, both at Chemical Control and the neighboring Loizeaux property.

Water remaining from the decontamination joined surface water at the site for its own special treatment. Pumps collected such water, much of which originated from firehoses during the fire, and stored it in tanks, diked areas and even a portable swimming pool.

It then received attention of an unusual machine: The Blue Magoo, as it is dubbed by its EPA owners and operators, is a huge trailer-mounted filter unit. It passes polluted water through as much as 18,000 pounds of activated carbon filtration, after which EPA deems the water fit to drain into the nearby Arthur Kill.

What had been purely a DEP operation burst into a multi-agency cooperative activity when the fire struck. Because of the fire's proximity to the waterfront, the federal Water Pollution Control Act made the U.S. Coast Guard the lead federal agency. Captain James L. Fleishell, Captain of the Port of New York, technically took command of the situation and immediately returned DEP to its original role in the cleanup.

On hand within hours to provide a multitude of backup services were the New Jersey Department of Health, and from the federal level, the Environmental Protection Agency (EPA), National Institute of Occupational Safety and Health (NIOSH), National Oceanic and Atmospheric Administration (NOAA) and the Occupational Safety and Health Administration (OSHA). An investigation

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ENERGY . . .

distance offshore. To this end, in August 1976 the federal government offered 154 tracts or nearly 1,000,000 acres of the Outer Continental Shelf as part of a lease-sale (Sale #40) in the hopes that oil companies might find economic deposits of either oil or gas. Each tract is a nine square mile area covered by ocean water from 130' to 600' in depth. (See Map) If such deposits are indeed found in sufficient quantity in the next eight to twelve years, pipelines to bring the oil or gas to shore would have to be built. The development of the fields would require shore bases of various kinds, some of which would benefit the shore municipalities.

SOME 21 WELLS HAVE been completed by semisubmersible (floating) drill rigs which are used to outline the extent of any oil or gas fields. Seventeen (17) of these exploratory wells have been dry holes, two have hit some gas or oil (condensate), and two have shown gas only. Although two wells are still being drilled offshore as of March, 1980, the size of these gas and/or oil fields has not yet been determined.

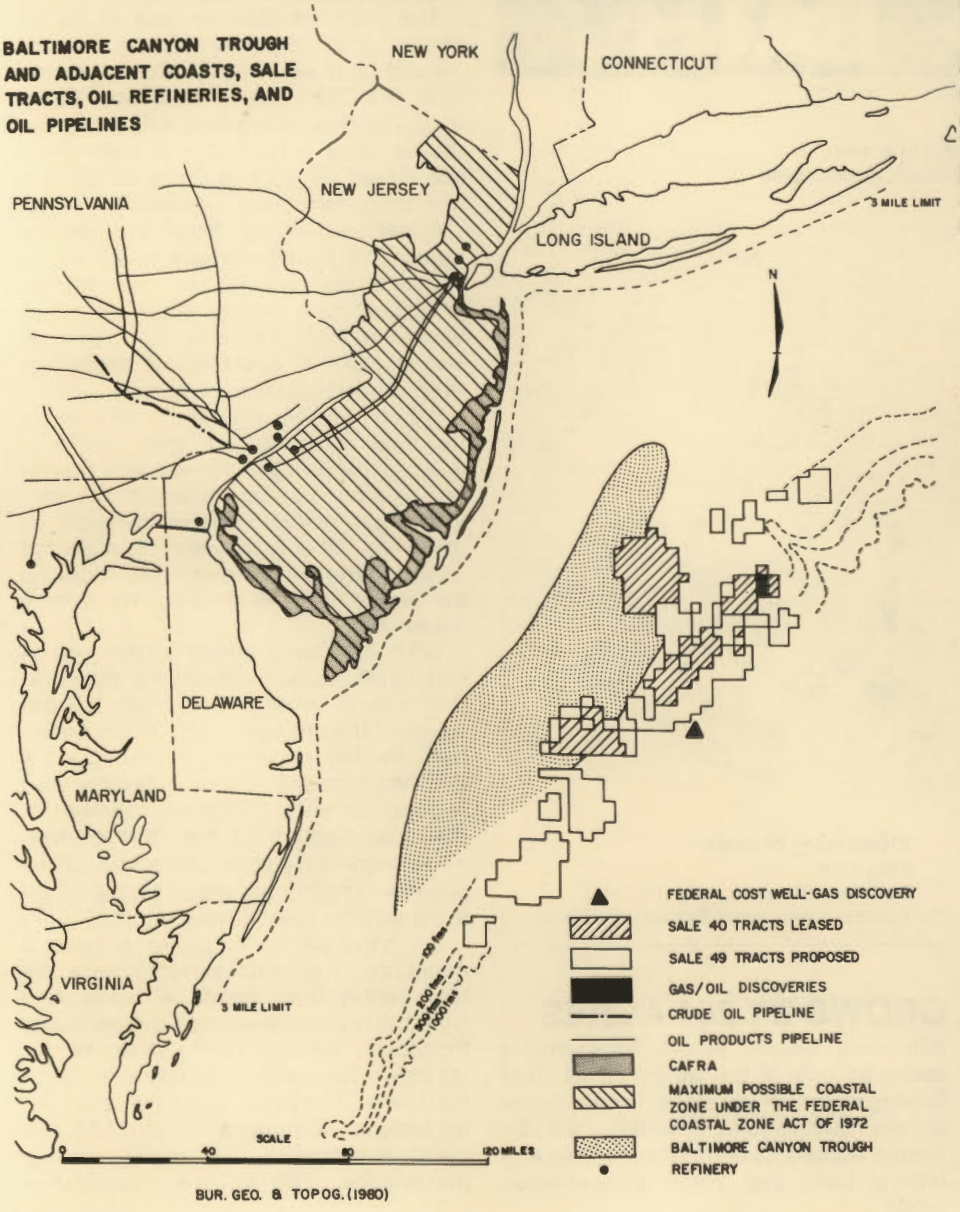
A SECOND LEASE-SALE (#49) was held in January 1979, offering 136 tracts in the same area of previous sales or further offshore with water depths up to 4,700'. (See Map) Some tracts are actually on the Continental slope. No wells have yet been started on the tracts leased under Sale #49. A third lease-sale is tentatively scheduled for December, 1981, with many of the tracts inshore from those included in the two earlier offerings.

SINCE NO ONE CAN see below the surface of the ground and even the various wonderful means of attempting to determine geologic structures, such as the geophysical, the final proof as to whether oil or gas actually occurs depends upon the exploratory wells which are put down to find and then determine the size of the oil or gas structures of fields. Because of the depth to which modern wells must be driven, the costs of individual wells is often considerably more than $10 million per well. Much money and time is required during this exploratory phase and, if successful, there is then the cost of drilling platforms, the pipelines, and the separate bases for the development of the oil or gas fields.

THE OFFSHORE EFFORTS ON the Outer Continental Shelf await confirmation by many more drill holes before deposits which are big enough to warrant the development of the pipelines to bring the oil and gas ashore to existing pipelines or refineries can be assured. The sediments at the edge of the Outer Continental Shelf are some 37,000' thick and the oil and gas so far discovered are at depths in these sediments in excess of 15,000'.

ALTHOUGH FOUR HOLES OUT of 21 does not seem encouraging, this is considered a good average for exploration. The ultimate discovery of economic deposits of oil and natural gas off the New Jersey coast at some time in the future is still a possibility. □

BALTIMORE CANYON TROUGH AND ADJACENT COASTS, SALE TRACTS, OIL REFINERIES, AND OIL PIPELINES



BUR. GEO. & TOPOG. (1980)

Public Participation

SUSAN SMALL WILL HEAD PASSAIC BASIN PROJECT

Susan Small of Rockaway Township (Morris County) has been named Public Participation Director of DEP's Passaic River Basin Flood Management Project office being established in the central basin area. She will coordinate efforts to aid and encourage citizen involvement in the U.S. Army Corps of Engineers' (Corps) new study to find remedies for the region's historically severe flooding problems. The office will serve as an information and communications center for citizen groups involved in the Corps study, and as administrator of the Sub-Basin/Basinwide coordination program.

Mrs. Small received her B.A. degree in political science from New York University and is presently a Masters candidate in City and Regional Planning at Livingston College of Rutgers University. She also serves as a Councilwoman in Rockaway Township and previously was a Legislative Aide to Assemblywoman Rosemarie Totaro of Denville. □

Continued from page 16A

SHORE PROJECTS

for the lake shore; and *Keansburg Borough* (Monmouth), $20,000 to develop a revitalization plan for the downtown waterfront area.

In 1979, the first year of operation of this local coastal planning grant program, $65,000 was passed to three municipalities. This year $196,000 is being used to fund projects affecting 26 municipalities. DEP intends to continue the grant program in 1981, but future programs will be conditional on federal approval of a statewide Coastal Management Program. □

ORGANIZATION CHART DEPARTMENT OF ENVIRONMENTAL PROTECTION

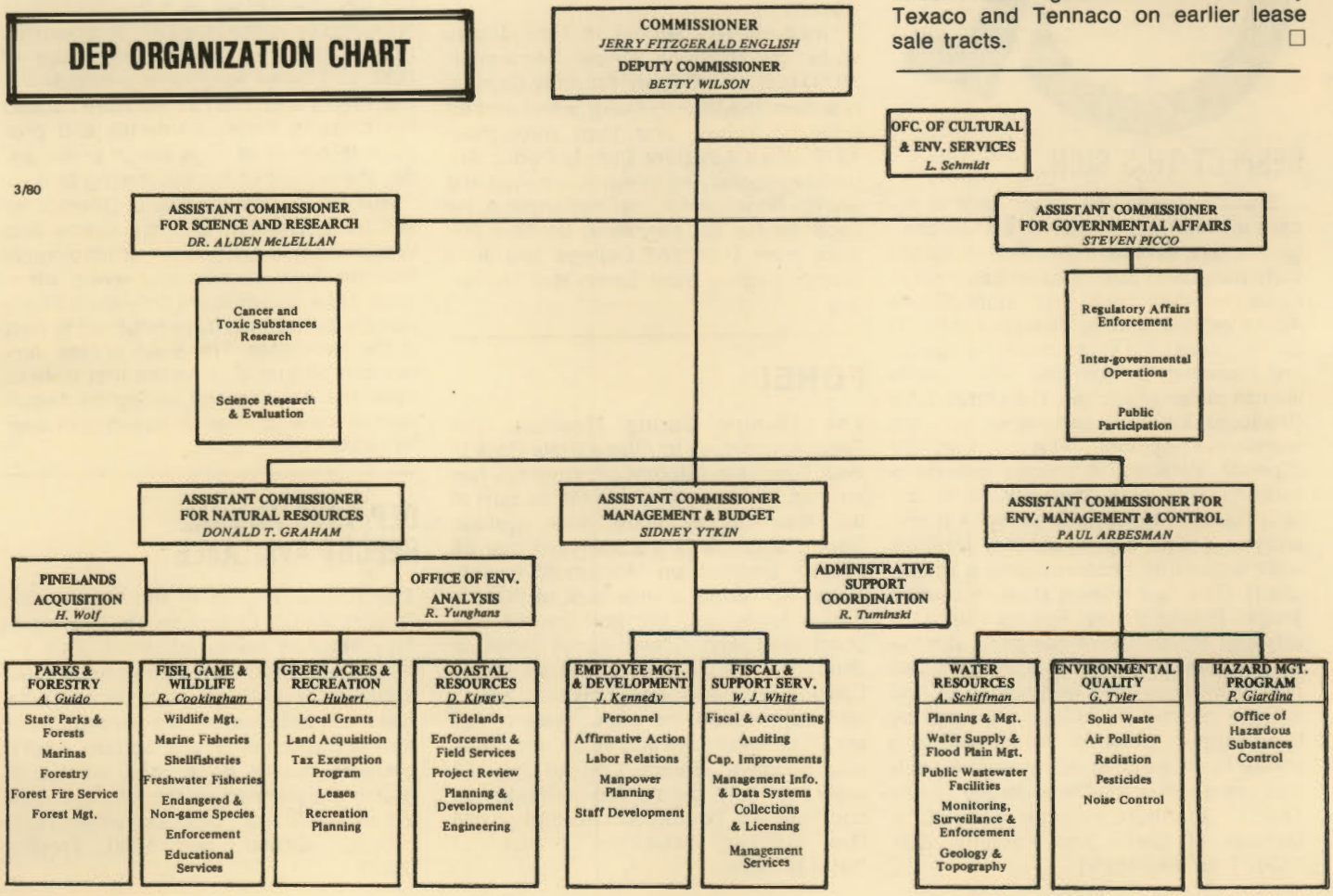
The departmental organization chart (below) will be a great help in finding your way through DEP's units and identifying administrators mentioned in NJO Environmental News stories, newspaper articles, TV and radio reports. Students will find the chart valuable for environmental papers. Clip and save! □

