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**OUTDOORS**



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# New Jersey OUTDOORS

<b>Lobstering in New Jersey</b>	<b>2</b>
<i>By Marion W. Figley</i>	
<b>Soaring in New Jersey</b>	<b>4</b>
<i>By Carleton V. Brairton</i>	
<b>Environmental Awareness Achieved Through Simulation: A Technique For Teachers</b>	<b>7</b>
<i>By Stephen J. Zipko</i>	
<b>The Great Canoe Race</b>	<b>11</b>
<i>By Carol C. Nash</i>	
<b>Shucking the Oyster</b>	<b>12</b>
<i>By Susan Grant</i>	
<b>Otter Trawling/Perpetual Search for Fluke</b>	<b>14</b>
<i>By James Daddio</i>	
<b>Restoring New Jersey's Riverfronts</b>	<b>16</b>
<i>By Elizabeth Chace</i>	
<b>Wildlife in New Jersey/Return of the Tiny Tiger</b>	<b>17</b>
<i>By Robert Lund</i>	
<b>Visiting History by Canoe</b>	<b>20</b>
<i>By Don Kamienski</i>	
<b>New Jersey's Forgotten People</b>	<b>22</b>
<i>By Linda Joy Fanning</i>	
<b>An Angler's Other Autumn</b>	<b>28</b>
<i>By Allen G. Eastby</i>	
<b>DEPARTMENTS</b>	
<b>Environmental News</b>	<b>16A</b>
<b>MINI FEATURES</b>	
<b>1980 Young Waterfowlers Program</b>	<b>10</b>
<b>National Hunting and Fishing Day</b>	<b>10</b>
<b>Endangered Species Treefrog T-Shirt</b>	<b>31</b>
<b>The Salt Marsh of Southern New Jersey</b>	<b>31</b>

INVESTMENT IN NEW JERSEY'S  
NATURAL RESOURCES  
*(A Center Spread Snapshot)*

# from the editor

## Still Looking

I read a news story last night which discussed the "Global 2000 Report to the President." Nothing but bad news. This report predicts that by the year 2000 we'll have "mass poverty, overcrowding, malnutrition, food shortages and deterioration of the planet's water and atmosphere resources."

And these disasters will come about because of our loss of farmlands, wetlands, plant and animal species, forests, fisheries, and unprecedented pollution of our air and water.

As a conservation magazine dedicated to the wise management and conservation of our natural resources, we are naturally concerned about these matters. In the very first issue (January/February 1974) of this new series of *New Jersey Outdoors*, we printed an article by a distinguished conservationist, John S. Gottschalk, now Executive Vice-president of the International Association of Fish and Wildlife Agencies.

On the first page of the article titled, "The Question of Recreation in the Coastal Zone" this contemporary comment was made:

*Our "development" of the coastal zone has long since gone beyond the point where we are concerned about isolated instances. We are looking at whole-scale invasion! We have extended ourselves into the coastal zone in a geometric progression. In so doing, whole chunks of the coastal zone have been and are being occupied by dwellings, roads, parking lots, factories, dumping grounds, offices, or whatever. The barely-treated effluent and trash of mobs of humanity reared in a "throw-it-away" society foul the water and litter the beaches. The noxious odor of raw or lightly treated sewage now drifts with the breezes over famous beaches from Waikiki to Coney*

*Island. "Red tides", a sure indication of deadly pollution, kill fish and clams, undermine the economy of fishery dependent communities, and depress tourist business. Tawdry buildings and blatant billboards mar the roads and streets in many a resort area.*

In an editorial titled, "We can't Pull the Plug" in the September/October 1976 issue, I wrote about worldwide ocean pollution which described incidents of French fishermen rebelling against the polluted Seine River estuary in France, the dumping of sludge containing methyl-mercury chloride in the waters near the fishing village of Minamata, Japan, which affected as many as 10,000 residents, killing over 100, and maiming over 700, and the red tides that plagued the Jersey Shore for most of the bicentennial month of July 1976 killing hundreds of thousands of fish and shellfish.

I made a comment in the first paragraph of that piece that is still pertinent today:

*When we, in New Jersey, travel to our sandy shores to try our hand at fishin' or crabbin', or to take a dip in the refreshing surf, or just to walk along the beach to clear our heads and uplift our spirits—but find instead a beach smelly with dead fish or littered with throwaways, a surf poisoned with sludge, or a shoreline streaked with oil—then we're being cheated out of a vital piece of our heritage. And if it happens often enough, on countless other beaches, on other continents, then we're all in trouble.*

In still another editorial in the January/February 1979 issue, I asked: "What Happened to the Conservation Ethic?"

I'm still looking for it.

## IN THIS ISSUE:

"Lobster. Delicate, delectable, and (if whole) messy lobster, dipped in drawn butter and savored . . ." *Read Lobstering in New Jersey* by Marion W. Figley, a new author. The lobster drawings were provided by wildlife illustrator, Mary C. Redfern, also new to our publication.

"I have just begun my pre-solo instruction. Someday, when the Jersey sky is filled with cumulus clouds, I hope to be the pilot circling over Route 78 and racing with cars far below. I'm looking forward to that day . . ." So says author Carleton V. Brairton in the article, *Soaring in New Jersey*. When she's not flying gliders, author Brairton teaches high school English. She said when she gets her license, she'll take me up for a ride. I said,

"Let me think about it."

Stephen J. Zipko, Ph.D is a widely-known and respected environmental education teacher in New Jersey whose work has appeared in *New Jersey Outdoors* three or four times. His article, *Environmental Awareness Achieved Through Simulation: A Technique for Teachers*, gets students into acting out predator-prey relationships, and allows teachers to use the near outdoors for these simulation exercises.

*The Great Canoe Race*, by Carol C. Nash, is about the annual race on the Oswego River in the Pine Barrens. "Piney" Nash, a DEP employee, says the race this year will be held on Saturday, October 4th. It's the place to be!!!

Nutritionists assure us that we

couldn't go wrong if we ate oysters at least once a week. Although their reputation as an aphrodisiac remains mythical at best, their food value is rated above beef and pork . . . "Do I have your attention? *Read Shucking the Oyster* by Susan Grant, who has appeared here before.

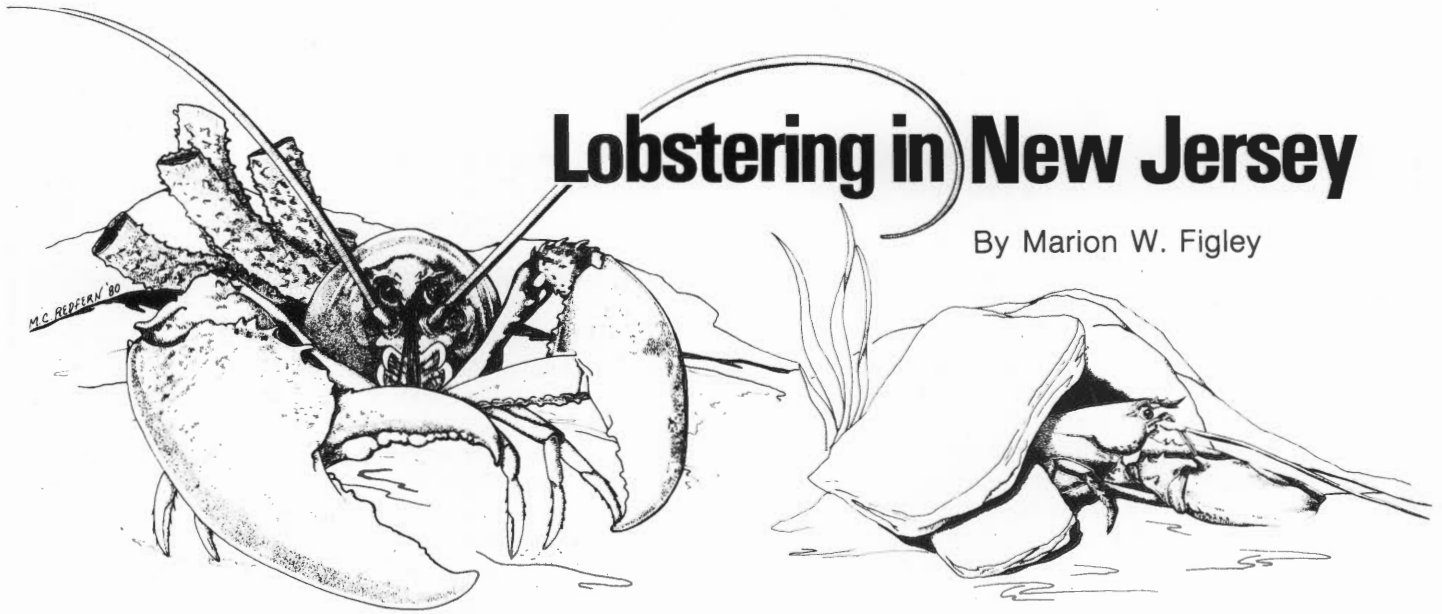
Writer-photographer James Daddio, new to our pages, writes about a seven-day trip aboard the commercial fishing ship, *Blue Diamond*, in the article, *Otter Trawling/Perpetual Search for Fluke*. "Unlike other fishing careers, most of a fluke fisherman's life is spent at sea trawling a prolonged journey north to Cape Sable and South as far as Cape Hatteras."

Our Wildlife in New Jersey series

*Continued on page 10*

# Lobstering in New Jersey

By Marion W. Figley



Vacationers and seafood dinners are inevitable partners at the Jersey shore. A big, let's-get-dressed-up-and-go-out-for-a-seafood-dinner signals the end of a (generally) suntanned stay at a beach resort. And also generally, the dinner to which most people sit down is lobster.

Lobster. Delicate, delectable, and (if whole) messy lobster, dipped in drawn butter and savored. On most menus, lobster is advertised as "Maine," conjuring up pictures of hardy salts along a rocky shore hauling wooden traps aboard a squat lobster boat. Maine does account for 60 percent of the United States catch, but New Jersey has also developed its own lobster fishery, employing 179 persons. In comparison, Maine has 11,715 lobstermen, New York, 612.

The range of the North American lobster, *Homarus americanus*, extends from Labrador to Cape Hatteras, North Carolina, with the greatest quantity of lobsters occurring from Nova Scotia to New Jersey. Of the 10 North and Mid-Atlantic lobstering states, New Jersey ranks seventh in commercial landings.

Lobsters were marketed as early as 1740 in Boston, and 1810 saw the first large-scale commercial fishery. Unlike today, when 75 percent of lobster catches are shipped live, Maine's canneries in the late 1880s sent half its average annual landings of 19 million pounds of meat to Europe, the balance to the American South and West.

New Jersey also has an old, traditional lobster fishery known as the Ambrose Fishery, located near Raritan and Sandy Hook bays, in a seven-mile radius around Ambrose Light Tower, and in the Shrewsbury Rocks fishing grounds. This area is lobstered by commercial potters from Belford and Highlands.

With the advent of motorboats in the 1930s, commercial pot lobstering extended in the next 30 years to the Alongshore Fishery, generally located within 25 miles of the shoreline. An Alongshore area from Long Branch to Point Pleasant is fished by lobstermen out of

Belmar and Point Pleasant. In 1976, the Ambrose and all Alongshore fisheries had a fleet of 50 coastal trap vessels with a combined total of 23,955 pots.

Beyond the 50-fathom (295-foot) line, the Offshore Fishery is a relatively new lobstering area coming under increasing pressure from the deepwater trap fishery begun in the late 1960s. Twelve vessels work here with a combined total of 7400 traps. The lobstering season for traps peaks in June.

Besides the potters, 17 otter trawlers take lobsters incidental to their groundfishing livelihood in the area between the Alongshore and Offshore fisheries.

In 1978, New Jersey's coastal pots, the Ambrose and all Alongshore fisheries, trapped 420,600 pounds of live lobster. Offshore pots, which consistently produce the greatest amount of lobsters, caught 621,300 pounds. Otter trawlers fishing exclusively for lobster had 21,900 pounds but took an additional 10,100 while groundfishing. Other catches totaled 3380 pounds. In 1976, the combined total pounds for all fisheries was only 645,000; yet in 1973 the total had been 1,363,000. Biologists can only theorize about the fluctuation but cannot offer a definite explanation to its cause. New York's lobster totals also declined in the years from 1973 to 1976.

At dockside, the price per pound of lobster ranges—surprise, lobster fans!—from \$1.75 to \$2.50 depending upon availability and demand. Even calculated at the lowest price, the 1978 lobster catch generated \$1.9 million. These lobster harvest figures and the monies they generate are conservative. New Jersey does not have a highly structured dealer-to-wholesaler-to-retailer operation, so record keeping is inadequate. Since there are only six major dealers in the state, most lobstermen either sell directly to restaurants and institutions or to wholesalers and retailers. In major lobstering states, dealers "speculate" in lobsters by holding them in onshore tanks when the market is flooded. By the time the lobster reaches a wholesaler,

DRAWING BY MARY C. REDFERN



the price is 40 percent higher than dockside. Last summer in New Jersey, lobster retailed at \$4 per pound around the shore area. The \$16 that diners pay in a fancy restaurant is for just that—the fancy restaurant—since whole lobster dinners vary from \$6.95 to \$8.50

There is a high mortality rate for lobsters, restaurateurs will argue, which ups the cost of serving these critters. And this is true, for lobsters, unless they come in good condition right off the boat, are difficult to keep alive. Initially, at least five to six percent are damaged in the traps by predators, other lobsters, and by the hauling and handling of fisherman. A few states mandate venting traps with escapement hatches since sublegal lobsters, those with a carapace or trunk measuring less than 3 1/8 inches, are most subject to damage. Also, 20 percent of the pots are lost annually but continue to catch lobsters. Legislation has been proposed to incorporate degradable sections in the traps so that lobsters in these "ghost" traps can escape. At present, New Jersey requires neither vents nor degradable sections. Otter trawls contribute greatly to lobster injury and mortality, which can reach 30 percent. Of lobster injuries from all three fisheries, trawlers are responsible for 51 percent. Some dealers refuse to buy trawled lobsters because their gills become clogged with silt during the fishing operation,

thus reducing the likelihood for survival in restaurant tanks.

In any fishery, it is no mean feat to land a healthy, legal-size lobster considering the crustacean's biology. Gravid, or "berried," females carry anywhere from 2000 to 50,000 eggs on the appendages under their tails. However, only one-tenth of one percent of the eggs can be expected to reach maturity. The carapace (the protective shell extending backward from the head to the tail) of a mature female measures from 2 3/4 to 3 1/4 inches, although half the females in Maine do not mature until the carapace reaches at least 3 1/2 inches. Similarly, sexually mature females in New Jersey's ocean waters are closer to this size. Males, on the other hand, can mature with a carapace as short as two inches.

Lobster reproduction requires a two-year cycle, and, as with most marine animals, fertilization is external. During the first year, the male deposits a sperm packet in a seminal receptacle under the female's tail while it is still soft from molting. In the following year, the mature eggs are fertilized as the female extrudes them from the base of her tail. Normally, this two-year cycle remains consistent; however, sometimes the molt occurs before fertilization, and the sperm packet is lost.

An individual lobster brood hatches over a period of 2 to 14 days. The larvae then rises to the surface waters to feed on plankton, to drift with the currents and wind, and to go through a series of molts before finally settling to the ocean bottom. These diminutive juvenile lobsters are less than one inch long; by the end of their first growing season, many will reach 1 1/2 inches. Macroplankton and comb jellies feed upon larval lobsters, while young lobsters are subject to a wide range of predators including puffer, cunner, tautog, pollack, lumpfish, eelpout and black sea bass. That enough lobsters remain to grace diner's plates and to reproduce is a tribute to nature's bounty.

Until now, there were no studies on the New Jersey lobster population, although the NMFS has recorded lobster catches since the 1880s. With federal funds, the state's Division of Fish, Game and Shellfisheries started a tagging program to collect data on the abundance and distribution of lobsters. From spring of 1975 to the summer of 1979, 2034 lobsters were tagged and 97 recaptured and rereleased. Except for occasional tag returns from cooperative lobstermen, the project is over, and no new monies are available. Molt increment and mortality rates of lobsters can be accurately charted from the collected data and they are also helping biologists to determine molt frequency and migratory patterns.

Since the lobsters along the lobstering states are all part of one population, an integrated management plan must be adopted and enforced by all the states in order to ensure future lobster stocks. A cohesive policy in New Jersey alone would settle disputes among lobstermen in the different fisheries over migratory patterns, sexual maturity, and catch requirements.

For example, many lobsters off New Jersey never spawn at all. Approximately 80 percent of the lobsters landed in the Ambrose Fishery have a carapace of less than 3 1/8 inches, the legal size limit. Of these lobsters,

# Soaring in New Jersey

by Carleton V. Brairton

*... like a bird on high  
Ego tripping  
Through the sky  
I mean... I... can fly*

Far below I could see the irregular patchwork of New Jersey's rolling landscape stretching for 60 miles in all directions. The glider's altimeter read 2500 feet when the pilot felt the lift of a thermal. He pulled the red knob on the instrument panel, releasing the tow line which linked us to the power plane. As the tow dropped steeply to the left, we veered to the right. Slowing to 55 miles per hour, the glider began its leisurely descent.

Banking sharply to the right, we searched for that invisible bubble of warm air that would give us the lift necessary to remain aloft. The only sound was the whoosh of air streaming over the ship. Suddenly the glider bounced in the turbulence, and I felt the sensation of rising rapidly in an elevator. We'd found a thermal. Circling like a hawk, we gained altitude at the rate of 500 feet per minute. As I watched the instruments and the pilot's maneuvers, I was awed by man's ability to harness the invisible forces of the atmosphere, and I understood the thrill of flying a sailplane.

Throughout New Jersey, there are people who enjoy one of the most exhilarating and exciting sports imaginable—gliding in a sailplane. With free energy provided by the sun and wind, these soaring pilots can gain altitude at the rate of 500 to 1000 feet per minute, reach the base of a cloud, then fly away—sometimes with airspeeds of 100 miles per hour or better.

Like many people, I've always been fascinated with gliders. Whenever I am driving on Route 78 near Bedminster, I look upward hoping to catch a glimpse of one circling in the sky, or even to race one cruising at 50 or 60 miles per hour above the highway. The wide wingspan and graceful motion make them easy to spot. When curiosity about the

sport and people involved got the best of me, I couldn't resist a closer look.

What I discovered at each New Jersey gliderport that I visited were people who were totally dedicated to this challenging sport. Because they were so eager to share their knowledge and experiences with me, I became completely caught up in their enthusiasm. After one ride, I was hooked, and I knew I had to learn to fly. Each year more people like me are discovering the joys of soaring. For those who want to become involved—by taking a ride or lessons or just watching—New Jersey offers plenty of opportunities.

People have been soaring in this state for more than 50 years. The Aero Club Albatross, one of five soaring clubs in New Jersey, was founded in 1929 and is recognized as the oldest soaring club in America. Its founder, Gus Schuerer, used to launch open primary gliders with stretched rubber cords down a hillside in Bernards Township, where the Lyons VA Hospital is now located. These planes might glide only 100 yards at an altitude of 10 feet, but some of today's veteran pilots learned to fly in this way.

The sport of soaring has come a long way from the early days when planes were launched by manpower. To really appreciate what this unique sport is all about, it's worth a visit to any of New Jersey's gliderports to watch the activity and talk to the pilots, who are always willing to explain the operation of their ships.

