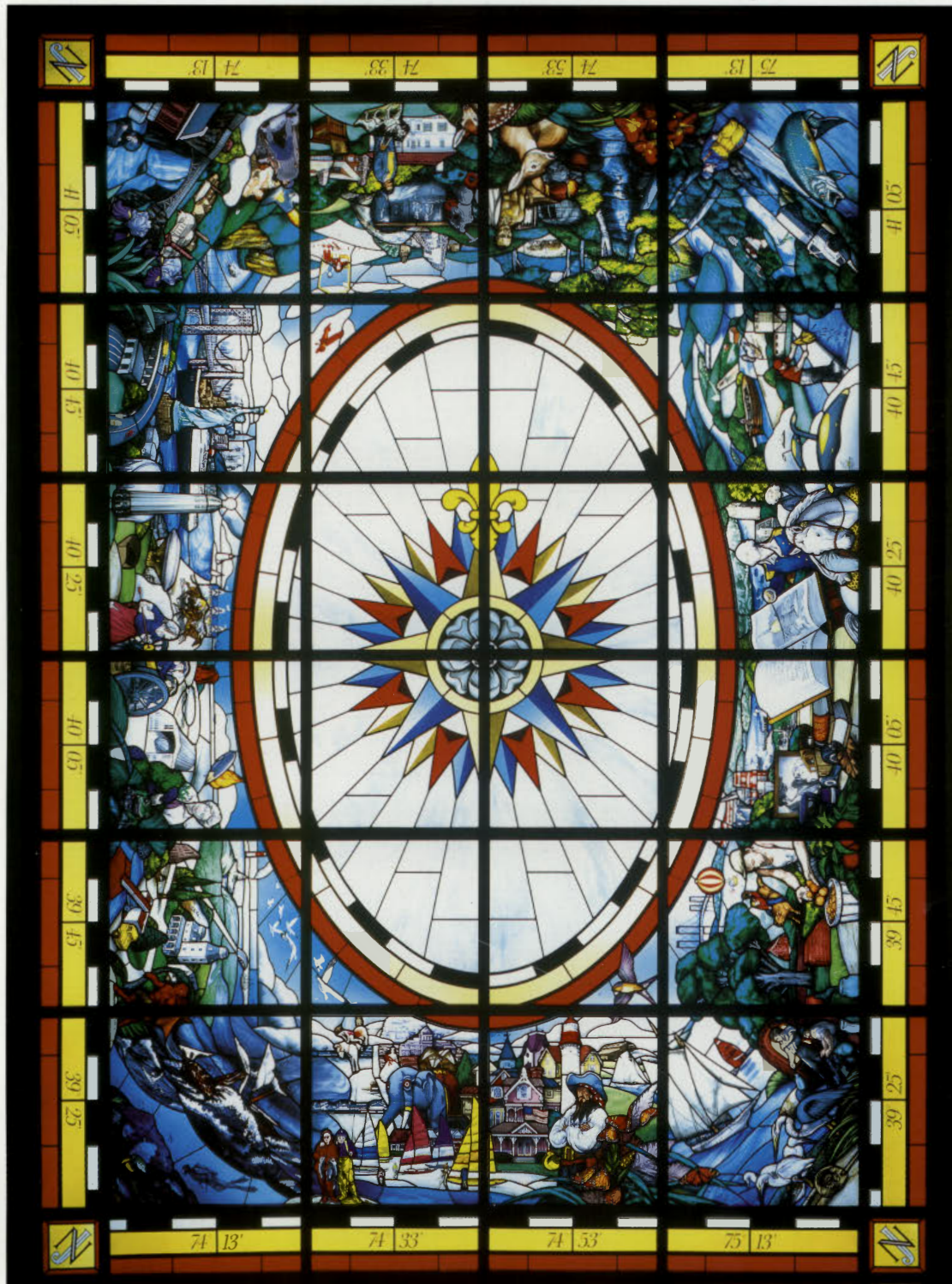


NEW JERSEY Outdoors

\$4.25

Spring 1996



Life on the Artificial Reef • Restoring Barnegat Bay
Catching the Fresh Water "Big One" • A Taste of the Old West
The Frelinghuysen Arboretum • A Bird's Eye View of Ospreys

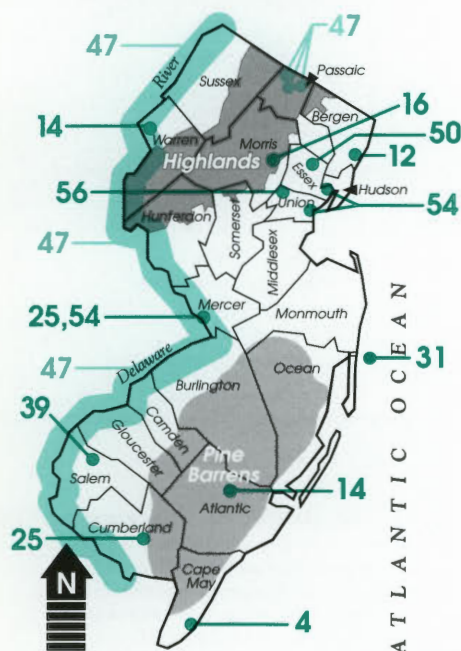
An osprey lands on its nest at the Wetlands Institute in Stone Harbor. For an inside look at life in the nest, see "Keeping an Electronic Eye on Ospreys" on page 4.



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Front: A panorama of New Jersey's history and culture is captured in this stained glass skylight in the State House Annex. For more information on the glass industry in New Jersey and additional examples of art in glass, see "Magic Under Glass" on page 25. Photo by J. Kenneth Leap

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CALL FOR ENTRIES



New Jersey Outdoors 1996 Photo Contest

Calling All Shutterbugs



■ **What:** The *New Jersey Outdoors* 1996 Photo Contest welcomes black and white or color images (prints, 35mm slides and large format) of New Jersey — from scenery and historic sites to wildlife and outdoor activities — regardless of the season. There will be 21 first place winners — one featuring each of the state's 21 counties — one of which will be the grand prize photo. Prizes, which will include photographic equipment, NJO subscriptions and more, will be detailed in a future issue of *New Jersey Outdoors*.

■ **Who:** The contest is open to any New Jersey resident or visitor, except *New Jersey Outdoors* employees and members of their immediate family.

■ **Where:** Only photos taken in or of New Jersey (including its territorial waters and air) will be eligible.

■ **When:** Only photos taken between September 1, 1995, and August 30, 1996 will be eligible.

■ **Why:** To spotlight the wonders of our beautiful state and ways to enjoy them. Winning photos will be featured in the Winter 1997 issue of *New Jersey Outdoors*.

■ **How:** Each entry must be accompanied by the photographer's name, address, daytime phone number, caption (including location and description of shot, date taken and names of any people featured in the photo), and signed releases from each person featured. All entries become the property of the Department of Environmental Protection and may be published/used for any purpose, such as illustrating a story or advertising NJO; photographer credits will be given.

Enter as Often as You Like!



Christine Todd Whitman, Governor

Save the Bay

Barnegat Bay is a rich, yet fragile, ecosystem.

As home to a wealth of economic, environmental and recreational assets, the 660-square-mile watershed is at a crossroads. With the help of the National Estuary Program (NEP) — along with federal, state and local governments and businesses and environmental groups — Barnegat Bay soon may be on the road to recovery.

Through the NEP, a federal program that identifies and preserves significant, threatened estuaries across the country, we will begin a three-year process to determine how to manage this diverse resource. We will build upon the efforts of grassroots organizations, which have made significant strides in the region since 1987. These include new or upgraded pump-out facilities for boat waste at five marinas, a hydrographic study by Rutgers University to understand water circulation and pollutant transport, and a \$2.5 million donation from the Ciba-Geigy Corporation to acquire open space in the watershed.

The NEP will help us address problems that still threaten the region, such as nonpoint source pollution, which creeps into the bay from leaking septic systems, vehicle exhaust, spills from oil changes and pesticide and herbicide runoff from lawn and garden maintenance. We also will look at the issues of open space and public access to the watershed, as well as water supply and groundwater protection in the area.

There is a lot at stake in the Barnegat Bay. It is home to one-quarter of New Jersey's commercial catch of hard clams, blue crabs, white perch and eels. Tourists flock to the region for swimming, boating, fishing, hunting and other recreational activities. And the bay area is home to rare and endangered species, including ospreys and peregrine falcons.

The NEP will help us balance the needs of all who share this valuable resource so that its rich legacy can be enjoyed by generations to come.



Robert C. Shinn, Jr., Commissioner

Putting "Green" Back in the Garden State

New Jersey has found a way to turn abandoned, polluted properties into productive, thriving sites, and it is being done with the cooperation of business, industry and even homeowners.

The Voluntary Cleanup Program is an innovative approach to "recycling" contaminated property using a variety of tools for cleanups, including low interest loans and grants, consistent rules and regulations and protection from liability claims. The program relies on the voluntary participation of property owners and developers and has made it faster, easier and less expensive to get the job done.

Since the program began in 1992, approximately 2,700 projects have been completed, with hundreds of new applications being added each month. These cleanup efforts include everything from homes with underground oil tanks to large, vacant industrial complexes. As a result of this program, properties are added to the tax rolls, and new jobs are created.

Prime examples of this program's accomplishments involve the transformation of a vacant industrial lot into the home of the Trenton Thunder, and the New Community Corporation's Townhouse Project in Newark, which revitalized abandoned row houses into 50 low-income townhouses.

With 6,500 known contaminated sites in New Jersey, many of which are sited in our cities and have an industrial or commercial past, the opportunities to reuse and redevelop these sites are substantial. The program provides for a "greener" New Jersey — in terms of both a cleaner environment and a richer economy.

State of New Jersey
Christine Todd Whitman
Governor



Department of Environmental Protection

Robert C. Shinn, Jr.
Commissioner

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New Jersey Outdoors
Spring 1996, Vol. 23, No. 2

This publication is dedicated to promoting and encouraging the wise management and conservation of our natural, cultural and recreational resources by fostering a greater appreciation of those resources, and providing our residents with the information necessary to help the Department protect, preserve and enhance them.

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Mailbox

No Snow Job

Thank you! Thank you! Thank you for the article on the High Point Ski Touring Center in the winter issue ("Scenic Vistas Await Cross Country Skiers," NJO, Winter 1996). I read it on Friday evening after the December 20 snowfall and went there the next day. In spite of the fact that I receive tons of ski advertising in the mail, I was not aware of its existence.

The snow was absolutely super! I have never experienced better, not even in Vermont. The elevation certainly makes a difference. When I returned home everything was melting (which, of course, means that the cold night would make everything hard-packed, while High Point is still enjoying the same glorious conditions.)

Richard Wolff
Montclair

Arts in the Environment

The summer 1995 issue of *New Jersey Outdoors* featured the poetry of Theresa Halscheid and Frank Finale in conjunction with the photographs by Rick Vizzi. The theme was the New Jersey Shore. We are pleased that *New Jersey Outdoors* has chosen creative writing to blend with themes.

It is our wish that your magazine continues to feature creative works: poetry and/or prose. Combining science and history with the arts lends a new dimension to the ways in which we view our world. Regardless of individual background, all can profit from the perspective creativity brings to nature.

Rev. Msgr. Joseph F. O'Connell
Sicklerville

New Jersey Outdoors welcomes letters to the editor. Please include your name, address and daytime telephone number. Our address is NJO, NJDEP, CN 402, Trenton, NJ 08625-0402. We reserve the right to edit letters for length and clarity.

The Library

■ **Buy into the Future: How to Purchase Recycled Products**, published by the Department of Environmental Protection (DEP), is a how-to manual for businesses addressing product specifications, tips to assist in purchasing recycled products and examples of purchasing strategies. *The manual is free. Available from the DEP's Bureau of Recycling and Planning at 609 984-3438.*

■ **Permits, Licenses, Approvals & Certificates**, published by the DEP, is a guide book to help people seeking permits, licenses and approvals administered by the DEP and related agencies. It contains a description of each permit, the issuing agency, statutory authority, a contact for assistance and an estimated time frame for technical review. *The handbook is free, but limited quantities are available. Available from the DEP's Office of Permit Information and Assistance at (609) 292-3600.*

■ **Survival of Species, A Matter of Habitat**, produced by New Jersey Network (NJN), is a half-hour documentary about the recovery of three species that had nearly disappeared from the state of New Jersey: the bald eagle, the osprey and the peregrine falcon. This video follows biologists from the DEP's Endangered and Nongame Species Program as they band chicks and maintain nests from osprey towers in Barnegat Bay to a peregrine falcon nest on the ledge of a power plant in Kearny. *The cost is \$19.95. Available from NJN Video at (609) 777-5093.*

To Our Readers

We are sorry that unavoidable production problems resulted in the late delivery of your copy of *New Jersey Outdoors*.

We are back on schedule, and it won't happen again.

We value your readership and hope you will be pleased by the improvements we have planned for coming issues.

The Scales of Justice

In the winter 1996 issue of *New Jersey Outdoors*, an article on tautog by Jim Campbell appeared, entitled "The Bulldog of the Winter Sea." On two occasions, there was a reference to the lack of scales in this species of fish. However, tautogs do indeed have scales, and this is evident in the picture on page 11 of the article.

Sam Wainwright, Ph.D.
New Brunswick

Editor's Note: The Division of Fish, Game and Wildlife's Bureau of Marine Fisheries confirms that tautogs, also known as blackfish, do have scales, although they are absent around the gill cover near the head.

Correction

In our story on harbor seals in the winter 1996 issue of *New Jersey Outdoors*, the harbor seal painting was done by Andy Cialone. In addition, the phone number for the Marine Mammal Stranding Center in Brigantine was incorrectly reported. To reach the organization, call (609) 266-0538.

Missing an Issue of New Jersey Outdoors?

Back issues of *New Jersey Outdoors*, when available, may be obtained at a discounted price of \$3. To order copies, call 1 (800) 645-0038.



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Electronic Keeping an Eye on Ospreys

Amidst the beauty and wonder of Cape May's coastal marshes, thousands of children spent part of last summer glued to a television drama.

Their parents and teachers not only approved, they watched side-by-side.

The stars of this production were a family of ospreys that nested at the Wetlands Institute, a nonprofit research and education center in Stone Harbor. In March 1995, the institute installed a television camera above the nest and displayed the live footage on two television screens inside the lecture hall.

By all accounts, the results were compelling.

The birds' daily adventures would turn quiet summer afternoons into life and death dramas. The male suddenly would fill the screen clutching a headless flounder speared on his fierce talons. And equally quickly, this raw action story would turn into a situation comedy when the female would accept the fish coolly and peevishly dismiss her mate.

Visitors, volunteers and staff shared in the family's joy as two eggs hatched and grew awkwardly toward adulthood over the summer. They also shared the pain when one of the chicks was found dead outside the nest after a strong July storm — apparently blown from the nest by the winds, says Karen Bage, educational director at the institute.

Even longtime observers of the birds

found amazement and amusement in the up-close and personal footage of the family. In particular, the female's brusque treatment of her mate created no small degree of sympathy for the proud, but badgered, hunter. He often tried to pitch in around the nest by bringing home seaweed and sticks and arranging them carefully. His mate, however, granted no points for trying.

"She rearranged everything he did. He couldn't do anything to please her," says Linda Hamilton, a volunteer educator at the institute. "He was good. He hung around, but she would dismiss him."

And as a lesson to ill-mannered children everywhere, osprey young were models of patience and self control. "I was amazed at how patiently the young waited to eat. They would wait quietly while the mother gave five or six bites of raw fish to the other one and then took a bite herself," Hamilton says.

In contrast, young barn swallows nesting at the institute tried to outyell each other in hopes of getting fed first, she says.

A Threatened Species

Ospreys, which also are known as fish hawks, are on the state's list of threatened species. Sometimes confused with bald eagles, ospreys have a wingspan of five to six feet, a white breast and a head flecked with dark and white feathers. Their diet is almost exclusively fish and to snare their prey, they plunge into the water — often going under the surface — with talons extended.

Not long ago, no one could guarantee the future of ospreys in New Jersey.

Visitors, volunteers
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in the family's joy
as two eggs hatched
and grew awkwardly
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over the summer.

Kathy Clark, a principal zoologist with the New Jersey Division of Fish, Game and Wildlife's Endangered and Nongame Species Program, says longtime shore residents tell her of a time when osprey nests were found on poles throughout coastal areas. By the time of the program's first census in 1974, however, only 50 pairs were counted, and the osprey was listed as an endangered species.

The birds were caught in a double trap of habitat destruction and chemical pollution. While increased coastal development was destroying nesting areas, chemicals — especially the pesticide DDT — were affecting their ability to reproduce by weakening or deforming their eggs, Clark says.

Today, the osprey is making a comeback. In 1985, it was upgraded from endangered to threatened in New Jersey. The number of nesting pairs counted in the state's biennial census has grown to 235 pairs — up from 200

A video camera documents the life and death struggles of this pair of ospreys at the Wetlands Institute in Stone Harbor (opposite page).

Research

in 1993, Clark says. While they are still threatened by the effects of some environmental contaminants, the nesting population has more than doubled in the last 10 years.

"Ospreys are good environmental indicators. If you understand what's happening to the osprey, you have a good idea what's happening with the regional marine ecosystem," Clark says.

A Bird's Eye View

To better understand this unique species, the Wetlands Institute is providing a bird's eye view of the daily life of the osprey with its video camera.

Staff at the institute had discussed the idea of installing a television camera for several years, but they lacked the money and technical expertise to make it happen. Their luck changed when they mentioned the idea to Michael Oates, a friend of the

institute with professional experience in television production.

"We just happened to wish out loud to the right person at the right time," Bage says.

The equipment had to withstand the wind, spray and salt of a coastal environment, so Oates devised a system using a tiny camera housed in a stainless steel box about the size of a paperback book. He ran 100 feet of cable from the institute's building to the nest.

"I had to get something that was absolutely indestructible and waterproof," Oates says.

The camera he chose is the type used for specialized industrial applications, including viewing inside nuclear reactors and behind the walls of historic homes to investigate their construction. They also are used to look for leaks and blockages in sewer lines.

Oates' contribution of time and

materials accounted for about half of the project's \$8,000 cost, and the institute paid the rest, says Cindy O'Connor, executive director for the facility.

Throughout the summer, the institute taped footage of the osprey, and the staff plans to incorporate it into an educational project, says Bage. Oates also hopes to develop a computer program and a teacher's guide for use with the video.

Glimpses of Life

The camera has been able to capture delicate movement in the osprey's rituals that often are missed when observing from afar. Clark marveled at how the male created a nursery for the eggs. He began by arranging soft aquatic weeds in the cup of the nest and then pressed them with his breast to customize the job.

"You wouldn't have seen that without



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Visitors watch ospreys through a scope (left) at the Wetlands Institute.

Adults and children alike view action "live from the osprey nest" on a television screen (above).

the camera in there so close," she says. "If you're anywhere near the nest, ospreys know they are being watched, so they may modify their behavior."

The camera also allowed a close-up of the courtship ritual, Bage says. The male brings sticks and fish to the nest and, if he gives them up quickly to the female, she is expected to be more receptive to copulation, she says.

Ospreys mate for life, but no one knows how long this pair has been nesting at the Wetlands Institute, Bage says. Osprey mates usually migrate separately to different areas of Central America or northern South America, yet last year, they still returned within a day of each other. The institute sponsors a potluck dinner on the last weekend in March or first weekend in April to celebrate the return of the birds.

In addition to the insights provided to professional researchers, the camera also gives the general public a rare opportunity to see these birds in action.

Adults and children respond with equal excitement to activity in the nest, Hamilton adds. "Adults react just like the children. They may even get more excited because they see what the children are seeing, and they immediately want to follow up with questions. They want more details and information."