PASCERI NAMED CHIEF, HAZARDOUS WASTE UNIT

Dr. Ralph Pasceri, a career employee with DEP, has been promoted to the position of chief of the department's Bureau of Hazardous Waste, Solid Waste Administration. He will be in charge of the unit which is responsible for licensing hazardous waste treatment facilities, enforcement of the state's hazardous waste laws and the identification of abandoned hazardous waste sites. Pasceri has extensive experience in air quality monitoring and planning, and motor vehicle emissions testing and control. Before assuming his new post in March, Pasceri served as assistant chief of administration and planning for the Bureau of Air Pollution Control. □

STATE FAVORS FEDERAL FIVE YEAR OIL AND GAS OFFSHORE LEASE PROGRAM

David N. Kinsey, acting director of DEP's Division of Coastal Resources, expressed support for the federally proposed Five Year Oil and Gas Leasing Program for the Outer Continental Shelf (OCS) in testimony, this past April, before the House Select Committee on the OCS in Washington. Kinsey, who represented Governor Byrne, said that although New Jersey supports the efforts of the U.S. Department of the Interior to fully implement the OCS Lands Act Amendments of 1978 (under which the leasing program for oil and gas exploration was prepared) it is concerned with the availability of appropriate technology that will be necessary for OCS activities in some areas scheduled for sale in the Mid-Atlantic. (In some of the deeper waters unstable bottom conditions present geological problems.) The proposed Five Year Program calls for two sales off New Jersey's coast, one in the Mid-Atlantic in December 1981 and one in the North Atlantic in October 1982. It also provides for reoffering for sale those tracts left unsold in previous auctions. There have been promising finds of natural gas in test wells drilled by Texaco and Tennaco on earlier lease sale tracts. □



Continued from page 16E

CHEMICAL CONTROL

into the cause of the fire was immediately launched by New Jersey State Police and the Union County Prosecutor's office.

With chemical-laden water from the fire hoses running into the Elizabeth River and Arthur Kill, Commissioner English and her counterpart, New York Commissioner of Environmental Conservation Robert Flacke on April 22 issued a joint resolution banning fishing in an area bounded by Sandy Hook, the George Washington Bridge and Rockaway Point on Long Island. The ban was reduced April 25 to cover only Kill and Bay waters near Chemical Control. □

RESPECT THIS SIGN.

Signs carrying the "international access symbol" of a person in a wheelchair (above) are familiar sights in New Jersey state parks and forests as well as recreational facilities built with state Green Acres money and/or federal funds. In parking areas the signs mean the spaces are reserved for vehicles with special license plates or sticker. The plates: DAV (Disabled Veteran) and those with the wheelchair symbol. The sticker: SV (Special Vehicle). If placed outside a building, the sign indicates it is accessible to handicapped persons (ramp entryway, wide aisles, sanitary facilities wide enough to accommodate a wheelchair). (The four newest state recreation areas—Round Valley, Spruce Run, Liberty and Atsion—were designed with the barrier-free philosophy. Specific areas should be contacted in advance to find out the degree of difficulty for use by handicapped persons. Addresses and phone numbers of state recreation facilities are given in the "New Jersey Invites You . . ." brochure available from DEP's Division of Parks and Forestry, Box 1420, Trenton 08625.) □

KEITH A. ONSDORFF ENFORCEMENT CHIEF

Keith A. Onsdorff, an attorney, of East Windsor (Mercer County), in March was appointed to the newly created position of Chief of Enforcement for DEP. He will be responsible for leading the department's greatly expanded enforcement activities, particularly in the areas of waste chemicals, and will coordinate DEP's efforts with the many agencies addressing this public health and safety issue. (These stepped-up enforcement efforts involve the combined actions of DEP, the Governor's Strike Force on Hazardous Wastes, N.J. Division of Criminal Justice, U.S. Attorney's Office and the federal Environmental Protection Agency.)

Onsdorff has served in New Jersey state government since September 1974, first as a Deputy Attorney General representing DEP in major water and air pollution cases, and then throughout 1979 as an Assistant Deputy Public Advocate specializing in environmental and energy litigation for that department. He received his BA degree in political science from Davidson College and Juris Doctor degree from Seton Hall University. □

FORE!

The 18-hole Spring Meadow Golf Course, adjacent to Allaire State Park in Wall Township (Monmouth County), has opened for its second season as part of the New Jersey state park system. Spring Meadow is a 5,302-yard, par 68 course. Located on Monmouth County Route 524 about a mile east of the entrance to Allaire, the golf course was purchased with Green Acres funds in January 1979. It is operated by DEP's Division of Parks and Forestry, which also administers the park. Greens fees are $6 on weekdays and $8 on weekends and holidays; Senior Citizens fee, $3 weekdays only, regular fee on weekends and holidays. For further information call the Spring Meadow office at 201-449-0806. □

A N.J. First

FIRST PEREGRINE HATCHING IN WILD IN OVER 30 YEARS

New Jersey has been successful in hatching the first peregrine falcons in the wild in over 30 years. On Friday, May second, biologists observing the hacking tower on the Brigantine National Wildlife Refuge reported that the eggs hatched and the adult peregrine immediately began feeding the young.

This hatching represents the first time in history that hacked peregrine falcons have laid eggs and completed the incubation in a man-made structure. In 1974, the State Division of Fish, Game and Wildlife's Endangered and Nongame Species Program began a cooperative study with the Peregrine Fund at Cornell University designed to imprint captive raised young peregrine falcons on man-made structures on the New Jersey tidal marshes.

Over 50 young peregrines were fledged from three towers between 1974 and 1979. All three towers have paired falcons and the tower near Manahawkin has a nesting peregrine at the present time.

The peregrine falcon once nested on the Palisades along the Delaware River, but became extinct as a nesting bird in New Jersey in the late 1940's. Scientists believe that the indiscriminate use of DDT and other long-term pesticides in the 1940's and 1950's may have caused the birds to become infertile and produce thin-shelled eggs which broke under the weight of the incubating bird.

Russell A. Cookingham, Director of the State Division of Fish, Game and Wildlife states "This is an ornithological first for New Jersey and every other state. New Jersey is the only state where pairs of peregrines have returned to nest at the hack sites. The State of New Jersey can be proud to be the first state to have the endangered peregrine falcon nest in the wild after an absence of over 30 years." □

DEP 1979 ANNUAL REPORT AVAILABLE

The Annual Report of the New Jersey Department of Environmental Protection for 1979 has been published. This annual report marks the department's 10th anniversary and as such recaps what has been accomplished environmentally for the public health and welfare, what is currently being done, and what programs are planned for the future. Copies are available from DEP, Documents Distribution Center, Box 1390, Trenton 08625. □

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Inner-City Children

woods," the response was judged to be positive; if she disagreed, this was taken as a negative response. Similarly, if she agreed that "the forest is dark and gloomy" or "birds are dirty and make a lot of noise," that was a negative response. If she disagreed with either statement, she was credited with a positive response. There were 25 such statements on the inventory, and one point was given for each positive response. Scores on the pretest were compared with scores on the post-test to see if any change in attitude or perception had occurred over the four-week period.

Data collected from "Ten Things I Love to Do" were tabulated according to the number of outdoor and nature-oriented activities each child listed, such as fishing, watching animals, going to the park, growing plants, and climbing trees. Drawings of "Favorite Places" were divided into three categories: indoor scenes (home, pizza shop); outdoor/manmade scenes (swimming pool, amusement park); and outdoor/natural scenes (park, lake, woods). For those drawings which fell into the latter category, the written reasons given for liking a particular place were also analyzed. The data from all three instruments were subdivided and compared on the basis of the children's age and amount of previous outdoor experience.

What were the results of the study? Was there any change in the children's perceptions of the natural environment over the course of the camping experience? According to our analysis, yes. Overall, the children showed a statistically significant improvement in environmental perceptions. However, when the girls were divided according to age and previous experience, the change was significant only for those aged nine to twelve, and those classified as inexperienced in outdoor living. The older girls and more experienced campers did not show a significant change, primarily because these two groups already had developed very positive attitudes toward the environment. Previous experience proved to be the most important factor. Pretest scores on the perceptions inventory averaged 16.4 for the inexperienced girls and 21.2, nearly 5 points higher, for the experienced girls. Considering that about three-fifths of the girls at Trail Blazers had previously attended at least one week of overnight camp (and therefore were probably above average in initial receptiveness toward the out-of-doors) the results are even more meaningful.

The results from "Ten Things I Love to Do" and "Favorite Places" were used mostly to support the premise that city children, despite their highly artificial environment, do have some inclination toward outdoor pursuits and places. Eighty-five percent of the children participating listed six or more

Cleaning up the dishes after supper.

outdoor pursuits among their favorites. One-fourth of them listed three or more activities specifically oriented to enjoying the natural environment.

Nearly one-half the children drew natural scenes such as parks, bodies of water, or campsites as their favorite place. The percentage of experienced campers drawing natural scenes was higher than that of inexperienced campers. Among the written responses of those children drawing natural scenes, one-half mentioned reasons relating to the psychological values inherent in the out-of-doors (this was most common among the older girls). The children appreciated the "peace," "beauty," and "quiet" of the natural setting. One repeated element, even among the younger children, involved "getting away from the city" and enjoying solitude. One-third of the responses also mentioned some natural attribute (fresh air, water, sun, trees, animals) as a reason for valueing the place.

What is the significance of all this? Consider the following comments from these inner-city girls:

> *I like this place*
>
> *. . . because it's so beautiful and quiet and I can be near the ducks.*
>
> *I like the mountains, because it is so quiet. I just like to sit and listen to the things around me.*
>
> *. . . because it's very quiet and I can cry or do anything in this spot.*

In this modern, urban world we are fast losing touch with our natural surroundings; yet these city children have learned that the outdoors can be a place of both self-discovery and discovery of their total environment. They do respond to the natural world in a positive way, and their responses changed in the direction of even greater acceptance, interest, and appreciation over the four-week camping period.

Programs like the primitive camping experience offered by Trail Blazer Camps are invaluable for developing in any child a sensitivity toward the out-of-doors. What happens to a 12-year-old child when she leaves her city home to spend four weeks at camp? Plenty! □

PITCHER PLANT

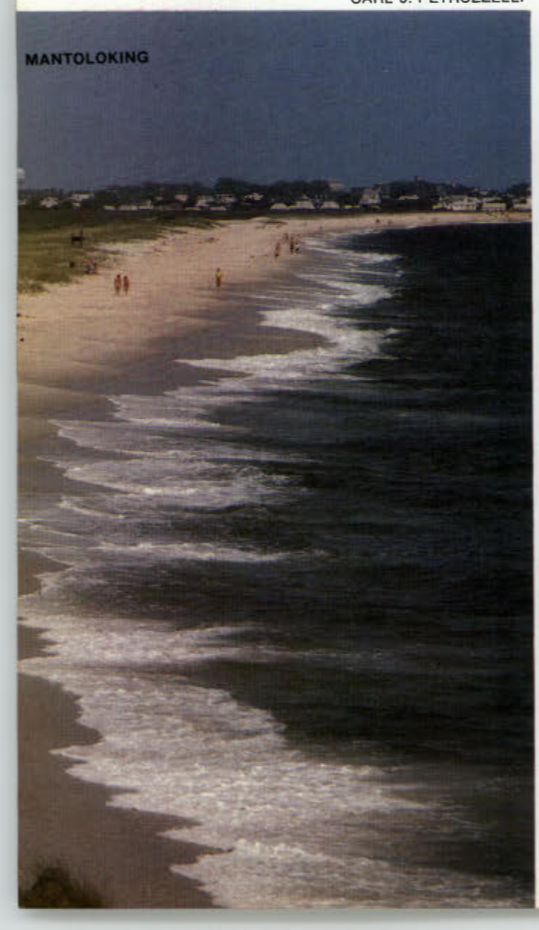
ARETHUSA

Alphonsa Adams, 85, took up photography as a hobby at retirement age 65. He has more than 27,000 slides, mostly of nature and pine barrens flowers (400-500 varieties), some so tiny that one must search to find them. He is a member of the Pemberton and Moorestown Camera Clubs and the Photographic Society of America. He is a 5* photographer—over 600 slides have been accepted for showings in salons in the USA and several foreign countries.