The best days for soaring occur after a cold front has moved through, bringing clear dry air and swelling cumulus clouds. When the conditions are right, no glider pilot can resist the lure of his sport. The real activity at any gliderport begins about 11:00 AM when the sun has had enough time to heat the earth, creating the rising air currents called thermals. Before flying, pilots discuss the wind direction and cloud formation. They point to the hawks and vultures circling un-





Getting ready for a demonstration ride.

PHOTOS BY JOE SEIDEL

der a cloud—a likely “hot spot.”

The sailplanes vary in both size and performance levels—from the bulkier two-place gliders, which are used for training and carrying a passenger, to the sleek single-place planes built for speed and endurance. Regardless of glider type, a pilot flies with three basic instruments: an altimeter, an airspeed indicator, and the most important, a variometer, which measures the rate of climb or descent. Direction and angle are controlled by a stick between the knees and rudder pedals at the feet. The knob on the instrument panel is the tow release.

For the spectator, one of the most fascinating aspects of gliding is watching the take-offs and landings. Gliding enthusiasts have a strong sense of camaraderie, so everyone pitches in to help position, checklist, and retrieve the planes in a well-oiled operation. Most sailplanes are launched by aero tow, which is similar to towing a water skier. A 175-foot rope is hooked to

both power plane and glider. Both pilots fan their rudders to signal go, and the power plane heads down the runway, which in New Jersey is usually a grass strip. The glider pilot lifts off first, then the towplane pilot. The glider follows in formation, keeping about level with the power plane. The glider pilot usually pulls the tow release at 3000 feet, but if he feels the rising air currents sooner, he may release at a lower elevation.

Landings look as smooth as takeoffs. Pilots have complete control over the glider's airspeed, touchdown spot, and roll out. When the sailplane drops to an altitude of 1000 feet, the pilot knows exactly where he will land, and he prepares for his approach. Precision landing is a vital part of glider pilot training, because there is always the possibility that he might land off-field away from an airport. As long as there's an open area that's clear of obstructions

such as fences or rocks, gliders can land there. And they often do, especially when the pilot attempts a cross-country flight out of gliding range of his airport, and he can no longer find the lift needed to continue flying. If he happens to land in a pasture, he removes the wings of the plane and calls for a trailer to retrieve him. Sometimes he may also have to contend with a bewildered farmer, but that's all part of the sport. If he is lucky enough to land at another airport, the pilot calls for a power plane to tow him home.

**Pilots the hunters**  
**... invisible ... illusive**  
**Thermals the quarry.**

Of course the real challenge in soaring is keeping the sailplane flying as long as possible. When the conditions are right, a pilot can take off and be gone for hours—sometimes staying within gliding range of the airport, and sometimes attempting cross-country flights of more than 100 miles. The secret is knowing how to take advantage of the thermals. As the sun's rays heat the earth, bubbles of warm air break away and rise like hot-air balloons through the cooler atmosphere. The ideal thermal occurs when the ground source continually warms the surrounding air, which then rises in a column. If the glider pilot finds a thermal, he circles and gains altitude. But finding the rising air currents is the difficult part of soaring. Unlike the hawk, who seems to have a special sensor and can circle and climb for hours, the glider pilot must use his wits. Earth surfaces do not heat uniformly. A plowed field or the intersection of major highways generates much more lift than a forest, which cools the air with moisture. At Bedminster, for example, pilots who fly from Somerset Airport may look for thermals rising from the parking lot of American Hoechst Corporation or the intersection of routes 78 and 287. At Blairstown, gliders might get lift from what one pilot called the “house thermal,”

*Continued on page 6*

A high-performance fiberglass gets a final polish before an afternoon of ridge soaring.



# Soaring

Continued from page 5

generated from a local Dairy Queen, or from a gravel pit near the Kittatinny Ridge. A pilot soon learns where thermals form, but there is no guarantee he will catch one over these areas. Winds can dissipate a weak thermal or the pilot can find the warm air, but not be able to center himself in the strongest area of lift. Or he may gain lift, then lose it because he was in a bubble and not a column. Even if a pilot doesn't find a thermal, he can still glide for about 15 or 20 minutes before landing at the airport. For example, some medium-performance sailplanes are capable of gliding 30 feet forward while dropping only one foot. If such a glider is towed to 3000 feet, it can travel nearly 15 miles before landing.

## **Demonstration flight Sampling the silent skyways Suddenly . . . you're hooked.**

There's only one way to really know what it's like to feel the lift of a thermal or to enjoy the peace of flying without the drone of an engine—and that's to take a demonstration ride. There are three commercial operators in New Jersey who offer introductory flights with experienced glider pilots who have passed stringent FAA tests in order to carry passengers (see box). The pilot does the flying, so the passenger, who sits in the forward seat, can just relax, enjoy the view, and learn something about the art of flying a sailplane. Each flight, which costs anywhere from \$16 to \$25 depending on the airport, lasts about 20 minutes. If the conditions are ideal for soaring, the experience is unforgettable. The three gliderports are located in some of the most scenic regions of New Jersey, and the aerial views are spectacular—from the rolling farmland of Central Jersey, to the rugged landscape of the Kittatinny Ridge at Blairstown, where the Delaware River, Tocks Island, and

Sunfish Pond can also be seen from the air. During a demonstration flight, the pilot explains how he flies the ship; and since there is no engine to muffle voices, pilot and passenger can converse at normal voice levels.

## **Kittatinny green Sprinkled with dogwood blossoms Ridge soaring is here**

Soaring from Blairstown is unique because this is the only place in the state where experienced pilots can ridge soar. They use the horizontal currents which are deflected upward as the northwest winds blow against the Kittatinny Ridge. With the constant lift, these pilots can ride the ridge for 200 miles in either direction: to Harrisburg, Pennsylvania or Ellenville, New York. When the conditions are right for ridge soaring, pilots will spend all day flying back and forth along the ridge. Sometimes they dip so low over the tree tops, that they scare the hikers on the Appalachian Trail. There is even a pilot, Dr. Thomas Solt, who practices aerobatics over the ridge. Of course, he is one of the best pilots in the state, and his plane is designed to take the stress.

It takes years to learn how to fly like Doc Solt, but it doesn't really take long to learn the basics of flying a glider. All three commercial operators provide lessons to anyone who wishes to learn. The sport is so safe that a student doesn't need any previous flying experience and can be as young as 14. The first step is learning how to solo. This initial training is done in a two-place glider with a Certified Flight Instructor, who sits in the rear seat. Since there are dual controls, the instructor can always take over if there's a problem. Most students can solo after about 30 lessons. The average cost per lesson is \$20, which includes glider rental, instructor's fee, and tow plane service. To carry passengers, a student must continue with instruction and pass the FAA's written and flying exams for a private pilot's license.

I have just begun my presolo instruction. Some day, when the Jersey sky is filled with cumulus clouds, I hope to be the pilot circling over Route 78 and racing with the cars far below. I'm looking forward to that day. □

*Haiku printed with permission of poetess  
Mayra/Aryam*



**Heading for the Ridge**

### **Where to soar in New Jersey**

**AIRBORNE ARTS, INC.**  
Mary Jo Smela  
Sky Manor Airport  
Pittstown, N.J.  
201-996-6772

**DERRY AIRE, INC.**  
Dan Walker  
Somerset Airport  
Airport Road  
Bedminster, N.J.  
201-722-2444

**TOCKS ISLAND SOARING, INC.**  
Henry Scarborough  
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201-362-8311 and 201-667-9234  
Soaring lessons are also available during the summer months only at Forrestal Airport, Princeton. For information contact:

**SOARING SOCIETY OF  
PRINCETON UNIVERSITY, INC.**  
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# Environmental Awareness Achieved Through Simulation: A Technique for Teachers

By Stephen J. Zipko, Ph.D.

## Introduction

"Human to crippled deer . . . I see you . . . You've been caught!" "I'm the hawk and you're a snake . . . I've caught you!" "You mice had better separate or I'll catch all of you!"

At first this sounds like a group of children playing an imaginative game of tag. Actually, they are seventh-graders participating in one of the most effective techniques of environmental education. They are simulating the lives of various woodland animals, not in a classroom, but in a 40-acre woodland within a 212-acre municipal park.

"How many toothpicks did you get? I caught 20 reds, 14 blues, 5 greens and 30 yellows." "Amy had better eyes than Sue when they were competing. Sue only got 5 reds and 8 yellows but Amy got 25 reds and 30 yellows."

This sounds like a parlor game during a birthday party, but the same youngsters are simulating those skills necessary for successful predation and competition for limited food. Again this is occurring outside, but in a field adjacent to the school.

Many teachers in elementary, secondary, and college levels bypass the opportunity to motivate and educate students while increasing their environmental awareness through a systematic program of simulation activities. In this magazine I have discussed the use of a wildlife population simulator to demonstrate population dynamics and the principles of predation and competition (see the Sept.-Oct. 1978 issue). The use of this device is one of several simulation experiences that teachers, youth leaders, and outdoor education specialists



PHOTOS BY AUTHOR

*Pupil initially "hunts" toothpicks alone within 25-square-meter quadrat. Afterwards two students "compete" by hunting simultaneously within the same quadrat.*



*Groups of young people record the numbers and colors of toothpicks caught as each person completes his or her five-minute test.*

can institute to help promote a reverence for life and conservation ethic in our citizens, especially young people. The objective of this article is not only to show the necessity of simulation in any effective environmental education program, but to explain two relatively easy simulation activities which exemplify my conviction that youngsters learn more and with greater retention when environmental concepts are illustrated through active simulation.

## Toothpick Birds

This exercise is done early in the school year, just after basic ecological

principles are presented with the wildlife population simulator. September is the best month for this because grasshoppers (which although not required are nevertheless preferred for the second portion of the experiment) are still abundant. The activity takes my junior-high students four to five days to complete. It is best to allow an extra two days for elementary groups. College-age students need two days, while high-school people can finish in four days.

We usually lead into the exercise with a classroom discussion about predator-prey interactions. The question is asked:

*Continued on page 8*

# Simulation

Continued from page 7

what hunting skills should a successful predator have? All suggestions are entertained and listed on the board. We arrive at nine skills including camouflage, speed, agility, persistence, patience, good sensory capabilities, nerve-muscle coordination, strength, and silence. Students are told that these are generalized characteristics and that, depending on the predator species, different combinations may predominate and some may not be required at all. Youngsters now form hypotheses as to which characteristics are still necessary for modern man's survival. One purpose of the toothpick bird experiment is to test these hypotheses.

Students receive a three-page description of the experiment including an introduction, list of materials, step-by-step procedure, and interpretation questions (\*The Toothpick Bird Experiment sheets are available from the author. Write to the address listed at the end of article.) This lab ditto is purposely flexible so that, depending on academic level, portions of it may be expanded or deleted by the students and/or teacher. It is preferable to conduct the study outdoors in a field (either mowed or tall grass) and compare the results with those obtained in a vacant lot, playground, or any other nongrass surface. Urban schools, however, may effectively utilize the vacant lot exclusively and/or perform the work in the school gym or classroom by stretching large piece of green felt on the floor to act as the grass.

This is a simulation or role-playing experiment, for youngsters play the role of toothpick birds preying upon toothpicks which symbolize grasshoppers. Regardless of where the work is undertaken, each day groups of four students measure off 25-square-meter areas. This size is ideal for elementary and junior-high youngsters; older students would require a larger area.

After each area is marked off with wooden stakes, first one student then another plays the role of "hunter." He or she is blindfolded or stands someplace else while the other group members randomly distribute toothpicks of different colors and quantities within the area. Four colors (yellow, green, blue, and red) are used to simulate the effects of camouflage (or lack of it) on predation. Different numbers of toothpicks of each color are used to counteract their respective abilities to remain camouflaged. Red, blue, and green toothpicks, for example, are more difficult to find than yellow ones. Yellow toothpicks, there-



*"Rabbits" and "mice," being dwellers of the forest floor, should periodically find shelter beneath leaves and other debris. They must not, however, remain in one spot for more than several minutes.*

fore, are several times more numerous. Further, the yellow color more accurately simulates the true grasshopper color in the field.

The hunter now has five minutes to "capture" as many "grasshoppers" as possible (see figure 1). Other youngsters are not to coach, aid or hinder the hunter, nor are they to speak to him or her. At the end of the hunt, all team members record the numbers and colors of toothpicks caught (see figure 2).

Meanwhile, the toothpicks are once again randomly placed while another person prepares to hunt in the same quadrat. The procedure is repeated for

each individual within the first study area (short grass, for example), then again in the second area (vacant lot, for example).

During the next day, the two study areas are again marked off and used by the same groups; but this time two hunters hunt simultaneously for five minutes. All group members record their data, then another pair "compete." Everyone is informed that this technique helps to exemplify the effect of competition on hunting success when: (a) the competitors have the same number and degree of adaptations, and when (b) they do not.

The last portion of this experiment involves live grasshoppers (or crickets in urban areas) and plastic bags or glass jars. Sufficient numbers of grasshoppers can be field-collected in September and October by youngsters in suburban or rural regions prior to the start of the investigation. These can be kept in an empty classroom aquarium under mod-

Students randomly return the live animals to the study plots after each erately cold temperatures until needed. The cold forces the animals to become inactive.

When needed, they can be randomly released within the outdoor environment encompassing the study plots just before the youngsters arrive for class. It is important that you release them directly from the cold container to ensure that they remain in place during the several intervening minutes between the release time and the start of class. Be advised, however, that sunshine on the study area will shorten the time required for them to warm up and become active. Of course, students working at each quadrat area must be told how many live grasshoppers have been released into that area.

As class begins, distribute a plastic bag or jar to each student. The hunt is conducted the same way as before, with initially one person at a time capturing grasshoppers and placing the still live animals in the bag or jar over a five-minute period.



*"Woodpecker" boy must simulate the behavior of his representative animal exactly, even to the point of finding food and cover for himself and his young. The same applies to all students during the two-hour simulation.*

hunt. They then record the number caught. Individual hunting can again occur first in a grassy area followed by a vacant lot. Competitive hunts between two people at a time in each habitat are possible, but such practices might be dangerous to the grasshoppers due to excessive trampling in a limited area.

The interpretation questions resulting from this study can be basic or thought-provoking. Included are some of both to show that it depends on what your students can absorb. Do not expect youngsters to come away from this one exercise filled with ecological knowledge, however. The long-term success of this or any activity mandates both pre- and post-lab explanation and discussion. When accomplished in this manner, you will find students suggesting questions in addition to those you offer. These often lead them to suggest other simulation experiences, such as the one that follows.

### Food Web Simulation

Studying about food relationships in a book is one thing; acting out the lives of organisms is quite another. My students therefore perform a food-web simulation outside in a local woodland about 40 acres. This activity is also a logical extension of the toothpick bird exercise, and is usually accomplished immediately after that investigation.

The woodland in which the food web is simulated should have natural and/or artificial boundaries to prevent youngsters from getting lost.

Note that nowhere in this description is the outdoor simulation called a "game." It is important that pupils realize this, especially elementary and junior-high people. Two class periods of preparation help to engender an atmosphere of silence and alertness while they are performing the study. Otherwise, they will consider it as nothing more than a game of tag. Indeed, it is more akin to a stalking maneuver.

During the preparation periods, a few forms are distributed. Students either volunteer their wildlife roles or these are assigned. All roles require youngsters to remember that, throughout the exercise, they must not only find food and water but avoid predators. Prior to the study they must conduct library research on the animal they are simulating, as well as its predators and prey. Students are told that the two-hour exercise will represent four days of survival. Therefore, they must find food, water and cover of sufficient quality and quantity to keep them and their young "alive" during the simulation. Moreover, the types of food and cover utilized must simulate the needs of the animals they are representing.

During the second day of preparation students are given various dittoes which

they can carry for reference while performing the study. These "task sheets" contain information on what kinds of food and how much is needed for survival, which predators should be avoided, and how predators can claim prey. In some cases the predator must tag its prey, while at other times it merely has to see the prey in order to "kill" it. Sometimes the predator must stalk and surprise its victim from a given distance. It all depends on the types of predator and prey. Wherever possible, the method of make-believe predation closely simulates the real thing.

Notice that injuries and age-specific mortality are also simulated. A youngster with a sprained wrist or fractured arm may be designated as a crippled deer. Smaller students may be mice or young rabbits; aggressive or tall people could be hawks.

The behavior of the youngsters must simulate that of their animals. Woodpeckers must spend much of their time in low trees (see figure 3). Mice or rabbits must cover themselves with leaves or forest debris when remaining in one spot for short intervals (see figure 4). When running, they must stay low along with rabbits and garter snakes. Toads should hop rather than run.

The human hunting element is an important one in this simulation, especially if done in the autumn. It helps to convey the very real potential for human disturbance of fragile ecosystems when human entry into such systems is thoughtless and poorly planned. It likewise does much to teach students that, when done properly, the human influence can greatly benefit an environment.

Since students spread out and remain silent while in the wooded area (except to announce their capture of someone), they follow a simple coding system to distinguish others as their prey, predators, or other co-inhabitants. They are told to wear plain clothing so that masking tape can be attached to jackets, sweaters, shirts, or blouses according to patterns shown on the task sheets.

Once marked, youngsters are led to the staging area. The rabbits, mice, deer, woodpeckers and toads are given a 15-minute head start as they enter the woodland; this also allows them to disperse and seek out their cover and water supplies. The carnivores are then released into the area.

All students must synchronize their watches. If caught, they must record the time of capture and which predator caught them. They then tear off the tape and walk briskly to the nearest boundary, then to the staging area where they also record the same information from everyone else who gets caught. These

data are later used as a basis for a classroom discussion centered around the question: Why were certain types of animals caught first? The solution is that more herbivores exist in a food web than any other group, thus they experience the greatest pressure from several types of predators. All students who are not caught return to the staging area at the end of two hours.

The chief advantage of this simulation is its realism achieved without need for any more equipment other than masking tape. Any area can be used so long as you realize its inherent qualities, dangers, and boundaries. Seasonal effects on predation can be studied by taking the same student group to the region during the fall, spring, and summer. If you dislike the tape method of identification, uniforms can be made by cutting out pieces of sheets that are then pinned on the youngsters according to the patterns shown on the task sheets.

### Conclusion

As was indicated on my November-December 1977 article in *New Jersey Outdoors*, relatively few teachers use the school environs for meaningful outdoor experiences. School is a fortress against the very world about which youngsters ought to be learning. Childhood has become a state of nonadmission to the world of decisions and responsibility. This attitude by the public, including far too many teachers, is particularly dangerous in an era characterized by an overwhelming disregard for environmental values on the part of society. Schools that resemble factories dictate a factory-like conception of education: raw materials in, standardized product out. Our environment is deteriorating; yet many schools continue to attempt to shelter us from it and force us through an irrelevant mill until we emerge unable to cope with the problems of the real world.

*Simulation is therefore an essential ingredient of a truly environmental classroom. Without it, we can rest assured that no lasting qualitative conservation education will occur, while the attempted cultivation of an awareness ethic will bear little fruit.*

**Acknowledgments.**—The author wishes to thank the principal and vice-principal of Randolph Intermediate School, Mr. Milton Ortiz and Mr. Joseph Mascott, respectively, for their cooperation and encouragement during these studies.