Hamilton, who is a seasoned high school biology teacher as well as an eight-year volunteer at the Wetlands Institute, recalls discussing research on endangered turtles when all heads turned to the television in the room.

"The male appeared with a headless flounder," she says. "At that point, forget the turtle. You immediately say 'wow, look at this,' and your excite-

ment comes right through. That's the moment, and you go with it. You go back to the turtles later. You teach for that moment."

With the camera in place in the spring of 1995, the hatching of the family's second chick was cause for celebration, too, when it was discovered during an environmental education class.

"The mom was sitting on the nest, and the dad arrived with a flounder," Bage recalls. "When the mom stood up, the chick moved and you could see another chick. The kids were psyched about it. We were excited, too. The staff came running in, and the kids started singing *Happy Birthday*."

Educators define such times as "teachable moments" — when an instructor can channel the excitement of discovery into an opportunity for reflection.

The Wetlands Institute is located at 1075 Stone Harbor Boulevard in Middle

Ospreys mate for life, but no one knows how long this pair has been nesting at the Wetlands Institute.

Township. Live video of the osprey nest is expected to be on display from late March or early April through the end of the summer. For more information, call (609) 368-1211.

by Jim Morris, a freelance writer from Basking Ridge and associate director of Continuing Education at Rutgers University's Cook College



The Wetlands Institute (right) is surrounded by nearly 6,000 acres of tidal salt marsh.

© RICK VIZZI

In Search of the Spring Gobbler

by Dave Chanda



ROY DECKER, DIVISION OF FISH, GAME & WILDLIFE

Have you ever had a hummingbird hover just inches away from your face? Or a turkey poult hide under your boot, or a coyote stalk to within several yards of where you were sitting, thinking you were lunch? These are just a few of the wildlife encounters I've experienced while spring turkey hunting.

No other sport generates the kind of excitement that goes with spring turkey hunting. Can you imagine any other activity where, although you never saw the animal you were pursuing, you still managed to have one of the greatest experiences of your life? It happens often while spring turkey hunting.

The spring woods are filled with all types of wildlife activity. I've watched sharp-shinned hawks catch songbirds, deer come so close I almost could touch them, squirrels jump on my shoulder thinking I was nothing more than a log, and scarlet tanagers, ovenbirds and veerys go about the business of nest building. As a bonus, I have witnessed some of the finest sunrises imaginable — all while most people are still in bed.

Prior to 1976, these wonderful natural scenes would not have included wild turkey, which had become extinct in New Jersey. But due to restoration efforts by the Department of Environmental Protection's Division of Fish, Game and Wildlife (DFG&W), there is now a thriving population, exceeding 15,000 birds throughout the state.

The restoration program began in 1976, when the DFG&W obtained 22 wild turkeys from Vermont and New York. The birds were released in the foothills of Sussex County where they prospered in the woods and fields. As the population flourished, the DFG&W moved some birds to other locations in the state through a trap and transfer program.

Wild turkeys now can be found in mature forests and agricultural areas throughout the state. Female birds, called hens, generally weigh between eight and 12 pounds; males, known as toms when adults and as jakes when juveniles, normally range from 17 to 25 pounds.

In 1991, the state introduced a hunting season for wild turkey in the spring. Only male birds may be legally harvested, and the season is timed carefully to coincide with the period when hens are incubating their eggs and generally are not out foraging in the woods and fields.

Talking Turkey

A typical spring turkey hunt begins long before the first sunrise in May. The process actually starts in February, with the submission of an application for a spring turkey permit. Not everyone gets one; permits are selected by a random computer lottery drawing for different regions.

If you are lucky enough to get a permit, late winter is also a good time to get ready for the hunt. You may want to walk through your selected area to see if wild turkeys are using it and to practice your calls.

The strategy for bagging these birds is to become proficient at imitating a hen. This call will lure male turkeys, also known as gobblers, to within range, where they can be taken with a gun or bow.

During mating, wild turkeys use a wide array of calls to communicate with one another. Males gobble to stake out their territory and lay claim to hens or to attract females for mating. Hens

Wild turkeys
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the state.

In a breeding display called "strutting," a tom turkey fans his tail, puffs up his feathers and drops his wings.



ROY DECKER, DIVISION OF FISH, GAME & WILDLIFE

cannot gobble, but they do have a repertoire of calls all their own, such as yelps, clucks, whines, purrs and whistles.

Once a hen responds to a tom's call, she is in for quite a show. As the tom gobbles and moves toward the hen, he fans his tail, puffs his feathers up to give the appearance of a much larger bird and drags his wings. This breeding display is known as strutting and serves to impress the hen and put her in the mood for breeding.

To imitate the hen's alluring tone, hunters use turkey calls, which come in an array of types, shapes and sizes. There are two general types of calls: friction- and air-operated. Friction calls usually are hand operated and use a lever or striker on a wood, slate or glass surface. Air-operated calls are controlled by mouth and usually require air to be either blown through the call or pulled into the call. (Hunters must have calls in their possession during hunting season; stalking or sneaking up to birds is not permitted as a safety measure for hunters.)

Although I carry several different types of turkey calls, I consider my friction-operated box call to be the most effective. For those not sure of how to use a call, there are many educational tapes and seminars available. In addition, the DFG&W offers seminars on the dos and don'ts of turkey hunting. For a list of this year's events, check the *New Jersey Fish and Wildlife Digest*.

Thanksgiving in Spring

My hunt actually starts the night before, as I visit my hunting area to try to locate a gobbler. Veteran turkey hunters refer to this as "putting a bird to bed." Toms often gobble just before dark and even will respond to the calls of a hen turkey or barred owl. If you are successful at locating a turkey, it will give you an idea of where to start hunting the next morning.

The day of the hunt typically begins at 3 a.m. After a quick stop for coffee and bagels, I quietly work my way through the woods near the spot where I located a gobbler the previous night. (That's easier said than done in the pitch black.) I select a calling location approximately 150 yards from where the turkey has roosted. At this point, I just sit back and enjoy the start of a new day.

As the first glimmer of light starts to break over the horizon and the birds begin to sing, I give a few soft turkey calls to let the tom think a hen has roosted in a nearby tree. I give no other calls until the tom leaves his roost and is on the ground. Then I try to imitate the sexiest hen imaginable. If all goes well, the tom answers and begins moving my way.

As he answers my calls and excitement builds, the hardest part of the hunt is to remain motionless. Wild turkeys have tremendous eyesight — their vision is 10 times better than humans. Any movement by a hunter certainly will give away one's location and end the hunt.

In addition, wild turkeys can see colors. Therefore, camouflage plays a critical role in a successful hunt. Both the hunter and his or her call box should be completely camouflaged to avoid being seen by a wary tom.

As the hunt unfolds, self doubts linger. Will the gobbler come or not? Will a predator, a fox or coyote, slip in and scare off the bird? Will that tree root sticking in my backside make me so

Males gobble to stake out their territory and lay claim to hens or to attract females for mating.



Author Dave Chanda (right) and his father, Joseph, after a successful hunt for the king of game birds.

uncomfortable that I will move at an inopportune time? Will my calls be good enough? The thoughts are endless.

Most times the tom is not fooled and just teases me into thinking my calls are good. Even the best turkey hunters in the country fail to bag a turkey more often than not.

But when everything is right, the bird will come near enough for a shot. Try to remain calm and wait for the turkey to either turn away or pass behind a tree before making your move.

If hunting with a gun, the best range for a clean kill is about 35 to 40 yards. Aim for the head and neck, since the body has strong wing feathers and heavy bones that might result in an injury to the bird rather than a kill. With the bow, the bird should be within 15 yards of the hunter, and the shot should be to the body, since the head and neck often are too small a target.

An Obsession

Turkey hunting doesn't have to be a solo sport — it also provides a great opportunity to share experiences afield with friends or family.

I'll never forget the first time I took my brother turkey hunting. All I wanted was for him to hear the gobble of a male wild turkey. With perhaps the exception of the bugle of an elk, no other sound in the wild is as exciting.

At our first stop, I could hear a bird gobbling several hundred yards away but, try as he might, my brother could not hear it. We moved closer, but the turkey seemed just as far away as the first time we'd stopped to listen. Thinking the bird was heading away from us, we quickly crept closer. "Now listen closely. I am going to imitate a hen turkey by giving a few turkey calls, and the tom will answer from beyond the ridge," I said, pointing to a spot a few hundred yards away.

I called and a second tom turkey not 50 yards away responded with a gobble that nearly blew off our hats. As I looked over at my brother, he whispered, "I heard it that time."

We never did see that turkey, let alone get an opportunity to bring it home as dinner. However, we still talk about that day afield, and we both always will remember his first encounter with a wild turkey.

My wife describes my affiliation with the wild turkey as an obsession, and she is right. Many people who take up the sport become addicted for life. Every time I encounter this magnificent game bird, it teaches me something new and constantly reminds me why it is known as the king of game birds. Regardless of the outcome of the hunt, one thing is certain. I just will have spent a day in New Jersey seeing and hearing sights and sounds few people even realize exist.

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Dave Chanda is the chief of information and education at the Division of Fish, Game and Wildlife.

Volunteers

Caretakers of the Wild

When the eagle nest blew out of the tree during a blustery winter storm, it was a loss for more than just the pair of endangered birds.

"These poor birds went hysterical. I went hysterical. They are just like part of my family," says Elmer Clegg, a retired foreman from a waste treatment plant.

After all, Clegg had been with the birds every day, often twice a day, during their nesting season. From 400 to 500 feet away, he watched through binoculars or scopes to report when branches were brought to build the nest or when the male and female swapped turns at sitting on the egg. And year after year, he watched the parents' attempt at raising young fail.

"We call them the hard luck pair," he says. "Anything that happens, happens to that pair. It's heartbreaking. You sit here and watch them go through the motions. They spend hours sitting on the egg, through the rain, through the snow. They don't give up. They keep going all the time. And you keep pushing for them."

Clegg is one of dozens of volunteers working with the Endangered and Nongame Species Program through the Wildlife Conservation Corps (WCC). The corps, which is 1,800 strong, assists the Division of Fish, Game and Wildlife (DFG&W) with various aspects of wildlife management — everything from clerical work in the office to field work with the fish, birds, mammals, amphibians and reptiles that call New Jersey home.

"All of our volunteers are doing what

Volunteers assist with the landscape project at Bear Swamp in Cumberland County, where neotropical birds are captured in nets (right) and banded.

A piping plover chick is banded (opposite page) with the help of volunteers.

our management and research staff are doing," says Stephen Toth, the volunteer coordinator for the DFG&W. "Anything that our full time staff is involved in, our volunteers are involved in."

Volunteers work on a variety of projects, including eagle nests, beach nesting birds, bluebird restoration and fish surveys, to name just a few. Other parts of the WCC program assist with fish stocking, deer check stations and children's BB gun ranges.

Wildlife Conservation Corps members come from all walks of life, contributing their talent in many different ways. In this non-traditional program, volunteers may bounce around to many different projects as long as they put in at least 40 hours a year. After undergoing a four-to five-hour workshop, which includes an orientation to the Department of Environmental Protection, the DFG&W, volunteer benefits and ethics and disciplinary procedures, they get on the job training for the project in which they are involved.

The Protectors

For those working in the volunteer program, there is a strong connection to the wildlife they are protecting.

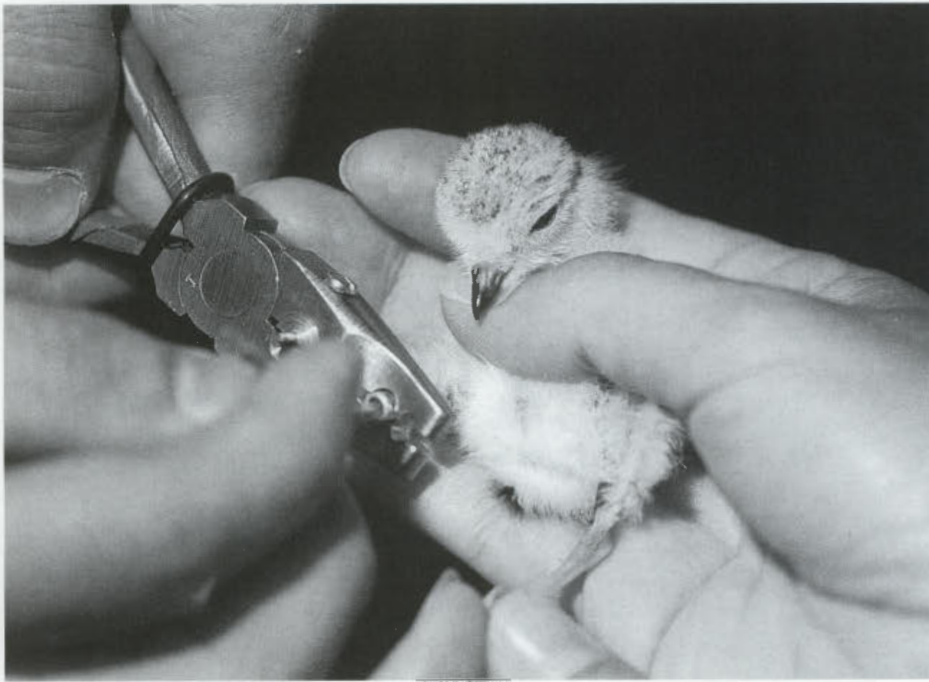
As an avid bird watcher, Linn Pearson of Fort Lee would scan the cliffs of the Palisades, hoping one day to see a peregrine falcon at its historic nesting grounds. One freezing March day, she saw a "bump" on the George Washington Bridge. Scanning it with her binoculars, she discovered the first peregrine in the area.

Since that day, Pearson has spent hours in freezing snow and blistering sun looking for and studying peregrine falcons in northern New Jersey. She spends her days documenting nest sites and scouring through animal carcasses to catalog what the birds are eating.

And why does she do it? "Because I love them," says Pearson, a horticulturist. "They are power and light. They are the Lamborghini of the bird world," she says.

Pearson's love of the peregrine falcon is infectious. At the Public Service Electric and Gas nesting site in Kearny, she shared information about the species with workers there. Now, the





workers are "spouting facts about the peregrine and all taking their lunch outside" to watch the birds, she says.

The Educators

Education is a large part of a volunteer's job. In fact, it was the volunteers who started and organized their own offshoot program called the Endangered Species Speakers Bureau. This bureau provides volunteers at shows and to groups to discuss state endangered species and the work at the DFG&W.

Even those not involved in the speakers bureau naturally become advocates for the species and, in turn, the DFG&W.

"They are just a great bunch of morale boosters," says Allison Nichols, a wildlife technician and coordinator of the beach nesting bird volunteers. "When you get a little burned out, they just pump you up. These people are out there for the love of something. These people are doing us a service, the community a service and wildlife a service."

Todd Pover of Tuckerton may look like a law enforcement officer patrolling the beaches of Brigantine in his brown

uniform, but his biggest job is as educator. Not all volunteers wear uniforms, and they do not carry guns. As a volunteer on the piping plover project, Pover tries to make people realize why sections of the beach are blocked.

"It's a little bit hard to see what all the fuss is about," Pover says. "The piping plover is so hard to see; they blend into the sand. All the people see is signs and fences."

Pover has become personally attached to the half dozen nests at the site and carefully monitors their progress. He particularly remembers a nest close to a heavily-trafficked area where one of the parents died, leaving the other behind to tend to four eggs.

"That one parent was able to fledge all the chicks. That was particularly heartening," he says. "Now that I have a child myself, I am more attached to the project.

You see the chicks and find out how vulnerable they really are."

Clegg, Pearson and Pover all have shared in the joys and sorrows of the animals they have vowed to protect.

"I'm just so proud to be a part of this," says Clegg. "I'm 58 years old, and I never thought I would see an eagle in the state of New Jersey. We have gone from one nesting pair to 11. That is a tremendous accomplishment for the people working here. It's outstanding that we have (DFG&W) people doing this job and that my grandkids can get the biggest kick out of seeing one."

For more information on the Wildlife Conservation Corps, contact Stephen Toth at (609) 633-6316.

by Beth Kuhles

Support New Jersey's Wildlife by checking-off a donation on line 46B of this year's state tax return.



Get Ready to Go . . .

Rafting

Story and Photo, © by Art Lackner



You're floating quietly down a clear river, everyone paddling in unison. Time drifts by as you guide your rubbery vessel through the still water. Mile after mile of undisturbed forest passes in and out of view. No hazards, no stress — just friends or family working together in peace and harmony. That's rafting, New Jersey style.

Former president George Bush might describe New Jersey rivers as "kinder and gentler" than those normally used for rafting. The Garden State lacks the thundering white water that draws rafters to places such as West Virginia, Idaho and Arizona.

But rafting is alive and well in New Jersey, thank you, with the emphasis shifted from thrills and spills to safe fun and beautiful scenery.

Where to Begin

Step one in this sport is to obtain a raft; for most of us that means a visit to a rental facility. Most facilities along the Delaware River at the western edge of

the state and in the Pinelands in the south rent canoes exclusively, but a few see a market in rafting. Daily rentals can range from \$12 to \$20.

George Hayek owns the Delaware River Family Campground on Route 46, just south of the Delaware Water Gap in Delaware, N.J. In addition to his campground business, Hayek rents both canoes and rafts from April 1 to Oct. 31. He shuttles boaters to a spot above the Water Gap, eight miles upriver.

"It's a 3-to 3-1/2-hour raft trip back to the campground," Hayek says. "And it's pretty safe. I've never had a raft tip over or sink in the 12 years I've been renting."

Hayek rents rafts in two sizes. The smaller ones are suitable for four rafters, while the larger ones carry six. "It's the difference between a sports car and a truck," he laughs.

Since battling white water and maneuvering around rocks are of little concern to New Jersey rafters, there's plenty of opportunity to appreciate nature.

"People come back with great stories of wildlife they've seen along the way," Hayek says. "They see cranes, hawks, muskrats, deer, even a bear from time to time. And of course, plenty of fish."

Riding the Gap

The Delaware River — most notably the S turn at the Water Gap — offers some of the best rafting in the state. At the Gap, majestic 1,500-foot peaks on both the New Jersey and Pennsylvania sides drop down to meet the river, which meanders through the big turn. What better way for an entire family or group of friends to experience this natural wonder than from the middle of the river, all together on a raft?

For more great rafting on the Delaware, check out T & W Rental, also on Route 46, in nearby Columbia. Their trips begin just south of the Water Gap, covering a shorter, yet very scenic, five-mile stretch down to Belvidere.

Looking for something to make your rafting experience even more special? Then plan your Delaware trip in late April or May and witness thousands of shad swimming upstream as they make the long and exhausting trip to their spawning areas in the upper Delaware. At times, the river is so thick with shad that you can literally reach down and touch them.

Pinelands Treasures

Pinelands rivers are generally narrow and shallow — conditions much better for canoeing than rafting. But in the spring, when rain swells the rivers, rafters join in.

To rent in the Pinelands, contact Bel Haven Canoe Rentals on Route 542 near Green Bank. When conditions are right, they rent rafts for trips on the lower Wading River (between Evans Bridge and Beaver Branch) and on the Mullica River when the tide is going out. You can choose a trip as short as 2-1/2 hours or as long as 6.

"Our rafts seat up to six people," says

co-owner Lois Bell, which is great for keeping families or friends together.

Janet and Graham Blundell of Ocean Township have rented rafts from Bel Haven. "It's an enjoyable way to spend time with our teenage children in a relaxed, non-threatening activity," says Janet Blundell. "We'll just glide along, counting painted turtles along the way."

"And if you get tired of paddling," Graham Blundell adds, "the current will take you down river."

Attack Vessels

Rafting as we know it began shortly after World War II. During the war, the U.S. Navy developed an inflatable assault raft to attack Japanese-held islands in the Pacific. These black neoprene "ten-mans" were manufactured by the thousands and sold as surplus after the war. Soon the heavy inflatables were running rivers across the country.