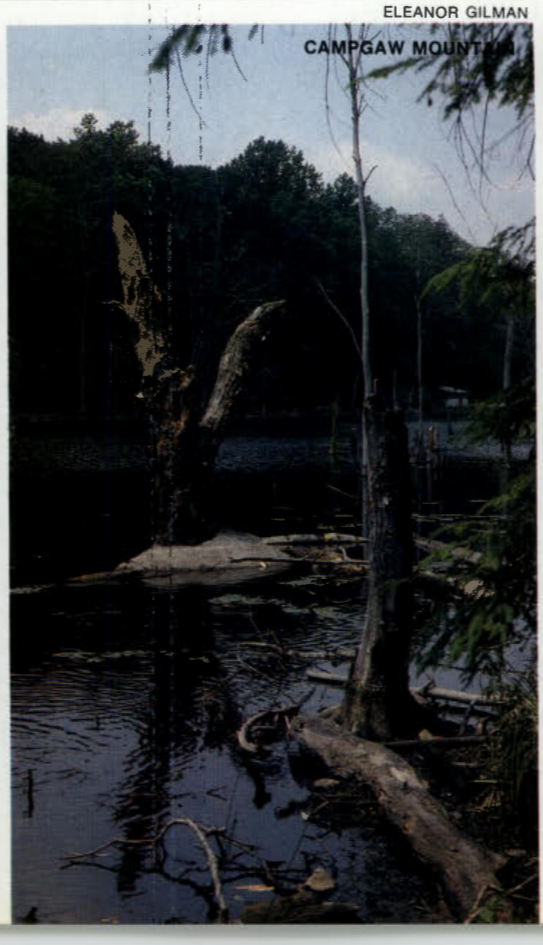
Recently Alphonsa and Marie Adams celebrated their 60th wedding anniversary.

New Jersey in Summer Attire

CARL J. PETRUZZELLI



ELEANOR GILMAN



KEN ORAVSKY

BERGEN COUNTY

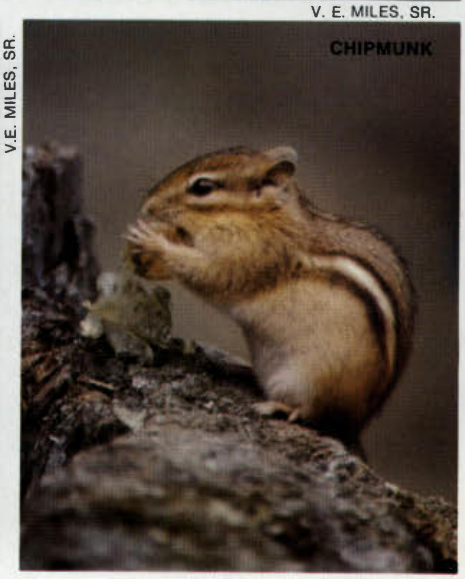
ELEANOR GILMAN

PINK WATER LILIES

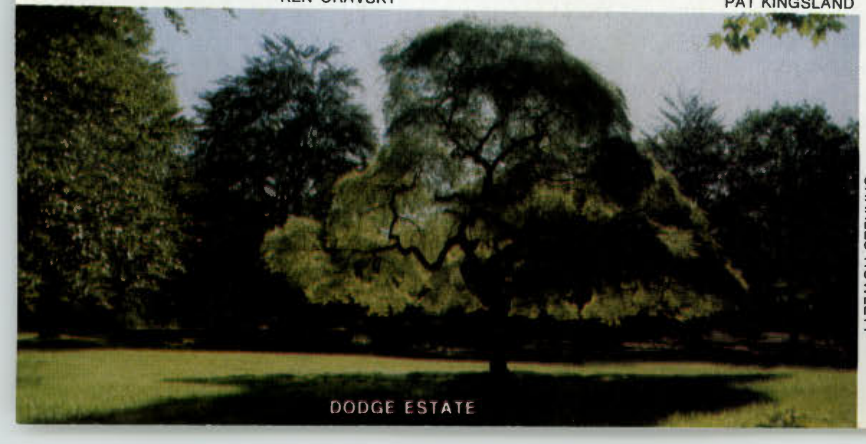
V. E. MILES, SR.

V.E. MILES, SR.

KEN ORAVSKY



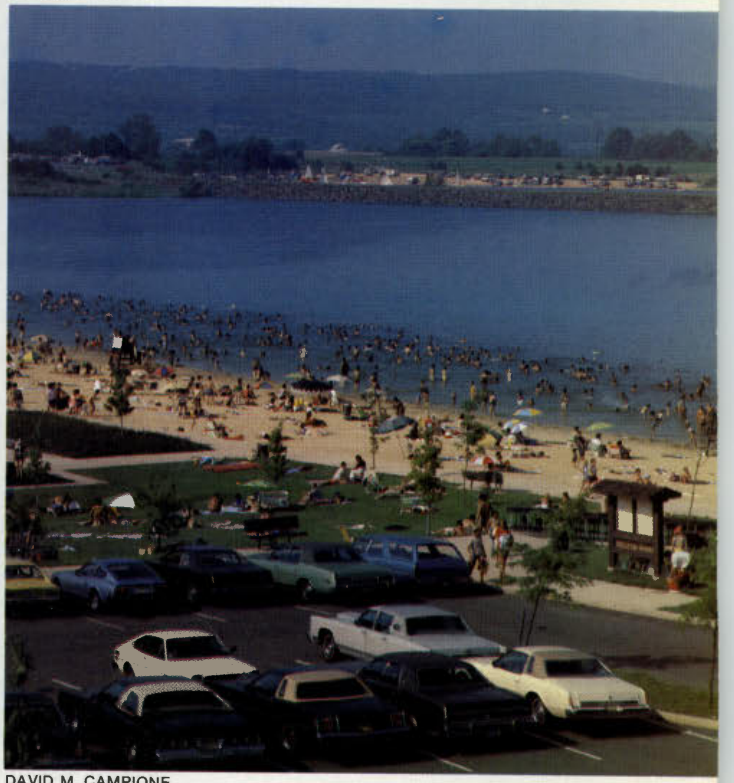
PAT KINGSLAND



CHARLES HOWLETT

ROUND VALLEY RESERVOIR

DAVID M. CAMPIONE



DAVID M. CAMPIONE

WANDERING THROUGH RECYCLING IN NEW JERSEY

BY MILLARD C. DAVIS

Spring brings a sharp upswing in all outdoor activities and recycling is mostly on outdoor activity. Ask the people who run recycling programs. They know. And perhaps one of the most knowledgable about anything dealing with citizen participation in wide ranging recycling programs is a broad-shouldered citizen from Rockaway Township, Charles Raska. During 1978 he was involved in no less than 13 recycling programs at once, which is not bad juggling. And when others have needed help, he has donated his own trucks, equipment and even time to volunteer groups. During one day alone he collected over seven tons of recyclables to help rebuild a burnt out school in Mountain Lakes. The bill? His own pleasure. Of course that kind of spirit may be a sort of tradition among people from Rockaway.

In tune with this spirit of doing the best with what you have, the 1978 recycling programs around Rockaway realized an average of 20 tons of materials per month at the hands of volunteer groups. As a matter-of-fact, since 1973 they have received $30,000 with the help of the man from Rockaway. Rockaway itself has also prospered, since Raska prepared for the township a recycling directory, with 1,200 copies distributed for free.

This is recycling country. Out of at least 130 municipally supported recycling programs known to exist in New Jersey, ten are located in Morris County, the county of Rockaway Township. Another eight and six flourish along the way in Essex and Passaic Counties respectively. Finally, as you enter New Milford, having stopped in River Edge to visit the early eighteenth century Zabriskie (Von Steuben) House, you will be in Bergen County. Here no less than 54 such programs are making a new American history.

In New Milford Boy Scout Troop 78 stands today as another example of what is best in both voluntary curbside recycling and Scout tradition. You might even be interested in contacting the National Office of the BSA; from them you will receive as detailed packets on recycling drives as you can get almost anywhere else. Well, Troop 78 was originally chartered in 1917, only seven years after William D. Boyce followed the lead of Britisher Robert Baden-Powell and organized, then incorporated, the association in America. Having begun recycling drives at least as early as 1956, by 1957 the New Milford troop was being sponsored by the New Milford Presbyterian Church Men's Club; this group soon took on the "salvage drive" activities, cooperating with other volunteer agencies at various times along the way. For the past twenty years recycling has supported the troop satisfactorily as its principal mode of income.

Here monthly curbside collections of newspapers, magazines, and even rags have led to Boy Scout activities, equipment, and trips. On the average they pick up about 30 tons of these recyclables each month, a fair amount for "Boy Scout Power."

Only a jog to the east, Tenafly Borough itself collects newsprint at the curb and has a recycling center for magazines, glass, and aluminum. Belief in the rightness of recycling is so strong here that the township has even passed an ordinance which both mandates curbside collecting of newspaper and has provisions to protect this paper from paper pirates.

Every day the recycling center in Tenafly is open from 8 a.m. to 4 p.m., with the curbside program operating at the very commendable frequency of once every week. Monthly tonnages have been estimated at 77.8 (60 tons of newsprint, 3.8 of magazines, and 14 of glass). That figures out an astounding 10.3 pounds per month per person! Many collectors feel that mandated ordinances such as the above make the difference between successful recycling programs and bland ones or even out-and-out failures. The United States Environmental Protection Agency considers that the people of Tenafly are reducing their solid waste by 8% through the newsprint collection alone. For 1978 the sales of these items, as well as of aluminum, have resulted in an income to the Borough of $23,926.74. The saving in landfill bills is not even mentioned, but it was obviously something—and remember, Ben Franklin wrote (in *Necessary Hints to those that Would Be Rich*, "A penny saved it two pence clear."

Continuing southward down the Palisades, you travel only a few miles before reaching the Borough of Leonia (named, in 1865 "the place of Lee," after Charles Lee, who had been second in command to General George Washing-

ton). Here a municipal recycling center which is operated by members of the Leonia Environmental Commission collects over 20 tons of newsprint, glass, and aluminum per month. Then the Borough chips in by carting all the recyclables to the appropriate markets. Together with the American Legion pick-up of newsprint, more than 38 tons are gathered each month. Seventy-five percent of the proceeds go to volunteer organizations.

Leonia's program actually opened up in a living room. Here CLEAN (concerned Leonians for Environmental Action Now) chose its co-chairman, George Tamaro and Martha Lieblich. They were soon dubbed "Mr. and Mrs. Clean." On the very first day of operation of the recycling site, September 26, 1970, in the parking lot of the Methodist Church, 5815 pounds of glass poured in. The income, $58.15 from Owens-Illinois Inc., was donated to the Leonia Community Chest.

Recycling of glass became a townwide link. Volunteers might be there as long as from 9 a.m. to after 4:30 p.m. when the center was open, on the last Saturday of each month. Pizzas and beverages and fun became a new sort of diet. (At voluntary recycling centers food and drink are often a must, a party atmosphere helping overcome the drudgery of working in rainstorm, snow, and freezing wind). Not only did the Church support the drive but on one occasion even delayed a wedding—"Volunteers were very busy trying to clear the parking lot in the rear," says Commission Chairwoman Martha Lieblich, "as the bridal party was entering the Church grounds in the front."