\*For those who desire copies of task sheets, the procedures for these experiments, or further information about Randolph's environmental education program, contact Dr. Stephen J. Zipko, Randolph Intermediate School, Millbrook Avenue, Randolph, New Jersey 07869. □

## IN THIS ISSUE

Continued from Editorial pg.

is back with *Return of the Tiny Tiger* by wildlife biologist Robert Lund. The "Tiny Tiger" is the bobcat, and the article discusses the restoration of the bobcat to a portion of its historic range in our state. The article is introduced by the suitable-for-framing illustration of the bobcat on the inside back cover by Carol Decker.

A unique way to visit historic places is suggested by writer Don Kamienski in the article, *Visiting History by Canoe*. Bass fisherman Kamienski tells us where to rent canoes, how long the trip will take, what to wear, and what you'll see on this adventure. Try it. I've canoed several streams in the Pine Barrens and it's a marvelous experience.

Freelance writer Linda Joy Fanning, new to our magazine, has written a truly different article titled, *New Jersey's Forgotten People*. She writes about the Lenni Lenape nation, what they were, what happened to them, and what they left behind.

Another new author, Elizabeth Chace, writes about *Restoring New Jersey's Riverfronts* in our urban areas for recreational use—a revival and reuse of these areas—a "riverlands renaissance." Ms. Chace, formerly with DEP's Green Acres Program, has returned to school.

In *An Angler's Other Autumn*, trout fisherman Allen G. Eastby takes up his camera and shoots some autumn scenes near one of his favorite fishing spots. The fish weren't biting that day, and he had to bring something home.

This issue contains a special center spread snapout four page supplement titled, *Investment in New Jersey's Natural Resources*.



# NATIONAL HUNTING & FISHING

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27,  
1980



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# 1980 Young Waterfowlers Program

This is the 6th year the NEW JERSEY WATERFOWLERS ASSOCIATION has sponsored a class and a hunting day for the young hunters of New Jersey.

### October 19, 1980

Highlands Yacht Club, Highlands, N.J. 8:30 AM. Classes on Decoy Carving, Duck Hunting Methods, Duck Hunting Equipment and Boats, Waterfowl Identification, Hunter Ethics and Wetlands Conservation. Films will be shown and lunch served.

### October 26, 1980

Wayside Skeet Club, Wayside, N.J. 10:00 AM. The Program students will be given a chance to fire their shotguns at clay birds, and get some practice in for the hunting season.

### November 29, 1980

### December 6, 1980

Each student will be assigned a seasoned Waterfowler as his personal instructor and taken hunting at the BRIGANTINE NATIONAL WILDLIFE REFUGE. A closed area of the Refuge has been set aside by Mr. Gaylord Inman, Federal Wildlife Service, Refuge Manager for the participants of the Young Waterfowlers Program. This is the best area in New Jersey for observing and taking waterfowl.

The Young Waterfowlers Program is open to any resident of New Jersey, ages 14 thru 17, who has completed the N.J. Hunter Safety (Shotgun) Course. He or she must have a valid N.J. Hunting License. Anyone interested in the course, should write Bill McVitty, Chairman, Young Waterfowlers Program, New Jersey Waterfowlers Association, P.O. Box 208, Monmouth Beach, N.J. 07750

### APPLICATION—1980

NAME \_\_\_\_\_

AGE \_\_\_\_\_

ADDRESS \_\_\_\_\_

HUNTING LIC. NO. \_\_\_\_\_

DATE \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_

# The Great Canoe Race

By  
Carol C. Nash



PHOTOS BY AUTHOR

At last, the big day had arrived! The weeks of conditioning, practicing, and trial runs were over. This was it, no turning back now.

The weather was not cooperating, though. The day dawned with rainy, gray skies. But we were undaunted, our spirits were high.

We were all gathered at the south end of Lake Oswego for the race which is sponsored by the Green Bank Volunteer Ambulance Company, Inc. The Oswego River Canoe Race is an annual event that is held on Saturday, October 4, this year. The race course is that portion of the Oswego River that lies between Lake Oswego and Harrisville Lake. The starting time of each entry is recorded by the race conductor and the race is an individually timed event.

A time handicap of five minutes is assigned to those entries that consist of one male and one female team member or of one male and one team member under the age of 16. A time handicap of eight minutes is assigned to those entries that consist of two female team members, two team members under the age of sixteen, or a combination of the two.

The 1979 race began at 11:00 A.M. and had many exciting moments for the participants. The river is narrow in many parts and makes passing other canoes difficult. One must deal with quite a bit of canoe traffic other than the race participants, for many canoeists are out for the day enjoying some peaceful hours in New Jersey's beautiful Pine Barrens. But most of them realize that there is a race in progress and yield the way to the racers.

The pace is highly competitive as all play the game of "beat the clock." The 1979 finish times were close indeed: In first place in 1 hour, 28 minutes, were

Steven Bush and Charles Leppin; second in 1 hour, 31 minutes, 15 seconds were Robert Westcott and Cecil York; and third in 1 hour, 32 minutes, 40 seconds were Whitey Fanslau and George Peterson. Trophies were awarded to the crew members.

If you would like to try your luck and skill in this year's race, please contact the following persons for registration forms and further information:

Dudley H. Lewis	or	Barbara Cavileer
R.D.#2		R.D.#2
Box 135		Box 250C
Egg Harbor City,		Egg Harbor City,
New Jersey 08215		New Jersey 08215
(609) 965-2646		(609) 965-4035

There will be food and beverages available at Lake Oswego and Harrisville Lake. See you at the starting line and "Good Luck!" □



# Shucking the Oyster

By Susan Grant



Misty morning at Bivalve.

PHOTOS BY BRIAN BURKHARDT

Last year in Bivalve, New Jersey, 450 shuckers shucked 44 million oysters—just about 100,000 each—between September and May. As they moved from dockside through the shucking houses, the harvest almost quadrupled in value; a bushel of oysters selling for \$10 dockside will be worth \$36 when it is shucked. Another 75,000 oysters left Bivalve in-the-shell, shipped out to points all over the Eastern U.S. and Canada along with their shucked cousins and also going to restaurants in France, Switzerland, the Netherlands, W. Germany, Austria, and Belgium. It all added up to a \$7 million harvest—a good year for the Maurice River Cove.

Oysters have been harvested and eaten by people since prehistoric times. They have been consumed raw, cooked, pickled, and smoked. The ancient Chinese cultivated them; the Romans kept them alive in table-side tanks for demanding aristocrats. Oysters were described in the 1800s as "... one of the elements of social existence, a delicacy of no age, sex, or condition, but patent to the universal family of man."

Delaware Bay and Maurice River Cove in particular, and the ports available—Bivalve, Shellpile, Mauricetown—have been vital sources of this sought-after seafood since the area was first settled. As early as 1719 the first restrictive laws had to be passed to protect this abundant natural resource from its voracious human predators.

By the beginning of the 20th century the oyster fleet sailing out of Bivalve numbered more than 300 vessels. Many people still recall the pleasure of watching the fleet wind down the Maurice River to the Bay at dawn, sails floating visible over the marshes. Today, the fleet of 70 dredge boats are diesel powered and make use of other mechanical devices to speed and ease the labor of dredging and unloading, although most of the boats are converted sailing dredges, and one boat, the *Cashier* built in 1848, is still in action.

It wasn't until 1923, however, that shucked oysters made an appearance in Bivalve markets. Prior to this time oysters were either shipped to consumers in-the-shell (packed in ice) or shipped to shucking houses elsewhere. In 1923 the first three shucking houses opened; two more developed in 1924, and the rush was on as the profit margin grew. Experienced shuckers, black men from the Chesapeake Bay region, manned the first shucking houses; today the 10 operating companies employ men and women—many of whom represent the third generation of shuckers in their family.

Despite the inevitable changes of mechanization, shucking

remains a hand job, one requiring skill and expertise. Any novice who has attempted to shuck an oyster knows this instantly. It is not an activity for bleeders or people with rare blood types. An oyster has no offensive capabilities but instead concentrates on a formidable defense. The thick, ugly exterior not only discourages shell collectors but offers no easy entree to predators. The muscles holding the hinged bivalve shut when threatened reputedly can resist pulling forces of up to 33 lbs.

There are 2 approaches to breaching the oyster's fortress—stabbing and breaking. Stabbing requires good aim, strength, and the correct weapon. A stabber jabs the oyster in the hinge with a specially designed knife, and with a quick and deceptively easy-looking twist, pries the hinge open. He then slides the blade around the inside of the shell, severing the oyster's ties with its home. As an 8-hour-a-day activity, it demands stamina and resilience.

"Breakers" are more common in shucking houses; although the technique is slightly slower, it isn't as demanding on the shucker. A breaker holds the oyster hinge down, sometimes against a solid surface, and smashes the bill once with a hammer, iron bar, or the handle of his unique knife. The knife blade is then shoved into the break, twisted to pry the shells apart, and the oyster scraped loose.

In 1925, the pay was 30¢ a gallon, and you could run as high as 15-18 gallons a day or better, providing the oysters were big ones. The smallest oysters can run into 400 per gallon, and a good shucker might be able to shuck that many in an hour. The best oysters run about 135-160 per gallon—obviously a much better deal for everyone involved.

Today shuckers are paid about 40¢ per pound of shucked oysters and the average daily take-home pay, when the weather and harvest are good, is about \$22-\$24 a day. One serious drawback in paying shuckers for shucked oysters by weight or volume is that when faced with a slightly undersized shell, a shucker will chuck it rather than shuck it. Some estimates count one out of every three oysters wasted this way; although the oyster is edible and marketable, it is thrown out because shuckers are paid not by the number of shells they open but by the final weight of the shucked oysters.

After shucking, the meat is washed by machine and either packed in cans, which are shipped in iced barrels for immediate use, or canned. Shells and discarded unopened oysters are added to the towering shell piles out back of the shucking house, similar to slag heaps outside coal mines.

Unlike slag, oyster shells are used to replenish the crop; thousands of bushels of shells are dumped back into the Bay seed beds each year for oyster "spat"; to settle on. During the first two weeks of their lives, the finicky infants propel themselves through the murky Bay waters looking for a home—a hard, clean surface to which they will permanently cement themselves forever (or until the dredge boat comes along.) In the turbid shallow waters of the Bay, such surfaces are constantly being covered over with muck and debris; without the return of their shucked parents and grandparents, oyster spat might never make it in Delaware Bay.

What do you do with a shucked oyster? Legions of oyster fanatics swear that you must eat them raw within five minutes of shucking time in order to best appreciate their unusual flavor. In *Alice in Wonderland*, the Walrus and the Carpenter downed them with pepper and vinegar and a side of bread and butter. If this doesn't appeal to you, don't reach for the Alka Seltzer, reach for the traditional "Oyster Cocktail Sauce"—a delicate blend of horseradish, worcestershire, catsup, tobasco, and red peppers.

There are literally thousands of recipes for cooking oysters; the English concocted one called "Angels on Horseback" and another group countered with "Devils on Horseback." Even the more familiar "Oysters Rockefeller" has several variations, all costly, complex, and rich. But the real beauty of the beast is that it can be prepared quickly and simply in a few classic styles and be quite delicious.

*Pulling in the harvest of oysters of Delaware Bay.*



*Shucking stalls and shells piling up.*



*Hand Tonger at Bivalve, Shake Scriber.*



**OYSTER PAN ROAST (Serves 4)**

- 1 qt. shucked oysters
- Three-quarters cup butter or margarine
- Parsley
- Salt, pepper, cayenne
- Lemon Juice
- Toast

Melt butter, drain oysters, add them to hot butter. When the oysters are plump and fluffy—a few minutes—they are done. Season as you like, serve on toast with pan butter and parsley.

**OYSTER STEW (Serves 4)**

- 1-1/4 pts. oysters and juice
- 4 tbs. butter or margarine
- Salt, pepper, cayenne
- 1 pt. milk
- 1 pt. cream
- (Milk or skim milk can be substituted for cream)

Drain juice and heat it with the milk and cream. In the meantime, heat 4 soupbowls with a pat of butter in each. Season liquid as you like, add oysters, heat just to the boiling point.

**OYSTER PIE (Serves 6-8)**

- About 1 qt. oysters
- Butter
- Flour
- Pie Crust

Line a buttered pie or baking pan with plain pastry crust. Put in a layer of oysters, dot with 2 tbs. flour and 2 tbs. butter. Keep adding layers of oysters, butter, and flour until filled. Add oyster juice to within 1" of the top. Cover with pie crust, bake in hot oven until golden brown.

**OYSTER OMELET (Serves 2-4)**

- 1 cup chopped raw oysters
- 4-6 eggs
- Butter

Make a standard omelet, and add the oysters (drained) when you are folding it over. Cover, let sit on simmer for a few minutes.

**OYSTER-PEANUT BUTTER SANDWICH (Serves 1)**

David Elliott. Shuck 2 oysters. Plop on bread coated thickly with peanut butter. Eat immediately.

**FRIED OYSTERS (Serves 800)**

The oyster and ham dinner is a common fund-raiser in Bay areas; Port Norris Fire Company has two a year, seating 800 hungry oyster fans each time—an all-you-can-eat affair. If you want tickets for the October dinner, better start trying now—the events are tremendously popular.

- 30 gallons of oysters (about 8,000)
- 300 pounds of bread crumb mix
- 75 dozen eggs

Dip each oyster in well-beaten eggs, roll in break crumbs, repeat both steps. Place on sheets of waxed paper and freeze for one to two weeks. Fry frozen oysters in deep hot fat (360°) until golden brown—a few minutes.

**FRIED OYSTERS (Serves 4)**

- 1 pt. shucked oysters
- 2 tbs. milk
- 2 eggs
- 1 cup bread or cracker crumbs or cornmeal
- Salt and pepper

Beat eggs and milk together, mix crumbs and seasonings. Follow process described above.

Nutritionists assure us that we couldn't go wrong if we ate oysters at least once a week. Although their reputation as an aphrodisiac remains mythical at best, their food value is rated above beef and pork and just slightly below other seafoods. Three oz. of oysters contains only 40 mg. of cholesterol and 2% polyunsaturated fats, while the same amounts of beef or pork contain twice as much cholesterol and 15 times as much in saturated fats. Oysters are also beneficially high in

*Continued on page 31*



PHOTOS BY AUTHOR



**OTTER**



**TRAWLING**

*Perpetual Search  
for Fluke*

By  
James Daddio

An early morning mist rises as chilled dewdrops cling to the dark tarred pilings which line the Fishermen's Dock Co-Op at Pt. Pleasant, New Jersey. Old nets and the rusted debris generated by the 16 individually owned and operated fishing boats are scattered throughout the dock and packing house. In a year-round engagement, combating weather and seas, many of these boats will trawl approximately 30,000 nautical miles annually in their determined oceanic quest for fluke.

Joining to board the 75-foot otter trawler *Blue Diamond* this morning are the three members of her crew. Among them, Walt Swensen, salty captain of the *Diamond* and fishermen for more than over 40 years. When folks seek information on commercial fluke fishing they will be directed to Walt, who has trails of fluke from Cape Sable to Cape Hatteras lined within his memory.

Jack, Walt's brother and partner, sits comfortably mending a net while Billy, full-time fisherman and cook aboard, returns with the groceries. Together, the three comprise an inseparable team. Aboard ship one can sense that every article warrants its usefulness and seagoing occupation of space. The captain casts a few last assuring glances as the monotonous rumble of the *Diamond's* 350-horsepower engine is fired up.

The area harboring the larger fluke in early fall is known by local fishermen as "the Fingers." Located within the Cholera Bank, the Fingers extend from 15 nautical miles east of Elberon, New Jersey, to eight nautical miles south of Fire Island, Long Island. This winding region of ocean floor ranges from 14 to 16 fathoms in depth. Since this area was once the anchoring site for British sail ships and rum-runners bound for New York Harbor, many anchors have since been caught in trawling nets here.

The Fingers will be thoroughly trawled by fluke fishermen from mid-September throughout October. "Fall fishing is spotty and unpredictable as the weather while the fluke is spawning," explains Walt calmly. "Come end of October they'll move out to deeper waters along the shelf; they go where the food and water's right."

The *Blue Diamond* switched to cod fishing during November and December of last year, rejoining the fluke migration in January along the edge of the continental shelf near the Hudson Canyon, trawling the 25 to 83-fathom depths until the first fluke entered Barnegat Bay in spring.

Throughout spring and fall fluking trawlers can be seen from shore traversing the coast from Long Island to Cape May, just outside the special licensed two mile limit. "We pay for the privilege to fish," complains Walt, "while the sport-fishermen are killing em in the Bay and along the coast." A creel census on fluke taken in spring and summer by sport-fishermen revealed that sport-fishermen land more pounds of fluke than commercial fishermen.

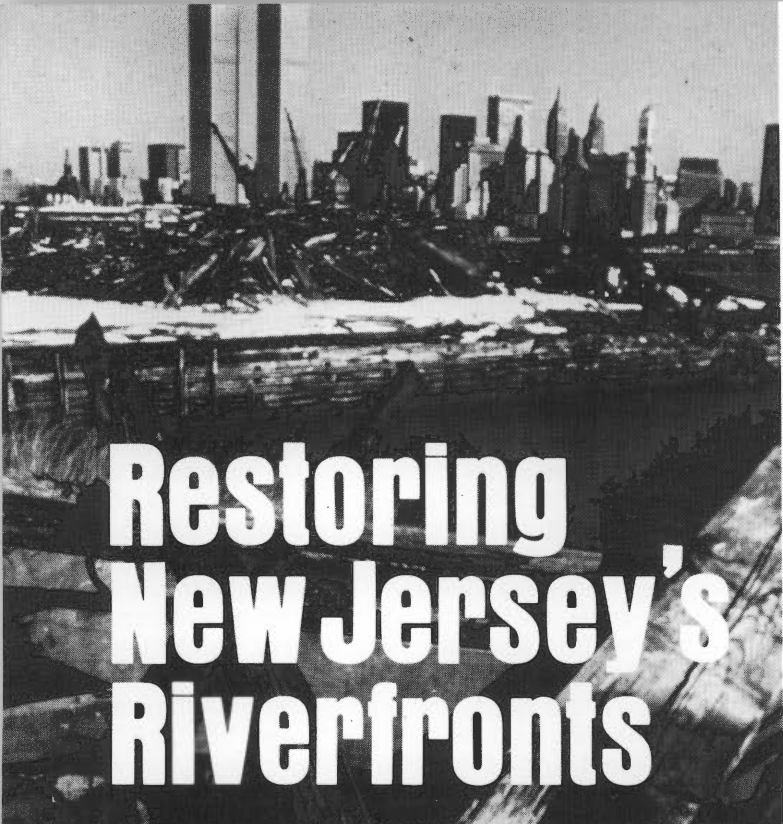
The dreamlike mystical awareness of the sea begins for us all as the trawler slowly cuts a path through the Manasquan Inlet. Upon leaving the inlet the trawler will not be seen from land for a minimum of seven days, depending upon sea conditions and quantity of each catch. The easy rolling seas and cerulean skies beckon

our rig forward as the large boom outriggers are lowered by hand-pulled block-and-tackle riggings. These large protracting outriggers have a three-fold purpose: as balancing beams to center gravity; to support the well wheels for winding to the tow cable; and to support the heavy metal wing-shaped stabilizers hung from the far end of each boom which are pulled through the water to help steady the ship in high seas.