It wasn't long before inventive entrepreneurs began to improve upon the Navy's design. As time went by, rafts kept getting lighter and stronger, with features custom-designed for virtually all river conditions.

Modern rafts consist of a main tube, which forms the oval perimeter of the craft, a floor and cross tubes for weight distribution and stability. Most modern rafts have upturned bows and sterns, which aid in turning and help keep spray from entering the boat. Some of the newest, most expensive models incorporate a self-bailing feature. All rafts are made of coated fabrics, usually polyethylene polymer or plastic over nylon or polyester. Modern rafts are super strong; some are even bullet-proof.

Rafts either are rowed or paddled. A raft fitted with oars has a rigid metal frame into which the oars are locked. Used for heavy white water, these boats customarily are rowed by an experienced guide. Everyone else on board is a passenger along for the wild ride. On calmer rivers, such as those found in New Jersey, rafts are generally paddled. On a paddled

raft, everyone on board helps guide the craft downstream.

Paddlers generally sit on the outer edges of the cross tubes or on the main tube with their feet inside the raft. Since all are involved in the action, everyone must be coordinated to guide the raft properly. With a little practice and experimentation, you'll learn how different combinations of forward strokes and backstrokes will guide the raft in different ways. Don't worry about making a mistake. On New Jersey rivers, the inexperienced crew's mistakes might send the raft spinning in circles, but that's about the extent of it. You won't get caught sideways in roaring rapids, cursing each other as your raft flips over.

Shape Up

While paddling a raft down a slow-moving river is peaceful and calming, it's not easy. Bulbous inflatables don't slice cleanly through the water the way canoes and kayaks do. And without enough water, these bulky rafts get stuck more easily on rocks or riverbeds. So prepare yourself for a gentle aerobic workout. Before venturing out, be sure the muscles in your upper body — particularly those of the shoulders, neck, arms, hands, back and abdomen — are up to the task. Halfway down the river is no time to discover that the entire crew is ready to pass out from exhaustion.

Buying a Raft

After renting a few times, you might decide that you really want a raft in your inventory of goodies. Owning your own raft opens up a number of options, particularly with rental facilities so few and far between. But be forewarned — owning is not cheap.

Oh sure, you can find rafts at sporting goods stores for under \$100, but a quality inflatable that will hold up over time can run you between \$1,400 and \$4,000, depending on size and features. And don't forget the extras. Manufacturers and suppliers offer a variety of

Floating Down the River

With rivers high and currents swift, spring is the best season for rafting. So contact one of the following rental facilities and get ready to go!

Delaware River

■ Delaware River Family Campground

Route 46, Box 142

Delaware, N.J. 07833

(908) 475-4517

■ T & W Rental

Route 46, Box 1796, RD # 1

Columbia, N.J. 07832

(908) 475-4608

Pinelands

■ Bel Haven Canoe Rentals

RD 2, Box 107

Egg Harbor, N.J. 08215

(609) 965-2205

"stuff" to go along with their rafts.

Paddles, oars, frames, air pumps, repair kits, life jackets, rescue equipment, special clothing, equipment bags, coolers, books, videos . . . all this and more for the dedicated rafter on the move.

Spring is the best season for rafting. Rivers are generally at their highest levels, and they flow along most briskly. Translation: you don't have to paddle so hard or spend all of your time lugging the raft over rocks!

So now's the perfect time to shake off those winter cobwebs, pack a big lunch, get the kids away from the television and enjoy a few hours of peace and tranquillity on a sparkling New Jersey river. So pump up your family or friends and go rafting.

Art Lackner is a freelance writer from Eatontown.

A Piece of Paradise in Morris County

Combine a dazzling rainbow display of annuals, perennials, conifers and deciduous trees, miles of natural trails past rhododendrons, redwoods, wild flowers and flowering cherry trees, and tips on double-digging soil, planting in a single color, selecting the best plants for the shade and setting up a garden for the disabled, and you've created a gardener's paradise.

That's the George Griswold Frelinghuysen Arboretum in Morris Township.

The arboretum, which abuts Route 287 in this central Morris County community, includes nine separate ornamental gardens, three guided nature trails — including one laid out with ropes and Braille markers for the blind — acres of natural hiking paths and a breath-taking rose garden, to mention just some of the delights on the 127-acre tract.

Formerly Whippany Farm, the manicured rolling hills were the summer home of George Griswold Frelinghuysen, a patent lawyer and president of Ballentine and Company brewery. Matilda Frelinghuysen inherited the estate from her parents and deeded it to the Morris County Park Commission, which took it over in 1971. The circa-1890 Colonial Revival house, with imposing columns, Federal urns and a Palladian window, now serves as park commission headquarters.

The arboretum
also features
guided nature trails
to tour the estate.

Knots and Roses

The rose garden and formal gardens were planted to bloom from May through September, when the family summered there. Lining the walkways into the rose garden are multi-colored flowering begonias, vincas and nicotianas, and pots of the impressive yellow flowering tree, angel's trumpet, adorn the corners of the garden. But the stars are, of course, the roses.

Among the more unusual varieties here are pink Mount Blancs, which bloom into October; burr roses, tall shrubs from East Asia with prickly fruit and bark that peels like that of a sycamore tree; and apothecary's rose, first used for medicinal purposes by the ancient Greeks.

The Knot Garden, done in the Tudor style, includes carefully pruned evergreen shrubs, such as boxwoods, variegated Japanese holly and barberry, that form intricate knot-like designs, as well as oakleaf hydrangea, which has large, oak-like leaves and clusters of showy white flowers in June.

Two peaceful spots to sit and relax here are the gazebo, adjacent to the Knot Garden, and the trellised patio, adjacent to a wall fountain directly behind the house.

Garden Paths

For explorers, the arboretum also features guided nature trails to tour the estate. The red trail, an hour hike, and the blue trail, a half-hour walk, lead through patches of the blooming shrubs spireas and viburnums, spring bulbs and wildflowers, all showing different colors in different months.

The red trail leads past the Shade Garden, a cool spot even on a summer's day, with its pool and 25 different varieties of ferns, grasses, perennials,

The gardens are dissected by paths which lead to the 1890 Colonial Revival house (opposite page), now the headquarters of the Morris County Park Commission.

A Seasonal Guide

The George Griswold Frelinghuysen Arboretum offers an explosion of colors year-round. Following is a list of when to catch the best blooms and fall foliage colors.

Annuals	June — mid-September
Azaleas	May — early June
Bulbs	Spring and autumn
Cherries	Late April — mid-May
Conifers	Year-round
Crabapples	May and autumn
Daffodils	Late April — early May
Dogwoods	May and autumn
Fall Colors	October
Ferns	Spring — autumn
Hollies	December
Lilacs	May — early June
Magnolias	Late April
Peonies	Late May
Rhododendrons	May
Roses	May — October
Wildflowers	Spring — autumn
Witch hazels	January — February



© DOITY WAXMAN

trees and shrubs, including Christmas rose, an evergreen with white flowers, and Kousa dogwoods, similar to the American dogwood with white flowers. The walks also wind beneath some extraordinary trees, especially a 100-foot tall silver maple with bright green leaves and a silver underside.

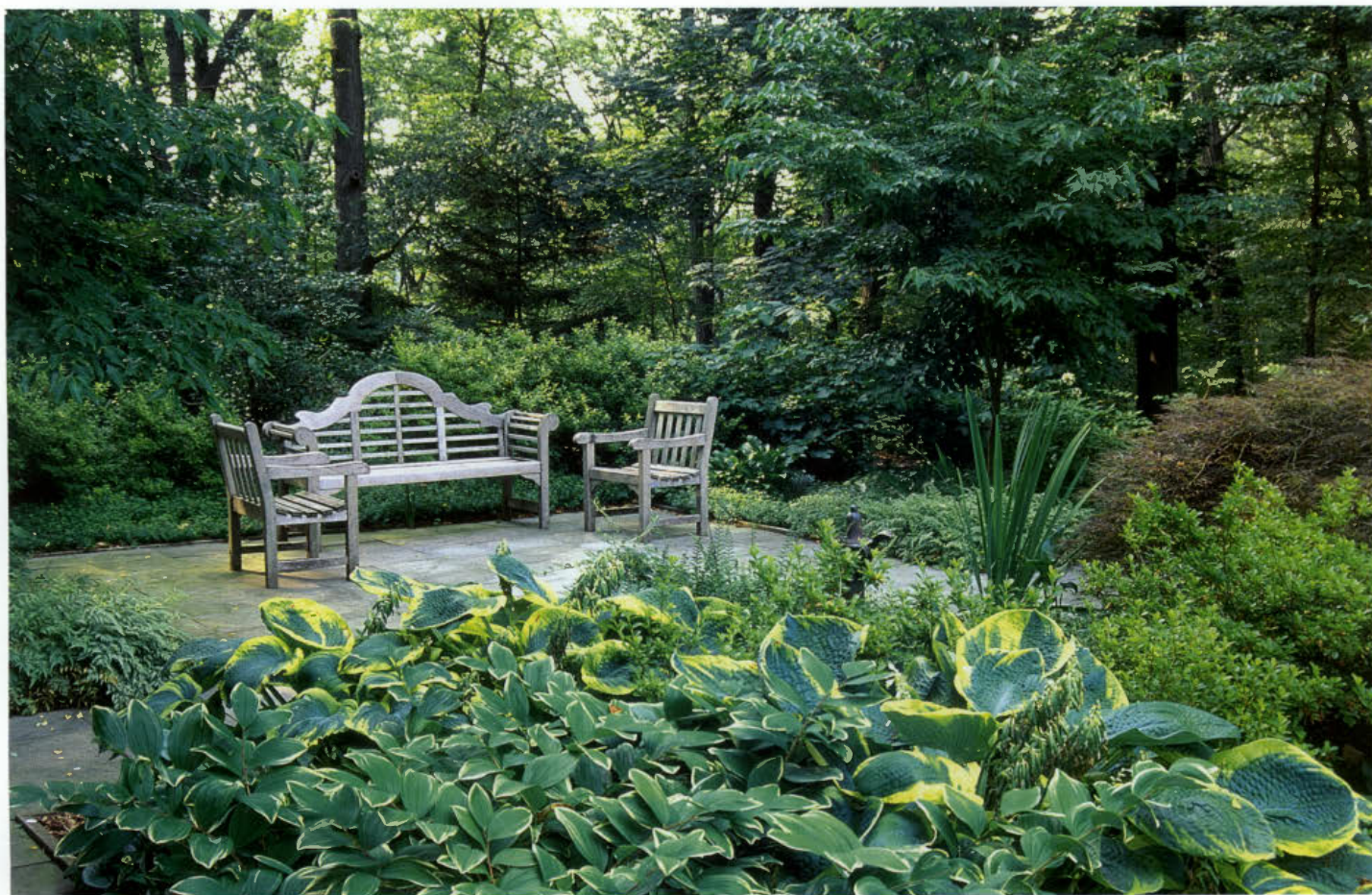
But one doesn't have to venture so far afield to find a varied collection of lush flowers and greenery. Just pick up a free brochure and begin your magical tour through the ornamental gardens.

Ornamental Gardens

The Entrance Garden features plants in containers. Especially overwhelming are 40 varieties of coleus in massive 24-inch hanging baskets, that are invisible under the mounds of gold, green and ruby leaves. The color scheme along the walkway includes white, purple and pink blooms with silver and burgundy foliage. At the base of a stone and slate pool grows *atropurpurea*, a flowering onion that is a great foliage for indoors in winter or outdoors during summer. Here gardeners can pick up tips on planting in containers, including the appropriate times to water, the best fertilizers and soil to use and overwintering plants.

The Winter Garden includes a variety of trees, shrubs, perennials and bulbs that maintain color and interest during the coldest months. Sporting colorful berries are Hawthorn trees, three kinds of holly and skimmias. The golden-twig dogwood has unusual gold bark. Christmas rose and snowdrop have little white flowers to brighten winter days; adonis, winter aconite and winter jasmine sport yellow flowers in the early part of the year.

The Rock Garden, with its waterfall and water lilies, has an Oriental feel. Most of its plants form tufts or mats along its slope or grow close to the rock. It boasts six Canadian hemlocks, cotoneasters and Japanese shield ferns. Carpathian bellflowers and maiden



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pinks grow like a low blanket of green, mixed with white and pink flowers respectively. Though the area is small, as are many of the plants, it paints a beautiful picture.

The Blue Garden is a model for anyone interested in designing a garden around a single color. The arboretum has gathered a full 42 perennials and shrubs with hues of blue and lavender that are still diverse enough in size and texture to keep the eye's interest. English lavender, with its stalks of small purple flowers and fragrant scent, and the sky blue pincushion flower are among the flowers featured here. Others include mugwort, blue star juniper and purple gem rhododendron.

In a few steps, one color turns into a kaleidoscope. Despite its informal appearance with old-fashioned flowers

spilling over the walkways, the Cottage Garden was well planned. This type of garden began in medieval times, when peasants grew their vegetables and herbs by the cottage door. The more modern "cottage style" evolved during the 19th century as flowers were added to beautify vegetable and herb gardens. Hollyhock, in various colors of bell-shaped flowers, and fuzzy, soft lamb's ear cultivar are among the multitude of plants featured here.

Nearby, the Vegetable Garden uses the French intensive gardening style to plant a wide variety of vegetables, herbs, flowers and fruits in a small space. The method includes planting vegetables close together, immediately replacing those that are harvested and using seasonal vegetables. Dwarf fruit trees are planted close to a wall and

trained to grow in a one dimensional manner. Double digging is required to create the rich fertile soil needed for intensive gardening. Grown here in a 20 foot by 20 foot plot are 28 different vegetables and 10 fruits, plus some herbs and flowers.

A special Frelinghuysen plot is the Vera Scherer Garden, designed for and tended by people with disabilities. It includes a wide variety of flowers and vegetables in low-hanging baskets, whisky barrels and raised beds. All planting surfaces are within a two-foot reach of a person using a wheelchair, but also would entice those who don't like working at ground level.

Finally, the Perennial Garden stretches from the entrance road to the gates of the Children's Garden, where youths aged 7 to 12 tend plots of

vegetables and flowers each spring and summer. The 60 different plants and ornamental grasses along the informal perennial garden ensure color from early spring through late fall. There are hollyhock, astilbe cultivar and sweet autumn clematis, to name just a few.

A Practical Guide

Of course, if you're still not satisfied, there are miles of roads and trails — some paved, some grassy and some dirt — through the more natural corners of the property. One path leads past dwarf conifers; another along a patch of bald cypress at the edge of a swamp. And in May, don't miss the colorful walk to the east of the entrance road through clusters of blossoming native azaleas, crabapples and flowering cherry trees.

In addition to feasting your eyes on a diverse array of plants and garden styles, the arboretum also provides practical tips on starting your own garden. There are free brochures at many of the ornamental gardens with suggestions on shade trees, gardening

in a single color, container plants and vegetable gardening.

Also on site is the Haggerty Education Center, where seminars on such varied topics as improving soil, deer damage and pumpkin arrangements are held nearly every day.

The arboretum, located at 53 East Hanover Avenue, is open year-round, except for holidays, from 9 a.m. to dusk. Admission is free. (The arboretum will be undergoing major renovations, including a historic restoration of the mansion's roof, the construction of a new parking lot and a revamping of the interior road, from June to September. Although the facility will remain open, it is best to plan your visit before or after those dates.) For more information, call (201) 326-7600.

*by Colleen O'Dea, a freelance writer
from High Bridge*



© WALTER CHOROSZEWSKI

Benches provide places to rest amid lush green vegetation in the Shade Garden (opposite page).

This statue (above) is among many scattered throughout the arboretum.

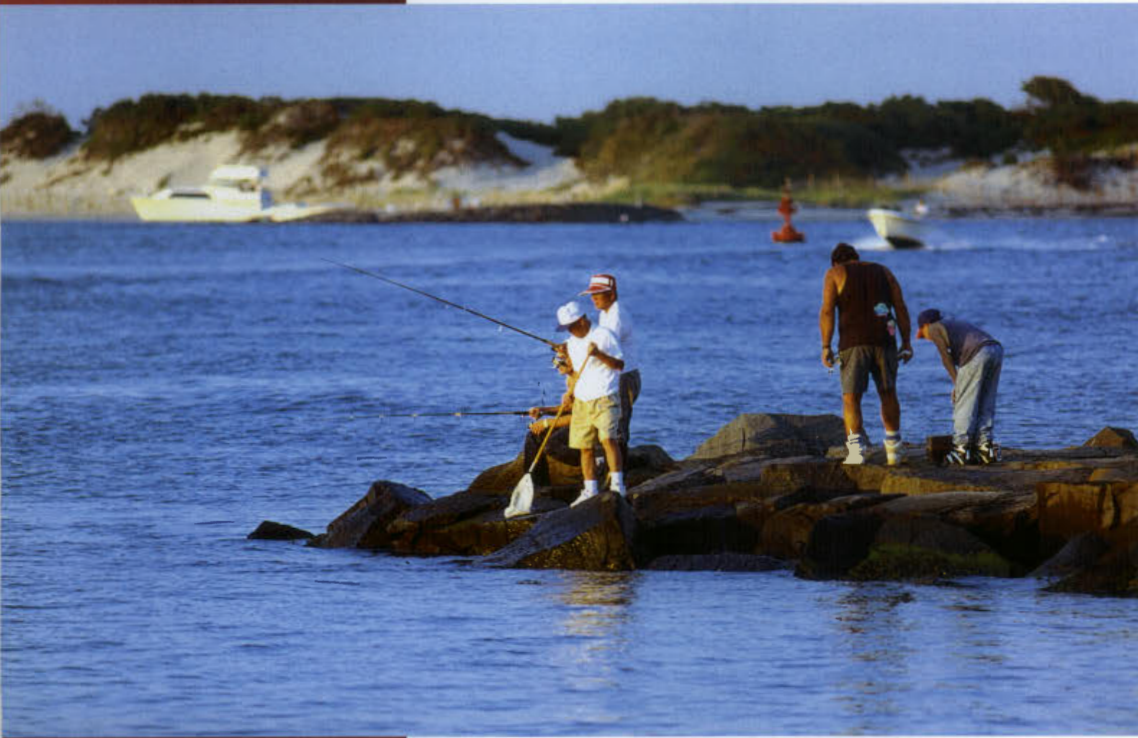
Angel's trumpets adorn the corners of the Rose Garden (below).



© DOTY WAXMAN

*Turning
the Tide on
Barnegat Bay*





It's a piece of
New Jersey most
people don't see.
It's an aquatic
wilderness.

— Pete McLain

Seagulls fly around a buoy
on Barnegat Bay at sunset
(opposite page).

The Barnegat Inlet is a
popular spot for
fishing (left).

© RICK VIZZI

by Cheryl Baisden

In the pre-dawn hours, Pete McLain effortlessly maneuvers his small sneakbox through the water around the marsh grasses of Barnegat Bay, guided only by the shimmering reflection of the moonlight on the water and his own keen recollections. Armed with a shotgun, a thermos of piping hot coffee and all the time in the world, he waits patiently for the first pink fingers of sunlight to caress the horizon, signalling the start of another duck hunting day.

"It's not really about duck hunting," muses McLain, who began exploring Barnegat Bay in the late 1940s and spent 36 years in New Jersey's Division of Fish, Game and Wildlife. "I just go out there to be in that quiet, peaceful place. It's a whole different world out there. It's a piece of New Jersey most people don't see. It's an aquatic wilderness."

McLain's passion for one of New Jersey's largest estuaries is not uncommon among those who have traipsed through Barnegat Bay's marshlands and navigated the waterway's shallow channels. Once the somewhat salty scent of the air and the haunting sounds of the wind rustling through the marsh grass work its way into a person's subconscious, the region's natural beauty permeates their very soul, insist longtime Barnegat Bay enthusiasts like William deCamp, who serves as president of the citizen group, Save Barnegat Bay.