The Commission took over the program in April of 1973. Now weekly collections of newspaper, glass, and aluminum were handled. The site was changed to the parking lot of the S/T Videocassette Corporation. Other volunteer groups added their manpower; they receive 75% of the gross receipts from the sales of recyclables while the Borough, which provides trucks and drivers, gets 25% to cover expenses. Over the years more than 20-25 volunteer organizations have benefitted from this recycling program.

At the new location, taken up at the beginning of 1979, the recyclers have the pleasantries of indoor plumbing, shelter from weather, and even electrical outlets for coffee pots; the parking lot and its entrance/exit are given special care so people can get together easily.

Just about ten miles west is the headquarters of the Montclair Recycling Program, which appropriately goes back to the Earth Day concerns of 1970, resulting in the incorporation in May 1971 of a group which called itself the Montclair Organizations for Conservation. The Recycling Center was actually opened no later than the 24th of that July! And within one month the original loan had been paid off. Now this joint effort of MOC and the town's Recycling Department is receiving newspaper, magazines, glass, and aluminum, and the town picks up newspaper at the curbside in a program which was first voluntary and is now mandatory.

No one who has met the founder and coordinator of this program, Jean Clark, would be stunned at the success in Montclair. A list of her executive positions in volunteer organizations would give a hint.

From Montclair it is no great distance to 215 Central Avenue in Newark. Here are the offices of Newark Recycling Incorporated, earlier known as Project Resource, a strong anti-crime program run by Newark's Office of Criminal Justice Planning and The Department of Engineering. In their newspaper and office wastepaper recycling project ex-offenders operate 1) curbside collecting of newspaper in two of Newark's five wards and 2) an office operation in more than 85 public and commercial buildings. So far this very enlightened program, directed by energetic and firmly committed Donald Bernard, has successfully sent at least 40 of the participants into private sector employment—and the re-arrest rate for all 150 past and present employees is below 33%, whereas the national average is 75%.

When you come to New Providence perhaps you can visit a recycling center which is not only operated very successfully on a volunteer basis but by volunteers from no less than 18 groups devoted to serving the public. Whoever said "You can't do it by committee"? Not only do they staff the center and maintain it in concert, but they promote the idea, plan, and even hold social affairs.

Somewhat similar is the program only a little ways away down in Westfield. Here as many as 32 youth organizations, including groups from churches and temples, Scouts, service organizations, and various Westfield High School organizations operate a recycling center. After seven years of operating, the center has risen from a collection of 5000-6000 pounds of glass per Saturday during early 1970's to an expected 20,000 pounds of glass, 70,000 pounds of paper, and 125 pounds of aluminum during 1979. Any one group on a Saturday, comprising at least eight workers and a supervising adult, can expect to receive no less than $100. To increase public participation the center has even added a pick-up service, available by phone on recycling days just by dialing the number which is listed in the town newspaper.

Already in progress in Hunterdon ty of New Jersey's natural areas.

Further, individuals as well as groups and organizations may earn extra cash by participating in the aluminum recycling effort. Collective recycling programs not only help to clean neighborhoods, but funds realized by the clean-up effort may be used to help fulfill a variety of organizational fund-raising goals.

Recycling Guidelines

Before you begin collecting aluminum this spring and summer, you should become familiar with the kinds of aluminum materials which may be recycled and know how these products should be prepared for sale to Reynolds.

- **Beverage containers:** Reynolds purchases only all-aluminum beverage cans for recyling. Other cans, including bi-metal and tin cans will *not* be purchased by the company. How can you identify an all-aluminum beverage can? It's simple . . . just take a household magnet and place it to the *side* of the beverage can. If the magnet *does not* attract the side of the can, then the can is all-aluminum and may be purchased by Reynolds for recycling. It is most important to remember to place the magnet on the side of the can as the can tops on almost all beverage cans are aluminum while the sides of the cans may be either of aluminum or steel. So, testing the *side* of the can is the only way to accurately determine that the can is all-aluminum.

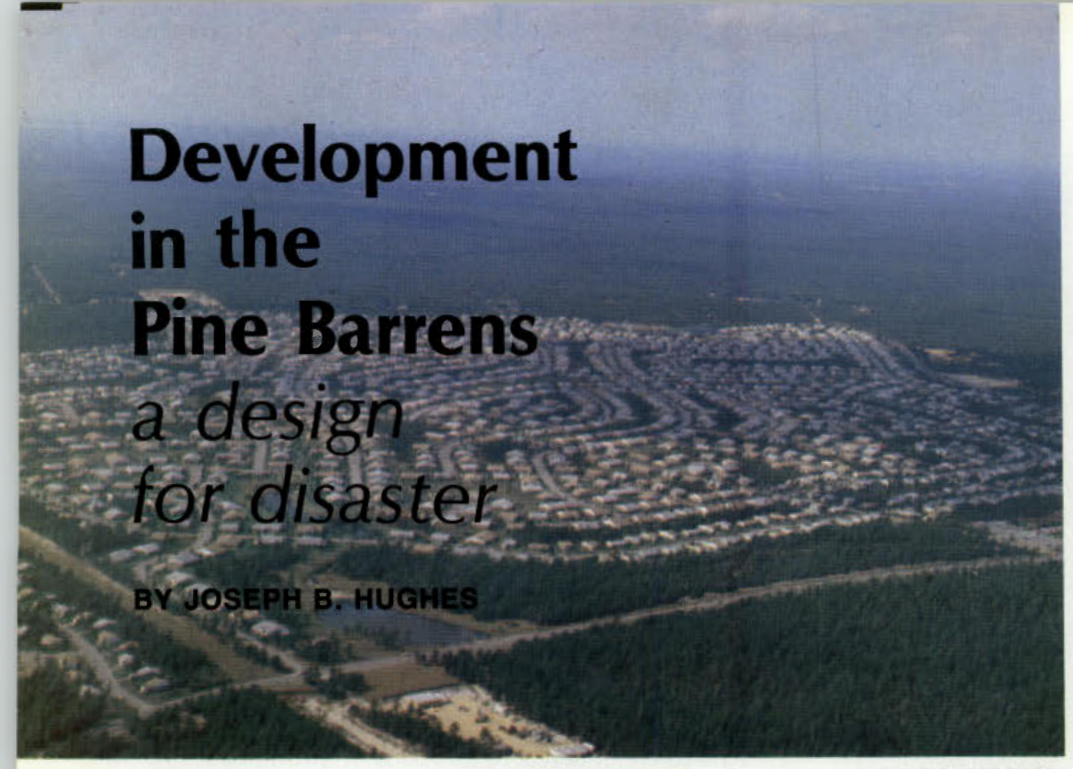
Make sure that the magnet you use to test the cans is reasonably powerful by checking first with a few common nails, or other steel or iron household items.

- **Other aluminum materials:** In addition to all-aluminum beverage cans, Reynolds pays 23 cents per pound for household aluminum products such as pie plates, foil, frozen food and dinner trays, and dip, a pudding and meat containers. These should be cleaned of all food particles—especially if you're planning to store these for some time in your house, apartment or garage.

Reynolds also recycles aluminum siding, gutters, storm doors and window frames, and lawn furniture tubing. This aluminum must be free of all foreign materials, cut to lengths not exceeding three feet and should not be mixed with aluminum cans. Certain aluminum castings—including bumpers and automotive grills, pots and pans, power lawnmower housings and barbeque grills—may now be recyled by Reynolds.

- **Storage:** Aluminum beverage cans and other household aluminum products may be stored in large, clear plastic bags and cans may be flattened to facilitate dense storage. Recyclable aluminum scrap items should be kept separate from cans and may be bound together with rope to facilitate easy handling and weighing.

Continued on page 28



Development in the Pine Barrens *a design for disaster*

BY JOSEPH B. HUGHES

PHOTOS PROVIDED BY DEP

Fire has been a part of the Pine Barrens ecosystem since prehistoric times. Repeated cutting and severe wildfire have played a primary role in the development of a forest cover that is considered to be one of the most hazardous wildland fuel types in the nation. Many of the wildfires have been large and devastating; however, owing to the undeveloped nature of the area, the problem, except for an occasional news article, has gone largely unnoticed. But now the character of the Pine Barrens is changing rapidly—it is no longer uninhabited wilderness. Housing developments and retirement communities are converging on the region and it is more intensively used for recreation. As a result, risks to humans in the Pine Barrens have increased significantly along with the likelihood that future fires will involve large acreages often interspersed with structures or other improved property.

The potential for wildfire disaster in the Pine Barrens has already been dramatically illustrated. Large conflagrations occurred in 1930, 1954, 1963, and more recently in 1971 and 1977. The most notable was in 1963, when damage to improved property exceeded $8.5 million. When this tragedy occurred, the region was still largely undeveloped. With the increased development of the last 17 years and the tremendous escalation of property values, the results of a similar series of fires today would be staggering, but this is the threat of disaster that residents of the Pine Barrens face. Two essential elements are already present: highly hazardous wildland fuels and numerous human ignition sources, with weather as the critical variable. Thus, conditions need only be similar to April 1963 for a fire disaster to occur.

This article analyzes the fire control problems that increased development are expected to cause and also explores various initiatives for limiting development and reducing the impact of a wildland conflagration.

Fire has long been a factor in the Pine Barrens ecosystem. The Lenape Indians, residents of New Jersey for approximately 10,000 years, burned the woods deliberately in the spring and fall, and accidentally at other times. These burns were used to drive game, improve visibility, facilitate travel, drive away insects and snakes, increase the supply of grass seeds and berries, and for offense and defense in war. The predominance of pine in the early history of South Jersey has been attributed to these fires.

The large mature pine trees that greeted the early settlers were soon removed to support the early industries of the region. The combination of relentless cutting and increased frequency of fire resulted in less productive scrubby pine types that dominate the area today. These scrub pines now comprise one of the most hazardous wildland fuel types in the nation.

The driest spring on record in New Jersy culminated on the weekend of April 20-21, 1963, when a series of wildfires burned 183,000 acres of woodland, consumed 186 homes and 197 outbuildings, and was responsible for the loss of seven lives. Thousands were forced to flee and entire communities were evacuated. As already noted, more than $8.5 million in improved property was destroyed.

More recently, 15,000 acres, eight homes, and a number of outbuildings were destroyed in the South Jersey region on March 31, 1977. Later that year, four firemen were killed while fighting a 2300-acre blaze on the Bass River State Forest.

However, developers continue to build in some of the region's most hazardous areas with little or no regard to the dangers of wildfire. The most dramatic example of this can be seen in the vicinity of Whiting in Ocean County, site of numerous residential and retirement developments.

In some cases, lot clearing amounts to no more than a swath cut by a bulldozer with little room for the structure. Forest fuels are dangerously close, and in certain instances, are in direct contact with buildings.

A number of dwellings are constructed of flammable building materials such as wood siding and cedar shakes, which can ignite readily in an intense wildfire. The problem is compounded because firefighters cannot use normal wildland fire suppression tactics when structures are involved. The immediate protection of life and improved property would become a primary concern and control of the wildfire would be delayed. As problem fires gain in size and build in momentum, overall damage to improved property would be greatly magnified. Firefighters may have to sacrifice some structures in order to reduce total damage, placing the fire boss in an unenviable position.

Furthermore, State Forest Fire Control initial attack vehicles are not designed to control structural fires nor are personnel properly trained in structural firefighting tactics.

Controlled Burning

Fighting a wild fire

Many of the rural volunteer fire companies located in or adjacent to the Pine Barrens are poorly equipped and undertrained and would not be able to respond effectively to multidwelling fires involved in a wildland conflagration.

The combination of urban development and wildland fuels that has led to disastrous fires in California is similar to the situation that is developing in the Pine Barrens. Both areas are included in the same fuel classification (Fuel Model B) of the National Fire Danger Rating System, with terrain being the only major difference between the two areas. California is not the only state to experience a wildland fire disaster involving improved property; Wisconsin and Montana have recently experienced similar problems.