Out at sea, enduring the rising breath and falling thrust above tons of sea space, time is measured in bushels per catch. Few, if any, words are spoken. Most waking time is occupied gazing at the rising and falling horizon, or at the foaming forms and swelling shapes sculptured by the capricious sea. A fisherman's thoughts are truly his own, coupled with memories of land activities. Most conversation entails basic day-to-day items. During a game of solitaire, Bill asks, "How do you want your potatoes tonight?" "Matters little to me," I reply. The crew aboard the *Diamond* never eat fish. "Billy don't like it," Jack jokingly complains, "and what he don't like, I don't trust him cookin."

Occasionally, the sleepy nebulosity of the journey is abruptly awakened by Jack's familiar holler, "it's time," and like clockwork three hardcore fishermen in yellow slickers begin the routine of hauling in the net. The engine's consistent hum is toned and replaced by the rusty groans of winding gears emanating from the winch, rapidly winding the 500 feet of heavy, dripping tow cable aboard. During the process of winding a watchful "WHOA" is eventually heard, and the winch is stopped by the captain at the rope pulleys, while the otter doors are disengaged from the cable and secured to the stern of the ship. These 1100-pound monstrosities of solid wood laden with heavy metal pull the net and cables along the bottom, creating the drag necessary to scoop in fluke. The scissors chain which connects the cable and net mouth is secured to the large stern net drum, and slowly winched aboard. Occasionally the process is halted by one of the fishermen guiding the net onto the drum, so that a sandshark or two can be yanked through the five-inch nylon mesh to avoid jamming the drum. A sling strap is securely wound around the cod of the net, that being the final section of mesh where the fish are crowded during trawling, and the entire catch is winched high above the deck as a deep salty sea aroma is brought to air. Bill carefully maneuvers the hugh dripping bag of seafood into position and in a ritually calm fashion pulls the toggle release, sending shimmering flapping splashes of sea life across the deck. Three rugged, windburnt faces gaze for a brief moment at the essence of their lives' perpetual quest, then resume the ritual of resetting the net. As if summoned by telephathy, scout flocks of sea gulls inevitably materialize and hover in hungry anticipation, signaling to all that the catch has been brought aboard and that there will soon be a selection of discarded fish afloat. Among the sea life tossed to the scavengers are calico and white crabs, angler fish, skates, sandsharks, and smaller fluke. The larger fluke are gaffed and placed into metal baskets, later to be rinsed and packed on ice. The engine is fully steamed and the ship resumes her trawling rock as the yellow-clad figures receive windy splashes of salty sea

*Continued on page 30*



# Restoring New Jersey's Riverfronts

Jersey City Riverfront View

PHOTOS PROVIDED BY DEP

**BY ELIZABETH CHACE**

Within the New Jersey Department of Environmental Protection, the Green Acres Program has been focusing attention on the importance of waterfront recreation acquisition and development projects as an important element of urban waterfront revitalization. Most of New Jersey's large cities are situated on a river, lake, bay or ocean, and their waterfronts are in desperate need of improvement. Their revitalization would be a dynamic response to the many environmental concerns which are inhibiting the rebirth of our older cities.

Urban waterfronts are special places, rich in natural, cultural, and historic values. New Jersey possesses a great wealth of these urban waterfront lands, each having its own character and redevelopment potential. The Department of Environmental Protection's Commissioner, Jerry Fitzgerald English, considers the revival of New Jersey's urban waterfronts a vital step in reversing the plight of our cities. She envisions a "Riverlands Renaissance" taking place.

Successful waterfront projects combining recreational, commercial, and other uses have already been completed in several cities throughout the United States, including San Francisco, Baltimore, Boston, Seattle, and San Antonio. These projects have ranged from small-scale improvements and linear parks which provide access and community activities, to large-scale, multipurpose developments which combine recreation, housing, and commercial uses.

Why the growing interest in reclaiming our urban waterfronts? A nationwide "back to the city" movement is drawing people into urban neighborhoods which are in close proximity to the water. Furthermore, the in-

roduction of containerized cargo and the abandonment of railroad properties in the mid-1960s have released many acres of urban waterfront lands for other uses.

New Jersey's Urban Waterfront Program was born indirectly out of state concern over urban blight in the late 1970s, and was implemented to help carry out Governor Byrne's Urban Policy of encouraging projects that contribute to the livability of our cities. Some urban waterfronts will eventually be incorporated into the Wild and Scenic Rivers Program, under the "Developed Recreational River" category. This program is aimed at enhancing the recreational, historical, and cultural significance of river areas where they have been modified by urbanization and suburbanization; it also takes advantage of water quality, and other environmental improvement programs that are working towards similar goals. New Jersey has invested heavily in cleaning up its rivers during the past 10 years, with the construction of water treatment plants a continuing part of the process.

Under the 1978 Green Acres Bond Issue, \$200 million was authorized, with \$100 million designated specifically for urban areas. As a result, the Green Acres Program is attempting to identify the recreation potential of urban waterfronts, which are often ignored or abandoned. As part of the Local Assistance Program, special consideration and funding at a 90 percent level is being offered to eligible cities. Funding is also available from a variety of other sources, including the Department's Division of Coastal Resources, the Department of Transportation, the Economic Development Authority at the state level, and various federal agencies.

The Green Acres Program encourages urban municipalities to submit applications for funds, and provides technical assistance in all stages of a project. It starts with the application process itself, and continues to the planning, acquisition, and development phases.

There is a critical need for parks and open spaces in highly populated areas, and lands along the water's edge can provide much-needed close-to-home recreation within the urban community, further enhancing the urban environment. By generating interest, identifying sources of funding, and coordinating with other government agencies, Green Acres hopes to fulfill this need.

New Jersey is now beginning to see the fruits of its efforts throughout the state, on various urban waterfront projects. On the Delaware River in Camden, a \$20 million Waterfront Park is under construction, directly across from Penn's Landing in Philadelphia. The 23-acre site was acquired through a matching Green Acres grant to the city, which in turn leased the site to the Camden County Park Commission for \$1 a year for 25 years. The Park Commission will build, operate, and maintain the waterfront park for the life of the lease. The design and application costs of Phase I were financed by the city. Development is to be funded by a \$2 million Green Acres grant, combined with a \$1.6 million grant from the Heritage Conservation and Recreation Service's Land and Water Conservation Funds, to make up 90 percent of the funds. The remaining 10

*Continued on page 27*



# Environmental News

## PINELANDS UPDATE



JIM STAPLES

**Pinelands law amended:** Under terms of the Pinelands Protection Act of 1979 a comprehensive management plan was to be developed by the Pinelands Commission for both the preservation (535-square-mile area) and the protection (1,000-square-mile area) areas for adoption by August 8, 1980. However, on July 11 Governor Byrne signed a measure (Assembly bill A-1812) amending the original law to extend the time by which the Pinelands Commission must adopt a comprehensive management plan for the protection area. (The provisions of the Pinelands Protection Act of 1979 limiting development in the area will not be affected by this amendment.) This plan is to be presented by November 14, and adopted no later than December 15, 1980. Once adopted, the plan will become effective after 31 days, allowing interested persons to thoroughly review and comment on the plan and allowing the Legislature to respond to it.

The August 8 adoption date for a comprehensive management plan for the preservation (core) area remained unchanged.

**Public hearings held:** The Pinelands Commission held a series of six public hearings around the state in July to receive comments and suggestions on its Draft Comprehensive Management Plan for the Pinelands which it released on schedule, June 6.

**Acquisitions:** More than 1100 environmentally sensitive Pine Barrens acres were recently purchased by the state for the Pinelands National Reserve with Green Acres bond issue money and matching grants from the federal Land and Water Conservation Fund.

In Barnegat (Ocean County)—the 194.4-acre Cedar Bridge tract near

Greenwood Forest is a key parcel in preserving the headwaters of the east branch of the Wading River. The one-and-a-half acre lake on the property is a significant body of water in the vicinity of the West Plains, an 11,000-acre pygmy pine forest. There are areas of cedar and upland sections contain mixed pine-oak forest, shrubs and flowers typical of Pinelands flora. Purchase price: \$84,000.

In Tabernacle (Burlington County)—the 909-acre tract, located on the south side of county route 532, is important for protecting a portion of the headwaters of the Batsto River in the Mullica watershed. It contains pine and oak forests and former cranberry bogs; and it links two sections of Wharton State Forest. Purchase price: \$998,720. □

## DEP STAFF CHANGES

Commissioner English on July 7 announced staff changes which included the appointment of Paul H. Arbesman to succeed Betty Wilson as First Deputy Commissioner.

Wilson left DEP to become Associate Director for Recreation Programs with the Heritage Conservation and Recreation Service of the U.S. Department of the Interior in Washington, D.C. Arbesman had been DEP's Assistant Commissioner for Environmental Management.

The new Assistant Commissioner for Environmental Management is George J. Tyler, who had been Director of the Division of Environmental Quality.

John J. Stanton succeeded Tyler in that position. Stanton had been Deputy Director of the Division of Environmental Quality.

"New Jersey is fortunate to have such a cadre of dedicated experts in environmental protection to fill these positions," Commissioner English said. "Betty Wilson is a unique talent, and New Jersey will now have to share her with the other 49 states. The calibre of the DEP administrators who are changing jobs as a result of her departure from state government testifies to the ongoing attraction of DEP for the best people in the environmental field."



**Paul H. Arbesman**, now First Deputy Commissioner of DEP, joined the department in 1975 as Director of the Division of Environmental Quality and in 1978 became Assistant Commissioner for Environmental Management. Before entering state service, he spent five years with the U.S. Environmental Protection Agency (EPA), first as Chief of the New Jersey and Caribbean Section Air Programs Branch, and later as Chief of the Environmental Impacts Branch in New York City. From 1966 to 1970 Arbesman, a chemical engineer, was employed at the U.S. Naval Ordnance Laboratory, White Oak, Md., and later was a member of the

*Continued on page 16B*



## English on the Environment

A price we pay for making many of the products essential to our lifestyle is the problem of safely disposing of hazardous wastes. We need only turn to Love Canal or the mercury-tainted Meadowlands to see what unsafe disposal means.

Safe management of hazardous wastes is New Jersey's major environmental problem because ours is a tiny state with a big population and industry, especially in the area of petrochemicals. DEP estimates that 720,000 tons of hazardous waste are produced annually in New Jersey, with another 95,000 tons of similar materials shipped here for processing each year.

There are various ways of handling hazardous wastes so that danger is avoided or at least minimized. For example, waste may be made harmless by chemical treatment or some other process, or they may be incinerated, provided there is enough consistent heat so that residues of the wastes will not enter the atmosphere as a dangerous kind of air pollution.

Today, there are a handful of landfills, carefully policed by DEP, receiving only hazardous wastes produced on-site by individual industries. DEP regards landfill of hazardous wastes as, at best, merely an interim form of storage.

Last year Governor Brendan Byrne appointed a Hazardous Waste Advisory Commission to research the problem and recommend remedial measures. In its report to the Governor in January 1980, the commission set forth specific guidelines for the siting, construction and operating of privately-owned toxic waste disposal facilities. This large project would be under the direction of a state-established management corporation with authority to select sites for disposal facilities, to construct and operate the plants if private sector support is not forthcoming, and to require firms creating the wastes to pay disposal costs.

Siting criteria are being developed. (The Delaware River Basin Commission this summer presented its siting criteria study for the four-state region of New Jersey, New York, Pennsylvania and Delaware.)

Challenges which remain are getting localities to accept the carefully chosen disposal sites; wiping out "orphan" (abandoned, unsupervised) hazardous waste dumps; apprehending and penal-

izing midnight dumpers (people who illegally and with wanton disregard for public safety deposit dangerous wastes along roadsides and elsewhere); and securing adequate funding. New Jersey has so far used the spill fund provided through the Spill Compensation Act and Amendments for high priority cleanups, but the expense is so great that our state, and others with hazardous waste problems, look to the federal government for aid. I have gone to Washington to speak in support of the establishment of a federal "superfund" for hazardous waste control.

DEP is carrying out a year-long study to find out where in New Jersey dangerous substances are located. Our Office of Cancer and Toxic Substances has sent questionnaires to more than 15,000 industries throughout the state in an effort to gather information about 155 substances which are toxic or suspected of being carcinogenic. In addition to determining quantities and types used, stored or manufactured, emphasis will be placed on methods of disposing of manufacturing wastes containing dangerous materials. This information will give us the basis for new and needed regulations which will help to prevent and control environmental pollution.

Confidential information supplied by industries on the questionnaires will, of course, be protected by DEP. Great thanks are due to the Chemical Industry Council, the New Jersey Chamber of Commerce and to the New Jersey Business and Industry Association for the public-spirited help they have given DEP in making the survey possible.

You can help, too. If you discover evidence of illegal dumping, call DEP's 24-hour Environmental Action Line, 609-292-7172. Keep informed through media coverage as to what is being done about hazardous waste disposal. Participate in any local public meetings or hearings on the subject. □

## OVER \$790,000 TO DEP FOR TOXICS RESEARCH PROJECTS

The U.S. Environmental Protection Agency (EPA) recently awarded DEP \$794,053 for research projects dealing with the presence of toxic substances in air, water and vegetation, as well as how they got there; and for an experiment involving a biological analysis technique that could alert scientists to carcinogens (cancer-causing substances) that haven't yet been examined in the laboratory. The grant also will finance the creation of a Toxic Substances Information Resource Center—a data bank made up of library materials, on-line systems for literature-searching, and a computerized catalog system. □

## STAFF CHANGES

*Continued from page 16A*

Commissioned Corps of the Public Health Service. Arbesman holds a master's degree in Chemical Engineering from the University of Maryland and bachelor's degree in the same subject from New York University.



**George J. Tyler**, now Assistant Commissioner for Environmental Management, has been with DEP for 11 years. Tyler, who is both an engineer and an attorney, joined DEP in 1969 as an environmental engineer and in 1974 became a Special Assistant to the Director of the Division of Environmental Quality. In 1978 he was named director of that division. Tyler received his Juris Doctor degree from Seton Hall University and his bachelor's degree in Engineering from Manhattan College.



**John J. Stanton**, now Director of the Division of Environmental Quality, came to the department from EPA in 1979. At EPA he spent four years as Chief, Progress Assessment Branch, in the Program Reporting Division at Washington, D.C. Earlier he had been Chief of the EPA Planning and Evaluation Branch, and Chief of the Basin Planning Section and a senior engineer. He joined EPA in 1971. Stanton holds a master's degree in Business Administration from Adelphi University, a master's degree in Civil Engineering from Stanford University, and a bachelor's degree in Civil Engineering from Newark College of Engineering (now the N.J. Institute of Technology).

## NEW JERSEY WINS OVER \$5 MILLION IN FEDERAL GRANTS FOR URBAN PARKS

Governor Brendan Byrne and Under Secretary James Joseph of the U.S. Department of the Interior on July 16 announced the award of \$5,453,365 in 13 Urban Park and Recreation Recovery (UPARR) grants to 10 New Jersey cities and two counties. The UPARR program, established by the Carter Administration in 1978, is directly aimed at reviving and rebuilding critically needed parks and other recreation facilities in certain fi-

*Continued on page 16D*



Over the past 10 years, construction of wastewater treatment facilities has resulted in cleaner waters and thousands of construction and related jobs.

## THE PROPOSED 1980 NATURAL RESOURCES BOND ACT

On November 4, 1980, New Jerseyans will be presented with an opportunity to add another chapter to their long and proud history of support for the Garden State's environment. This opportunity will come in the form of a public question on this year's ballot entitled the "Natural Resources Bond Issue." The Natural Resources Bond Issue, subject to the approval of New Jersey voters on November 4, will authorize a \$145 million State investment in maintaining and enhancing the essential quality of New Jersey's natural resources. This investment of State dollars will attract an estimated \$732 million in federal funds and private investment. Another \$142 million in local government funding will be leveraged, making a total of \$1 billion available for investment in New Jersey's Natural Resources.

In addition to the Natural Resources Bond Issue, New Jersey voters will be asked to approve two other bond issues: one concerning energy conservation in State-owned buildings and another, which has not yet been approved by the Legislature, concerning construction and renovation of State institutions. The Energy Conservation Bond Issue will provide \$50 million for improving the energy efficiency of State buildings. The Public Purpose Buildings Construction Act, if passed by the Legislature and signed by the Governor, would provide \$159 million for construction and renovation of State institutions such as mental hospitals, nursing homes and prisons.

Over the years, New Jersey citizens have demonstrated a keen interest in maintaining and enhancing the quality of our State's environment. New Jersey's support for environmental programs has resulted in substantial improvements in the quality of our air and water. At the same time, unique natural resources such as the Pinelands and our coastal wetlands have been protected from dangerous development which could have deprived future generations of their enjoyment. These accomplishments are a source of great pride for the people of New Jersey, and they pay dividends in the form of a more prosperous, more healthful, more aesthetically pleasing environment in which to live, work and play.

A recent poll by the Eagleton Institute has shown that people enjoy living in New Jersey, and this is largely a result of the quality of the environment within the State. In addition to enjoying New Jersey and appreciating its environment, the Eagleton poll showed that people in the Garden State are quite willing to invest in preserving and enhancing the environment. In this respect, the quality of New Jersey's environment appears to be a key factor in decisions concerning the location of both commercial and residential development.

The Natural Resources Bond Issue was developed after extensive review of New Jersey's environmental needs by the State's Commission on Capital Planning and Budgeting, which includes members from the Legislature, State Government and the private sector. Their recommendation of this bond issue, its passage by the Legislature and approval by Governor Byrne signify its importance in restoring New Jersey's environment.

# An Investment in New Jersey's Natural Resources



State of New Jersey  
Brendan Byrne,  
Governor



Department of  
Environmental Protection  
Jerry Fitzgerald English,  
Commissioner

The Natural Resources Bond Issue calls for a \$145 million investment in New Jersey's natural resources, consisting of:

- \$60 million for matching grants to local governments for developing and improving wastewater treatment facilities;
- \$50 million for grants or loans to promote resource recovery projects;
- \$15 million in aid to municipalities for dam reconstruction;
- \$12 million worth of harbor cleanup activities; and
- \$8 million for interconnections between existing water supply systems and for reservoir design.

In October of 1979, when the Department first presented its needs to the Commission on Capital Planning and Budgeting, \$753 million was requested in order to meet New Jersey's most critical needs in these areas. The Commission on Capital Planning and Budgeting decided it was necessary to cover

*Continued on page 2*

a number of the areas identified, even if all revenue could not be provided at one time. The \$145 million Natural Resources Bond Issue will combine with New Jersey's triple A credit rating to assure that bonds will be marketed at the lowest possible interest rate. The fact that it will provide for more than \$1 billion in capital improvements, will generate over 11,000 jobs annually and, most importantly, will help protect and enhance the quality of New Jersey's environment makes it a lucrative combination from both an economic and environmental perspective.

### Wastewater Treatment

The Natural Resources Bond Issue includes a proposal for \$60 million in State aid to local governments for sewerage facility planning, design and construction. The \$60 million will be allocated to cover 8 percent of the eligible costs of sewerage facilities. This \$60 million will leverage an additional \$570 million in federal funds over the next four years to improve water quality throughout the State. Thus, for every one dollar invested by the State, the federal government will invest approximately \$9.40. Affected municipalities will invest about \$2 for every one invested by the State as their share of the projects.