"I've been here pretty much my whole life," notes William Vibbert, superintendent of Island Beach State Park and Barnegat Lighthouse State Park. "My father was a fisherman. He took me here all the time when I was a kid, and my feelings for the place go back as far as I can remember. This is a very special, very unique place. It's hard to put into words just how valuable it really is."

A Fragile Ecosystem

Stretching from Manasquan Inlet to Little Egg Inlet off Long Beach Island, Barnegat Bay spans more than 75 square miles, a body of water bounded by wild tufts of reedy vegetation. A delicate blend of salt and fresh water, the estuary's ecosystem furnishes a rare haven for birds, fish and a surprising variety of mammals and plant life.

As one of the East Coast's prime locales for recreational and commercial fishing and a seasonal

© RICK VIZZI

home to the state's largest population of osprey and the coast's main colonization of brant, Barnegat Bay is one of New Jersey's finest natural treasures. Bottoming out at little more than 13 feet in its deepest spots along the Intracoastal Waterway, the majority of the bay is less than six feet deep. As a result, the estuary's highly productive ecosystem is far more fragile than it appears.

"The balances of nature are sometimes very subtle," says Vibbert, "but even the smallest change is very significant. It's really like the links of a chain. Everything is interconnected, and if you change one link, the whole chain is threatened."

Along Barnegat Bay, those potentially detrimental changes include man-made alterations to the waterway's inlets, designed to improve road and water access to the region. These alterations to Barnegat Bay's natural landscape have shifted the mix of salt and fresh water, as well as the current in several areas, deCamp says. The physical changes even have led to bank erosion and, although no studies have been completed to document the theory, have probably started to alter the fragile ecosystem.

Some Ocean County communities pump water from the aquifers under the Barnegat Bay watershed to accommodate the increased residential demand for drinking water, which has contributed to the bay's growing saline imbalance, adds deCamp.

A National Estuary

With an estimated 435,000 people calling the watershed region home and resident rolls more than doubling during the summer months, maintaining the bay's natural beauty has become increasingly more challenging. But a recently approved three-year federal grant, which may range from \$900,000 to \$1.5 million, is expected to make the daunting task a bit more manageable.

The U.S. Environmental Protection Agency (EPA) designated Barnegat Bay for inclusion in the National Estuary Program in July 1995. Established by Congress under the Water Quality Act of 1987, the program provides funding for the conservation and management of significant estuaries, according to Theresa Fowler, the Department of Environmental Protection's project officer for the Barnegat Bay Estuary Program.

The money will be used to develop a comprehensive conservation and management plan. A management conference, consisting of various committees and work groups, will be put together to accomplish this. The plan also will incorporate commitments from groups and agencies to proceed with funding and to carry out the plan, Fowler says.

To date, the state has received \$75,000 in start-up money, with another \$50,000 ready for disbursement once initial organizational steps, such as setting up a management office in Toms River, are taken. The rest of the money will be allocated in future federal budgets.

Winning the federal designation was far from simple, notes Fowler. In 1992, the state's petition for national estuary status was rejected because it lacked a detailed management plan and proof of public and political support. The proposal submitted by the state in March 1995 provided strong documentation in both areas.

"What I think the EPA saw in this Barnegat Bay proposal was that we have an excellent chance for success," she says. "We have a great base to start from, with a lot of interested people on all levels, from the citizens up through the federal government. The ecological value of the bay generated interest, along with the immense economic value of the place."



© ROBERT BIRDSALL

A full moon glows in the early morning hours over Barnegat Lighthouse.

Ecological Deterioration

Unfortunately, the growing popularity that won Barnegat Bay its national estuary status could also result in its downfall.

As civilization continues to encroach upon the waterway, with housing projects, shopping centers and increased recreational usage, nonpoint source (NPS) pollution problems are becoming more and more apparent along the bay. The total cumulative effect of everyday human activities on nature, NPS pollution already has begun to change the bay's ecosystem, says Fowler, although limited hard facts on the damage exist.

The prospect of suburbanization permanently altering the bay's ecosystem and general appearance launched several citizen groups more than a decade ago, including deCamp's Save Barnegat Bay. Their efforts have helped add preserve land to federal and state-owned wildlife refuges, but development in the bay area has continued.

Vibbert and McLain, who spend most of their days on and around Barnegat Bay, note that some signs of ecological deterioration already are rising up along the waterway. Brown algae blooms, an early sign of pollution, have been increasing steadily in the estuary in recent years, and the clam yields, still the biggest draw for water sportsmen and women along the bay, have been declining over the last decade due to pollution and the change in water flow. The most recent figures show daily clam yields at 500 per day as opposed to 1,500 a day several years ago, according to Gef Flimlin of the New Jersey Sea Grant Marine Advisory Service.

"The traditional type of pollution people worried about 15 years ago was a pipeline carrying some chemical or effluent that caused degradation," Vibbert explains. "That threat has been eliminated over the years by industrial restrictions and the mandated conversion from septic to sewer in the surrounding areas. These changes have had an amazing effect on the water quality over the years, but Barnegat Bay is now threatened by a different type of pollution." Unlike sewage-spewing pipelines or trash-littered banks, today's pollution concerns are far more difficult to detect, monitor and correct. They are the result of continued suburbanization in the 29 municipalities that lace the waterway. They spring from lawn fertilizers, pet waste and oil slicks accumulating in the region's ever-increasing number of parking lots. Each of these substances and more drains into the storm sewers and ultimately makes its way into Barnegat Bay.

Recreational use of the waterway is taking its toll as well. Boaters, with only a few pumping stations available to extract the waste from their portable toilets, have had little alternative but to dump the by-product overboard. In an effort to resolve the problem, five new pumping stations recently were added along the bay, Fowler notes.

"That's the one thing that can be done to help resolve part of the problem," says Vibbert. "But these other pollution problems are much harder to address. That's what we have to contend with in connection with the estuary program."



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Jet skiers and swimmers share the water at the Barnegat Bay public beach.

Unfortunately, the growing popularity that won Barnegat Bay its national estuary status could also result in its downfall.

Fortunately, nonpoint source pollution and shifting currents haven't taken an irreversible toll on the estuary yet, McLain says. "All in all, Barnegat Bay is not really polluted, yet," explains Vibbert. "It's still a very productive waterway, producing clams, crabs and fish and supporting a huge collection of wildlife. In an urban state like New Jersey, with as much development as we have on the bay, it's interesting how clean the water really is."

The reason for the bay's relative cleanliness, officials agree, is that so many other waterways feed into it that there is a steady flushing of pollutants. Still, long-term damage to the ecosystem is a very definite threat to the estuary and its inhabitants.

A Wildlife Sanctuary

More than 300 species of plants have been identified along Barnegat Bay, with the more pronounced collection being found within a 10-mile stretch of Island Beach State Park. Identified as a completely intact barrier island ecosystem, the highly vegetated spot remains virtually in the same pristine state as when Henry Hudson navigated these waters in the late 1500s. A 1951 study conducted along the stretch is still the definitive work on American barrier island ecosystems, notes Vibbert, and the U.S. Fish and Wildlife Service recently added the property to its list of Critical and Unique Habitats in the Northeastern United States.

Birds and animals always have been drawn to the shoreline for nesting and feeding. Beavers regularly dam vital streams leading to Barnegat Bay, yet continue to intrigue nature lovers. Foxes scamper through the underbrush, with little fear of human contact, and groups of seals frequently frolic in the inlets.

Underwater, bluefish, weakfish and striped bass, along with an assortment of other fish, make their way through the inlets. In fact, one-quarter of New Jersey's commercial catch of hard clams, blue crabs, white perch and eels are harvested from the bay annually. (However, there is a state-wide advisory on the consumption of eels, bluefish and striped bass.)

Long, lanky herons and egrets share the skyward landscape with hawks, falcons, gulls and terns, Canada geese, widgeons, brants, bank swallows, colorful warblers and a variety of delicate little shorebirds. Black ducks, with their telltale white wing linings, are present along the estuary, although their numbers rapidly are declining elsewhere in the nation.

The bay area is home to many rare and endangered species, including major portions of the state's osprey and peregrine falcon populations. Least terns, piping plovers and black skimmer also make their homes along Barnegat Bay beaches.

"What it comes down to is that this is just an amazing place," says Vibbert. "And it's different here every day. If you take the time to notice, you can judge the changing of the seasons based on the different characters populating the bay. It's just fascinating and thrilling. The other day, I looked over and there was an osprey sitting on top of my sailboat mast. How many places in New Jersey can you still see a sight like that?"



© HERB SEGARS

The diamondback terrapin is a common species found in and around Barnegat Bay.

Birds and
animals always
have been
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shoreline for
nesting and
feeding.

Magic Under Glass

by John T. Cunningham

The glassblower always has been esteemed, whether in a southern New Jersey glasshouse or a Phoenician shop of 3,000 years ago. In Germany or France 400 years ago, he would have been considered an aristocrat. Even today when a blower demonstrates his skills at Wheaton Village in Millville, he astounds rapt audiences by turning sand into glass, using only strong forearms, deft fingers and a few puffs of breath.

Glassblowers consider themselves artisans, not magicians, yet they can't escape the aura of alchemy that has surrounded the craft since the first glass was blown more than 30 centuries

ago somewhere in the Mediterranean area. While alchemists were believed to be able to make gold out of base metals, glassblowers spun their treasures from molten sand.

The work of today's glassblower is at one with all who preceded him. He steps to the furnace "glory hole" (the opening), braving searing heat to thrust his long hollow pipe into a cauldron aglow with molten sand and a mix of blenders. He twirls the pipe, using his delicate touch to gather exactly the right weight of molten glass for the magic he is about to perform.

He picks up speed, pulling the pipe from the furnace, its end holding a "gather" that looks like brilliant orange butter. He rolls the gather smooth on a slab, then lifts it, either to blow an offhand object or to insert the fast-cooling liquid glass into a mold for shaping as a bottle or goblet. Either way, he blows calculated, seemingly small, puffs, fashioning whatever he desires.

For those of us who merely watch, there is no escaping the thought that we are seeing a sorcerer, no matter how often we have witnessed the artistry and the skill of a glassblower.

The Cradle of Glassmaking

Anyone with even a rudimentary knowledge of New Jersey's industrial history recognizes that today's glassblower has a direct link with four German glassblowers imported in 1739 to ensure success for America's first successful glassworks — at Wistarburg in Salem County.

The glass factory at Wheaton Village.



© WILLIAM C. ERICKSON/NEW WAVE PHOTOGRAPHY

The "glory hole," where sand and a blend of mixers are heated to become glass.

© WILLIAM C. ERICKSON/NEW WAVE PHOTOGRAPHY



Early glassmaking — at Jamestown, Virginia and Salem, Massachusetts — had floundered on the lack of investors and the poor market for the finer things of life. Bear in mind that the vast majority of colonial Americans couldn't afford such things as window panes, goblets or even drinking glasses.

Thus, when Caspar Wistar, a prosperous Philadelphia manufacturer of brass buttons, decided to found a glassworks in 1738, he first shrewdly gauged that his affluent neighbors could afford the glass products he would market. Wistar knew, too, that southern New Jersey's fine sand and abundant forests could add up to a lot of glass.

The button maker could not have blown a glass bubble if saving his soul required it, nor could anyone else within 100 miles of Philadelphia. A German immigrant himself, he imported four skilled German glassblowers to teach the art of glassmaking to him, his 12-year-old son Richard, "and no one else." When not teaching, they would be expected to blow glass for the trade.

When they stepped from the ship in mid-January 1739, the precious four were met by Wistar and whisked away to the 2,000 acres of Salem County wilderness that he owned near present-day Alloways. They found no furnace, no benches — in short, no glassworks. They would start from scratch. Teaching could wait.

The artisans had the upper hand: they knew the secrets and practiced the ancient art. They demanded, and got, a third of all profits plus food and servants, as befitted aristocrats gifted

almost beyond price. It is not likely that they shared their knowledge: there is no record that the Wistars themselves ever blew glass. They were sales oriented, not hands-on, capitalists.

Simplicity overlay the Wistar plant (and all early glass-houses). Everyone helped mix the batch, but once the melting process began, the blowers went home to await the knock on their doors proclaiming that "white metal" awaited their pipes.

Then the blowers went to work, dipping their blowpipes into the molten mix, swinging the white-hot glass liquid with dexterity and delicacy, rolling it and blowing into it at exactly the right second and with exactly the right pressure (even as glassblowers do today).

They fashioned the stuff of enchantment — bottles, globes, decanters, even window glass, which by extraordinary spinning and dexterous touch they converted from gather to flat window glass before the very eyes of disbelieving workers.

[Such offhand-blown window panes can be seen occasionally in very old New Jersey houses. Paradoxically, the most prized of such glass today is the "bull's eye" (the point where the blow pipe was fastened to the original gather.) In colonial days, that piece was the most difficult to sell.]

Wistarburg's laborers included many Germans eager for freedom, who worked in exchange for their passage to this country. Some learned, or were taught, how to blow glass. Many drifted away, carrying trade secrets with them, fanning out through southern New Jersey, on to New England, and — in other generations — throughout the nation. Wistarburg properly became known as "the cradle of American glassmaking."

The most prominent escapees were the seven Stanger brothers. In 1770, advertisements in Philadelphia newspapers advised that Jacob Stanger was one of two "German servant lads run away" from Wistarburg. Five years later, Jacob and his brothers — Solomon, Daniel, Christian, Adam, Francis and Philip — all set up their own glassworks as "Glass House," N.J. (now Glassboro).

American freedom had been the Stanger goal; they bought their land and built their works with gold. The American Revolution ruined the family, for their customers paid for glass with worthless Continental paper money. They lost their glassworks, went to debtors prison and, on their release, went to work for Revolutionary War Colonel Thomas Heston, who had bought their business at a bargain price.

A few of the Stangers left to found other glassworks, but records show Jacob Stanger blew 268 mustard bottles at Glassboro in a single day — September 28, 1802. Others there blew cordial bottles, pocket flasks and half-gallon jugs.

Center of American Glass

When high tariffs went into effect in 1825, New Jersey entered a golden age as the unrivaled center of the American glass industry for nearly 40 years. In 1840, 23 works (28 per-

cent of the nation's glassblowing factories) made 31 percent of all American glass products.

By 1900, New Jersey glass manufacturing centered in five towns — Glassboro, Salem, Vineland, Bridgeton and Millville. There were exceptions, such as the Quinton Glass Works established in 1863 on Alloway's Creek, within sight of the plant Caspar Wistar had established 114 years before. Quinton turned out plate glass, made by molding rather than blowing. For 55 years, three million square feet of the nation's finest plate glass came annually from Quinton. Competition from Western countries killed the plant.

Some glassblowers earned enduring fame. A young Vineland worker named J. L. Mason blew the first of his famed "Mason Jars" at Crowletown in Atlantic County on the eve of the Civil War. In Vineland, Victor Durand not only started Vineland's first glassworks in the 1880s, but also blew the nation's first thermo jug. Millville's Dr. T. C. Wheaton opened a drug store in the 1880s to supplement his practice, started blowing his own bottles and vials and, in 1888, went full-time into making glassware.

Glassblowers sniffed at such things as plate glass and molded glass, insisting that anyone who stooped to such stuff was not a real glass man at all. They refused to work when semi-auto-

matic bottle blowing machines appeared in the 1890s, then went into deep despair when Michael J. Owens of Toledo, Ohio, invented the fully automated bottle maker in 1903.

The Owens machine was awesome. It gathered glass for forty bottles, dropped that into molds, blew into the molten glass and within seconds set 40 perfect bottles on a moving belt — minute after minute, hour after hour, day after day. Demand for the bottles necessitated hiring workers. Proud glassblowers returned to jobs, pushing buttons and letting machines do the puffing.

The machines pushed southern New Jersey glassmaking to dizzy heights, in employment and products made. The Bridgeton-Millville-Vineland triangle became one of the nation's major glass centers, producing millions of bottles daily and hiring thousands of employees. Much of that has faded away in recent years, but glass is still a viable industry in the area.

In their own way, even the machines were beyond understanding, performing the acts of glassblowing with a precision and speed that no mortal could match. Relatively few saw the feats, outside of employees who might pause to watch the hulking machines clang, bang, hiss, puff and spit out bottles far beyond any human capability. But the legerdemain lingered.

The huge bottle makers hired a myriad of off-hand human blowers to fabricate wares beyond the scope of unimaginative machines. Several small firms, most notably Clevenger Brothers in Clayton, continued to make splendid, hand-made, human-blown glassware. Glassblowers became vital in making scientific glassware.

Fortunately, the ancient craft of glassblowing remains close in Millville. There at Wheaton Village, four or five adept blowers turn back the clock in a replica of an 1888 glass factory. Three times daily, they bring to life the romance, artistry and mystery of glassblowing.

The blowers patiently explain their skills, discuss shaping, molding and blowing. Then they pause, pick up a rod, approach the furnace, gather a blob of molten glass, step back and blow. The magic begins. It never fails to astound the audience of all ages.

It's magic, it's wizardry. Actually, it's glass blowing.

Wheaton Village, one of the nation's major glass museums, features many other attractions in addition to the glassblowers. For information, write Wheaton Village, Glasstown Road, Millville, N.J. 08332-1566 or call (609) 825-6800 or 1-800-99-VILLAGE.

John T. Cunningham of Florham Park is the author of 34 books and is one of the founders and a former chairman of the New Jersey Historical Commission.

A glassblower spins a gather of red-hot glass.



History in Glass at the State House



The skylight in the State House Annex is located outside Committee Room 6.



© PETER GROESBECK

The 10-foot-by-14-foot skylight, which contains 1,500 pieces of glass, was installed in 48 separate leaded panels.

© J. KENNETH LEAP



J. Kenneth Leap is a modern day glass artist using old-fashioned techniques.

With methods perfected in medieval times in the construction of cathedral windows, Leap uses painted glass to bring images to life. His latest projects, which include a series of stained glass windows and a skylight in the State House Annex in Trenton, depict the history and culture of New Jersey.

Leap, an artist in residence at Wheaton Village in Millville, creates his artwork by first painting the glass and then sealing the image by firing it in a kiln. This allows the paint to actually become part of the glass. Through this method, Leap has created masterpieces in glass.

In 1994, he was commissioned by the state to create 10 stained glass windows during the renovation of the Statehouse Annex to replace those lost. (Seven original windows by George William Sotter of Holicong, Pa. had been restored at the site.)

To capture the essence of



New Jersey, Leap's creations depict state symbols — the state flower, the purple violet; the state animal, the horse; the state bird, the gold finch; the state insect, the honey bee; the state tree, the red oak; and the state fossil, the *Hadrosaurus foulkii*. In addition, there are two other windows with a Native American theme for a room which formerly held the State Museum's collection



Artist J. Kenneth Leap paints part of the Camden panel (top, left).

A farmer with peaches (top, right).

A seeing eye dog from the institute founded in Morristown (center, left).

This South Jersey panel shows Barnegat Lighthouse, a sneak-box, the Harrisville paper factory, the cranberry harvest, Batsto Manor and the Jersey Devil (center, right).

The state dinosaur, *Hadrosaurus foulkii* (bottom).



Birds of the wetlands
(top, left).

The horse, the state
animal (top, right).

on Native Americans and two on birds of New Jersey in a room that had featured the museum's habitat collection.

Leap also created a skylight, a 10-foot by 14-foot window using 1,500 pieces of glass. The masterpiece, using the concept of a pictorial map, includes dozens of vignettes of the common and lesser known aspects of the state. These images, which include historical figures and sites, are laid out according to their geographic locations, creating a 360-degree panorama of the landscape of New Jersey as seen from Trenton.