Considering the experience of other states, and the region conflagrations that have already occurred in South Jersey, the question, "Are the Pine Barrens being primed for a major fire disaster?" must be asked. Statistics and past history support the premise that it is only a matter of time before such a calamity occurs.

How do we prepare for the inevitable?

First, a number of steps can be taken to reduce the impact of future wildfires in the Pine Barrens.

Several attempts have been made at the state and federal levels to limit development in and preserve certain portions of the Pine Barrens. They are as follows:

The Pinelands Environmental Council, created by an act of the State Legislature in January, 1972, represented the first coordinated effort to save and protect the resources of the Pine Barrens. The Council had the authority to review any project that would destory or substantially impair significant historic or recreational resources or bring about a major change in the appearance of the region.

One of the Council's primary tasks was to develop a comprehensive plan for preservation, enhancement, and development of the area's resources. Owing to a variety of problems both political and economic, its work was never completed.

A study was prepared by Rutgers University at the request of the National Park Service, purportedly to survey the New Jersey Pine Barrens as a possible candidate for incorporation into the National Park System. An outer protection zone and inner preserve are proposed and plans for both federal and state control are outlined.

In addition, Governor Byrne created the Pinelands Review Committee by Executive Order 56, on May 28, 1977. The purpose of the committee was to develop a comprehensive land use plan for the Pine Barrens. The plan proposed an outer protection zone and an inner preserve similar to those of the Rutgers Study.

Based on the recommendations of the Pinelands Review Committee and federal legislation, the Governor issued Executive Order 71 on February 8, 1979, imposing a building moratorium on 1500 square miles of Pine Barrens territory. This was done to allow sufficient time for the planning process without further degradation of the Pine Barrens ecosystem.

The Pinelands Protection Act became law on June 28, 1979. The Act established the Pinelands Commission and gave legal status to the building moratorium.

The Pinelands Commission will carry on the work begun by the Pinelands Review Committee and complete the land use plan for the Pine Barrens. The Commission will determine the type and amount of human development that the Pine Barrens can sustain while still maintaining its overall ecological values.

Land acquisition by the state or federal government is another method of controlling development in areas considered critical to saving the Pine Barrens. Both federal and state initiatives have been made to purchese these areas.

In both the Rutgers study and Pinelands Review Committee Management Plan, the importance of fire in shaping and maintaining the Pine Barrens is emphasized. The need for prescribed burning and harvesting on a continuing basis is also stressed. However, no reference is made to the danger that wildfire poses to current and future development.

In short, the dangers of wildfire have been generally overlooked by all but fire control personnel. There is, it seems, a tendency for people to forget, especially it if has been a few years since the last major fire season. Many individuals moving into the Pine Barrens region have never seen a wildfire and planners and developers ignore its potential when planning, locating, or building a development.

Better wildfire education programs are needed. Currently, a Wildfire Hazard Inspection Form has been prepared by the State Bureau of Forest Fire Management and distributed to residents as part of a contractor program. A brochure outlining fire danger to residents of

Continued on page 29

Cleaning and Preserving Fish

BY JOE BILBY

On a recent trip to the supermarket, I visited the "fresh fish" section. Nestled in a little styrofoam box covered with a transparent wrapping was a grayish piece of fish. It was labeled "flounder fillet," and the price was $3.89 a pound. In the fishmarket down the road, somewhat more appealing flounder retailed for even more.

I have always enjoyed fishing as a sport, and I have always enjoyed eating fish and other seafood, but I have also secretly believed that my view of the economic good sense of the sport was, in reality, a rationalization. You can, however, spend an awful lot on tackle, bait, and gas before you spend almost four dollars a pound for Jersey Shore fluke or flounder.

In addition to the economic incentive of fishing, enjoyed by few other sports, there is no doubt that fresh fish, caught by the individual sport fisherman, properly cleaned and preserved, is the finest piscatorial eating available anywhere. It is superior in flavor and texture to fresh fish brought in by local commercial fishermen and does not even bear comparison with supermarket offerings. Over the years I have striven to make my fish a gourmet delight. Sadly, much freshly caught fish does not fall into this category because many fishermen are simply not aware of the care and preparation needed when dealing with such a highly perishable commodity.

New Jersey waters, both fresh and salt, are blessed with an abundance of palatable fish species all year 'round. The proximity of the coast puts excellent saltwater fishing, from party boat, private craft, or shore within the reach of virtually every inhabitant of the state throughout the calendar year.

Treatment of the angler's prize varies according to the season. In the summer, fish should be put on ice as soon as possible. To avoid the necessity of purchasing ice, I save plastic gallon and half-gallon containers, fill them with water, and keep them in my freezer between trips, thus assuring a steady and convenient supply. When fishing with light tackle for small species from docks and marinas, I take a small lunch-type cooler and several of the prepackaged refreezable ice substitutes available in most sporting goods stores. If no cooler is available, fish should be kept in a wet burlap bag, since evaporation of the water keeps the bag cooler than the surrounding air temperature. Many anglers dump their catch in an uncovered plastic bucket, under the mistaken assumption that the water they pour in it will retard spoilage. They do not realize that the water heats up in the sun and literally begins to poach the fish. If fish are kept in a plastic bucket, it should be covered with a piece of wet burlap and kept out of the sun. Stay away from plastic garbage bags and similar containers which do not "breathe," retaining heat and hastening decomposition. In winter fishing these problems are not as critical, especially when fishing for whiting in January when the fish begin to freeze as soon as they are removed from the water.

Once you get off the boat or leave the beach, get your catch home as soon as possible. It is better to clean or fillet them before you leave the area, if practical. Many party-boat patrons clean their fish while the boat is coming in. While the type of filleting or cleaning generally done under these conditions is satisfactory temporarily and helps preserve the meat for the trip home as well as reduces the bulk to be carried, it should not be considered the end of your cleaning chores. A more thorough cleaning is necessary before refrigeration or freezing.

There are two philosophies of fish cleaning. You can decapitate the fish and clean out the organs of the body cavity, leaving the carcass intact for cooking, or fillet the meat off the carcass. I prefer the latter course in almost all cases. Fillets are easier to handle and allocate into meal-sized packages and are preferred eating by most people, even those who profess not to like fish.

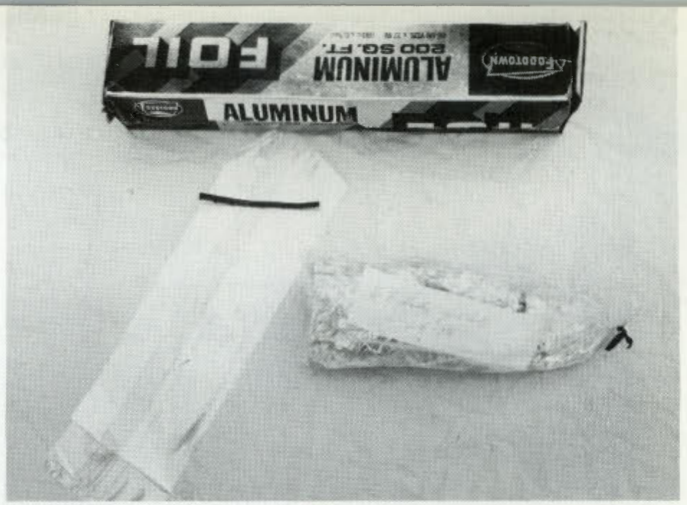
The fillet knife should be long and slender, with a flexible blade. The stainless steel ones resist corrosion and hold an edge for a long time. The carbon steel variety are initially cheaper and easier to sharpen, but are subject to rust if not promptly washed and dried after use. Both are equally effective tools.

To properly fillet a "round" fish, such as a blue fish, weakfish, or mackerel, lay the fish in front of you with its head facing to your right. The fish should be on a cutting board, or on one of those boards made for filleting, which have a large metal clamp to secure the fish's tail. Grasp the fish several inches behind its head and make a downward cut just to the rear of the head until you reach the backbone. Turn the knife on its side and cut straight back towards the tail, removing a solid piece of meat. After performing the same surgery on the other side of the fish, you should skin your fillets. Lay the fillet in front of you, the larger or head end again to your right. Take the knife and make a straight downward cut about one quarter inch or less from the tail end. Hold the tail end with the tip of your left index

PHOTOS BY AUTHOR

A smoker with hickory chips and Kosher salt

An assortment of knives: left to right: worn down carbon steel butcher's knife (good for filleting), stainless fillet knife, carbon steel fillet knife, carbon steel steaking knife, sheath knife for gutting.



A package of fillets ready for the freezer, along with the packaging material

finger. Turn the knife so that it is flat, with the edge pointing towards the wide end of the fillet. Remove the skin by sliding the knife between it and the meat until both are separated. Conclude the operation by trimming any remaining small bones out of the fillet.

If you are filleting "flat" fish, such as flounder or fluke, place the fish in front of you, head facing away. Make a cut with your fillet knife across the top of the fish, behind the head. Take the knife and cut straight down the middle of the fish, along the spine. Cut away from the center, removing first one fillet then the other. Turn the fish over and perform the same operation on the other side. This will give you four fillets.

If you wish merely to clean the fish and preserve it whole, you will find it more convenient to use a stiff-bladed sheath knife with a four- to six-inch blade. You should scale the fish first, unless it is to be smoked. Some people prefer to use a separate scaler, but the blade of the knife will work as well. After scaling, remove the head. This will expose the entrails. Insert the tip of the knife blade in the vent or anus, edge facing towards the head, and cut forward. Scoop out the entrails with your fingers. Rinse out the body cavity, making sure to get every trace of blood and entrails; if left, these will cause spoilage. Slide the tip of the knife deeply alongside both sides of the fins, and pull them out with a pliers. The fish is now ready for eating or freezing.

Large fish, such as big bluefish or striped bass, may be steaked. To steak a fish, first clean as described above and then slice off steaks of the desired thickness as if you were cutting a loaf of bread. A large, sturdy knife is preferred for this type of preparation.

If you are not going to eat your catch within the next 24 hours, it is advisable to freeze it. It has been my experience that fish frozen properly at home tastes almost as good as fresh fish and much better than commercially frozen products.

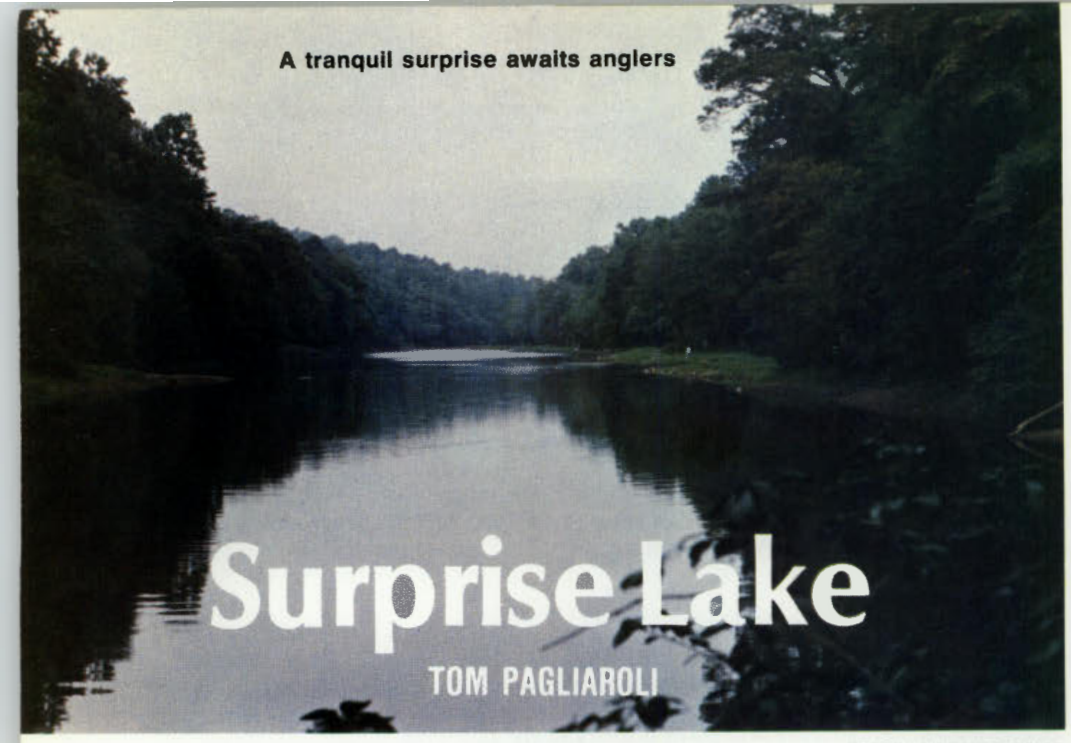
When freezing, I dip my fillets in a mild brine (1/4 cup Kosher salt to three cups water) and pack them in individual meal packs wrapped in aluminum foil. The foil packages are then inserted in plastic freezer bags with a slip of paper indicating the contents and the date. All air is forced out of the bags and they are tied with the ties provided and placed in the freezer. Whole fish are frozen in a similar manner.