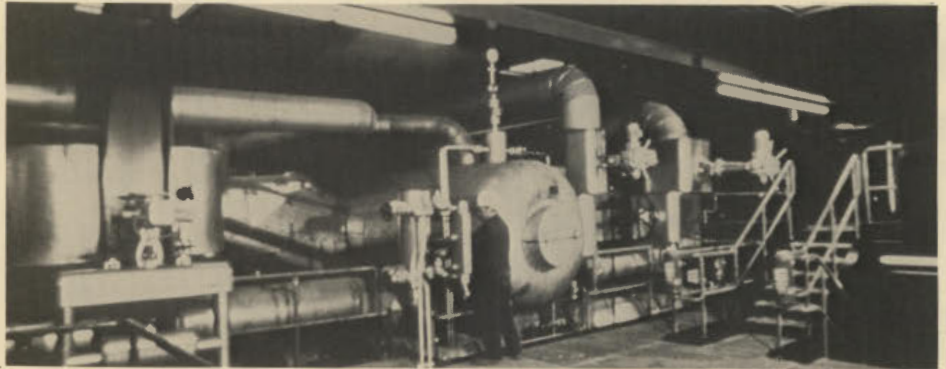
This program dates back to the passage of the 1969 Water Conservation Bond Issue, and it has been continued over the past 10 years with funds from the 1976 Clean Water Bond Fund. All in all, this program has pumped more than \$1.5 billion into New Jersey's economy. Today, we are beginning to see the results of the new treatment plants in the form of cleaner rivers, cleaner bays, and the reopening of previously condemned shellfish beds. As New Jersey's economy continues to grow, improvements in existing wastewater treatment facilities will be needed, particularly in urban areas, if the quality of the State's water is to be maintained and enhanced.

### Resource Recovery

The Natural Resources Bond Issue also includes a proposal for \$50 million in new funding for grants or loans to cover between 20 and 33 percent of the costs associated with the development of resource recovery facilities. Resource recovery facilities supplement recycling activities by producing energy from waste products which cannot economically be recycled.



**Landfills are not only unsightly, they are potential sources of groundwater pollution.**



**The technology exists for transforming solid waste into useable materials such as energy.**

This portion of the Natural Resources Bond Issue was proposed in order to provide the needed stimulus to get resource recovery moving in New Jersey. It is an urgent need in light of the estimation that New Jersey has only an average of a four year supply of remaining dump space. After that time, we will run out of room to dump our garbage, which means we must either invest in more landfills or in energy and resource recovery facilities. The State and the counties have made the decision that resource recovery is the appropriate technology for New Jersey's future.

In addition to the problems associated with simply running out of available landfill space, today's garbage dumps are currently polluting groundwater with hazardous or toxic substances which seep out; this condition demands that alternatives be developed. In Europe, where they faced the problems associated with limited areas for disposal long before we did, resource recovery has become a viable alternative to dumping. This technology is available now and is operating successfully in many parts of this country.

In New Jersey, the problem of a dwindling supply of landfill area was

formally recognized in 1975, with the passage of legislation requiring that each county and the Hackensack Meadowlands Development Commission submit a Solid Waste Management Plan which makes maximum use of resource recovery. The planning process is now drawing to a close, and this Bond Issue will allow the State to follow through with the development of facilities designed to relieve New Jersey's dependence on landfills, and will help establish viable alternative methods of disposal.

The need for investment in resource recovery over the next 10 years is estimated to be approximately \$1.2 billion. Development of these facilities will result in thousands of construction, engineering, and other technical and non-technical jobs over the next 10 years. The \$50 million provided for in the Natural Resources Bond Issue is expected to result in a \$150 million to \$200 million investment in resource recovery plants. As such, it is only the beginning of a program which promises to improve the quality of life in New Jersey over the next 10 years by producing energy, by creating a more healthful and aesthetically pleasing environment and by promoting the reuse of trash that we now discard with such

*Continued on page 3*

disasterous consequences.

**Dam Restoration**

The \$15 million proposed under this Bond issue for the restoration of high hazard dams throughout New Jersey will insure a continued service of water supply, flood control, and recreation and will protect the life and property of the State's citizens. The need for this project was identified as a result of a U.S. Army Corps of Engineers program to inspect the safety of 320 New Jersey dams classified as high hazard. The high hazard dams, by definition, have the potential to cause loss of life or major property damage should failure occur. To date the U.S. Army Corps of Engineers has identified 80 dams in need of repairs. The funds proposed will enable New Jersey to begin to address this serious problem.

Under this Bond Issue, \$15 million will be available to municipalities to cover 50 percent of the cost of restoring dams which are in danger of failing. The maximum grant available for the restoration of any single dam would be \$1 million. In cases where the owner of any public or private dam refuses to make necessary emergency repairs, the Natural Resources Bond Fund will enable the State to make repairs necessary to protect the public and charge the owner for the work performed.

**Harbor Cleanup**

The Natural Resources Bond Issue also proposes \$12 million in State funding for the completion of harbor cleanup activities in the New York-New Jersey Harbor area and the initiation of new harbor cleanup work in the Delaware River area in South Jersey. This program began at Liberty State Park in Jersey City in 1976. In 1977, the voters approved \$10 million of the Beaches and Harbor Bond Fund for harbor cleanup and the expansion of this program. In order to complete the work in the New York-New Jersey area and to provide aid in the Camden area of the Delaware River, \$12 million in new bond funding is needed—\$10 million for completion of the New York-New Jersey Harbor cleanup and \$2 million for work in South Jersey.

In the New York-New Jersey Harbor area, each State dollar is matched by two federal dollars from the New York Harbor Collection and Removal of Drift project. Combined state and federal funding for harbor cleanup will benefit New Jersey through the im-

Continued on page 4

**Here's how the bond questions will appear on the November 4 ballot.**

**PUBLIC QUESTION**

**NATURAL RESOURCES BOND ISSUE**

Should the "Natural Resources Bond Act of 1980" which authorizes the State to issue bonds in the amount of \$145,000,000.00 for the purposes of testing, designing, acquiring, planning, and constructing resource recovery facilities, sewage treatment facilities, water supply facilities, dam restoration projects, and harbor clean up projects, providing the ways and means to pay the interest of such debt and also to pay and discharge the principal thereof, be approved?

**PUBLIC QUESTION**

**ENERGY CONSERVATION BOND ISSUE**

Should the "Energy Conservation Bond Act of 1980" which authorizes the State to issue bonds in the amount of \$50,000,000.00 for the energy audits and renovation of public buildings, institutions, and educational facilities to produce a net reduction in energy consumption therein; and to provide a means to pay the principal and interest on these bonds, be approved?

**PUBLIC QUESTION**

**PUBLIC PURPOSE BUILDINGS CONSTRUCTION BOND ISSUE**

Should the "Public Purpose Buildings Construction Bond Act of 1980" which authorizes the State to issue bonds in the amount of \$159,000,000.00 for construction and improvement of facilities serving the mentally retarded, mentally ill and children in need of supervision; for construction and improvement of correctional institutions; for construction of long-term care facilities for disabled veterans; and for the creation of a fund to encourage the construction of long-term care facilities for the aged and disabled; and to provide means to pay the principal and interest on these bonds, be approved?

**BOND ISSUE PROPOSALS ON NOVEMBER 4 BALLOT**

The Legislature and the Governor in mid July approved a \$145 million Natural Resources bond issue proposal and a \$50 million Energy Conservation proposal for voter referendum in the November 4 general elections.

**NATURAL RESOURCES:** Approval by New Jersey voters would authorize the sale of bonds to provide funds for matching grants or loans to local governments for resource recovery, sewage treatment and water supply facilities, dam restoration projects and harbor clean-up projects; and funds for similar state projects.

Revenue from the bond sale would be allocated as follows: \$50 million for resource recovery facilities, \$60 million for sewerage plant construction, \$12 million for harbor clean-up projects; \$15 million for dam restoration projects, and \$8 million for water supply projects. Total: \$145 million.

**ENERGY CONSERVATION:** Approval would authorize the sale of bonds for energy audits and for energy

saving renovations to public buildings, institutions, and educational facilities supervised and controlled by the State to produce a net reduction in the amount of energy consumed and reduce the State's annual energy bill.

Revenue from the bond sale would be allocated as follows: \$3 million for energy audits, and \$47 million for energy saving renovations. Total: \$50 million.

It is expected that the ballot also will present for voter approval a \$159 million **Public Purpose Buildings Construction** bond issue proposal to provide funds for the construction or improvement of facilities for the care of the mentally retarded, the mentally ill, and children in need of supervision; construction of additional long-term care facilities for disabled veterans and construction and improvement of prison facilities; and a loan guarantee fund to encourage construction of long-term care nursing homes for the aged and disabled which would provide additional Medicaid beds. □

Continued from page 3

provement of waterfront property values, reduction of damage to vessels, reduction of fire hazards, improvements in the quality of air and water in harbor areas, elimination of hazards to life and health, and improvement in the aesthetic qualities and general appearance of New Jersey's waterfront. The primary beneficiaries of these projects are New Jersey's urban areas, but all New Jersey residents can enjoy and take pride in an attractive, prosperous waterfront.

### Water Supply Deficiencies

The Natural Resources Bond Issue provides for an additional \$8 million for State projects and matching grants to local governments for planning, testing, designing, acquiring and construction water supply interconnection facilities and for completion of the design of the Manasquan Reservoir project. These funds will provide for a one year program to improve New Jersey's water supply systems. Other longer term new funding requirements have been tentatively identified by the Water Supply Master Plan, and additional funding for these water supply projects will be pursued in the future. Therefore, the \$8 million provided for in the National Resources Bond Issue addresses only our most crucial and immediate water supply needs.

Water supply system interconnections are critical components of the overall water supply planning strategy in New Jersey. In some cases interconnections can be direct sources of water for large centers of use or the only source of emergency supplies in the event a system fails or a drought occurs.

Unfortunately, in many instances the condition and carrying capacity of many of the emergency links in the State are unknown. A statewide program to test and analyze up to 80 existing interconnections is essential and will be undertaken with funding from this bond issue. The study phase of this program will focus initially on twenty urgently needed interconnections in Bergen, Essex and Hudson Counties. The need for rehabilitation of these interconnections and for construction of new ones will be evaluated and followed by a program to implement the work which is deemed necessary.

Up to \$4.2 million will be authorized by the Natural Resources Bond Issue for evaluation, design and initiation of



**Gropp's Lake Dam, which burst on May 27, 1979. The Natural Resources Bond Issue will provide money to study and repair other dams throughout the State in order to avoid similar incidents.**

site acquisition for a large multipurveyor interconnection and pumping station at Great Notch. The Great Notch Reservoir is located in Passaic County and is owned by the Passaic Valley Water Commission. This project will link four large water supply systems: the North Jersey District Water Supply Commission, the Passaic Valley Water Commission, and the Newark and Jersey City Water Departments. This project will reduce the likelihood that severe cutbacks in water use, including possible industrial and commercial shutdowns, would have to be invoked in times of drought, severe contamination, or other emergencies.

In 1976, the voters approved \$2.7 million of the Clean Waters Bond Issue for the design of the Manasquan Reservoir. An additional \$.5 million will be allocated from the Natural Resources Bond Issue to complete this work and answer questions related to environmental impact. Once design is completed, construction funds will be estimated and requested in order to bring

this urgently needed project on line. The proposed Manasquan Reservoir is intended to serve an area from mid-Monmouth County to the northern part of Ocean County where existing groundwater supplies are currently over utilized.

### Investing in the Future

**The \$145 million Natural Resources Bond Issue addresses New Jersey's most urgent capital needs in the areas of water supply and treatment, harbor cleanup and resource recovery. New Jersey's needs in many of these areas far surpass the funding which would be made available under this bond issue. In this respect, the Natural Resources Bond Issue represents only the beginning of a massive new investment in New Jersey's essential natural resources; another chapter in New Jersey's proud history of commitment to the preservation of its natural environment and investment in its future.** □



**This picture was taken in the early 70's, before harbor cleanup work began at Liberty State Park. The waters surrounding the Park have been cleared of this debris, but many of the State's rivers and harbors are still cluttered and unfit for navigation or development.**



**BREAKING GROUND FOR NEW PESTICIDES LAB.** Jerry Fitzgerald English, DEP Commissioner (left) and Jan Geiselman, Director of the Division of Air and Hazardous Materials for Region II of the U.S. Environmental Protection Agency (EPA), together turn the symbolic first spadeful of earth in the recent ground-breaking ceremony for a new DEP Pesticides and Toxic Substances Enforcement Complex in Ewing Township (Mercer County). When completed, the one-story, 25,000-square foot building will house the Office of Pesticide Control, a unit of DEP's Division of Environmental Quality. George Beyer, chief of the Office since its inception in 1971, is heading up development of the complex. The facility will provide quarters for administrative, laboratory, training and enforcement activities principally in the area of pesticide control.

EPA selected New Jersey as the site of the country's first Pesticides and Toxic Substances Enforcement Complex because of its position as a heavily industrialized state with substantial agriculture, and its solid pesticides control program. Funding is being provided by a \$2.7 million federal grant from EPA (95 percent of the cost) and \$200,000 from the State of New Jersey (5 percent of the cost). Construction is expected to begin in the fall.

DEP Commissioner English praised EPA Administrator Douglas Costle and his staff for "providing for these critically needed facilities. The laboratory will be the only one of its kind in the northeast and will help meet regional-analytical requirements for pesticides and toxic substances." She also thanked Regional Administrator Charles Warren and Deputy Regional Administrator Richard Dewling of EPA Region II for their support. □



JORGI ROSKY

Removal of burnt out drums beside the Elizabeth River at the Chemical Control site after the April 21 fire, enabled DEP to build this dike by the river to keep polluted runoff water onsite for purification.

## CHEMICAL CONTROL CLEANUP

*... The End is in Sight*

BY JAMES M. STAPLES

Transition of the Chemical Control Corporation hazardous waste site in Elizabeth to valuable recycled land continued through the summer, despite a major fire last April 21.

DEP Commissioner Jerry Fitzgerald English said that the clean-up of the Chemical Control site will prove to the world that "we can recover from society's heritage of toxic carelessness."

By the end of July, only about 2,500 drums still occupied the three-acre Chemical Control site between Front Street and the Elizabeth River in Elizabeth, down from the over 50,000 drums of waste originally stored there. Supervisors of the cleanup were guardedly predicting that the site should be cleared by October, even of rubble left after the two fire-damaged buildings were leveled. The cost had reached \$6 million, paid from the New Jersey Spill Compensation fund.

Optimism was tinged with caution because more than half of the remaining drums were laboratory packs, drums with removable ends into which jars, bottles, boxes and flasks may be placed. Unpacking, identifying and disposal of the contents of more than a thousand such "lab packs" in one of the former buildings took up most of the summer of 1979.

Those earlier lab packs contained a hair-raising combination of poisonous gases, explosive chemicals and other touchy materials. There were even small amounts of radioactive waste, virus-bearing substances and human organs, the latter apparently from some medical laboratory.

As workmen from O.H. Materials, Inc.,

of Findlay, Ohio, one of the contractors hired by DEP for the cleanup, began gingerly opening this latest batch of lab packs, it appeared that they, too, carried dangerous cargoes. Quantities of explosive chemicals began appearing, along with flasks of gases. Although they survived the fire, some of the lab packs contained flasks and other containers upon which identifying labels were charred and illegible.

Once the site is cleared of drums and surface rubble, there will be one more task to perform: DEP will begin removing surface soil which has been contaminated by chemicals. Just how much soil must be removed remains to be seen.

"The Blue Magoo," the U.S. Environmental Protection Agency's portable water purifier, remained at the site after the fire. With 18,000 pounds of granulated carbon, the device cleanses polluted water from the site so that it is of good enough quality to be drained into the nearby Arthur Kill. A total of 375,000 gallons of water, both from firemen's hoses and subsequent rainfalls, had been purified as of July 25. EPA moved the Blue Magoo elsewhere later, and O.H. Materials supplied DEP with another purifier.

The contents of at least 15,000 drums burned in the fire. Luckily, this incineration minimized potentially hazardous pollution. By late July, 35,000 drums had been crushed for removal to a landfill. Grossly contaminated soil, absorbent material put down to soak up chemicals and crushed drums provided 713 truckloads for landfilling at the CECOS International Landfill, Niagara Falls, N.Y.,

*Continued on page 16D*

## URBAN PARKS

Continued from page 16C

nancially hard-pressed communities. This program, the first of its kind on a countrywide basis, is administered on the national level by the U.S. Department of the Interior. DEP's Green Acres Administration follows through on the state level for New Jersey.

New Jersey ranked first among all states in the number of grants selected for funding in a national competition which elicited more than 200 applications from eligible local governments. Selection criteria for the grants included the local government's prior improvement of neighborhood recreation opportunities, the number of jobs provided by the proposed project for minorities, youth and moderate income neighborhood residents, overall need, the applicant's ability to match the federal money with private and local contributions, and innovative planning.

Byrne noted that "New Jersey has aggressively pursued UPARR funding and established a strong partnership among local governments, DEP and the Carter Administration in this area . . . It is encouraging to me that the state and federal governments can work with local governments to provide pleasant, close to home recreational opportunities for the residents of our cities, especially at a time when we are all striving to conserve

our energy and economic resources."

DEP Commissioner English said it was a pleasure "to be part of a program to protect one of cities' most valuable, but often overlooked, resources—urban parks. We have a responsibility to clean-up and protect not only our air and water but our recreational resources as well."

The UPARR Act of 1978 provides for grants covering 70 percent of approved projects. In addition, federal sources will provide a dollar-for-dollar match to state contributions to the local share of a project, up to 15 percent of the total cost, bringing the federal share to a maximum of 85 percent. This provision makes it possible for a park rehabilitation project in New Jersey to be completed at no cost to the community, as the matching portion of a Green Acres grant would be paid by federal sources instead of the municipality or county. A breakdown of the grant awards (see chart) will illustrate this funding provision—there are seven communities whose park projects will be paid for without local funds.

Money for the projects (see chart) will be available in two stages. Eleven of the grants are available for immediate use by the local governments, but the grants for the Newark and Perth Amboy projects were delayed due to the deferral of some federal monies until federal fiscal year 1981. Those two grants will be available October 1 (1980).

## URBAN PARKS GRANTS

### Rehabilitation Grants for immediate funding:

Applicant	UPARR \$	N.J. Green Acres \$	Local \$	Total \$
Bridgeton	90,151	13,641	5,508	109,300
Camden City	255,000	45,000	0	300,000
East Orange	123,002	21,706	0	144,708
Elizabeth	257,550	45,450	0	303,000
North Bergen	65,850	11,620	0	77,470
Paterson	224,157	26,553	31,583	282,298
Union County	1,334,804	235,554	0	1,570,358
Vineland	212,600	37,500	0	250,000

### Innovative Grants for immediate funding:

Camden County	28,000	0	12,000	40,000
Elizabeth	102,850	18,150	0	121,000
Paterson	11,000	0	2,500	15,700
			(2,200 private)	

### Rehabilitation Grants for delayed funding:

Newark	2,580,501	361,284	228,526	3,170,311
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### Innovative Grants for delayed funding:

Perth Amboy	168,000	0	72,000	240,000
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<b>Total grants for immediate funding UPARR share:</b>	<b>\$2,704,864</b>
<b>Total grants for delayed funding UPARR share:</b>	<b>\$2,748,501</b>
<b>Total UPARR funds to New Jersey:</b>	<b>\$5,453,355</b>

## CHEMICAL CONTROL

Continued from page 16C

a lined landfill approved by New York State to receive this type of material. All waste from Chemical Control's site was manifested in accord with New Jersey regulations.