For Leap, a resident of Runnemede, the project was a lesson in the rich history and culture of New Jersey.

"I learned a lot," he says. "I feel like I can work for the New Jersey Division of Travel and Tourism."

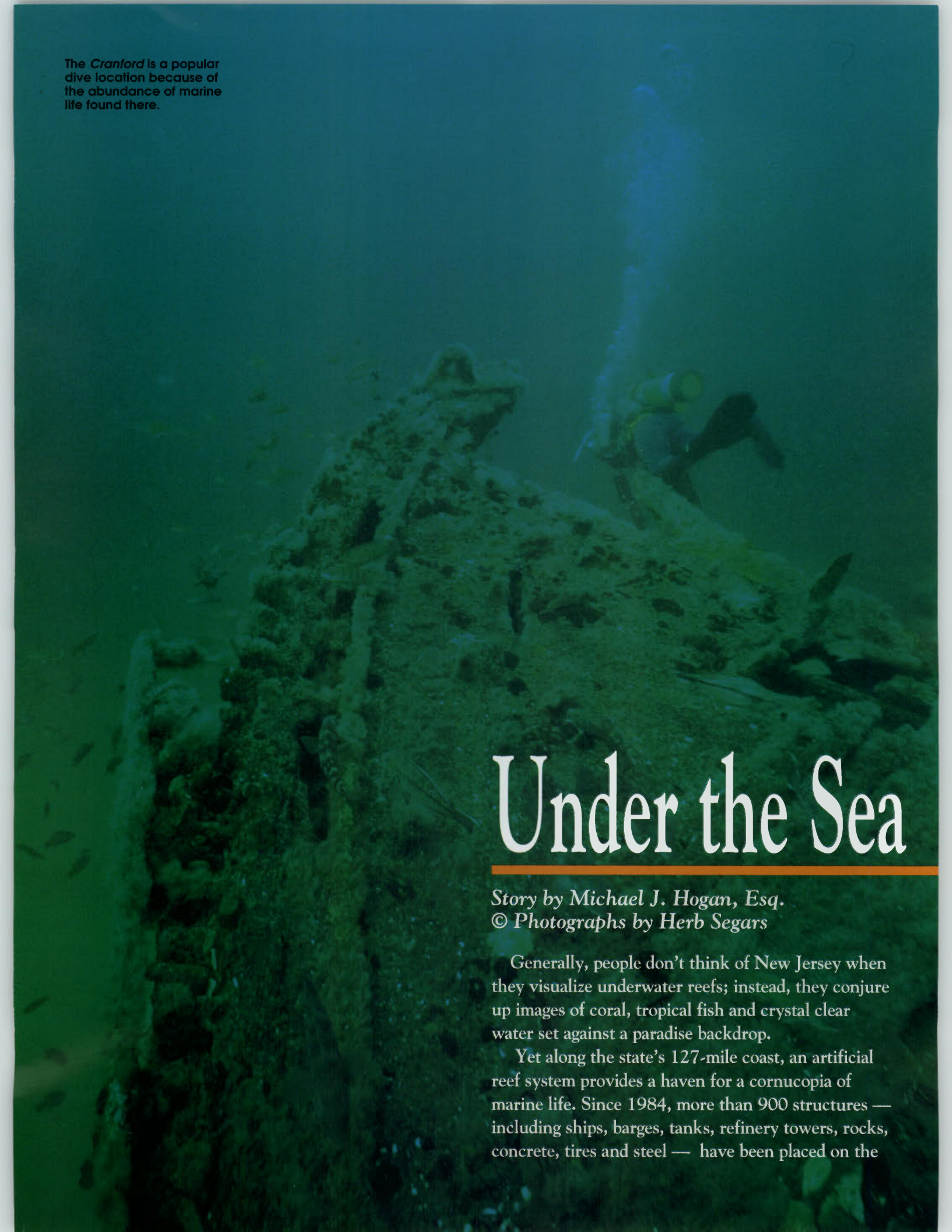
Leap's work is on display at the State House and is highlighted in tours by the Office of Legislative Services. You can see his works in progress at Wheaton Village.



Medallion windows
adorn the West Wing
committee rooms
(above).

Leap paints George
Washington (bottom).



A full-page underwater photograph with a greenish-blue tint. In the upper right, a diver in a blue and white suit is visible, with a trail of bubbles rising from their regulator. Below the diver, a large, rusted metal structure, likely part of a shipwreck, dominates the center of the frame. The structure is covered in marine growth and debris. The background is a hazy, deep-sea environment with some smaller fish visible in the distance.

The *Cranford* is a popular dive location because of the abundance of marine life found there.

Under the Sea

Story by Michael J. Hogan, Esq.
© Photographs by Herb Segars

Generally, people don't think of New Jersey when they visualize underwater reefs; instead, they conjure up images of coral, tropical fish and crystal clear water set against a paradise backdrop.

Yet along the state's 127-mile coast, an artificial reef system provides a haven for a cornucopia of marine life. Since 1984, more than 900 structures — including ships, barges, tanks, refinery towers, rocks, concrete, tires and steel — have been placed on the

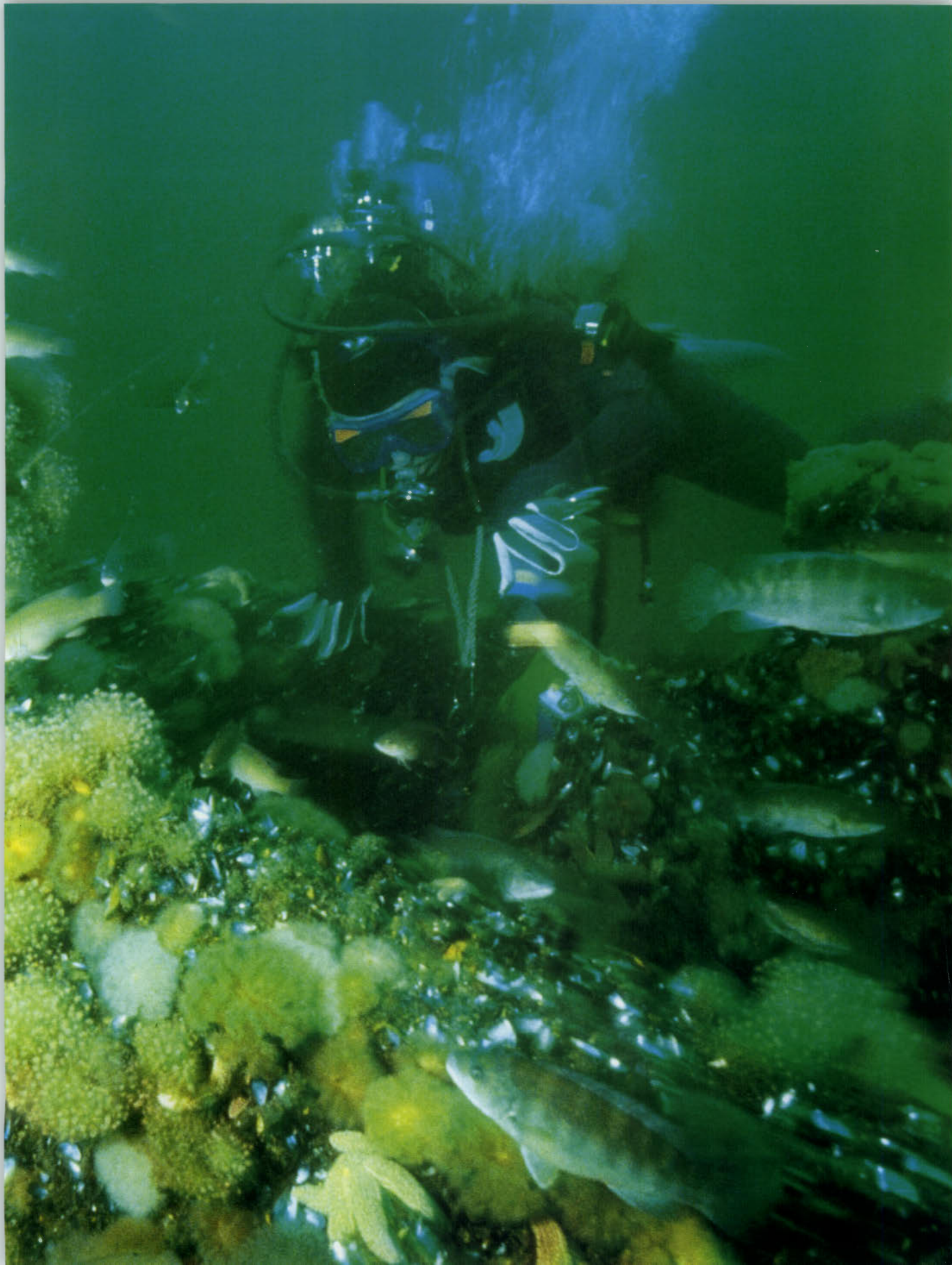


A frilled anemone (above, top), the largest and most common of its species found in New Jersey.

A northern sea star (above) usually features a row of spines down the middle of its arms.

A diver explores life on the *Spartan* (right).





ocean bottom, creating a home for an underwater food chain from the smallest organism to large fish and mammals.

Having scuba dived on many wrecks off New Jersey over the years, and recently having watched the sinking of the tug Big Mama off Atlantic City, I set out to visit an "official" Garden State reef wreck.

Taking a "Snapshot"

The *Snapshot* is an appropriate name for the dive boat commanded by Herb Segars, perhaps New Jersey's foremost underwater photographer. He invited me, together with his wife, Veronica, and extended diving family — friends Beth Dalzell and Tony Aurilia — to explore two wrecks that are part of the Garden State reef system.

After a short, but important, explanation of the safety rules and equipment aboard, the *Snapshot's* twin inboard Chrysler engines turn over with a roar; with little effort we pull away from the dock and head for the Point Pleasant Canal and the Atlantic Ocean.

Herb adjusts the navigational Loran for a course to the first of the day's two dive sites — the *Spartan*, an 85-foot tug four miles offshore of the Manasquan River on the Sea Girt Reef.

Although the day's ocean conditions are near perfect, he worries that a passing storm, remnants of a hurricane that spared New Jersey a few days earlier, might churn up the ocean bottom. Even with the sea being so calm, we all know that conditions under the surface can be quite different.

After an hour on open water, Herb pulls back the throttle and approaches the dive site. He flips on the switch to the depth recorder; instantly a colorful profile of the bottom begins to scroll across the monitor. We set a small float in the dark blue water to act as a visual aid to our immediate position, as landmarks are non-existent. Slowly, we maneuver in relation to the float and the electronic picture of the bottom, now clearly showing a large object. Veronica drops the "hook" and, with a few quick maneuvers of the *Snapshot*, the hook takes.

For safety reasons, we dive in pairs. Beth and I will be the first ones off, so we spend the next few minutes donning our gear — boots, wet suits, gloves, hoods, weight belts, ankle weights, knives, buoyancy compensators, single tanks, pony tanks, regulators, depth and pressure gauges, halogen lights, a netted bag, fins, snorkels and masks. Sitting on the side of the boat undergoing a final check, I feel uncomfortably warm, based in part on the warm day and in part by the exertion of putting on this life-sustaining equipment.

Beth rolls overboard first. A minute later, with one hand holding my regulator and mask and the other on my weight belt latch to keep it secure, I follow. As the cool water infiltrates the neoprene suit, the extreme body heat quickly dissipates.

We pull ourselves along the safety line to the anchor line, which we will use to guide our descent. After signalling to

those still aboard that all is fine, we again check our gauges to confirm a full tank. Air in the buoyancy vest is vented, and we head toward the wreck, pressure in the ears and sinuses building rapidly. It is important to equalize this pressure during descent to avoid severe pain and damage to the ears.

The answer to the visibility question is now obvious. The water, while pleasantly warm, is murky as the wreck begins to come into view at 65 feet.

Beth adjusts the hook so it easily can be set free at the end of the dive, and we exchange hand signals that everything is okay. After checking gauges, clearing water from our masks and venting the remaining air in our vests, we are off to explore the wreck.

The Spartan

The *Spartan*, one of dozens of obsolete ships, barges and army tanks that have been meticulously cleaned and sunk off the coast, is sitting upright and intact. An underwater haven for marine life since 1986, the reef is doing its job.

The vessel is covered with barnacles and a host of marine organisms, including hydroids and blue mussels. For comparison, just a few feet away from the hull, the bottom of the ocean is typical of New Jersey's coast — a flat, sandy underwater field, remarkably clean, with tentacles of scattered seaweed.

The *Spartan*, on the other hand, is alive. It is providing shelter for thousands of fish, including sea bass, blackfish (tautog) and carpets of blue mussels. The mussels compete for space with frilled anemones, which cover parts of the old tug like a blanket. Crabs, clams, starfish, sand dollars and marine life abound in and around the vessel.

On this trip down, we find no lobster, though these reefs are a great attraction for "bugs," as they are affectionately called in the diving world. Swimming over the tug's deck, I can feel the periodic surges of the underwater currents. I am thinking 18 pounds of weight on my belt and five on my ankles are not quite enough to maintain neutral buoyancy. I will use additional weight on my next dive.

Twenty minutes later, my tank pressure has fallen to 1,000 pounds per square inches (psi), an indication that it is time to make our way back to the anchor line. My eyes have adjusted well to the green filtered light from above, and I study the details of the tug. Schools of fish are everywhere. The curious creatures swim up to my mask as if trying to figure out who is making all the bubbles.

Back at the anchor line, we take one last poke around some debris that has collected on the deck. My temperature gauge shows 68 degrees — pleasantly mild for this 70-foot depth.

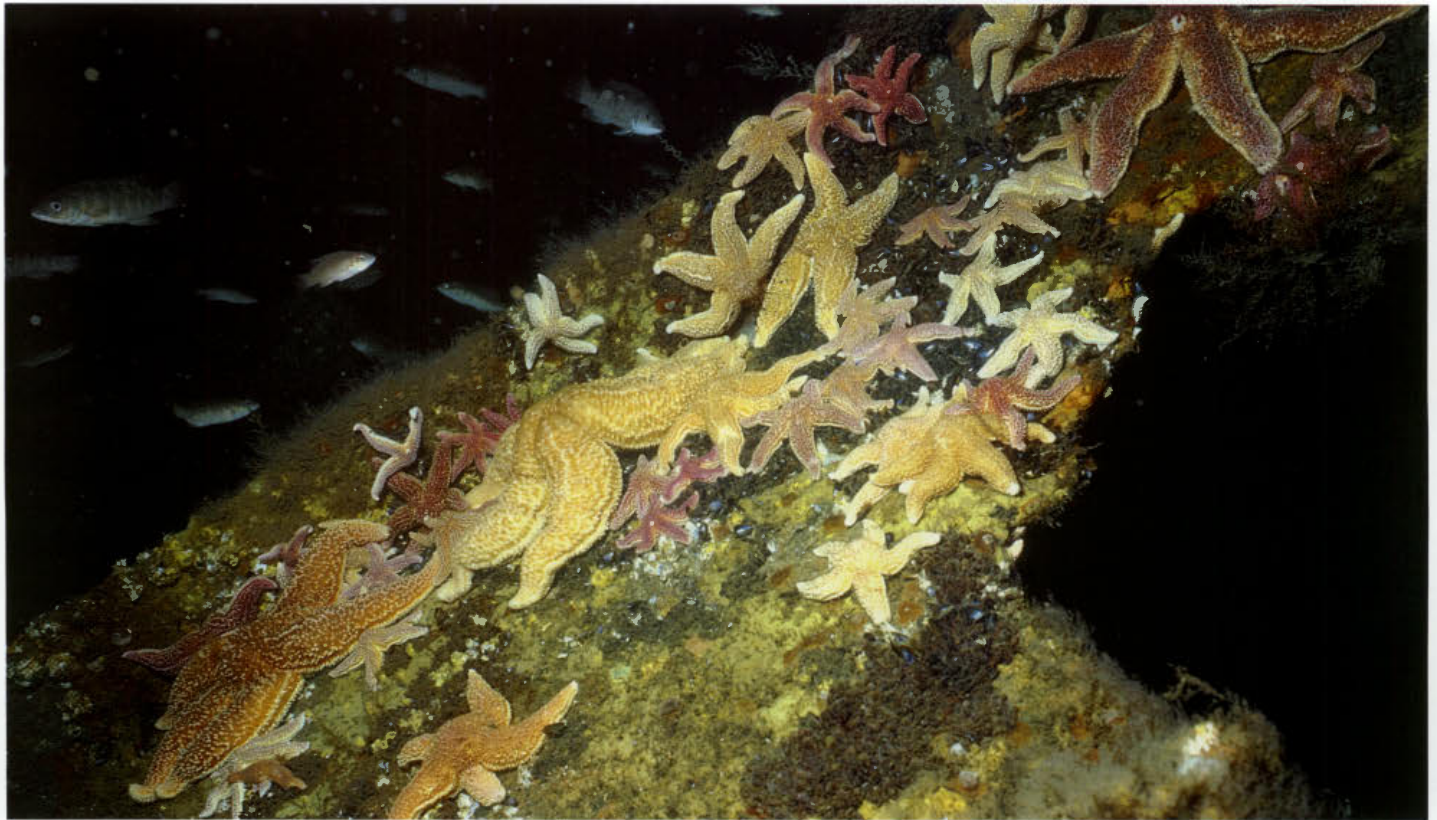
During our ascent, we stop and hang at a point 15 feet below the surface as a safety precaution. The physiology of diving mandates a very slow ascent to expel the excess nitrogen absorbed into the blood stream to avoid the bends, a crippling and often deadly reaction. As we hang on the anchor line, just under the surface,

American sea pouts bury themselves in crevices around artificial reefs.



North American lobster (bottom left) commonly is found on the reef.

The spotfin butterflyfish (bottom right) can be found along the Jersey Coast in summer.



the currents push and pull us, not unlike a flag in the wind.

Several clear jellyfish float by. Beth carefully reaches out and corrals them into her palm. The small creatures, unlike their captors, seem well adapted to their surroundings.

We move to the surface five minutes later. We struggle up the ladder with the weight of our equipment, which suddenly has become heavy, cumbersome and bulky.

While Herb and Tony prepare for their dive, Beth and I brief them on the bottom conditions. Because of poor visibility, Herb decides to leave his camera aboard. In short order, the two are overboard and heading down for their visit to the *Spartan*.

The *Cranford*

After a restful lunch, the *Snapshot*'s ignition bells sound, and the engines come to life. With the anchor aboard, we are on our way to the second dive site of the day, the *Cranford*, a 200-foot ferry boat sunk in 1982. With the hook in place, Beth and I check the dive tables to determine how long we safely can stay under at this wreck, located at a 65- to 75-foot depth. Our dive time is set at 30 minutes.

Herb says the *Cranford* is a good wreck for collecting mussels. We will not go home empty-handed.

Preparation and checkout on this second dive go more efficiently. With fresh tanks, we are back in the water and descending the anchor line, as if swimming through a dimly lit dark green tunnel. As I reach the end, the underwater world

seems to spread out before me, caused no doubt by the limited light reflecting off the wreck and the surrounding bottom.

Visibility is much better on this dive as the *Cranford* quickly comes into view. The ship is no longer intact. There is much more debris lying on and around this structure than I saw on the *Spartan*.

At the end of the anchor line, Beth attaches a strobe, which gives off a bright flash of light every few seconds. The strobe provides a sense of bearing and makes it easier to navigate around the vessel. It also will guide us back to the anchor line at the end of the dive.

The ship, as promised, is covered with literally hundreds of thousands of blue mussels, from some the size of my thumbnail to many three inches in length. In addition to mussels, the ship is home to thousands of starfish, many larger than my hand. The starfish, feasting on the mussels, will never lack a good food source.

At one point, I capture a large starfish and examine the thousands of tiny suction-like cups that help it maneuver. The starfish gently attaches itself to my glove with little effort. After a few moments, I place it back on a pile of mussels to resume its meal.