If you wish to smoke fish, leave the scales and fins on, as they help to hold the finished product together. I use one of the small, commercially available smokers for whiting, eels, mackerel, and bluefish, all of which develop a delicious flavor in the process. Complete instructions accompany the little smokers, which are a handicap only if you have a large quantity of fish to smoke. Smoking fish is a lot easier than it sounds, and every angler should smoke part of his catch, especially in the winter when whiting are available. The fish should be soaked overnight in a brine of one cup of Kosher salt to one quart of water. The brine draws out any remaining blood and aids in preservation. The fish should then be thoroughly rinsed to remove excess salt. At this point it can be placed directly in the smoker, or precooked at a very low oven temperature to hasten the process.

The smoking agent, pulverized hickory and/or hickory chips, is available wherever smokers are sold. I generally buy both, using the pulverized to get up a good head of smoke and the chips, which burn at a slower rate, to keep it going. If you have cut down an apple tree for firewood, save the sawdust and make chips out of the smaller pieces, as these can be used as a substitute for hickory and produce a pleasing flavor. Never use woods such as pine or spruce, as these leave a nasty resin in both the fish and the smoker.

When all of your catch is rendered fit for the table or stored away for future consumption, stop and think before you dispose of the carcasses and other remains. If you are a gardener, bury them beneath your cucumbers or tomatoes, thus recycling all that you have taken from nature.

Now, more than ever before, the individual sportsman should realize his niche in the food chain. By catching, processing and eating fish, he is not only enjoying himself and producing excellent table fare for a reasonable price, he is also actively participating in an ecological process. □



A tranquil surprise awaits anglers

Surprise Lake

TOM PAGLIAROLI

PHOTOS BY SANDI RADICE

The floating plug landed with a gentle "plop," barely audible in the early hour stillness. After a 10-second pause I gave the lure a few twitches and began a slow retrieve, creating a small wake through a clear alley in the expanse of weeds. The lure vanished in a swirl and then a sudden eruption shattered the glassy surface as a wrenching strike bent my ultra-light spinning rod to the breaking point. I reared back and held on as the drag whined and four-pound-test monofilament melted from the spool. The commotion came to an abrupt halt as the fish elected to sulk in the thickness of the weedbed. I waded out to my boot tops and delicately pumped the rod, sending irritating vibrations down the line and making the finned fighter down there angrier by the second. That about did it! With a sudden burst of speed the fish fled for open water and rocketed into the air once, then twice. I kept the line as tight as possible, wearing down my adversary bit by bit. Finally, exhausted, the fish turned onto its side and I guided it ashore, beaching it unceremoniously. Twenty-four inches of chain pickerel lay there, a picture of savage beauty. I gingerly removed the treble hooks from the tooth-studded jaws while these dime-sized eyes glared at me malevolently.

I released this one as I would two other later on that morning, and one of these measured less than 20 inches in length.

What made this morning's foray special was that I was fishing only a couple of miles from my home in one of the most heavily populated areas of northern New Jersey. To top it off, the only other angler I saw that morning was a crafty green heron stalking silently in the shallows. The place? Surprise Lake in the Watchung Reservation, which is situated in the towns of Summit and Mountainside in Union County. Surprising? Read on.

Surprise Lake is located on Blue Brook in the Raritan drainage. It is a fairly young body of water, having been created in the late 1880's as a source of power for a mill that once served the area. The mill has long since been abandoned but the lake lives on, providing high-quality fishing in the virutal shadow of the Big Apple.

Covering approximately 29 acres, Surprise Lake boasts a limited but thriving gamefish population which includes chain pickerel, largemouth bass, and channel catfish. A wide variety of panfish is present including black crappie, yellow perch, brown bullhead, bluegill and pumpkinseed sunfish, and even an occasional white perch. Needless to say, the opportunities to the angler are many and at times fishing pressure is intense. But for the most part, Surprise Lake is under utilized and its potential remains untapped except for a few knowledgeable anglers. This is a shame considering the shrinking availablity of public fishing places, not to mention the price of gasoline.

Surprise Lake is nestled between two wooded hills and is surrounded by a bridle path. There are some picnic tables and grills at lakeside and also convenient parking facilities. The area receives heavy recreational use during the spring, summer, and early autumn, and erosion is evident on parts of the shoreline. Surprise has an hourglass figure with a stone dam at the lower end. Siltation has taken its toll on the upper portion of the lake, which is gradually being filled in and choked with various aquatic plants. Eventually this portion will be pinched off entirely from the main body of water. Fallen trees, weedbeds, and other subsurface structures provide refuge for the aquatic inhabitants. The average depth is four feet and there is a channel in the lower portion of the lake that reaches 10 feet. The water level has a tendency to flucuate with the onslaught of summer's extreme heat and thunderstorms but numerous cold-water springs entering the lake manage to keep it at a fairly stable level. The bottom is mostly muck but a few areas of sandy and rocky bottom do exist, providing spawning habitat for largemouth bass while the weedbeds provide a spawning area for pickerel. Reproduction of these species is documented and their growth rates here compare favorably to those in most northern New Jersey lakes. The prolific panfish

Ralph Blaudow waits out those channel cats.

Proof of reproduction: young-of-year pickerel and bass.

Dick Nelson hoists up two of Ralph's channel cats.

Young angler with typical Surprise bass.

once threatened to overrun the place, but the Bureau of Fisheries seined out thousands of the critters a few years back and currently there is a healthy population of plump yellow perch, crappies, bullheads, and bluegills. White perch are not common but are taken now and then. The pumpkinseeds tend to be stunted, although a few large ones are caught on occasion. However, these small sunnies merely add to the gamefishes' menu of minnows, shiners, frogs, crayfish and leeches.

Largemouth bass *(Micropterus salmoides)* and chain pickerel *(Esox niger)* are the most sought-after fish in the lake. Bass wax fat in the food-rich waters and can attain heavyweight proportions. Although the average bass taken ranges between one and three pounds, it gives good sport. It seems that once bass reach this size they are kept by most anglers, leaving only a few to grow up enough to join the ranks of busters that inhabit Surprise. Trying for these eye-poppers is an exercise in frustration as they are wary customers, but they are there for the skillful (or lucky) angler.

Pickerel are the tough boys of Surprise, putting on inches and girth in the protection of weedy coves and overhanging trees or bushes. These are educated fish, wise to the array of hardware, feathers, and baits thrown at them. Your best shot at tangling with one of these toothsome sticks of dynamite is to fish from the first hint of light until the sun is shining on the entire expanse of water. Even better is an overcast day with a light, misty rain falling.

Overall, the early morning hours seem to be more productive for chainsides, while the waning hours of daylight seem to perk up Mr. Bigmouth. But remember that *Esox* and *Micropterus* are opportunistic feeders that may be on the prowl anytime, in any weather, during any season. So, to coin an old sayin', "The best time to fish is when you can."

Channel catfish are the success story of Surprise Lake. The Bureau of Fisheries stocked 1300 channel cat fingerlings in Surprise in 1959 and again stocked the lake in 1962 with 300 more, on an experimental basis. When the expected fishery never materialized, an energetic study was made of the stocking and managing of Surprise's channel cats. Again, in 1974, 1000 channel cats averaging four to seven inches in length were stocked in the lake; in 1979, another 500 were added. The painstaking study and careful management procedures paid off and now channel cats tipping the scales at five pounds or better are caught rather frequently by Surprise regulars who specialize in chasing these whiskered leviathans. One such "regular", Ralph Blaudow of Summit, has wrestled channels up to 10 pounds out of Surprise and rarely leaves without a sackful of three to five pounders. Says Ralph, "Some of my buddies still can't believe these cats come outta' Surprise Lake." Well friends, you gotta believe!

It is unfortunate that reproduction of channel cats in Surprise has not been recorded to date, despite aggressive work by the Bureau. Nevertheless, tackle-testing channel cats roam the waters of Surprise and are a challenge to both the casual and serious angler.

Now that you know what is there, what is the best form of trickery? Well, that can be debated until the cows come home! Floating-diving minnow plugs work fine and smaller jig'n tail combos are simply lethal. Plastic worms account for their share also, as do spinners, spoons, streamers and poppers. Live-bait enthusiasts swear by live shiners and the time-honored night crawler.

Fishing is not restricted to the shoreline either. A boat permit can be obtained from the Union County Park System Office in Warinanco Park, Elizabeth.

Lake Surprise fills an important niche in the state's fishery program. It offers anglers who do not have the time or money for a fishing trip to some faraway spot an opportunity to fish for gamefish not regularly found in other urban lakes. Surprise is within easy reach of most of Union and Essex counties, and even parts of Somerset County are within a stone's throw. Just follow Rt. 22 west out of Newark or east out of North Plainfield to New Providence Road, where you'll see signs for the Watchung Reservation. The lake can also be reached via Rt. 24 to Summit.

The urban angler does not have to drastically curtail freshwater fishing activity once the hatchery trucks stop rolling. Good fishing can be found close to home. The next time you get a hankerin' to wet a line, give Surprise Lake a try. You just might be "surprised"! □

Continued from page 21

RECYCLING...

County is the recycling center in Bethlehem Township, a well-recognized example of what can be done in a rural setting—population, 1,700 people. Collected product, every Saturday:a surprising variety, which is newspaper, glass aluminum, and steel.

Similarly well-established, for over seven years now, is the varied recycling program of more centrally located Somerville Borough, the seat of Somerset County. Today's action there of enforcing curbside collecting with a mandatory ordinance for newspaper separation, maintaining a voluntary glass, metal, and miscellaneous paper recycling center, tackling not only private residences but apartments and commercial operations, and recycling toys each Christmas did not come about easily. Still, during this past year more newspaper was collected than during all of the prior five years!

It was launched with a hope, embedded right away in the logo which has persisted for at least seven years now: WASTE, Inc. (We are Somerville, together for Ecology).

Says Manny (Emanuel) Luftglass, Chairman of the Somerville Environmental Commission:

At our various locations we used local people power to handle the volume. We kept about twenty percent of the receipts for the material we sold and used it to provide scholarships to high school graduates. The balance was distributed evenly to the groups who manned the lot. A local fire company received the major share. A group of kids formed "Operation Plant" and put together dollars to plant trees near the high school. The Girl Scouts bought a sail boat with some of their money. Several youngsters supported a poor Phillipino youth whose parents could not provide for him. Many dollars were given to our Middle School Warrior Athletic Club, to the CYO, the Jewish Center Youth, to two black groups, and to many, many other groups whose kids worked in the WASTE recycle lot.

We brought the Salvation Army into our program and once a month a truck would come into the lot and drive away with recyclable clothing, pots, pans, etc. We now have a permanent container standing at the site which people bring such items to. Recyclable toys, dolls, etc., are brought into the lot every December, and the Somerville Youth Development Project volunteers gift wrap and hand them out to the area needy at Christmas.

Curbside collection of newspaper has become a strong feature of the program, but the ordinance mandating this had some sticky moments before being passed. In 1973 WASTE volunteers collected about 900 signatures on a petition which requested the Borough Council to place on a ballot the question of whether or not to have such an ordinance. The request was voted down 4-3.