Rollins Environmental Services, of Logan Township, Gloucester County, received some 200,000 gallons of chemical wastes for incineration. Chemicals were analyzed by Rollins employees onsite and then removed to Logan Township in sealed bulk trucks. Material for incineration continued going to Rollins as the cleanup wound down, although need for a Rollins crew onsite ended in July. O.H. Materials experts made 1,000 analyses during the same period. The third contractor at Chemical Control is New England Pollution Control, Inc. of New Haven, Conn.

Companies which had generated and consigned wastes to Chemical Control for disposal had, before the fire, begun reclaiming drums for redispal. Nearly 8,000 of these "generator drums" were removed before the fire and another 1,715 survived the flames to return to their points of origin by late July.

Three contractor employees were hospitalized late in June due to apparent heat prostration, exposure to toxics, or both, despite stringent safety precautions exercised on the site. Gary Houpp, 26, a machine operator for a subcontractor of O.H. Materials, was flown home to Kentucky after spending three days in Elizabeth General Hospital. He later returned to work. Stephen Beck, 26, of Belmar, and Frederick Klotzbach, 28, of Sewell, both employees of Rollins Environmental Services, were admitted to Alexian Brothers Hospital, Elizabeth, and treated for chemical exposure. Both later returned home and Klotzbach returned to work.

Work at Chemical Control has continued under the supervision of George Weiss, onsite supervisor; Paul Giardina, director of the DEP Hazard Management Program, and Karl Birns, the Program's assistant director for response. □

### Local program

## GREEN ACRES GRANTS

### O.K.'D FOR 16 PARKS

Governor Byrne in mid July announced the approval of 16 Green Acres grants totaling more than \$2.6 million for park projects in 11 counties—Burlington, Camden, Essex, Gloucester, Mercer, Monmouth, Morris, Passaic, Somerset, Sussex and Union. The matching grants will be administered by DEP and include over \$1.4 million in development grants and over \$1.2 million in acquisition grants. □

# Return of the Tiny Tiger

## A Review of New Jersey's Bobcat Restoration Program

By Robert C. Lund

On March 16, 1978, No. 20624-20625, a 25-pound adult male bobcat, bolted from its holding cage and disappeared among the rocky ledges and rhododendron stands of the Kittatinny Ridge. So began an attempt by the Division of Fish, Game and Wildlife to restore the bobcat to a portion of its historic range in the Garden State. But why restore the bobcat and can it be done? Here are some answers.

The bobcat, along with its fellow predators the eastern panther and the grey wolf, once ranged throughout New Jersey. So abundant was the bobcat that early settlers put a price on its head in the 1600s and 1700s in an effort to eliminate this imagined threat to their livestock. Early bounty payments and other control efforts had only minor, localized effects on bobcat numbers. It was human modification of the land that eventually resulted in a significant reduction in the bobcat population. Clearing of the forest for crop- and pastureland soon made much of the cat's former range unsuitable, and the species was slowly pushed back to the point where it could survive only in the rougher, more inaccessible areas that held little interest for man and his plow. By the turn of the century, it was reported on the verge of extinction and known to occur only in the most northern counties. The last reported bobcat killed in Mercer County was in 1892.

Since that time, what records do exist indicate that the bobcat was confined to the rocky, broken county of New Jersey's north. It was still believed to occur in the Ramapos in the early 1940s, and sightings and an occasional specimen were reported throughout the north into the early 1960s. The most recent confirmed bobcat specimen was one hit by a car in Passaic County in 1961. In the winter of 1972-73, bobcat tracks and droppings were discovered by Division biologists while trapping and marking deer in wintering areas in Warren County. Though an occasional sighting report has been received since that time, none could be confirmed. Though it was possible that a few bobcats remained in the state, available evidence indicates that at best, the population was very low if in fact the species had not already been extirpated.

### What Happened?

Why New Jersey's bobcat population all but disappeared will probably never be fully understood. Though not totally protected until 1972, the number of "cats" taken by hunters and trappers in a given year never was more than a few individuals and the species was never common enough to be consistently pursued. Though much of its original range in northern New Jersey remains intact, its habitat niche in the central and southern areas has been eliminated. One exception is the extensive tract of land known as the Pine Barrens. Though reports are occasionally received of



Bureau of Wildlife Management personnel release the first bobcat of the experimental restoration program at the base of the Kittatinny Ridge in Sussex County, March 16, 1978.

PHOTOS BY HARRY GROSCH

bobcat occurring there, no confirmed sightings or specimens have been recorded from this area in recent times. It is possible that "the Pines" can support cats, however, the nearest existing population is too distant to act as a source of animals for natural reintroduction.

The frequency of human encounters may have increased to the point where some animals were forced to abandon areas. Even in the more remote northerly sections, the number of people using these areas for primarily recreational purposes has increased significantly in the past 20 years. It has also been theorized that the reduced bobcat population, now restricted to a relatively small area, may have become more susceptible to feline distemper from association with domestic cats. This would result in an increased loss of kittens and reduce the ability of the bobcat to maintain the minimum population level necessary for survival. However, this is all speculation. In the end it was probably a combination of many things that ultimately eliminated the bobcat as a viable component of New Jersey's ecosystem.

### Restoration—Why Bother?

The bobcat's decline did not go unnoticed. In 1975, biologists with the N.J. Division of Fish, Game and Wildlife reviewed the status of the bobcat and discussed the feasibility of attempting to restore the species to at least a portion of its former range.

One of the first questions that had to be faced was whether the public would accept such a program. Bobcats, like most predators, have long suffered from misinformation and "bad press." Many people still view animals in "good guy-bad guy" terms; the bobcat being one of the bad guys.

The Division felt that there would be some opposition as a result of these feelings, however it also felt that it had a responsibility to the total wildlife resource, not just the few species which directly benefit man. Part of its role as a professional resource management agency is to maintain the diversity of species where possible. True, it is too late for the New Jersey wolf, cougar, elk, or moose, for their conflicts with human activities and development would be too great. However, it was felt that there was still a place for the bobcat, this symbol of

Continued on page 18

## Return of the Tiny Tiger

*Continued from page 17*

New Jersey's wild past.

### The Plan

With the approval of the Fish and Game Council, a plan was prepared and submitted to the U.S. Fish and Wildlife Service in 1977. The plan was approved, allowing the Division to be reimbursed for 75% of the total project cost under the Federal Aid to Wildlife Restoration Program.

Together with the proposed study plan, an environmental assessment was also submitted, outlining the possible impacts of the restoration program on the human environment and on other species of wildlife. One of the more obvious concerns was the possible effect of the bobcat on New Jersey's wild turkey restoration program, since the initial releases of both species were to be made in the same areas. However, the wild turkey has never been found to be more than a minor part of the bobcat's diet; also, the greater reproductive potential of the turkey and the small number of bobcats present would minimize the effects of predation.

The first stage of the restoration plan was to review the available literature dealing with the bobcat. Numerous reports, books, theses, and technical papers, were reviewed, with special emphasis given the subjects of habitat requirements, capture and marking, food habits, and behavior. Armed with this information and a knowledge of New Jersey areas formerly occupied by the bobcat, potential release sites could be selected.

To learn about bobcat habitat needs first-hand, NJ biologists spent several days as guests of the Massachusetts Division of Fisheries and Wildlife, observing occupied bobcat habitat. Massachusetts presented a unique opportunity to study bobcats thriving in close proximity to dense human populations; in some cases, bobcats are living less than a mile from large metropolitan centers.

Based on the information obtained, two New Jersey sites were selected for the initial releases. The first was located along the Kittatinny Ridge in Sussex County, the second in the Pequannock Watershed in Passaic County. These areas satisfied the habitat requirements of bobcats as we knew them. Both were characterized by extensive areas of rough, broken country with numerous caves and crevices suitable for den sites. In the northern portion of the bobcat's range, rocky ledges are considered an essential component of bobcat habitat.

The bobcat is usually thought of as a predator of small mammals, such as mice, rabbits, hares, and squirrels. However, in the northeast deer are an important prey item, especially in the winter. Both areas selected provided a variety of food items, including deer.

### Where Do You Get a Bobcat?

We had space and a food source, but where do you get a bobcat? Several northeastern states and Canadian provinces were contacted and Maine and Massachusetts volunteered to supply cats. Capture efforts

began in Maine in March 1978.

The services of professional guide and cat hunter Neal Wade, and wildlife biologist Joel Hermes, were obtained, with the assistance of the Maine Department of Inland Fisheries and Wildlife. Using cat hounds and a dart gun, they captured three adult males in March 1978. However, we had hoped to obtain two males and four females during this period. Two males were transported to New Jersey and released, the third was liberated at the capture site in Maine. Additional efforts to capture females were unsuccessful and operations were terminated until fall.

Why females weren't readily captured by this method we can only guess. First, the males are larger and more aggressive and may not fear the dogs as much as the smaller female does; they are more likely to "tree" soon after the chase is begun. However, it is more plausible that snow conditions were such that the lighter females could keep well ahead of the dogs and couldn't be "pushed" hard enough to tree.

Obviously, another capture method had to be found. In the fall of 1978 (again with the assistance of the Maine Department of Inland Fisheries and Wildlife), contact was made with a private trapper, Mr. Luther Choate who was well known for his ability to trap bobcats. Using steel leghold traps, Mr. Choate provided us with two male and six female bobcats between November 1978 and November 1979.

Mr. Choate's success with the steel leghold trap brings up an interesting point. Considerable controversy surrounds the use of the leghold trap. Opponents claim that it is a nonselective and inhumane device which causes extensive damage and suffering to the captured animal. However, several states, New Jersey included, have employed the leghold trap to capture and mark animals for research purposes, with little or no resultant damage. The steel leghold trap can be a valuable tool in studies that require the capture of species such as the fox, coyote, or bobcat that are all but impossible to capture in box traps or other so-called live capture devices. Experience continues to demonstrate that it is not the steel leghold trap itself that is the problem in the current controversy, but how and where it is employed. Used with knowledge and skill, it is both selective and humane.

Captured bobcats were confined in steel cages and transported to New Jersey by truck. The cats tolerated confinement very well. With few exceptions, they readily accepted food, consisting of raw venison, rabbit, and hare. However, one young female refused all food offered. We became concerned until someone suggested that live food be tried. The cat readily accepted live quail and quickly regained vigor. When released, five days later, it had gained more than two pounds.

Before release, the bobcats were anesthetized, ear-tagged, and fitted with a radio signal transmitting (telemetry) collar. Nine of the ten cats released to date have been fitted with these collars. One animal, a 10-pound kitten, which we believed too small to carry the radio easily, was not collared. The collars were so attached, that they would break off after approximately six months of exposure to the outside environment.

The telemetry collars were used so that the activity of

the cats could be monitored following release. The signal lasts at least six months, more than enough time to determine whether the cat has established a home range in the area where it was released.

The first bobcat, an adult male, was released on March 16, 1978. Since this initial release, nine additional animals have been liberated; three males and six females. Five cats have been released at each location. The statistics for the 10 bobcats released to date are summarized in Table 1.

The signals from the collars have been monitored from the ground and with the use of aircraft. Because of the greater reception distance and the amount of area that can be covered in a relatively short period of time, aerial monitoring has proved much more productive. Though we are not entirely pleased with our telemetry monitoring efforts, enough contacts have been made to indicate that at least some of the animals have established home ranges within the state. Sighting reports and track surveys following snowfall have provided additional information on bobcat locations.

It is too early to tell whether the current bobcat restoration effort will succeed. Four more animals were released in the spring of 1980 (two males and two females), bringing the total to fourteen. Further releases are not planned until the fate of these animals can be determined. No one has attempted to re-establish the bobcat before, so there is very little to go on and many unknowns. Will the animals stay in their new homes? Will they breed and produce young? Can they cope with New Jersey's dense human population? We need answers to all these questions and more. We hope that we'll succeed, and that New Jersey's ridges and swamps will once again be inhabited by our "tiny tiger."

### Request for Information

If you see a bobcat or find a dead animal you believe to be a bobcat, please let us know. We depend on an interested public to supply much of the information needed to evaluate the success or failure of our restoration efforts. We would also be interested in any information dealing with the history of the bobcat in New Jersey. Specimens, pictures, news articles, personal accounts, and so forth would all be of value in helping to piece together the New Jersey bobcat story. All items submitted will be returned at the sender's request. Your cooperation is sincerely appreciated.

Write: Clinton Wildlife Mgmt. Area  
R. D. Box 409  
Hampton, N.J. 08827  
Att: Robert C. Lund  
Phone: 201-735-8793

### Acknowledgements

The New Jersey Division of Fish, Game and Wildlife would like to express its appreciation to the several individuals who made our restoration program possible; John Hunt, Henry Hilton, Joel Hermes and Robert Boettger—Maine Department of Inland Fisheries and Wildlife; Chet McCord—Massachusetts Division of Fisheries and Game; and especially Neal Wade and Luther Choate. A special thanks is also due to Harry

**Bureau of Wildlife Mgmt. Chief George Howard holds drugged adult female bobcat. Note radio collar in hand.**



**Putting radio collar on cat**



Grosch—NJ Division of Fish, Game and Wildlife, for many long drives between Maine and New Jersey transporting the "cats." □

**Table 1. Vital Statistics for 10 Bobcats Released in New Jersey During the Period March 1978—November 1979**

Date of Release	Sex	Age*	Weight (lbs.)	Total Length of (in.)	County Release
3/16/78	M	Adult	25.0	36.0	Sussex
3/27/78	M	Adult	25.0	42.0	Sussex
11/10/78	F	Adult	17.0	33.5	Sussex
12/10/78	F	Adult	18.0	38.0	Sussex
5/6/79	F	Adult	15.0	37.0	Passaic
5/6/79	M	Adult	17.0	36.0	Passaic
5/6/79	M	Adult	16.0	36.0	Sussex
10/5/79	F	Adult	14.0	36.0	Passaic
11/5/79	F	Adult	17.0	33.0	Passaic
11/5/79	F	Juvenile	10.0	38.0	Passaic

\*Adult (more than one year old)

Juvenile (less than one year old)

# VISITING HISTORY BY CANOE

BY DON KAMIENSKI

Located in the southeast corner of the Wharton State Forest in Burlington County is the historic village of Batsto. Once a center of colonial iron and glassmaking employing upwards of a thousand people, Batsto now attracts almost a quarter-million people a year. What attracts these visitors to Batsto is the restoration and reflection of a lifestyle that played an important part in America's revolutionary past. For it was here at Batsto that a huge iron forge produced a good portion of the armament for Washington's colonial army. Everything needed for the making of iron products was to be found in the Batsto area. Iron ore from the bogs was plentiful, as well as charcoal and clam and oyster shells used in turning the ore into pig iron.

While the iron forge is no more, the village is undergoing a constant program of restoration under the guidance of the New Jersey Department of Environmental Protection, Division of Parks and Forestry. But more on this effort later.

Most of the people visiting Batsto will hop into their automobiles, and take the pleasant drive through Atlantic and Burlington counties. As an alternative, I would



The Ironmaster's Mansion

PHOTOS BY AUTHOR



The Gristmill



The Sawmill which still works

like to suggest that you consider visiting the Batsto historical site in a much more adventurous manner—by canoe. Such a trip will provide you not only with a flavor of the countryside, but also with an idea of how the colonial iron makers made use of the waterways for transportation. I'm sure that places along the Batsto River have not changed in several hundred years, and hopefully they will long remain the same.

To begin your canoe trip to history, I will assume that you do not have a canoe, and need to rent one. Even if you have your own canoe, you may still want to obtain a rental for your first trip down the Batsto River.

Approximately eight-and-one-half miles northwest of Batsto is Atsion Lake. Atsion is located halfway between Red Lion and Hamonton on Route 206. Incidentally, the state recently opened a 36-acre recreational area at Atsion which can accommodate 2000 persons, with parking for 300 vehicles. Facilities include swimming, boating, and picnicking with gas grills.

On the north side of the lake, two commercial canoe rental facilities (Adams and Pic-A-Lilli) are available for your water journey to Batsto. Both rentals will include the necessary safety equipment for your trip, as well as provide a pickup service at the end of your trip, which avoids the hassle of having to use two cars.

Two different-length canoe trips are available down the Batsto River to the historic village. The first trip, from Hampton Furnace, takes approximately nine hours, while a shorter trip of four-and-one-half hours can be made from Quaker Bridge. Both estimates include time for a lunch break, and for the beginner, I would recommend the shorter trip. If you do take the longer trip, an overnight campsite is located at Lower Forge, your halfway point on the river.

The truck ride from the canoe rental to the launching area is along a typical narrow Pine Barrens sand road which is quite bumpy—so

hang onto your hats. Once at the launch site, you will find a river that is less than swift flowing, and that averages 20-30 feet in width. The banks of the river are lined with cedar, red maple, bayberry, water lilies, and oak, and whether you make the trip in spring, summer, or fall, you are always treated to an unparalleled nature display of shapes and colors. It's hard to describe the deafening silence as you drift down a green canyon of cedar trees that reaches up almost a hundred feet.

A look at the area's topographic map shows that the Batsto River from Quaker Bridge to the village is approximately five miles as the crow flies. The distance is actually somewhat longer, when you consider the many twists and turns the river takes as it flows southward. There aren't any difficult whitewater stretches along the Batsto, only a few spots that need to be navigated (not portaged) carefully because of fallen trees.

At last count, there were six natural sandy beaches along the Batsto River south of Quaker Bridge which make ideal spots for a lunch or rest break. Even a quick swim can be enjoyed. Most of the people canoeing the river are aware of the beauty and solitude of this area, and want to preserve this atmosphere. So they remember to pick up their trash when leaving the breaksites. Hopefully, you will do the same.

Each trip down the river is a new adventure in terms of the wildlife one can expect to see. White-tailed deer, turtles, ospreys, and even great blue herons can be seen occasionally as one paddles silently along the coffee-colored waters.

The state does not permit the taking of canoes into the actual village because of the danger of a spillway. So you must beach your canoe at a designated pickup site on the right side of the lake when your trip is over.

As your canoe adventure ends, a sightseeing adventure begins as you explore the historic village of Batsto. I would recommend that

you start your village tour at the Visitors Center, which can provide you with information and maps concerning Batsto and its history. There are presently some 30 attractions to explore at Batsto, including a bog iron exhibit, and ironmaster's mansion, a working sawmill and blacksmith shop, and for the youngsters, a stagecoach ride. Currently, five resident-artisans display their talents free of charge; included in the group are a candlemaker, weaver, woodcarver, potter, and a seat caning and rushing crafter.

In addition to the free exhibits, a guided tour of the village is provided hourly for a nominal fee. A word of caution, if you are visiting the village after a canoe trip: The state requires the visitors to the village to wear shoes and shirts, so dress accordingly.