Using a diving knife, we open a number of mussels and hand-feed hundreds of small fish called bergalls. They now are swarming about my hand as I hold the open mussels. In a feeding frenzy, these six-inch fish are so numerous that they bump into my hands and arms and swarm around my mask, even trying to nibble at my face plate.

Moving around the wreck is not difficult but, because the ship

This sea star, with its suction tube feet, explores a blue mussel bed on a New Jersey artificial reef.



A purple jellyfish (bottom, left) is one of many species found off the coast.

A winter flounder (bottom, center) makes its home on the ocean bottom.

A black sea bass (bottom, right) is a popular visitor to the reef.

Buy a Shirt, Sink a Ship!



Carry a reef on your back with this exclusive artwork featured on a quality T-shirt and show your support for this important program.

Buy a shirt, sink a ship.

That is one of the ways the New Jersey artificial reef program is able to keep sending old ships, barges, tanks and other clean debris to the bottom of the sea to become homes for marine life and resources for divers and sport anglers.

Through the sale of T-shirts featuring an abundance of creatures that can be found on the reef, the Artificial Reef Association (ARA), a non-profit organization, has been able to raise \$40,000 to help add to the underwater system.

The 1996 T-shirt, with more than 30 common marine species, is now available for \$14. The shirt comes in an assortment of colors and sizes. For more information, call (609) 748-2020 or write ARA, P.O. Box 16, Oceanville, New Jersey 08231.

has broken open and has many protruding pieces of wood and steel, great care needs to be taken. Coming across a small lobster hiding in a hole under some debris, I flash the light to get a better view. It backs up in a defensive posture, as if to say "leave me alone!" We did. Moving about the ship, schools of sea bass dart about the nooks and crannies of the old ferry, always just out of reach.

The *Cranford* is a gold mine for marine life. Beth and I begin to break off handfuls of mussels and carefully place them in the "bug bag." We are careful to avoid those covered by excessive marine growth and barnacles. In the matter of a few minutes, we have enough to assure a tasty meal for our respective families.

I regularly check my gauges and, with each check of air pressure, monitor my downtime clock. Time underwater rushes by and, inevitably, the air pressure reaches 1,000 pounds per square inch. As I look around, I see the anchor strobe reliably blinking, and Beth and I make our way toward the light.

She adds air to a lift bag, an underwater elevator that will send our loadstar of mussels on an express ride up the anchor line. We ascend, repeat our decompression hang and in a few minutes we are back aboard the *Snapshot*.

Tony and Herb, now with his camera in hand, head to the bottom for their turn on the *Cranford*. After a quick half-hour, the two climb aboard, Herb with a camera full of pictures and Tony with a bag full of mussels.

The trip back to shore gives us the opportunity to compare notes and to listen to stories of dives from the past. The conver-

sation comes all too quickly to an end as we turn away from the Point Pleasant Canal and approach the boatyard.

The Reef Program

Few people will ever see firsthand the results of the good work of the Artificial Reef Program, which is administered by the Department of Environmental Protection's Division of Fish, Game and Wildlife. It is a combination of interests that have come together to deposit on the ocean floor the discarded equipment of our industrial society, which otherwise would have become environmental eyesores. Instead, hundreds of people, with the help of Mother Nature, have given new "life" to these old boats, tanks and tires, converting them into environmental assets.

These artificial reefs have enhanced the habitat and improved the water quality, characteristics vital for the quality of a safe and enjoyable life for us "air breathers" as well as for the marine life below.

With the expertise of someone who has maneuvered a large dive boat into a boat slip a thousand times, Herb glides the *Snapshot* stern first into a narrow slip. A long and enjoyable day has come to an end. We quickly assist each other in unloading our equipment and say our farewells. Later, upon completing my dive log, I place an asterisk next to the *Spartan* and *Cranford* entries. It will remind me of this special day under the sea.

Michael J. Hogan, Esq., an avid diver, is counselor to Robert C. Shinn, Jr., commissioner of the Department of Environmental Protection.

Outings

A TASTE OF THE OLD WEST



he action's always fast, thrilling and intensely competitive at Cowtown Rodeo, where every Saturday from Memorial Day to Labor Day,

spectators can enjoy everything from rugged saddle bronc riding and steer wrestling to skillful, high speed women's barrel racing.

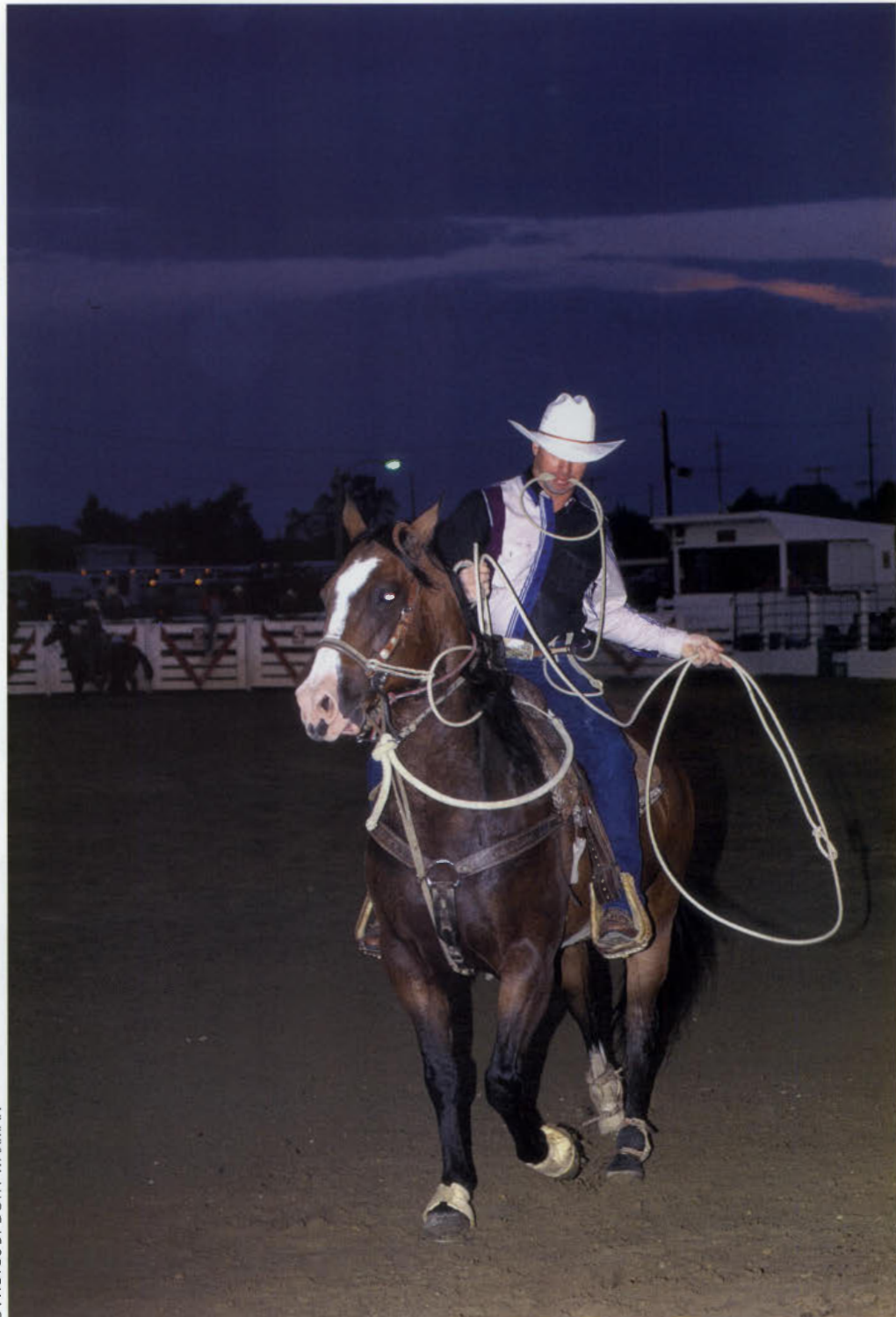
The oldest weekly rodeo in the country, Cowtown is located in Woodstown, Salem County and has provided professional rodeo entertainment in the true tradition of the Old West for nearly 70 years. At 7:30, as the sun is about to set, the excitement rises as cowboys and cowgirls test their mettle against wild horses, bucking bulls and the ever present time clock.

With high speed, often dangerous events, where precision, guts and endurance make or break the best, rodeo competition has become one of the country's top spectator sports. After all, who could help but be transfixed by the gritty battle of wills between a bull or bronc determined to throw its rider and a tough as nails cowboy stubbornly defying those efforts in an all-out attempt to make the buzzer.

"It's an eight-second wild ride," says John Winkers, a competitor in the bareback bronc riding event and two-time defending bareback bronc riding champion. "There really is no secret. You just never give up. You keep on trying."

Born in Wisconsin and raised in

A cowboy prepares his lasso for the calf roping competition.



© PHOTOS BY DOTTY WAXMAN

The rodeo has a way of getting into your blood, despite the bumps, bruises and broken bones.

Competitors parade into Cowtown, the oldest weekly rodeo in the country.

Oklahoma, Winkers has been competing since he was seven years old. A self-proclaimed "kind of gypsy," he has traveled throughout the country on the rodeo circuit, sometimes nine months of the year. Today, Winkers resides in Wilmington, Delaware, where he works as a blacksmith at area racetracks between competitions. He has competed at Cowtown for the past two seasons.

"There aren't supposed to be cowboys in New Jersey, but I'm glad there are," says Winkers jokingly, as he talks more seriously about the hardships that a cowboy's family faces because of constant, often long distance, travel between competitions. As a weekly rodeo, Cowtown offers local cowgirls and cowboys like Winkers a steady stage where they can compete.

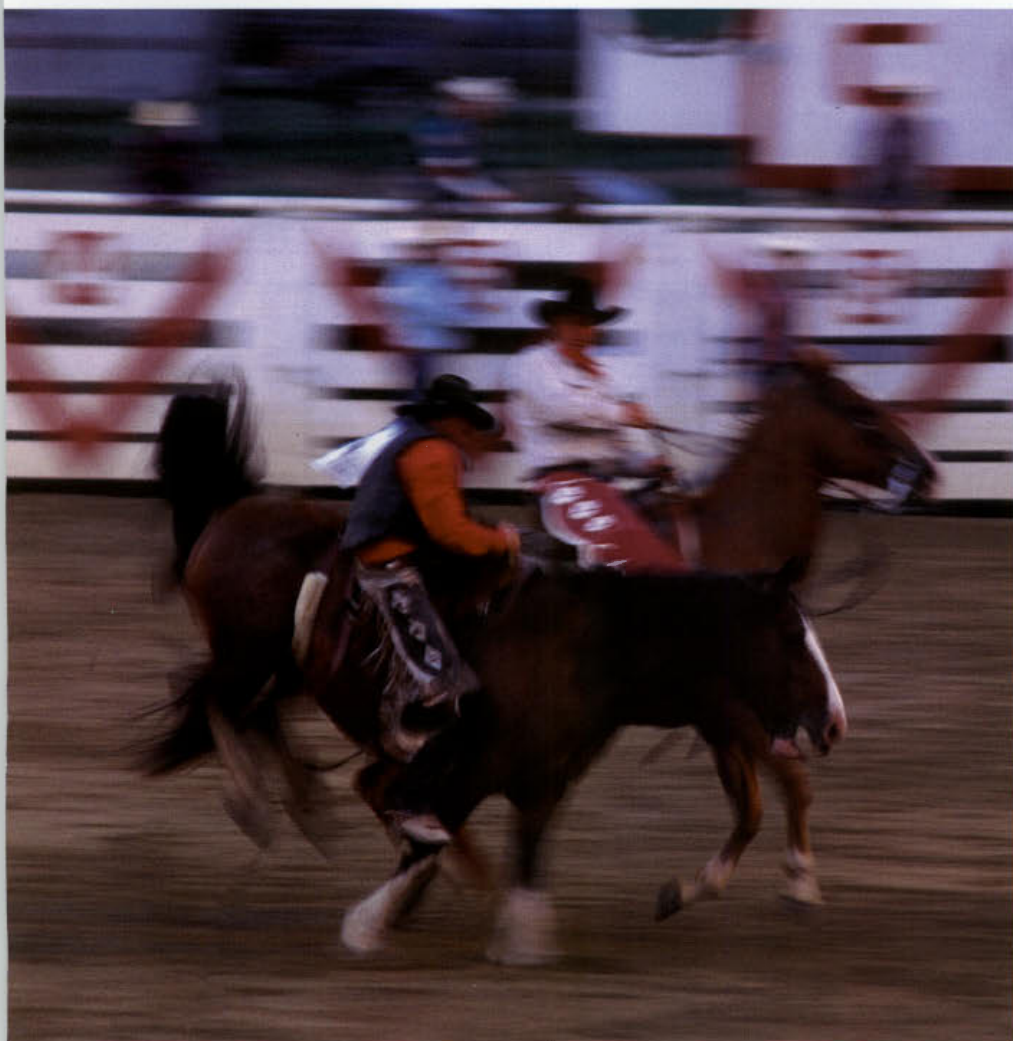
The Rodeo Circuit

The rodeo has a way of getting into your blood, despite the bumps, bruises and broken bones. Take the case of T.G. Hawkins, a 41-year-old rodeo veteran who has been the entertainer and bullfighter clown at Cowtown for more than 20 years.

Having to learn how to walk and talk again didn't stop Hawkins from continuing to compete in one of the most dangerous events in the rodeo. In 1979, he suffered a serious head injury after being thrown from a bull. After a little more than a year, and months warming up on a mechanical bull, he was back on the real thing.

Several years and competitions later, he became one of the clowns, or American matadors, at Cowtown. The





clown's job is to protect a cowboy from an angry bull at whatever price. In 1983, the price was a broken hip. During the 1995 season, he broke his leg falling off an arena fence while entertaining spectators. The crowd thought the fall was a great part of the act and laughed as he limped off the arena floor.

"I'm either old enough to know better or too dumb to quit," says Hawkins, grinning through his grease-paint. "There's just no question that the rodeo gets into your blood."

A Line of Champions

Hawkins, who has been traveling about 300 miles from his farm in West Virginia to Cowtown for the past 20

years, is just one of many familiar faces and traditions that perpetuate the Cowtown legacy.

"The bucking horses you come to watch at the rodeo today are the daughters, granddaughters, sons and grandsons of horses you would have seen at Cowtown decades ago," says Howard Grant Harris, the third generation of Harrises to own and manage Cowtown since 1929.

Harris grew up with Cowtown Rodeo. He won his first Junior Bull Riding Championship when he was only eight years old and entered the professional rodeo circuit at the age of 14. At 17, he began his rodeo travels that would lead him cross-country and win him such titles as the North East Circuit



Necessary equipment: a strong rope, a strong steed and durable denims (above).

A rider is thrown from a bucking bronc (left).

Saddle Bronc Champion — three times. In 1977, he also was one of 50 cowboys nationwide invited to compete in the North American Match Invitational Bronc Riding competition in Wolf Point, Montana.

Today, riding with the confidence and zeal of a champion cowboy whose work is his play, Harris proudly opens Cowtown's big gates and leads the evening's crew of tough, talented and hard-working riders out beneath the bright lights of the more than 3,000-seat arena.

"Although New Jersey is far removed from the main rodeo circuits in the West, the atmosphere at Cowtown would make any cowboy from Montana

Outings

or Wyoming feel right at home,” comments Harris. “I’ve experienced the nomadic lifestyle of a cowboy, living out of a suitcase in more than 46 states. I’ve seen a lot. We all work hard to keep Cowtown true to tradition.”

The West Revisited

Testimony to the authentic western atmosphere of Cowtown is present the moment you drive up toward the arena in a cloud of dust, and men and women clad in stiff legged Wrangler jeans, tall Stetsons, chaps and spurs amble by you as they prepare for upcoming events. Not to mention the live western music and the pungent smell of hay and livestock that hits you soon after you’ve cleared the dust out of your nostrils.

While most people see Cowtown as an exciting place to go, local competitors and employees at Cowtown know it encompasses much more. Cowtown Rodeo is unique in that not only has it

entertained spectators for longer than any other professional rodeo in the country, but also it raises its own bucking horses on the site’s more than 1,300 acres. In the past, it also raised its own bucking bulls.

“People aren’t aware that some of the top rodeo stock in the country comes from New Jersey,” says Harris, who is quick to note, “and so do some of the best cowboys.”

A present day rodeo cowboy is characteristic of legendary western cowboy only in his demeanor and profession, not his birthplace or ethnic background. In the past, the majority of professional rodeo competitors worked on ranches in the West. As part of their job responsibilities, they had to cover long distances, many times without the best trained horses. If they couldn’t handle a difficult horse, they had a long walk home.

Today, most professional cowboys and

cowgirls start out in the minor leagues in various parts of the country. Rodeo organizations designed for youth competition provide opportunities to learn the fundamentals of the sport. Many beginning professionals, like Harris, grew up on a family farm or ranch, with a strong livestock background instilled in them throughout childhood.

With the excitement and tension of such a high-speed, unpredictable sport, combined with the rodeo’s history and bona fide Western atmosphere, you might say Cowtown offers New Jersey’s residents something a little different for Saturday night.

“There is a lot of talent out in the arena,” says Chris Czock, a first-time visitor at Cowtown. “The entire crowd seemed to be holding their breath in sync during the bull riding events. Everyone was pulling for the riders right into the final round.”

So if you’re looking for a taste of the Old West this summer, check out Cowtown Rodeo, where the legend of the cowboy is still very much alive.

Cowtown Rodeo offers events in bareback bronc riding, saddle bronc riding, Brahma bull riding, calf roping and women’s barrel racing. In addition, a livestock and farmer’s market, featuring more than 700 vendors, is held every Tuesday and Saturday year-round. Cowtown is located on Route 40, eight miles east of the Delaware Memorial Bridge in Salem County. Tickets are \$10 for adults and \$5 for children; special group rates also are offered. For more information, call (609) 769-3200.

by Amy Cradic, a consultant with the Department of Environmental Protection’s Division of Parks and Forestry



A cowboy on the trail of an errant calf.

New Jersey's Bear Country

One of three female cubs discovered in a Stillwater den. At two months of age, each cub weighed about seven pounds.

The black bear is alive and well in New Jersey.

In the mid-1970s, only 10 to 30 bears called the Garden State home. With the help of land preservation efforts, increased bear populations in neighboring Pennsylvania and the suspension of the hunting season, black bears have made a dramatic comeback. Today, there are

350 to 400 bears roaming the state, most in the northern counties of Morris, Passaic, Sussex and Warren.