In 1976 Council created the Somerville Environmental Commission. This body then drafted the present "Save-a-Tree" ordinance, which the Council voted into law on 12/20/76. Notes Commission Chairman Luftglass:

On the second Saturday of March in 1977, five years after WASTE began, the "Save-a-Tree" ordinance started to be enacted. The ordinance had been so widely publicized locally that fifteen tons were picked up that Saturday. It is estimated that over 90% of the homeowners participate in this program!

To the Southeast, in Somerset County where out of 21 municipalities at least eight, or 38%, are into municipally supported recycling programs, the Middlebush section of Franklin Township holds the record for longevity: 41 years at this writing, since 1938.

Run by the Middlebush Volunteer Fire Department, curbside collection of newspaper in Fire District No. 1 of Franklin occurs on the first Sunday of each month. The income goes for uniforms, fire hoses, other equipment, building maintenance, and utility bills. With such a record for service, it is no wonder that the efforts by this Department have been cited many times over for excellence.

Only a few miles away Rutgers University in New Brunswick also operates what may be one of the prototypes of recycling; in this case, a university or college-centered operation. Here no less than 20 centers have been open around-the-clock all year long for newspaper, glass, aluminum, and steel bimetals. New Brunswick itself donates trucks and sites, while the university provides storage facilities and pays a full-time coordinator and seven part-time student workers from the profits.

The recycling tradition of New Jersey is well shown in many other places, of course, and one of the best is over at the shoreline. To follow the fortunes of regional recycling, which includes Shrewsbury, call the Regional Resource Recovery Committee in West Long Branch, 201-229-7678.

It may help to ask them for the contact person of the Regional Recycling Coalition. This group has developed from the more broadly designed Regional Resource Recovery Committee with the specific charge of handling curbside newspaper collecting in particular. The history and future of the two allied associations are worth investigating as a means of seeing how a committed group of environmentalists labored to ensure

Continued on next page

Making New Beverage Cans From Recycled Aluminum

If you bring aluminum to one of Reynolds scheduled recyclying locations in the Garden State, you'll notice the large, white Reynolds' tractor trailer displaying the Reynolds' red-and-blue logo on the sides and rear of the trailer. The line of recycling customers forms at the rear of the trailer.

When it's your turn, you may hand your bagged aluminum cans up to the Reynolds mobile unit operator. The operator weighs your aluminum on a fully-visible hanging scale. Records are made of the weight of your cans and scrap. You then will be paid by Reynolds—cash on the spot—at the rate of 23 cents per pound for the aluminum you bring in.

When all the customers have been serviced and the scheduled stop is completed, the Reynolds operator drives the aluminum recylcing van back to Reynold's Plant in East Rutherford. At the recyling plant, the arriving recycling van is unloaded. The aluminum beverage cans are then mechanically separted to remove any non-aluminum materials and run through a shredding machine—where the aluminum is shredded into popcorn-sized chips ready for shipping and further processing.

The shredded aluminum is blown—much like grain—onto large trailers for shipping to Reynolds Reclamation Plant in Bellwood, Virginia.

At the Reclamation Plant the chips are melted in a furnace and all coatings and foreign materials are burned away by the intense heat.

The recycled aluminum is then transported to other Reynolds plants where it can be used in a variety of ways; for instance, sheet ingot, for aluminum cans, is rolled into a continuous coil sheet and shipped to Reynolds' aluminum can-producing plant—in New Jersey, the can plant is located at 433 Blair Road in Woodbridge.

Using a draw-and-iron process, Reynolds produces new cans. The new cans leave the can plant and are shipped to beverage manufacturers where they are once again filled with beverage and begin a "second life" as beverage containers—ready to begin the cycle all over again. Each time the aluminum cans are recycled, Reynolds saves 95 per cent of the energy it would take to make the cans from virgin materials.

To determine the schedule of the Reynolds aluminum recycling location nearest you, call toll-free 1-800-228-2525 or contact the East Rutherford recycling facility at 201-935-0002. Now you're ready to join the aluminum recycling effort in the Garden State. □

that a dream would become a reality. To the first meetings since October, 1976, came authorized delegates who represented no less than seven municipalities: Long Branch, Eatontown, Little Silver, Monmouth Beach, Oceanport, Shrewsbury Borough, and West Long Branch. Today the list is longer; the volume of paper is beginning to promise a long-term precedent-setting, multi-municipal operation.

Earth Day has a special meaning here, for on April 22, 1979, the interlocal services agreement uniting eight municipalities under the Regional Recycling Coalition was signed. For these people it means recycling as a region and even more.

In New Jersey a fragile inland expansion of this outer coastal plain reaches westward nearly to Philadelphia. Along the way in this direction another of the more ambitious recycling programs is in its initial stages. The Camden County Shade Tree Commission, quartered in Blackwood, sees waste wood as such a promising source of materials and energy that it is proposing itself, directly or indirectly, as a major center for timber recovery.

Appropriately, one of the best volunteer recycling centers exists in Glassboro. Created by the Glassboro Environmental Commission and staffed by Boy Scout Explorer Post 118, the center is not only open every day from 7:30 a.m. to receive newsprint, glass, and aluminum but has a slide show to help educate local civic orgainzations.

Some sense that this is still pioneer country is retained in struggles which this center has had to overcome during its five years of existence. Reports a Boy Scout leader:

The original center, a 24 x 32 foot basketweave enclosure, was the victim of vandals and the elements. Someone tried to knock it down with a car, so the Post surrounded it with 55-gallon drums and filled them with concrete. A March windstorm with 90-mph winds flattened it. Post 118 then rebuilt it with adequate bracing and enclosed half of it so they could store newspaper away from the elements and the vandals. They designed it so that people could leave glass and paper in enclosed bins so they wouldn't get wet. They lined the walls with heavy plywood. Evidently they did it well because it has survived intact for the last four years, including a direct hit by a small tornado that overturned cars and nearby small buildings.

Let this program stand as a final tribute to the many on-going and incipient ones, a few here recorded and many left unmentioned due to limitations of space.

We gratefully acknowledge the invaluable help provided by the many individuals associated with the programs themselves. Many of those men and women went far out of their way to provide us with personal accounts of the history and present activities of these programs, so deserving of recognition. It is unfortunate that only a comparatively few could be cited here; but they are representative of the many who have made New Jersey truly one of the best examples of the newly emerging American Dream, "The Recycling State." □

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Development

Fire

wooded areas will be prepared and accompany the Hazard Inspection Form. Still, additional programs are needed to reach planners and developers.

Until recently fire standards could be enforced only through the enactment of ordinances and codes by local authorities. Unfortunately, very little was done in regard to wildfire protection.

The Pinelands Environmental Council made the first positive effort to incorporate fire features into subdivisions and developments. Plans were submitted to the State Bureau of Forest Fire Management for review and fire safety recommendations. Some recommendations were adhered to, but many were ignored.

Presently the Pinelands Commission has requested the Bureau of Forest Fire Management to develop a Fire Management Plan for the Pine Barrens. This plan outlines fire management policy and practices to be applied to Pinelands management. Wildfire hazard areas have been designated. A section of the plan outlines fire safety standards for subdivisions and developments. Specific recommendations for standards are made in the following areas: project planning, access roads, water supply, vegetative manipulation, and structural considerations.

The standards are based on a wildland hazard classification system that is tied to the rate of spread and resistance to control of native vegetation. There is a progressive scale for increasing the standards as the hazard becomes more severe. The standards will provide guidelines to municipalities for the enactment of ordinances and building codes necessary to make wildland subdivisions and developments as fire safe as possible.

The highly acid soils of the Pine Barrens lack earthworms and other organisms that would normally incorporate leaves and pine needles into the soil. Consequently, there is a rapid build-up of litter. Unless this fuel accumulation is periodically reduced, under controlled conditions, intense fire results which kill or severely damage the overstory. The vertical continuity of fuels enables flames to spread from the ground into treetops, resulting in dangerous and destructive crown fires. Prescribed burning has the greatest potential for large-scale fuel modification and hazard reduction in the Pine Barrens. Through periodic use of fire at three to five-year intervals, horizontal and lateral fuel continuity can be broken and its accumulation reduced.

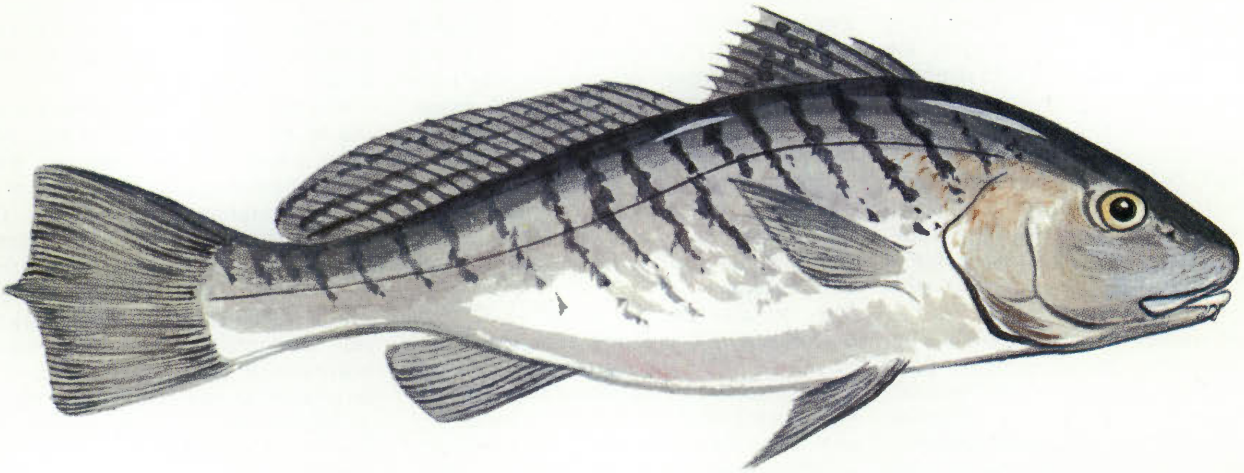
Prescribed burning has been used to some extent as a means of establishing and maintaining fire breaks around selected developments and other high-value areas. This practice should be expanded to other developments to increase fire safety.

Because of the vegetative composition and fire history of the Pine Barrens, the use of prescribed fire remains the most valuable and environmentally sound fuel management tool available. It will be an important element of the state's Fire Management Plan.

So, now you have the problem and some of the possible solutions. Unless we adhere to a prescribed set of strategic plans in this impending war (and yes it will be a war of sorts) then we may possibly have a future holocaust in the Pine Barrens far surpassing the fires of California. □

Continued from page 3

ATLANTIC CROAKER



BIOLOGY

Common names: Atlantic croaker, crocus, hardhead, king billy

Scientific name: *Micropogan undulatus*

Range: New York to Texas

Size: Average weight and length is 3/4 lb. and 12 inches.

Food: Croakers are bottom feeders, their diet consists mainly of mollusks, crustaceans, worms and fish.

Habitat: These fish inhabit sandy shores and shallow coastal waters.

Migration: In the summer, they are common near shore as opposed to September and October, when they are abundant in deep coastal rivers.

Spawning: The spawning season is long, commencing in August and extending into December. The number of eggs produced per fish is approximately 180,000.

In this particular species of croaker, both sexes can make a croaking sound. The croaking apparatus consists simply of a pair of croaking muscles and an air bladder. The two muscles contract, using the air bladder as a resonating chamber to produce the croaking sound.

RECREATIONAL & COMMERCIAL IMPORTANCE

Although the croaker has traditionally been an important gamefish of the Delaware Bay, only small numbers are encountered in the rest of New Jersey's coastal bays.