Regarding proper dress for a canoe trip down the river, I would suggest that you wear old clothes in the event your canoe tips, and you suddenly enjoy a refreshing dip. Also, place your dry clothes, food, bug spray, and camera in a waterproof container such as a double-lined trash bag. Be sure to tie these bags to your canoe. In the event you tip your canoe, your gear will stay with the craft instead of floating downstream and out of sight. While the Batsto River isn't dangerous, it should be respected; so it is a good practice to use the "buddy system" when canoeing in this area.

The next time you or your family want to visit a part of the New Jersey's historical past, keep the village of Batsto in mind. Also, keep in mind the different manner in which Batsto can be visited—by canoe. □

The solitude of a pine barrens river



# NEW JERSEY'S FORGOTTEN PEOPLE

BY LINDA JOY FANNING

Copyright Oct./1979

*The Indian runner traveled swiftly and silently. It was autumn, and sun-sprayed specks of color splashed through the dark recesses of forest. The air snapped with the promise of colder days, yet the messenger wore little more than his summer loincloth; the taut muscles of his dark-tan body glistened with controlled exertion. Around his waist he wore a belt of white wampum, which symbolized good news. A belt of dark purple wampum would have evoked a somber reaction from his people, because it would foretell a message of sickness, death, or even war.*

*The messenger's deerskin moccasins barely touched the path his ancestors had worn into the earth, but he flew with the knowledge that such paths were the fastest, most direct route to any destination. The young Indian man, so confident in his woodland world, would be shocked if he knew that men with white skin would soon cut down many of these trees to widen the Indian paths for their wagons. He would be stunned and saddened if he could see their white descendants flattening the countryside to build superhighways over the ancient Indian pathways. Unconsciously, the Indian messenger touched the protective charm he carried in a pouch around his neck. Realizing that he was under the constant surveillance of the spirits that lived in the trees, rocks, and animals, he appealed to his guardian spirit for safekeeping. But even his spirit world could not stop the forces that would eventually transform his quiet forest path to one of crowded concrete.*

The word "Indian" automatically brings to mind the stereotype of the Western Plains Indians. The image is one of elaborately feathered war bonnets, Indian ponies, bright war paint, and clashes with the cavalry. The Plains Indians are remembered because of Old West movies, but it was the Eastern Woodland Indians, among them our own Lenni Lenape, who helped shape the very beginnings of our nation. Today the Lenni Lenape are an all but forgotten people, yet words from their language are found in our dictionaries, crops they grew have become part of our diets, and herbs they used to cure sickness are found in our medicine cabinets. They are known as the first farmers and the first pharmacists, yet little reference is made to the Lenni Lenape in modern school textbooks.

They were called "Grandfathers," an Indian term of the highest respect, by tribes in neighboring states that had historically descended from them. When the white man settled in the New World, he called them the "Delaware" because they lived on the Delaware River and its tributaries. They, however, called themselves the Lenni



PHOTOS PROVIDED BY AUTHOR

# Monmouth Excavation

A student methodically scrapes the earth in a Monmouth County excavation site with a small, flat instrument. Oblivious to heat, sweat, and bent aching muscles, he meticulously sifts through the sand, grain by grain, his concentration broken only by an occasional swat at one of the many large gypsy moths that swarm around him. Nearby, other students work silently in their individual squared-off sections, each lost in the effort to recover a world long ago covered by dirt. Not only must their eyesight be sharp enough to spot tiny seeds and flecks of stone, but their touch must be sensitive, since even a change in the compactness of the soil might be a link in the story of the Lenni Lenape.

John Cavallo, Monmouth College archeology professor and president of the Monmouth County Archeology Society, began this Freehold excavation project five years ago with only a handful of volunteers. Since then a whole company of archeology experts, amateurs, and students have joined in the digging, and Monmouth College instituted a credited summer field school to continue the work. This past summer the excavation formally closed, and the final data are being compiled by computer. Already, however, many facts about Indian life in the area have been uncovered. In fact, the Cavallo excavation has unearthed the oldest radiocarbon date in New Jersey. This information confirms the existence of Indians in New Jersey between 6000 and 7000 B.C.

"What we look for are relics of human activity," says Sandy Hartzog, excavation assistant and professor of Environmental Science and Archeology at Stockton State College. "It's a little difficult here because the soil is extremely acid and dissolves most remnants except those that were burned or fell in a fire. But we've found plenty of charred seeds, which help determine food habits. Remnants of projectile

*Continued on page 24*

Lenape, the "Original People," and they were the original inhabitants of Scheyichbi, or New Jersey.

For thousands of years the Lenni Lenape lived in blissful content and traveled the length and breadth of their territory without restriction. They were a peaceful people who loved and revered Mother Earth. They appreciated her bountiful gifts and refrained from upsetting her delicate balance. Yet from the time Henry Hudson first met the Lenni Lenape at Sandy Hook in 1609, until what remained of the Lenni Lenape abandoned their reservation in Burlington County in 1801, a long and peaceful coexistence with nature was ended. In less than 200 years, the Lenni Lenape became a people without a home.

The Walum Olam, an ancient legend of the Lenni Lenape, tells of their travels to New Jersey. It was preserved from generation to generation through word of mouth. An older member of the clan would describe the prehistoric migration of their ancestors from Asia, across the Bering Strait, and into North America. He would tell how various groups parted company during the progression across the United States. Finally, these people, who would become the Lenni Lenape, entered the lands of the rising sun, the lands bordering the Atlantic Ocean, and here they settled. Since the Lenni Lenape had no written language, the Walum Olam was recorded in pictographs on pieces of bark. Today there is disagreement among historians as to the authenticity of the Walum Olam. In New Jersey, however, and presently in Monmouth County, evidence is surfacing which proves the existence here of humans almost 10,000 years ago.

By the time European voyagers were sailing the coastline of the New World, the Lenni Lenape had evolved from a strictly nomadic people to a civilization that tilled the earth and cultivated crops in an established society. Their villages were located along the banks of the Delaware River and its tributaries and along the Atlantic Ocean. Family wigwams, structured with saplings and covered with woven cornhusk mats or sections of tree bark, were scattered around a larger community wigwam. The villages were small and consisted of closely knit extended family groups. Each village had an elected leader. A chief, or Sachem, ruled over a number of loosely affiliated villages. Sachem was an inherited position, but the Sachem's family was not wealthier than any other family, and in no way resembled a European leader.

There were no tribes, as we learned of them. Instead, clans of autonomous family groups dotted the countryside and lived, hunted, and worked the land together. There were three divisions of the New Jersey Lenni Lenape. They knew each other as "The people of the stony country," the Minsi, who lived in the north; "the people down the river," the Unami, in central section; and "the people who live near the ocean," the Unalachtigo, in the south. These were geographical divisions, rather than political, as previously believed. The Lenni Lenape had no large political organizations until after the Europeans settled. Then, for reasons of self-defense, the Lenni Lenape were forced to unite.

A Lenni Lenape family lived simply, but contentedly. They had none of the pretensions that come with wealth and no desire to change their way of life. They lived in harmony with Mother Earth and all her creations. It was not a sexist society. Activities were family-oriented, and each member of the family had specified jobs of equal importance.

Women were responsible for planting and cultivating the crops, cooking, and making clothes and pottery. Men hunted, fished, and

*Continued on page 24*

# Monmouth

*Continued from page 23*

points (arrow and spearheads), tools, and stone chips give us clues to hunting and work activity. The depth at which objects are found tells us at what point in time these activities were performed."

Objects found in each 10-foot square are carefully charted. Combining all the charts will produce a three-dimensional coordinate of the entire excavation site, from this, the relationship between groups of objects found at each depth will help determine the lifestyle of the people and how it changed through the ages.

"We have evidence that Indians were living in this area continuously for 10,000 years," says Sandy. "It was a seasonal village. Small family groups of about 15-20 people came here during the summer and fall. They returned here year after year and collected berries and nuts and went hunting and fishing. This went on until colonial times. You can see the change in culture. In the lower levels of earth, they merely hunted and gathered their food. They stored food in storage pits that were dug out of the ground. (Storage pits are indicated by an unusually hard compactness of the soil, surrounded by looser soil.) In later ages, in the upper levels of soil, evidence shows that the Indians grew vegetables, made pottery, wore copper ornaments, and used leatherworking tools."

Why did the Indians return to this spot for so long? Archeological experts from the Monmouth County site have developed the following theory: Exploration has revealed that two ancient stream beds and a still-existent tributary of the Manasquan River bordered the Indian village on three sides. This much-needed water placed the village on a peninsula of high ground. The village was not far from the coast, so the Indians could gather shellfish and go fishing. The woods were full of acorns, chestnuts, hickory nuts, and berries of many varieties. A nearby swamp provided an excellent hunting ground. In short, everything nature produced for the comfortable existence of an Indian family was conveniently located. □

# FORGOTTEN PEOPLE

*Continued from page 23*

cleared the land for crops. Children assisted the women with farming. They also collected the many varieties of wild berries and nuts and gathered clams, crabs, and mussels at the seashore. Old people were respected for their age and wisdom, but they, too, helped produce the necessities of Indian life. Older women aided in the clothing and food departments. Older men fashioned bows and arrows, tools from stone or bone, and wampum. Wampum was made from the inner whorls of the whelk shell and played an important part in Indian life. It was used in religious ceremonies, to complete a transaction, or seal a friendship, and was even presented to victims to atone for a crime.

Time in the form of clocks and calendars meant little to the Lenni Lenape. Their days, months, and years were calculated by the revolutions of the sun and moon. Their year consisted of 13 lunar months, and each had a name. By Planting Month (April), Lenni Lenape families had returned from their seasonal (winter) stay in the clan hunting grounds to begin cultivating their individual gardens. The men of the family cleared the land by pulling out trees and burning brush. Using stone hoes, the women planted grains of maize, Indian corn, in little mounds of soil. Squash was planted between the mounds. Beans were later planted in the corn hills so they could climb the corn stalks.

Corn was one of the Lenni Lenape's staple foods. It was roasted, boiled, and added to stews. It made breads, cakes, and porridge. Husks were woven together to make mats. To Europeans, however, corn was an unknown food. The Lenni Lenape introduced white settlers in New Jersey to corn and how to grow it. Today corn is a familiar sight on our tables. Variations such as hominy and succotash are Indian dishes and still retain the Lenni Lenape names. Another Lenni Lenape crop that is well-known and widely used in our society was tobacco. The Lenni Lenape grew tobacco for religious reasons. It was used as a sacrifice during religious ceremonies and smoked before council meetings or other important transactions to create an atmosphere of friendship and trust.

Throughout the summer months of The Fawn (June), Raising Earth Around the Corn and Month of Roasting Ears, the Lenni Lenape men fished and occasionally hunted. An interesting fishing device of the Lenni Lenape was the weir. A V-shaped dam was built across a creek. Fish were then driven through a small opening left in the point, where they were easy targets for spears, nets, or catching by hand.

Meanwhile, Lenni Lenape women were busy preserving food for the winter months. Meats and vegetables were either sun-dried or smoked. Preserved foods were stored in pottery vessels or in storage pits in the earth.

Since a Lenni Lenape family could not purchase anything at a store, most of their life was consumed by working to produce those elements necessary for survival—food, shelter, clothing. But they did have time for fun. Competitive games and sporting events were exciting pastimes, and dancing sometimes continued until exhaustion concluded the festivities. Most of these events were connected to the Lenni Lenape religion, which permeated all their daily activities. Whether hunting, gathering herbs, or traveling, the Lenni Lenape was fully aware that the spirits, good and evil, were carefully scrutinizing every action.

The Lenni Lenape believed that Manito, who created earth and

all its animate and inanimate objects, lived in the 12th layer of heaven. Manitowuk, lesser spirits, delivered information and prayers to Manito. Spirits lived in everything found on earth, including wind, rocks, trees, and animals. In every daily activity, the Lenni Lenape endeavored to please the spirit world, considering the earth as their mother and her creatures as sisters and brothers. Powhatan Chief Roy Crazy Horse, director of the Native American Cultural Center, summed up the beliefs of Algonkian-speaking Indians this way: "We love Mother Earth because she is our mother. And we believe that every living thing has a soul, and every soul has a right to live."

Religious ceremonies were either community celebrations or personal family tributes to a particular spirit. Family practices stemmed from an ancestor's experience or communication with a spirit. The story of this experience and the ceremonial rituals were handed down and celebrated at regular intervals. The biggest annual community celebration was held after the autumn harvest. Today we celebrate this Indian holiday as Thanksgiving. On this day, we give thanks to our God, and during the harvest celebration, the Lenni Lenape thanked their gods, and asked for future health and happiness.

Sickness and the curing of it was also closely tied to religion. The Lenni Lenape medical people were called herbalists. (They also had Shamans, who were capable of magic, both black and white.) Herbalists were appointed to their vocation by a spirit, which appeared in some form of animal or plant during a visionary dream.

Over the generations, the Lenni Lenape herbalists had collected information about the thousands of plants and trees in New Jersey. They knew which roots, stems, leaves and stalks to use, how to combine them, and whether each component of a mixture should be boiled, dried, or used fresh. The medicines which the herbalists developed were comparable in effectiveness, and often superior, to the medical practices in Europe at the time. Unfortunately, the Lenni Lenape herb and plant cures were not recorded, and eventually were lost. The value of the few remedies that remain, such as witch hazel and wintergreen, have been recognized and incorporated into modern medicines.

The Lenni Lenape herbalists were proficient in treating illnesses common to their environment. They could treat rheumatism, pleurisy, and fevers. They could relieve the discomforts of arthritis, and most important, had earned the complete trust of the Lenni Lenape people. But the herbalist was no match for the sicknesses brought over by the Europeans. Smallpox and tuberculosis were two of the primary causes of the downfall of the Lenni Lenape.

When whitepeople first settled in New Jersey, there were more than 7000 Lenni Lenape. The influx of settlers was first met peacefully, but misunderstandings quickly arose between the two cultures and led to sporadic fighting. Land was the main cause of arguments. As Don Malvasi, Native American Cultural Center representative, explains, "When selling land, Indians thought they were leasing fishing and hunting rights. They had no system of money. The folly was that a European system of real estate was superimposed upon the Indian, who had no conception of land ownership. Therefore, land sales meant one thing to the whites and something totally different to the Indians."

In the years that followed the appearance of the white settlers, the Lenni Lenape valiantly attempted to preserve their homeland of Scheyichbi. But they could not overcome the European weapons and diseases. A gradual migration out of New Jersey began soon after the

*Continued on page 26*

## Native American Cultural Center

Not far from the Monmouth County excavation site, in Medford, Burlington County, there's an organization dedicated to changing the future, rather than telling the past, of New Jersey's Indians. The Native American Cultural Center was founded by descendants of the Powhatan nation. The Powhatans traditionally inhabited the coastal regions along the Eastern seaboard from Virginia to Southern New Jersey. Linguistically and historically they are related to our Lenni Lenape. Today, however, no New Jersey Indians claim Lenni Lenape descent, but a strong Powhatan nation has survived.

Long after the last Lenni Lenape left New Jersey, the Powhatans, along with Indians from various other nations, migrated here to find work. But today, these Native Americans still find themselves plagued by many of the same problems they sought to escape by leaving their reservations—poverty, lack of education, and discrimination. The Native American Cultural Center seeks to help *all* Native Americans through counseling, assistance in obtaining an education and jobs and, in extreme cases, even providing food.

Although the Native American Cultural Center was organized 20 years ago in Philadelphia, the Medford building has been occupied only since April 1978. Before that, members met regularly in each other's homes to give support and ensure the preservation of their heritage. It's only been in the last five years that the Center, under the leadership of Chief Roy Crazy Horse, has sought publicity "to dispel Indian myths and spread the truth."

Before the Center can begin to help needy Indians, it must first find them. Often this is a difficult job. The Center is currently taking an Indian census in the 10 southernmost counties in order to get a more accurate population figure and to better assess their needs. Difficulties arise with Indians who deny their heritage. Although many Native

*Continued on page 26*

## Cultural Center

Continued from page 25

Americans have resisted assimilation, "some Indians ignore their heritage because they feel mentioning it does more harm than good," says Chief Crazy Horse. "And others see no reason to activate because they think they are the only Indians around." Therefore the Center is forced to locate Indians through word of mouth, or encourage Indian response through features in newspapers and by setting up information booths at fairs and shopping malls. "We want to give Native Americans the opportunity to face the other side of their ethnic culture and to feel part of some community," says Chief Crazy Horse.

Pride in Indian heritage is accomplished by the Center's many cultural programs. In addition to the Center's newspaper, *Attan-Akamik*, which features articles on history and current Indian issues, the Center sponsors craft classes, nature field trips, and traditional festivals, so that young Native Americans may learn the knowledge of their ancestors. The Center also maintains a research library and houses a museum devoted to the Native American culture.

The emphasis at the Native American Cultural Center is pride in the Indian cultural heritage. But members of the Center realize that to preserve their society, they need a voice in the American society, and this depends on educating their people. As one of their pamphlets states, "Wisdom, knowledge, and truth are the surviving weapons that our forefathers have given us. Let us use these weapons to the utmost, in the fashion that legacy has given us. Let us sharpen these weapons and prepare our minds." □

## FORGOTTEN PEOPLE

Continued from page 25

settlers arrived. Many that remained in New Jersey succumbed to disease or were killed in skirmishes. In 1758, Brotherton, the first state Indian reservation in the nation, was created in Burlington County. It was here that the few hundred surviving Lenni Lenape moved their few possessions. Brotherton, however, could not support the Lenni Lenape way of life, so in 1801 the last group of Lenni Lenape left New Jersey to join the Oneidas in New York State.

After leaving New Jersey, the Lenni Lenape spent many years wandering from state to state in search of a permanent home. Today some Lenni Lenape still exist in Oklahoma and Canada. In New Jersey, however, there are no living Lenni Lenape descendants. We must be content with the legacy of the Lenni Lenape. Their memory is preserved in Lenni Lenape names, which still grace our towns, waterways, and streets. Their hospitality and initial welcome is evident on our dinner tables. And we can remember them as we travel our highways, many of which cover their ancient pathways. But the greatest lesson from the Lenni Lenape we have yet to learn; their reverence for Mother Earth and her creatures, and their reluctance to tamper with her delicate workings. □

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Professor Sandy Hartzog  
Chief Roy Crazy Horse  
Don Malvasi

## Safe Firewood Harvesting

The Bureau of Forest Management has published a pamphlet entitled *Safe Firewood Harvesting*. It was written to help the many homeowners who have recently purchased chain saws to harvest their own firewood.

We now want to let the people of New Jersey know that this pamphlet is available free. Copies can be obtained by simply writing to:

Anne Conley Utilization Forester New Jersey Bureau of Forest Management  
CN 028 Trenton, New Jersey 08625

# Restoring New Jersey's Riverfronts

Continued from page 16

percent share is provided by City Urban Renewal funds.

In conjunction with Phase I, the City Housing Authority is spending \$1.5 million to complete the boulevard leading to the site, and to build a bridge across the railroad tracks to the entrance of the park. Construction of Phase I should be completed within one year, and will consist of an entrance promenade, an amphitheater, bulkheading, and a landscaped lighted walkway along the water's edge.

Subsequent phases to be completed over the next four years will include the construction of a marina, a boat ramp, floating docks, and a ferry and railroad museum.