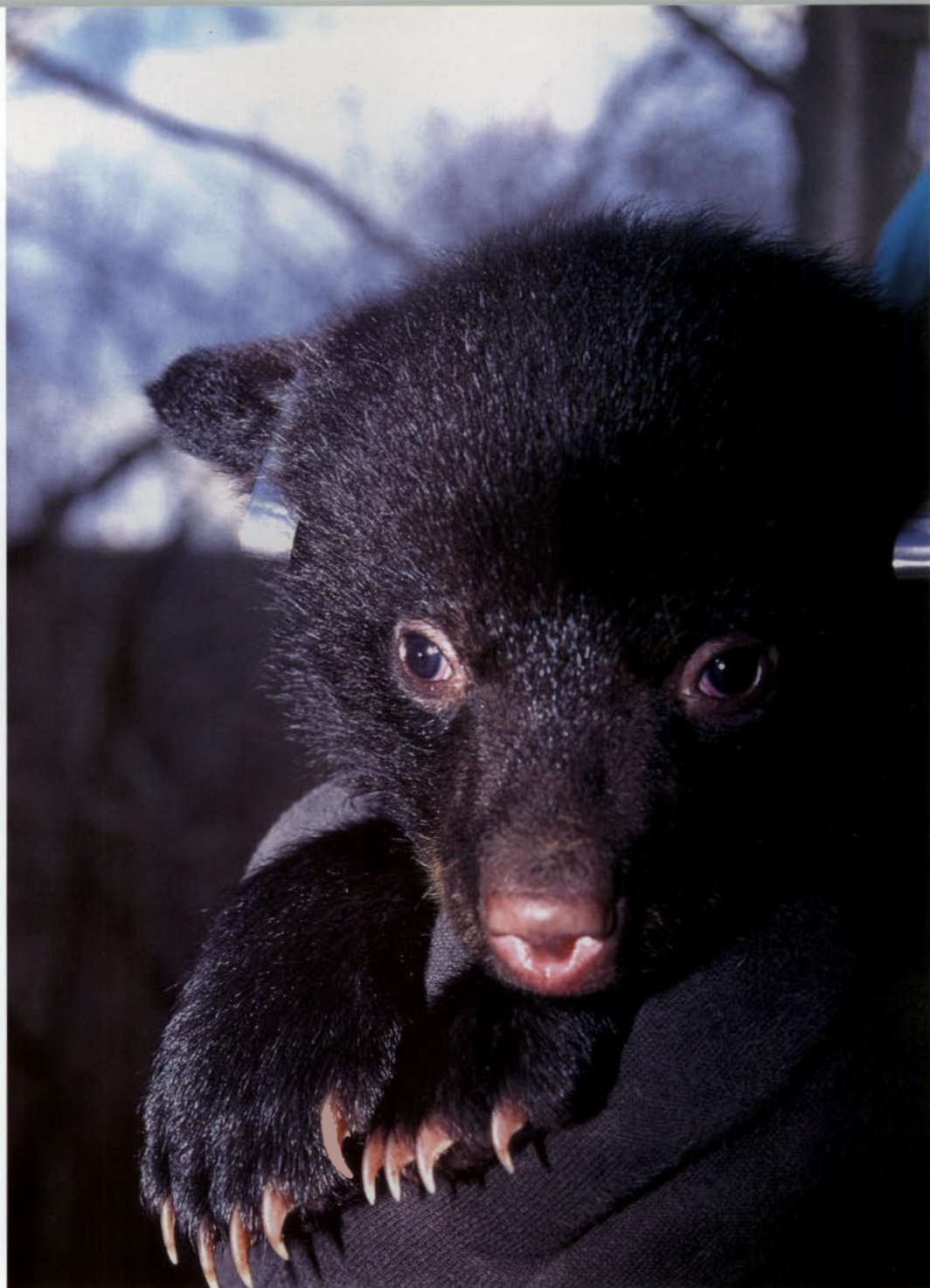
Keeping tabs on these bruins is the job of the state Department of Environmental Protection's Division of Fish, Game and Wildlife (DFG&W). Twice a year, they search out bears in dens and forests to gather data on

reproduction, survival rates and population estimates. They also help when bears and people clash — in everything from bears breaking into homes and cars to turning over garbage cans and bird feeders.

The black bear is the smallest of North American bears, standing about 30 to 40 inches at the shoulder.

An adult male averages 400 pounds and females generally range from 175 to 225 pounds. They are usually black in color with a brown muzzle.

Bears can eat practically anything, but most of their diet consists of vegetation. After gorging themselves on such things as roots, tubers, skunk cabbage, berries, acorns, dandelions, small



© DOTY WAXMAN



A tag is placed on each ear (left) and is used to track the bear throughout its life, providing hints about survival rates, movement and reproduction.

Patricia McConnell (above) prepares a tranquilizer, which will be administered by a jab pole, for the sow. The effects usually last 90 minutes.

A large male bear caught in a foot snare (opposite page). The snare, which does not harm the animal, is used to capture bears for research or for conditioning offenders.

mammals and birds, bears undergo a semi-hibernation in the winter, holing up in dens, such as hollow logs, wind falls, brush piles and caves. In January, females produce two to three cubs. Sows give birth every other year.

From January to March, DFG&W staff and volunteers do their den work with 30 mature females, which

have been fitted with radio collars to track their movement. During this time, new births and survival rates for one-year-old cubs are documented. Because of a bountiful supply of food in the state, 65 to 70 percent of the cubs survive, says Patty McConnell, leader of the DFG&W Black Bear Research Project.

In June, the research team returns to bear country in an effort to get an estimate of the entire bear population. Using leg snares and barrel traps, bears are captured, weighed, measured and tagged.

Finally, the bear research team is documenting bear denning sites, of which about 125 have been identified to date. These sites will be in-

corporated into the DEP's Geographic Information System, a computerized model of New Jersey with key geographic and environmental data. This mapping will provide information to help identify and protect the habitat preferred by these magnificent creatures.

With so many bears in such a highly populated



state, it is inevitable that there are confrontations between people and bears. Every year, the DFG&W's Wildlife Damage Control Unit responds to more than 140 such calls; last year, because of the drought that damaged the wild berry crop, more than 280 calls were logged.

"If you can think of it and imagine a bear might do it, a

bear's probably done it," says Bob Eriksen, a principal biologist with the seven-member unit.

Bear complaints are escalating. While most involve damaged trash cans and bird feeders, bears have killed domestic animals and livestock, as well as broken into cars and homes. During mating season, when bears may roam

50 to 100 miles in search of a mate, a few even have wandered into such urban areas as Morristown, New Brunswick, Trenton, Fort Lee and Rochelle Park, Eriksen says.

Bears often are lured into populated area by the availability of food. When they become a problem, the Wildlife Damage Control Unit is

called. Biologists and wildlife control representatives identify, mark and "condition" the offenders. In an attempt to dissuade bears from repeating their actions, they are frightened with exploding devices, doused with pepper spray and shot with rubber bullets.

For more serious offenders, such as those killing live-



If we keep open space and a productive bear population, we can also keep the other animals we treasure.

— Patricia McConnell



A bruin caught wandering in Bergen County is released in a rural area by the Wildlife Control Unit (top).

A bear, which lives in an area where domestic livestock were killed, is marked with paint (left) to more easily identify him.

stock, there is a black bear policy. First, an attempt is made to condition the animal and then to move the animal to a new location after one to two events. If the animal returns and actions are repeated a third time, the bear is destroyed.

For those living in areas inhabited by bears, the DFG&W has produced a

brochure called "Black Bear Nuisance and Damage Prevention" to help avoid these confrontations. Among its recommendations are:

- do not attempt to approach or feed bears;
- store garbage in airtight containers in secure areas;
- maintain bird feeders on a free hanging wire, at least eight feet off the ground; and

■ use electric fencing to protect bee hives or livestock.

In an effort to deal with the growing population, the DFG&W is developing a bear management plan to examine options for maintaining bear in New Jersey at levels that do not create a nuisance.

The presence of these large and powerful animals is a testament to the preservation of

open space and the diligent efforts of the DFG&W.

"Bears are like a mirror of the quality of the habitat," says McConnell. "If we keep open space and a productive bear population, we can also keep the other animals we treasure. This means a lot for people too. It means they have a high quality habitat."

Dana Ross caught this state record muskellunge on the Delaware River.

DIVISION OF FISH, GAME & WILDLIFE



The King of New Jersey Fresh Water

by Jill Barnes

In the past, if you wanted to pursue muskies, patience certainly was a virtue. A good day consisted of having one “come close” or “nip at the lure.” The elusive muskellunge seemed to be the mystery fish of New Jersey.

And until recently, if you wanted to try out your patience, one of the only places to find muskies was in the Delaware River — a very big and sometimes difficult waterway to fish. Today, with the help of fishing clubs and the Department of Environmental Protection’s Division of Fish, Game and Wildlife (DFG&W), that sly member of the *Esox* family is finding its way into local lakes. Catching a muskie just might have gotten a little easier. Maybe.

If you’re wondering why anyone would spend hours fishing for something that doesn’t want to be caught, understand this. Muskies can grow very big. The International Game Fish Association record for muskies is 67 pounds, 8 ounces. The possibility of catching a fish that big in fresh water can excite any angler. The present New Jersey state record is 38 lbs., 4 oz., caught in 1990 in the Delaware River near the Delaware Water Gap.

“When you see a fish, sometimes four foot long, follow your lure, it gets the juices flowing,” says Mike Ewasko, president of N.J. Chapter 22 of Muskies, Inc. “Who wouldn’t want to hook a fish that size?”

But once hooked, it’s still a difficult task to actually subdue

the fish. Muskellunge have a mouthful of very sharp teeth that can cut a line faster than you can set the hook. Their big teeth and long bodies also make them look ferocious and scary; they've been nicknamed "waterwolf" by some.

If you do manage to set the hook, they sometimes dive to the bottom and just sit. Many anglers mistakenly believe they've snagged a log — except this log is alive. If you're patient and don't panic, you might win this waiting game.

All of New Jersey's previous record muskellunge have come from the Delaware, but the Big D is getting some competition. Monkville Reservoir in Passaic County yielded a 33-pounder last spring and neighboring Greenwood Lake, which straddles Passaic County in New Jersey and Rockland County in New York, also holds a number of big fish.

State biologist Bob Papson is very encouraged by the way the muskies have taken hold in New Jersey's impoundments. "This is the first year we've collected eggs from a brood fish trapped in Monkville Reservoir," he says. "We then raised the fish at the Hackettstown Hatchery. In addition to the pure strain muskies, we also cross-bred them with northern pike to produce a few tiger muskies. We were very happy with our results."

A Growing Population

Although the amount of muskies stocked doesn't compare with the state's trout program, the DFG&W did release 200 fish about 12 inches long in Greenwood Lake and Mountain Lake in Warren County in September 1995. It did even better with the smaller growing tiger muskie, releasing about 12,000

in about a dozen lakes throughout the state. The state record tiger, also caught in the Delaware, was 29 pounds. Tigers, however, are sterile and don't reproduce. Muskies will reproduce although, so far, natural reproduction hasn't been officially confirmed in the lakes or the Delaware River.

"There's no reason why they shouldn't spawn," Ewasko says. "We just haven't verified any. But if you look into the spawning habits in the states that produce more muskies, like the Midwest, natural reproduction usually isn't that terrific."

Muskies Inc. established the muskellunge fishery in Greenwood Lake by stocking about 300 to 400 fish each year since 1985. Members use boats to stock the fish in various sections of the lake, not just along the shoreline. The fish, which come from a hatchery in Minnesota, average 10 to 12 inches and cost about \$10 each or about 75 cents an inch. That's quite a testament to the club's fundraising ability.

"We usually stock the fish in the fall, but if the hatchery can give us some winter holdovers in the spring, that's even better," Ewasko says. "They're about 15 inches and have a better survival rate."

"In the last few years, we've had reports of muskies in the 30-pound range in Greenwood Lake," Ewasko says. "We'd rather the anglers didn't try to weigh the fish. Instead, it's better if they just measure them. It seems if you lift up this huge fish, it hurts them too much and their survival rate goes down when released."

A rule of thumb is a 40-inch fish weighs about 20 pounds; 46 inches is about 30 pounds. The 33-pound fish hooked in Monkville was 48 inches. State size limits are 30 inches for most waters and 36 inches in Greenwood and Echo lakes.

Mike Ewasko, president of Chapter 22 of Muskies Inc., shows another big muskellunge caught on the Delaware River.

Many anglers
mistakenly
believe they've
snagged a log
— except this
log is alive.



BRUCE RUPPEL, DIVISION OF SCIENCE AND RESEARCH

Mysteries of the Deep

It's still a bit of a mystery just how the muskies got into Monksville Reservoir. Although they've never been stocked officially in the impoundment, it is connected to Greenwood Lake via the Wanaque River. That's a pretty good two-mile swim through this winding river filled with boulders and lots of narrow, shallow spots.

Bob Papson says it is likely the muskies traveled down river from Greenwood Lake during draw down periods. "They probably have come over the dam and into the Wanaque," he says. "It's not an impossible trip, especially when the water is high. But they seem to be thriving in Monksville and so far we don't have a problem with that."

Ewasko also is unsure just how the muskies arrived in the Passaic County reservoir. "Of course, they could swim all that way," Ewasko observes.

Guy Cisternino, owner of the Monksville Tackle Shop on Greenwood Lake Turnpike near the reservoir, says he's seen an increase in the number of muskies caught there.

"The spring of 1995 was very successful," he says. "I ran out of fingers counting the ones in some of the coves. We also saw a number of them again in the fall."

Monksville, which opened in 1988, is a horseshoe shaped waterway, 505 acres big, three miles long; it has depths of 90 to 100 feet in spots. So there are many places for muskies to hide.

The habitat and forage base in Monksville also is excellent for muskies, says Papson. Ewasko adds that Monksville is mostly a fishing lake, with no water skiers or big boats like Greenwood Lake, so it's a little easier to fish. Monksville is limited to 10 horsepower motors, making it a nice place to try your luck with the muskies.

To Catch "The Big One"

There are two schools of thought on how to catch muskies. Either cast and cast and cast huge plugs until your arms fall off — or troll. Each method has its proponents.

Cisternino notes that anglers have had success with both methods in Monksville, depending on the time of year. "Trolling along the shoreline with big stickbaits like No. 18 Rapalas or big MEPPS muskie spinners on planner boards seems to be the best tactic in spring. Later when the weeds start to pop up, they might cast to the weed lines. In summer, the best time to fish for muskies is when it's a rainy, overcast, misty day. Trolling about five to eight feet down is your best bet in the fall, especially near the dam."

Echo Lake, part of the Newark Watershed in West Milford, also received stockings of muskies in past years. "We did some stocking in 1991 through 1994," Ewasko says. "We've had some feedback on their growth, all of which sounded positive. We hope we can do more in the future, along with the state."

As noted, the Delaware River still has the biggest popula-

Just don't get scared when it
surfaces, flashes those teeth,
then winks at you
as it breaks off the line.

tion of pure strain muskies. Although New Jersey doesn't stock them, Pennsylvania does. Ben Ribaud, a past president of Chapter 22 of Muskies Inc., probably has caught more muskies in the Delaware than anyone else. He twice held the state record. After spending countless hours casting plugs with no solid results, Ribaud began trolling for his favorite fish.

He likes to use 30-pound test line along with a stiff wire leader, so the fish doesn't chomp down and break the line. "The fun of the muskie is that he acts like he doesn't believe he's caught," Ribaud says. "Sometimes he just calmly swims away with your lure, and sometimes he dives to the bottom. You just have to wait him out."

Some anglers are concerned that muskies may eat all the fish out of the lake. "Certainly muskie will eat forage fish, like herring and suckers, but will also look for the easy meal of a wounded or erratically swimming fish," Ewasko says.

Sometimes muskies attack the fish you've already hooked. "One guy had what turned out to be a four-pound brown trout at Monksville," Cisternino says. "He set the hook and felt the fish, then the line went slack. He thought he was caught on a snag. He started to pull the line, and it began to move, so he reeled in again, and the fish really gave a big tug. He finally got the trout in, but it looked like it had gone through a grinder. It was all chewed up. We're almost certain a muskie had tried to take it."

Cisternino also has reeled in a five-pound bass — minus its tail.

Sometimes, though, catching a muskie is just plain luck. The present muskie record was hooked on a tiny shad dart lure.

So, if you have the stamina for muskies, New Jersey has lots to offer. Just don't get scared when it surfaces, flashes those teeth, then winks at you as it breaks off the line. "That's just the way muskie fishing is," Ewasko says.

If you'd like more information on Muskies Inc., contact Mike Ewasko, 303 West Lakeshore Dr., Highland Lakes, NJ 07422, (201) 764-7561. And he asks if anyone does catch a muskie, that they practice catch-and-release so more anglers can taste the thrill.

*Jill Barnes is a freelance outdoors
writer from Fair Lawn.*

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"The Spirit of the Resurrection"
(above) in Laurel Grove
Cemetery in Totowa.

Battered bears (right) guard the
Roosevelt Monument in Tenafly.

© DOTTY WAXMAN



When Jack Chance signed up to catalog some outdoor monuments, he knew he would learn about sculpture. It was the people who took him by surprise.

Canvassing Clifton for New Jersey's Save Outdoor Sculpture! (SOS) program, Chance found himself behind the walls of the Holy Face Monastery, talking to a priest.

In the enclave off busy Route 3, Chance found four beautiful marble pieces, designed by Clifton residents and carved in Italy. One of them, *The*

Risen Christ, was vandalized 20 years ago, the arms severed. The monastery had it restored.

"It cost an arm and a leg to send it over to Italy," a jovial Father Hilary Conti told him. "I've met some wonderful people," says Chance, an Upper Montclair resident who has been surveying outdoor sculpture in northern New Jersey since the spring of 1994. Chance is among an army of volunteers — 150 in New Jersey; 7,000 nationwide — who have scouted their communities for outdoor art, some cherished centerpieces, others all but invisible in local parks.

directory of information. More than 4,000 of the 22,000 pieces of artwork detailed by SOS volunteers already have been entered on the World Wide Web, says Susan Nichols, SOS director at the National Institute for the Conservation of Cultural Property in Washington, D.C. The agency is a joint sponsor of the program that began in the mid-1980s with the Smithsonian Institution's Museum of American Art.

In New Jersey, about 650 sculptures have been identified, described and photographed and have had their histories, conditions and materials catalogued. They date from the mid-

About 650 sculptures have been identified, described and photographed and have had their histories, conditions and materials catalogued.



© DOTY WAXMAN

Finding Outdoor Art

One of the group's aims is to record all the country's public sculpture offerings in a central database, the National Museum of American Art's Inventory of American Sculpture. To qualify, a sculpture must be created by an artist for an artistic purpose and must be located outdoors. The other long term goal is preservation.

The inventory of outdoor artwork in public view will be available to perusers on the Internet, a worldwide computer

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19th century through today, says Meredith Arms Bzdak, New Jersey's SOS project manager.

"We have lots of war memorials in New Jersey. And a lot (of sculptures) of politicians," says Bzdak. Many abstract works also were discovered.

The state's oldest sculpture is an 1873 Civil War monument that stands in front of Cooper Medical Center in Camden. One of its newest is a statue of the late U.S. Congresswoman Millicent Fenwick, which stands with outstretched arms near the train station in the center of Bernardsville.

The tallest monument, a 96-foot edifice dedicated to the Monmouth Battle of the Revolutionary War fought in 1778, was erected on Court Street in Freehold. In contrast, the smallest sculpture, an eight-inch oval relief of New Jersey's official dinosaur, *Hadrosaurus*, sits in a park in Haddonfield.

This statue (above), depicting night, was part of the clock at Penn Station in New York. It now adorns the entrance to Ringwood State Park.

The Fishermen's Memorial (left) in Cape May.

© JAMES GRANELL/VISTA PHOTO



This Fort Dix monument pays tribute to "the ultimate weapon" — the America soldier.

Morristown claims the only full-sized statue of Revolutionary War firebrand Thomas Paine, while Ocean City boasts an unusual drinking fountain for dogs, sculpted in honor of Hobo, a dog who wandered the streets of the shore community in the 1930s, says Bzdak.

"We have lots of animal sculpture in New Jersey," she says, including those at St. Hubert's Giralda Museum and Education Center in Madison.

Chance also found some favorites.

He likes the J. Seward Johnson, Jr. life-size statue of a man reading a newspaper in front of Clifton City Hall so much, he took his family back to pose with him to stymie friends.

In the corner of Clifton's David & Denman steel fabrication and distribution plant property, the retired manufacturing sales representative found a curious work called Solstice. It's a large, polished, stainless steel rotating disk that catches the light. Surrounding it is an iron fence with a flock of birds crafted into the design.