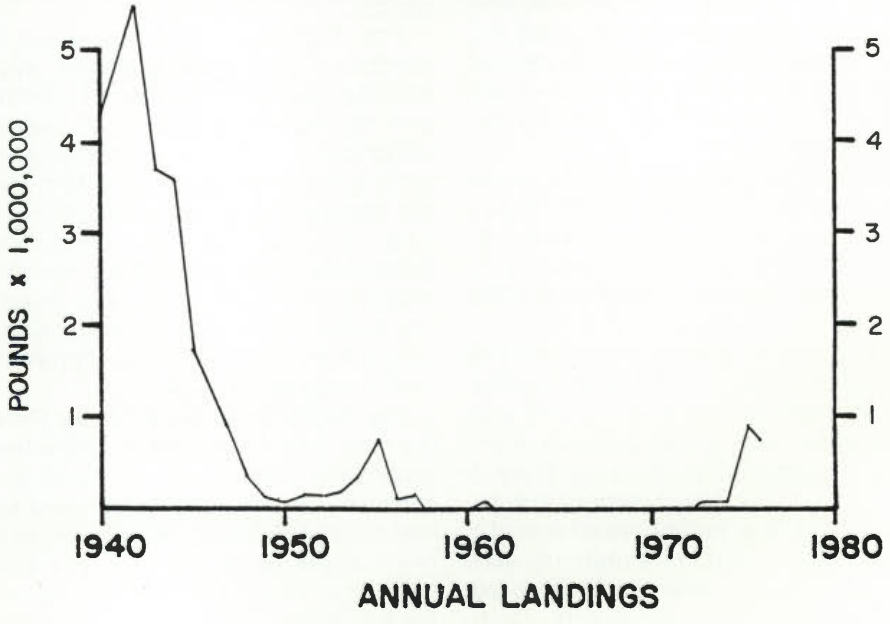
During the 1930's and 1940's, the croaker was a major commercial species. After 20 years of low population abundance, catches have begun to recover. Almost all of the croakers taken commercially in New Jersey are caught during late summer and fall outside Delaware Bay by otter trawl.

FISHING FACTS AND TECHNIQUES

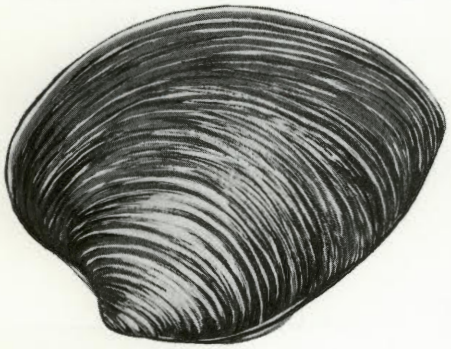
The feeding habitats of the croaker are very similar to its close relatives, the weakfish. Thus, the same basic fishing techniques are used for both species. Although croakers are hard-nosed fighters, they are small and require only light tackle. A spinning or bait casting outfit equipped with 8 to 20 lb. test and 1/0 to 4/0 hooks is adequate. A commonly used rig is the top and bottom, baited with strips of squid, clam or shedder crab. They are encountered during the same season and in the same waters as the weakfish, but in much smaller numbers in New Jersey.

ACKNOWLEDGEMENTS AND REFERENCES

Anthony Hillman (art), Barry Preim (graph), Lou Rodia, Breder (1948), Hildebrand and Schroeder (1972), Mettiyh (1977), Bigelow & Schroeder (1953), compiled by Bill Figley and Ray Townsend.



HARD CLAM



BIOLOGY

Common names: hard clam, quahog, chowders, cherry stones, little necks.

Scientific name: *Mercenaria mercenaria*

Range: All along the Atlantic coast from the Gulf of St. Lawrence to Florida.

Size: The maximum length of a hard clam is 5-1/2 inches; they can reach an age of 20 to 35 years old. One cannot estimate age by size as there are too many variables that affect growth.

Food: Clams have a siphon which usually extends outside the shell to filter their food. They filter minute organisms, usually microscopic algae and detritus.

Habitat: Clams inhabit sheltered bays and coves with water depths ranging from intertidal to 40 feet. Salinity must be greater than 15 ppt. and bottom type varies from gravel to mud. Clams will always try to burrow in the ground.

Spawning: Hard clams become sexually mature within one or two years. Spawning occurs in the spring (usually June), stimulated by a rise in water temperature. Eggs and sperm are released into the water where fertilization occurs. The fertilized eggs develop into free swimming larvae which drift as plankton with the prevailing currents for about two weeks, after which time they settle to the bottom. Initially, they attach by a byssus thread and then burrow into the substrate.

Although large hard clams have relatively few natural enemies, the young are beseiged by a variety of predators. The blue crab is the major threat to small clams, easily cracking open their fragile shells. Stingrays and drum fish root clams out of the bottom and grind them up with powerful crunching teeth. Whelks pry clams open with the edge of their shells. Moon snails and oyster drills use a rasp-like tongue to drill a small hole through the shell.

RECREATIONAL AND COMMERCIAL IMPORTANCE

The hardshell clam has always been an important bay resource for New Jersey commercial fishermen. During the past 40 years, the commercial harvest had two peaks, one during the early 1950's and another in the late 1960's; each peak was followed by a period of decline. The decline in the 1950's was caused in part by the closing of shellfish areas, particularly in Raritan and Sandy Hook Bays, due to pollution.

In 1978, there were 22,728 licensed shellfishermen in New Jersey. Of these, about 95 percent were recreational, four percent were part-time and one percent were full-time commercial. Two-thirds of the 58 million clams that were harvested that year were taken by the commercial men. Sixty percent of the catch was taken from the eelgrass beds of Little Egg Harbor. Full-time commercial men averaged 622 clams per day, part-time 416 and recreationalists 164.

FISHING FACTS AND TECHNIQUES

Their are several methods to catch hard clams, by boat raking, tonging, scratch raking, or treading. Raking and tonging are done from a boat. In raking, the boat is allowed to drift while the rake is dragged across the bottom. The handle is worked up and down by hand to insure a smooth and continuous drag. The long teeth of the rake lift the clams out of the bottom and the mesh at the back of the rake holds the clams until the rake is lifted into the boat.

Tonging is done from an anchored boat. The tong handles are opened and closed, forcing the tong's teeth to scrape the upper two or three inches of substrate and pick up loosened clams. The area around the entire boat is worked before the anchor is moved. Both tonging and boat raking require considerable work and are usually employed by commercial fishermen.

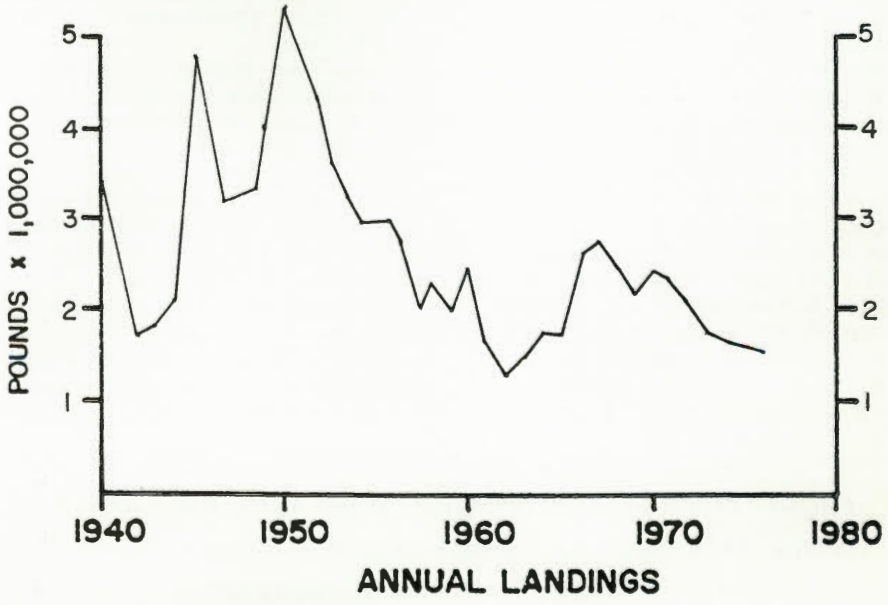
Recreational clammers prefer scratch raking and treading. Both methods necessitate shallow depths for the clammer must work in the water. With a scratch rake, the bottom is raked slowly until a clam is hit. The rake is then used to pry it out of the bottom. In treading, the clammer, proceeding backwards, shuffles his feet through the mud. When the hard edge of a clam is encountered, the clammer takes a breath, ducks under and pulls the clam out of the bottom. The equipment required for treading includes an intertube and basket to hold clams and thin rubber boots and gloves to protect feet and hands. In areas with large tidal fluctuations, most treading or scratch raking is done during the four or five hours of low tide.

Hard clams are found in the state's bays where salinity is above 15 parts per thousand. They are usually not abundant at the mouths of inlets where baywaters are very salty.

A license is required for recreational as well as commercial clamming. Clams smaller than 1-1/2 inch in length must be returned to the water. Clammers must be careful not to clam in either polluted waters or in leased clam beds. Condemned areas are delineated on a chart available with the clam license and leased beds are marked with cedar stakes.

ACKNOWLEDGEMENTS AND REFERENCES

Anthony Hillman (art), and Barry Preim (graph), Tom McCloy, McHugh (1977), Miller, Wallace, Shuster and Hillman (1975). Compiled by Bill Figley and Ray Townsend.



Dedicated to Waterfowl Conservation

NEW JERSEY DUCKS UNLIMITED 1980 DECOY CONTEST, EXHIBIT, AND AUCTION

SATURDAY, AUGUST 23

Beach Haven Bicentennial Park
Atlantic and Beach Ave.
Beach Haven, N.J.

Application Blank for Contestants

MAIL TO: F.W. Van Ness 219 87th Street Stone Harbor, New Jersey 08247

Contest Application:

Name _____ Tel. _____

Street _____ City _____

State _____ Zip _____

Display/Sales Table Reservation Form

MAIL TO: Same As Above

Will You Require Electricity? Yes____No_____

Enclosed is my check for $ _____ to_____
reserve 1____ ,_____ 2____, or 3____ table(s) for

display or sales, at $10.00/table. Make checks payable to New Jersey Ducks Unlimited.

Name _____

Street _____

City _____

State _____ Zip_____

Marsh Duck Family_____

Drake _____

Hen _____

Black Duck_____
Teal_____
Pintail_____
Widgeon_____

Diving Duck Family_____
Broadbill (Scaup)_____
Red Breasted Merganser_____
Bufflehead_____
Canvasback_____

Goose/Brant Family_____
Canada Goose_____
Atlantic Brant _____

Continued from the editorial page

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perience of some inner-city children. The article, *Inner-City City Children in the Out-of-Doors,* was written by still another new author, Chris Chaapel, a graduate with a Masters degree in Recreation and Forestry from Penn State University.

An important article for concerned New Jerseyans is *Wandering Through Recycling in New Jersey,* by Millard C. Davis, Recycling Coordinator with the Solid Waste Administration in the Department of Environmental Protection. As a sidebar to this article, we have included a short piece on the Reynolds Aluminum Recycling Company effort in New Jersey.

Another new author, Joseph Hughes, Senior Forester (Fire) of the Bureau of Forest Fire Management in the Division of Parks and Forestry writes about *Development in the Pine Barrens.*

If you like fishing, you should know about *Cleaning and Preserving Fish* so you can enjoy eating the fresh fish. The author, Joe Bilby, new to our pages, is employed by the N.J. Department of Labor and Industry and is a part-time free lance writer, specializing in outdoor subjects and local history.

A surprise for the urban angler is *Surprise Lake* in the Watchung Reservation in Union County. The author, biologist Tom Pagliaroli, writes ". . . . . I was fishing only a couple of miles from my home in one of the most heavily populated areas in northern New Jersey." The "surprise" is that local anglers have been taking large channel catfish, largemouth bass, pickerel, and other species from the lake.

And for good fishing for largemouth bass, sunfish, channel catfish, and brown bullhead, try *Rising Sun Lake* in the Assunpink Wildlife Management Area Monmouth County.

We've put together a pictorial spread to show off the creative efforts of several New Jersey photographers. □

Steve Perrone

FRONT COVER —Family Recreation at the Jersey Shore—Photographed by Al Nunes-Vais

INSIDE BACK COVER —Fishing at Sunset, Long Beach Island—Photographed by Carl J. Petruzzelli

BACK COVER —Winding Brook Farm—Photographed by David A. Bast