In Trenton, plans have been made for the revitalization of the Marine Terminal as a recreation area. This is part of the Economic Development Authority's proposed light industrial park along the Delaware River. The Green Acres Program will assist by funding improvements and new development (parking area, bulkheading, and marina) surrounding the terminal building for recreational use.

Farther north on the Delaware, the City of Phillipsburg has submitted an application for funding of its proposed Delaware River Park, which will include both active and passive recreation facilities.

On the ocean side of New Jersey, Atlantic City received restoration and development funds for its Historic Gardner's Basin maritime park. The park features a replica of the clipper ship "The Flying Cloud," and other nautical memorabilia. It also provides ecological and cultural maritime experiences.

On the Raritan River, the City of Perth Amboy is working on its waterfront. It plans to revitalize its decaying marina and the surrounding area, including a historic ferry slip.

The City of Newark has been targeted as a major city involved in the Council for the Northeast Governor's station area development study. The city has responded with a redevelopment proposal for the area abutting the Pennsylvania Railroad Station, which includes a large section of riverfront along the Passaic River. Plans include commercial, residential, and recreational high-intensity uses, as well as extensive expansion and improvement of the transportation network.

The Port Authority of New York and New Jersey and the New Jersey Department of Transportation are funding a marketing feasibility study for Hoboken and Jersey City which they hope will result in a development program for both waterfront areas. In Hoboken, the waterfront area surrounding the Erie-Lackawanna ferry terminal is the primary area of interest. In Jersey City the focal area is at Exchange Place at the foot of Montgomery Street.

Liberty Park, located on the Jersey City waterfront behind the Statue of Liberty and Ellis Island, was chosen as New Jersey's first Urban State Park. Still in the development stage, Liberty Park will transform some 800 acres of derelict waterfront land into an



Atlantic City-Gardner's Basin



Trenton Marine Terminal

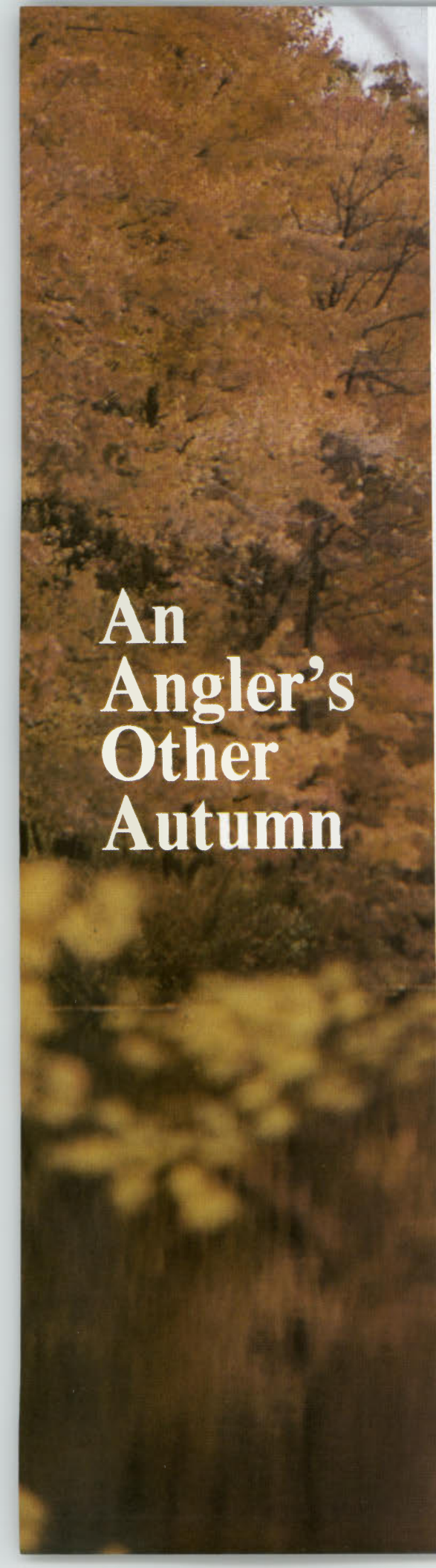


Camden Water Front (Model)

unparalleled regional asset. The park will be built in stages. To date, a 35-acre plaza on the southern end has been completed, providing a vista of the Hudson River harbor and New York skyline. Of the northern end of the park, rehabilitation of the historic Central Rail and Ferry terminal is underway for use as a cultural and educational center. The next phase to be constructed will be a two-mile-long crescent-shaped seawall connecting the northern and southern plazas.

If a renaissance is to take place on our waterfronts, we must continue to discover successful redevelopment strategies and techniques. We must consider each city individually and ensure that redevelopment reflects the character and needs of each community. The recipe for a successful waterfront project requires the proper involvement and coordination among public, private, and commercial sectors. A careful balance of social and economic functions, and public and private sector interests, must be reached at the same time. An urban waterfront can accommodate an assortment of both active and passive recreational opportunities, which in turn may be interspersed with commercial, residential, and other mixed-use development. Once visual and physical access is provided, the waterfront becomes open for public use. This encourages further development and interest in surrounding areas.

As we continue to gain experience, we anticipate a refreshing revival on our urban riverfronts. □



# An Angler's Other Autumn



BY ALLEN G. EASTBY

The fishing was bad, so bad that after several hours of fruitless casting I reeled in the line, tucked the fly into the hook keeper, and retired to the bank. Perching on a wind-toppled tree with hip-booted feet dangling in the water I consoled myself as best I could. Even if the trout were being unusually uncooperative it was still pleasant to be out on a cool October day, enjoying the solitude that only autumn anglers find on our crowded trout streams. My thoughts wandered back over the season pausing now and again to savor the memories of particular trout hooked and released, of friends old and new, of morning nymphs and evening dry flies. My reverie was broken when, out of the corner of my eye, a faint movement caught my attention.

Turning my head slightly I could see a bit of foliage, a little grass and a pair of branches, weaving in the October breeze. I felt a sudden quickening of my pulse as I stared at the once green now brown stalks and stems. I knew this patch of vegetation: I had lost flies there in May and again in June. But this day, in October, something was different.

I rose to my feet and lumbered clumsily down the bank. Kneeling, with coarse stones bruising my knees through fabric and rubber, I slowly studied the brush tangle. Then, looking about me, I began to slowly pick my way through the undergrowth peering intently at branches, leaves, and weeds. For

the first time I was really seeing fall and it came as a revelation. All thoughts of trout and fishing were gone now and as I picked my way back to the parked car I was struck by how the shapes, colors, and textures of the fields and woodlots I passed through had changed in just a few weeks.

Back at the car the flyrod was quickly packed into its tube and the camera readied. For the rest of the day I spent my time with the camera, seeing through the viewfinder a world I had never seen before.

Leaves changing color are becoming cliché. Everyone looks, says a-a-ah, and that's it. But there is more, much more, I learned this fall than reds and oranges. They are there, and they are, I suppose, the stuff of poetry. But there are also the more subtle, seldom noticed greys and browns and to these must be added the muted yellows and blues of late blooming fruits and flowers. As fascinating and as beautiful in their own ways are the grasses and weeds, the bare, leaf barren branches, and oddly incongruous conifers. In these instances it is not so much the color that captures the senses and engages the emotions as it is shapes and textures.

That first day of discovery was over all too quickly. The weeks slipped by as I spent less time fishing and more hours looking and photographing. The world of constantly changing forms and hues I had started to see was growing until it extended from the tiniest fragments of leaves to whole sections of



PHOTOS BY AUTHOR

valleys and mountains. Even the farms, the barns and outbuildings, houses and fields, and yes even the animals were transformed by the approaching winter and the soft sunlight of autumn. Some became stark and forbidding, fitting scenes for a novel of gothic horror. Others took on an aura of melancholy while a few seemed positively jolly and you half expected to see the family gathered on the porch shucking corn. It was wonderous, to be able to see so much, to see desiccated leaves as if they were sculptures and stubble fields as if they were abstract paintings. When cold winds and the first flurries of wet snow finally ended my explorations, I felt an overwhelming sense of loss.

But there have been other autumns since that first one. Each one has been special with its own memorable moments as when a sudden freezing rain stripped the leaves from the branches and gilded them with silver. There has also been the chance to use the camera so on those bitter winter nights when winds scream in from the ocean or on those July days when just blinking my eyes makes me sweat I can again walk the fields of fall.

I still go fishing—bass and trout, panfish and pike, anything that swims I'll try to catch. But autumn is now more than fishing. For one angler it is the time for touching, feeling, seeing a world too often ignored in the mad rush to make one more cast before another season closes. □



#### PHOTOGRAPHING FALL

To photograph fall, especially if you want to capture everything from the very small details to the broad canvas of hills and fields, a 35 mm single lens reflex camera is the best choice. But more important than the camera is the lens.

The most useful lens is a macro lens. Most manufacturers now offer at least one such lens and there are also many lenses featuring a "macro capability." I have had good success with both. If at all possible, avoid messing about with screw in "close up attachments." These things can work but they are bothersome in the extreme.

One of the keys to good pictures is holding the camera steady. A tripod, even one of the small ones, is useful but

you can, if you make an effort, learn to *squeeze* the shutter release button, hold the camera rock steady in your hands, and get crisp pictures.

Here are a few tips and tricks I have found helpful in getting pictures that please me:

- Use back and side lighting whenever possible.
- Avoid artificial light: even fill in flash creates an unnatural picture.
- Look for the unusual: unusual shapes, colors, textures, and camera angles.
- Don't try to do it all at once. Take it slowly.
- Stay away from color print film: you'll get better results, including better enlargements, from slide films.

# OTTER TRAWLING

Continued from page 15

and a sharp blast from the ship's horn signals the release of the net. The churning turbulence beyond the stern slowly engulfs the final buoyancy cork and all settles to a normal, steady-as-she-goes pace.

"Things ain't at all like what they use to be," complains Walt, pointing out to the yellow-dyed sea. "What you see there is acid dumped by a paint-producing chemical company." Fishermen complain that the acid drifts from the dumping site into the fluke-fishing ground and is detrimental to fluke feeding habits. Ever since the need for paint during World War II produced this situation, fishermen have complained that little attention has been paid to the problem of finding an acceptable dumping site.

Summer flounder, or fluke (*Paralichthys dentatus*) are flatfish with both eyes on their colored side. Fluke are fleshy fish, colored greenish gray or olive with dark spots on the eyed side and solid white on the bottom. Contrary to biologists' beliefs, fishermen aboard the *Diamond* assure that during deep-water migration in winter the flukes' spotty coloration will turn almost solid brown. Males grow slower than females and reach approximately 10 inches at one year old. Fluke have been caught weighing up to 30 pounds, but most caught by trawlers weigh from three to seven pounds. New Jersey trawlers accounted for more than six million pounds of fluke in 1978. The average price ranges from 50 to 80 cents per pound.

Unlike other fishing careers, most of a fluke fish-



erman's life is still spent at sea trawling a prolonged journey north to Cape Sable and south as far as Cape Hatteras. Otter trawling for fluke demands a patient, private and quiet oceanic lifestyle, but as best stated by Walt Swensen, speaking for generations of fishermen, "I wouldn't have it no other way." □



# Shucking the Oyster

Continued from page 13

calcium; phosphorous, potassium, iron, and vitamins A and B.

Down in Bivalve, oysters are now selling at around \$3 a shucked pint and \$10 an unshucked bushel; or \$3.75 for six on-the-halfshell at nearby seafood restaurants. Whether you shuck it yourself, or shell out a pretty penny, oysters are worth the effort.

## BOOKS OF INTEREST:

*Dredge Boats of Delaware Bay*, Donald Rolfs

*Stalking the Blue-Eyed Scallop*, Euell Gibbons

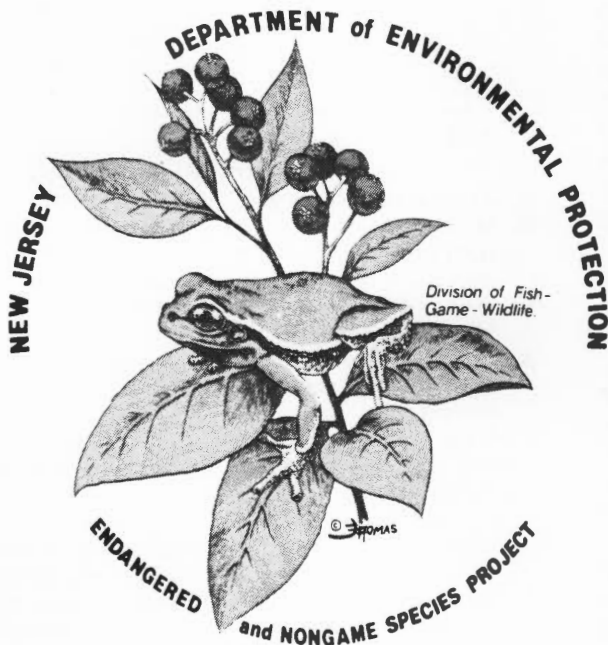
*The Long Island Seafood Cookbook\**

*The Free Food Seafood Cookbook\**

*The Craft of Dismantling a Crab (and other shellfish)\**

*Maryland Seafood Cookbooks #1 & 2\**

\*Available from "The Shellfish Digest," a bi-annual periodical, subscription rate \$2/year. 104 W. Market St., Georgetown, Del. 19947. Also sells shucking knives, cooking tools.



**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. The purchase of a T-shirt is tax-deductible and all proceeds from the sale of these shirts will be directed towards the protection of New Jersey's endangered wildlife. This T-shirt sales program is a cooperative effort with the Ocean Nature and Conservation Society.

These cotton T-shirts are yellow with blue lettering and are available in sizes Small (34-36), Medium (38-40), Large (42-44), X-large (46-48). To obtain a T-shirt submit your name, address, and size (S,M,L,XL) with a check/money order payable to "OCEAN NATURE & CONSERVATION SOCIETY" 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.

## "THE SALT MARSH OF SOUTHERN NEW JERSEY"



This booklet presents information concerning the productivity of the salt marsh and its importance to the people, wildlife, water quality, economy, and general well-being of the coastal area. The publication, with over forty illustrations, will be invaluable to anyone interested in this biologically productive land.

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# Lobstering in New Jersey

Continued from page 3

the majority measure from 2 1/2 to less than 3 inches. The Belmar-Point Pleasant Alongshore Fishery lobsters fare better, with 50 percent under legal size and the majority of these at slightly less than 3 inches. The Offshore Fishery catch is approximately 89 percent legal-size lobsters.

Lobstermen land sublegal lobsters by simply breaking off the tail and claws and discarding the carapace, thereby circumventing the law based on carapace measurement. Although the Ambrose lobstermen catch mainly sublegals, they complain in turn that offshore and otter trawl operations take berried females. It is true that more than half the trawlers scrub the eggs from the females, while some of the offshore trap fishermen do, too. But it is also true that very few berried females occur in the Ambrose Fishery because these sublegals haven't reached sexual maturity. Even the vast majority of "just legal" lobsters are not sexually mature.

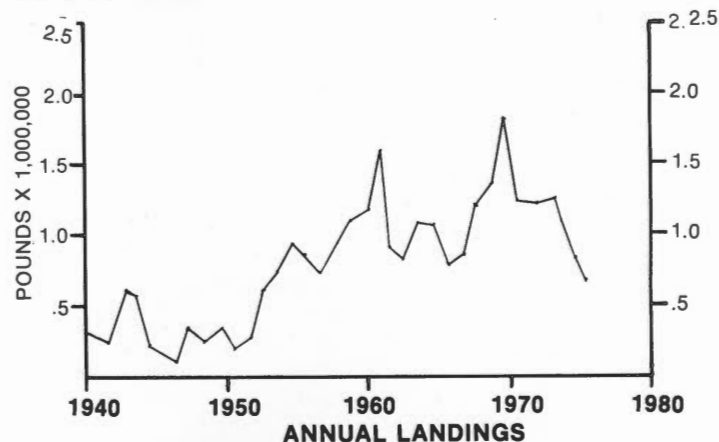
Dockside checking for sublegal lobsters is difficult since the state law on landing lobsters does not specifically prohibit breaking off tails and claws. Moreover, 90 percent of the lobsters are taken in federal waters, leaving Jersey conservation officers and marine police little jurisdiction. By the time lobstermen reenter state waters, the sublegal lobsters have been disjointed and the incriminating carapace discarded. Theoretically, according to the law, lobstermen do not have sublegals in their possession!

The enactment of a comprehensive management plan, coordinated on both state and federal levels, is slated for 1981. Thus far, the tentative plan includes a minimum carapace length of 3 3/16 inches for lobsters harvested in all states. Ironically, 7 of the 10 lobstering states already mandate this carapace length with the exceptions of New Hampshire, Rhode Island, and New Jersey. The plan calls for a study of the possible socio-economic impacts a greater minimum size limit would have on the individual lobstering states and their fisheries. On the basis of information available at present, biologists have determined an optimum (defined by Webster's as "the most favorable condition for the growth and reproduction of an organism") carapace length of 3 1/2 inches. An optimum length for the lobster perhaps, but not for the lobstermen in the Ambrose Fishery.

Specifying size limits for lobsters is too simplistic a method to guarantee a continual supply of lobsters, although an anti-mutilation or tail-length law is needed now in New Jersey. Data on migratory patterns, biology, and abundance of lobsters must continue to

be collected in all lobstering states so that any plan benefits both lobsters and lobstermen.

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- Q. At what age do lobsters mature?
- A. Male lobsters mature in 3 to 4 years, females in 5 to 6. Both sexes reach the legal, marketable size with a 3 1/8 inch trunk or carapace length by their fifth year.
- Q. How would an anti-mutilation or tail-length law help lobster stock?
- A. An anti-mutilation law ensures that all lobsters arrive whole at dockside where marine police or conservation officers can check carapace length for sub-legals. At present, sub-legal lobsters with a carapace of less than 3 1/8 inches are broken up at sea, and the carapace discarded.
- A tail-length law would set a minimum tail length for legal-size lobsters. Even if lobsters were broken up at sea, the tail length could be checked at dockside for sub-legals. At present, however, legal lobsters are judged on carapace length alone. Also, there are no state studies linking maturity and tail length.
- Q. Would the strict enforcement of a minimum length destroy the Ambrose Fishery?
- A. An immediate, strict enforcement would severely cut the Ambrose lobster catch since 80 percent of the harvest is sub-legal. However, biologists agree that each individual fishery would have to be managed independently since the size, composition and management needs of each vary considerably. For example, gradual increments of 1/8 inch over extended periods would eventually lead to a more mature lobster population in the Ambrose Fishery with little effect to its economic base.
- Q. Does the state require a license to harvest lobster?
- A. No. Nor are there any gear regulations, such as owner identification and degradable sections in traps, or commercial and noncommercial fisherman classification, or required reporting on amount of catch per lobstering effort. The only regulations are the minimum carapace length and the prohibition against keeping gravid females. New Jersey is the *least* regulated of the lobstering states. □

## FRONT COVER

*Windblown Pitch Pine on Rattlesnake Mountain—Photographed by Ken Oravsky*

## INSIDE BACK COVER

*Bobcat—Illustration by Carol Decker (See article on page 17.)*

## BACK COVER

*And away they go (milkweed seeds in a South Jersey field)—Photographed by Paul E. Taylor*



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