At Ringwood State Park, Chance found some more birds he thought merited a place in the inventory. The two eagles that greet visitors on either side of the driveway at the New Jersey State Botanical Gardens once lined the top of Penn Station in New York with 20

others. Pieces of the grand clock that adorned the station are placed on the lawn at the Ringwood Manor; the female figures that represented day and night are not displayed as art, but Chance believes their existence should be noted because of their place in history.

650 Masterpieces

New Jersey may be a densely populated state, but it's small. Compared to New York State, where 3,500 works of outdoor sculpture were inventoried, New Jersey's 650 is modest. The search in Vermont was easier; 150 sculptures were documented there.

In all, 106 projects were undertaken

in 50 states, the District of Columbia, Puerto Rico, Guam, American Samoa and the Virgin Islands as well as several major cities. Preservation, arts, veterans and cultural groups have lent volunteers to the effort. More than 60 of the projects have been completed, with all expected to finish by late 1996.

New Jersey's inventory will be completed by March. The Montclair Art Museum will host a photo exhibit through March to reveal the findings and feature one outdoor work of art from each county. The museum has sponsored the state SOS project in conjunction with the Department of State's N.J. State Council on the Arts, the Department of



© RICK VIZI

Environmental Protection's Historic Preservation Office, Preservation New Jersey and the Union County Office of Cultural and Heritage Affairs.

About \$5 million in state, federal and private business grants have funded the national SOS project, with about \$65,000 awarded in New Jersey. Most of the money, Bzdak says, went to mailings to get volunteers and workshops to train them.

Adopt-A-Statue

Once the inventory is completed, efforts will turn to the second, more difficult, phase of the project: preservation. SOS would like to see communities take on "Adopt-A-Sculpture" programs

to lure businesses, governing bodies and community groups to restore and maintain their outdoor art.

"That clearly is the next step," says Nichols. Six such programs are under way in cities, including Cleveland, Denver and Milwaukee, she says.

As part of the inventory, surveyors research who owns or is responsible for the statues and sculptures. Often the groups that commissioned them are long gone; other times, it's unknown who is accountable. What's necessary then, says Nichols, is to convince a community of the economic benefits of maintaining their outdoor art. A town that cares for its history exhibits pride, which could

help lure business, she offers.

This phase is just beginning in New Jersey, says Bzdak. Tenaflly is taking the lead, with its Historic Preservation Commission seeking grants to restore its Roosevelt Memorial. In other communities, it takes more convincing that the pummeling statues and sculptures take from weather, pollution and vandalism is detrimental.

"When copper and bronze change color, people don't realize that's damage," says Bzdak. "People get upset when you clean it. They want that patina. That's what they're used to."

Cleaning, restoring and maintaining outdoor art is costly, no question, says Nichols. "That's why we say neglect is so expensive," she says.

That's also why the second phase of SOS aims to establish maintenance plans for public sculpture not yet erected to advise artists on the best materials to use to lengthen the life of their work. "We worry about the ones that aren't here yet," says Nichols.

For more information on SOS, contact the national office at SOS, 3299 K Street N.W., Suite 602, Washington, D.C. 20007, (800) 422-4612 or Elyse Reissman at The Montclair Art Museum at (201) 746-5555 x20. The inventory of outdoor sculpture can be found on the Internet at lcclark@mic.org.

by Dory Devlin, a reporter with the Star Ledger and freelance writer from Basking Ridge

When copper and bronze change color, people don't realize that's damage. People get upset when you clean it.

— Meredith Arms Bzdak



A statue, in Cooper River Park in Pennsauken, commemorates the Holocaust (opposite page, bottom).

Abraham Lincoln (above) is memorialized in Jersey City.

Paterson honors native son, comedian Lou Costello (left).

Inside DEP

Turning Brownfields into Green

When the developers of a proposed baseball stadium along the Trenton riverside came across soil contamination at the site in late 1993, it seemed unlikely that the Trenton Thunder Double A baseball team would have a place to play in 1994. But after working closely with staff from the New Jersey Department of Environmental Protection's (DEP's) Voluntary Cleanup Program, construction was completed in time for the season.

Now sports fans who visit the ball park and motorists who travel along the riverside can take in the impressive view of the 20-acre Mercer County Multi-Purpose Sports Complex rather than a huge vacant lot that was once the home of several industrial facilities.

A few blocks from the ball park lies the former Roebling Wire Works site, where metals and petroleum were discovered in the soil. The developer, using resources available through the program, was able to clean up the property and now is expected to open a strip mall and office complex there by spring.

With the help of various types of assistance offered by the private sector and government agencies, aging, abandoned, industrial sites, commonly called "brownfields," are being recycled all across New Jersey. The four-year-old Voluntary Cleanup Program (VCP) is leading the way with such aid as low interest loans and grants, consistent rules and regulations and protection from liability claims. And the program is expanding rapidly.

The program is designed to spur economic growth in the state by "fostering the reuse of deteriorated sites and, at the same time, ensuring protection of human health and the environment," explains Robert C. Shinn Jr., the commissioner of DEP. The program was the "primary fac-

tor in getting the sports complex project underway," notes William Mate, Mercer County's development director.

Reclaiming Sites and Jobs

With the increasing ease and popularity of voluntary cleanups, many polluted sites that developers may have avoided in the past are being returned to the tax rolls and, at the same time, providing jobs.

Since the program began in 1992, developers and other interested parties have signed more than 4,500 agreements with DEP to clean up contaminated sites. So far, more than 2,700 of these projects have been completed.

At the rate of about 100 new agree-

ments monthly, DEP is addressing a variety of contaminated sites, ranging from former industrial properties and old landfills to residential lots with underground storage tanks.

The program primarily was developed to facilitate the cleanup of non-priority contaminated sites, those that posed no immediate threat to human health or the environment. Instead of using the process required for priority or highly contaminated sites, which often was burdensome, legally binding and potentially time consuming, the program introduced a user friendly system for those who wanted to investigate or clean up sites with limited contamination.



A large vacant lot along the Delaware River, once the site of several industrial facilities, has been reborn as Mercer County Waterfront Park, home to the Trenton Thunder AA baseball team.

Called a Memorandum of Agreement, the system stipulates the state requirements for testing or cleanup while building in flexibility. Interested parties may select a partial investigation or cleanup at their own pace without the fear of penalties. They even may back out of the agreement if they desire.

The agreement also allows a DEP case manager to function as a single point of communication for various concerns at the site, such as underground storage tanks or leaking drums.

Finally, the use of the *Technical Requirements for Site Remediation*, DEP's "cookbook style" guide for technical cleanup compliance, allows for speedy turnaround of consultants' technical documents. Less time is required by DEP to review and comment on these documents because the minimal technical requirements for site remediation are spelled out in the regulations.

An Industrial Revolution

The Voluntary Cleanup Program embodies the mission of the DEP, which is committed to protecting the environment while sustaining the economic vitality of the state.

The sports complex in Trenton had been the location of industrial enterprises since the mid-19th century and was last occupied by the American Bridge Division of U.S. Steel Company. Now the new stadium has "provided the anchor for neighborhood revitalization and, at the same time, has provided entertainment and jobs," says Jim Harveson, Trenton's director of economic development. He cites increased employment opportunities for local vendors, as well as increased revenue flow.

According to Mate, the \$18 million project resulted in the creation of about 1,000 construction jobs plus 400 permanent and part-time jobs. Annual revenue from the ball park amounts to approximately \$520,000, he says.

The 36-acre Roebling Wire Works complex was used from 1850 to 1950 to make steel cable and wire for world re-

nowned structures, including the Brooklyn and Golden Gate bridges. The developer, T.R.I. Berman Development Corp., was among the first groups to sign up for the program.

The developer faced requirements that presented a "moving target" because of the changes in the cleanup criteria and program compliance, notes Phil Zezulinski, vice president of T.R.I.

While these changes resulted in extensive department and consultant efforts to resolve environmental issues that cropped up during the various remedial phases, because of the VCP's built-in flexibility, the parties were able to work out any differences. Now, such environmental issues are resolved through the use of the guide book.

While the plans are already in the works at this complex for a science museum to showcase the huge machinery used in cable making, T.R.I. has begun converting some of the remaining historical structures into an office complex and shopping center, anchored by a large supermarket, according to Zezulinski. The Roebling reconstruction project should create roughly 250 construction jobs and 400 permanent jobs.

Another example of neighborhood revitalization through the program is the New Community Corporation's Townhouse Project on a two-acre property in the Central Ward of Newark. Redeveloping an urban area of dilapidated row houses with leaking underground storage tanks, this non-profit organization transformed the abandoned parcel into a new community of more than 50 townhouses.

Among the hundreds of voluntary projects underway is the remediation of an abandoned landfill located west of Kapkowski Road in Elizabeth in Union County. Now owned by OENJ Corporation, this 188-acre former municipal landfill will be redeveloped as a major regional shopping mall. In operation from 1960 to 1972, this landfill accepted municipal and residential waste from Elizabeth, Roselle and Union.

About 60 percent of the program's cases are residential properties.

George Tyler, a lawyer representing OENJ, estimates this project will provide the region with more than 3,000 permanent jobs and 2,000 construction jobs, as well as a \$4 million increase in the city's tax revenue, a significant jump from the \$200,000 currently generated by the site.

Home Sweet Home

While the program was developed to "recycle" former industrial and commercial facilities, the majority of the program's cases — about 60 percent — are residential properties.

Lately, the program has become a useful tool in helping to close out residential and commercial real estate transactions where the potential buyers are concerned about the condition of oil storage tanks.

Only three weeks before closing on the sale of their home, Frederick and Susan Norrell of Middlesex County, prodded by an insistent buyer, contacted DEP for guidance and approval of their underground tank removal. Taking advantage of the program's built-in speed and flexibility for case close-out, the Norrells were able to present a letter to the buyer in time for settlement that no further action was required on the tank.

The program continues to provide a way for businesses and residents alike to rebuild contaminated sites, adding to the prosperity in the state. For more information on the program, contact the Office of Site Remediation, Bureau of Field Operations, Case Assignment Section, at (609) 292-2943.

by Nate Byrd, an environmental scientist with the Office of Site Remediation's Bureau of Field Operations

Nature's Timing on the Water's Edge

It was a slow Monday afternoon until the egret came stalking up the Passaic River past my house in New Providence. Egrets are elegant hunters, deeply dainty, narrow and precise, snow white, delicate and then suddenly large when they fly. But this one didn't fly off; it just walked by.

I was up by the house when I noticed it. Fifty feet and 15 minutes later, I was almost at the water's edge. I'd crossed the yard from tree to tree, a slow motion cartoon, moving only when the egret stepped behind the sporadic bushes. I quietly opened the gate and crawled out onto the bank. I never ask my neighbors what they think about this kind of behavior.

The hunting was good, and it struck with almost every stop. Step, pause, strike, swallow, step. The pause reminded me of a cat before the pounce, the curled up snake neck weaving gently. I watched intently, holding mind and body very still.

Suddenly, a great blue heron glided in through an opening in the tree canopy, banked right in front of me and landed out of sight in the woods across the river. It was huge and unspeakably beautiful.

My aesthetic mind flooded with wonder, a more primitive part rose up in concern, and then the intellect struggled at last asking, "How does it fly through the woods with a six-foot wing span?"

If humans had a six-foot wing spans, we might fly everywhere with a six-foot ruler and a chain saw, cautiously, recklessly, cutting six-foot openings. We might pass laws requiring trees to stay six feet apart. In sharp contrast, this heron, which is free of measuring, simply brings her wings in and out to accommodate the ever-changing tree space.

This all happened around one o'clock. Just the day before, my

neighbor and I had spotted an egret in that same area at about the same time. So for weeks after I watched the river in the early afternoon. I never saw either bird again in that place or at that time. I had won an amazing synchronic lottery to see an egret and a heron simultaneously. But these birds do not wear watches, they follow some mysterious free-form clock, moving their schedule as they move their wings, to fit in the ever changing rhythm of life.

The emptiness of waiting created a void, and suddenly I became aware of the bees in the garden. What beautiful, schedule-free efficiency these fuzzy black and yellow flyers



The pause reminded me of a cat before the pounce, the curled up snake neck weaving gently.

practice. With no abstract timetable or clock, they pollinate the flowers, vegetables and fruit trees, each as it becomes ready. If one year there were suddenly no bees, all of us humans working together with schedules, maps and, I suppose, Q-tips, would be unable to do their job. We certainly wouldn't be able to make honey on the side.

Like the herons, the bees follow a rhythm that comes from the world around them. They do not show up to pollinate until the plants are ready for them. If people were bees, we probably would be impatient, prodding plants to open simply because we were there and ready to pollinate. We might be angry that they were not ready for us, forgetting that as bees, we are servants, not masters.

The Rhythm of the Waves

Water also follows a mysterious rhythm. This is not surprising, but we seem to have forgotten it. We expect the river to run like a machine, pumping out the same amount of water, day in and day out, in the rainy season and in drought. But the water does an amazing extravagant dance across and around the entire planet. We cannot control it, predict it or change it; we can barely even understand it.

It is wild in rivers, streams and oceans, placid in ponds, pools and lakes. Then it rises slowly, mysteriously, invisibly, becoming clouds, pink and orange in sunrise and sunset, black and gray racing across the moon late at night. It towers and rolls in thunderclouds, clouds of water as tall as mountains, and then floats as dainty, wispy, solitary, ever changing dancers on bright days.

It tumbles back down in floods, driving rain and brittle hail; it drifts down as gentle snowflakes and stands as gentle fog. Landing in uncountable numbers of places, it regroups with seeming intelligence, following gravity like a map. In some places, it rejoins rushing rivers or drops fresh into salty



These birds do not wear watches, they follow some mysterious free-form clock, moving their schedule as they move their wings, to fit in the ever changing rhythm of life.

water. In other places, it is sucked down into the sand or lands on pavement and runs to find the closest river. In the woods by my house, alongside the river, it lands in the still, flat, wood plains. Here the rain builds a floor of water, which slowly slips into the ground, down past rocks and roots, sand and silt, through a beautiful, living, complex and effective filter. The timing again is beyond our control, but perfect and slow, so that the water is clean before it reaches the aquifer deep below the surface.

As the water sinks, and the land rises, clumps of grass reappear, growing out of the settled floor. Pools and channels form. The channels slowly get cut off from each other, resembling scattered serpents on the woods' floor. The creatures of the river are trapped, and the creatures of the forest come to dine.

This cycle of water runs without us, but we cannot run without it. For the wild journey of the water that happens outside of us, happens inside of us as well. Like the bees, we are servants, not master.

We are not machines. We are more like the river, more like the herons, more like the bees. But we have forgotten. The river does not know what

time it is. The heron does not know what day it is. The bee does not know what month it is. But each knows how to match itself to the rhythms of nature. So do we, if we remember. We can act more like the heron and adjust to fit into the ever-changing natural surroundings. We can act more like the bees, when the time is ripe. We can feel the rhythms in nature and in ourselves.

As I write this, there are deer on the lawn. It's been weeks since I've seen them. Now they appear, following the rhythms of life that bring them once again to the water. They respond to the call of the wild. We too can answer that beckoning voice. Go outside and see. The time is right.

by Kathy Moser, a freelance writer, photographer, songwriter and environmentalist from New Providence

events

April

13 Spring Hike Guided leisurely hike through Norvin Green State Forest to Boy Scout Lake. **Time:** 11 a.m. to 2:30 p.m. **Fee:** Members, \$3; nonmembers, \$4 **Phone:** (201) 835-2160 **Location:** Weis Ecology Center, Snake Den Road, Ringwood

13 Spring Tilling (Also April 20-21) Horse-powered demonstration of plowing, discing or harrowing, depending on weather and soil conditions. **Time:** 1 to 3 p.m. **Fee:** Adults, \$4; seniors and children 6-16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

14 Art and the Environment Learn how composers and artists use their talents to comment on man's use and misuse of the Earth's natural resources, with a panel discussion featuring *New York Times* art critic Vivien Raynor. **Time:** 2 p.m. **Fee:** Free **Phone:** (609) 292-6310 **Location:** New Jersey State Museum Auditorium, W. State Street, Trenton

14 Caroline Foster's Birthday Celebration 18th century games. **Time:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors and children 6-16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

14 Cooking on a Wood Burning Stove (Also April 28, May 12 and 26, and June 9 and 23) Demonstration of historic cooking method. **Time:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3, children 6-16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** The Willows, Fosterfields Living Historical Farm, Kahdena Road, Morristown

14 The Forest and the Critters That Live in Them Celebrate Earth Day with a walk through the Great Swamp, as well as games and crafts to demonstrate the importance of wetlands. **Time:** 11 a.m. to 4 p.m. **Fee:** Free **Phone:** (201) 635-6629 **Location:** Great Swamp Outdoor Education Center, Southern Boulevard, Chatham.

14 Kaleidoscope Kids Family Day Hands-on workshops about Native Americans who lived in New Jersey. **Time:** Noon to 5 p.m. **Fee:** \$2 **Phone:** (609) 292-6308 **Location:** New Jersey State Museum, W. State Street, Trenton

14 Wildlife Sunday Displays, demos, talks, kids' crafts, a birdhouse building contest and bird banding. **Time:** 1 to 5 p.m. **Fee:** \$1 donation **Phone:** (908) 789-3670 **Location:** Trailside Nature & Science Center, New Providence Road, Mountainside

20 Bayfest '96 Seafood festival, crafts, environmental exhibits, boat show, children's activities and entertainment. **Time:** 11 a.m. to 5 p.m. **Fee:** Free **Phone:** (609) 927-5253 **Location:** Bay Avenue, Somers Point

20 Explorer Hike Seven to nine-mile hike along the Paulinskill Valley Trail and Sussex Branch Trail. **Time:** 10 a.m. **Fee:** Free **Phone:** (908) 852-0597 **Location:** Routes 519 and 626, near Newton

20 Festival of the Skies Features things that fly, including kites, remote control airplanes, frisbee golf, astronomy exhibits and more. **Time:** 11 a.m. to 4 p.m. **Fee:** Free **Phone:** (908) 842-4000 **Location:** Dorbrook Recreation Area, Route 537, Colts Neck



CALL FOR ENTRIES

NJO 1996

Photo Contest

See page 1
for details



Win a Camera

20 19th Century Village Market Day Crafts from the 1830s. **Time:** 10 a.m. to 4 p.m. **Fee:** \$3 for parking **Phone:** (908) 938-2253 **Location:** Allaire State Park, Route 524, Farmingdale

21 Earth Day Festival Entertainment, games, vendors, crafts and tours of the Atlantic County Utilities Authority's recycling operation and wastewater treatment facility **Time:** 10 a.m. to 4 p.m. **Fee:** Free **Phone:** (609) 646-5500 **Location:** Atlantic County Utilities Authority, Delilah Road, Egg Harbor Township

21 An Introduction to Sporting Firearms For women to learn about shooting sports, including how to choose and fit a shotgun, safe handling and proper sighting-in. **Time:** Call for information **Fee:** \$20 **Phone:** (609) 259-8692 **Location:** Pennsville

21 Canoe Trip Bring your own canoe. **Time:** 10 a.m. **Fee:** Free **Phone:** (201) 770-1625 **Location:** Blairstown Elementary School, Blairstown

25 1996 Spring Symposium Ellen Myers of Somerset County Parks Commission will speak and show slides on Victorian estate gardens. **Time:** 9:30 a.m. **Fee:** \$15 **Phone:** (201) 539-2016 **Location:** New Jersey Historical Garden Foundation, Jockey Hollow Road, Morristown

27 Dino Safari A traveling museum on dinosaurs. **Time:** 11 a.m. **Fee:** \$4 **Phone:** (201) 460-8300 **Location:** Hackensack Meadowlands Development Commission Environment Center, DeKorte Park Plaza, Lyndhurst

28 Marsh Madness: A Community Celebration Tours, talks, walks, activities, exhibits, food, music and entertainment for nature lovers, sponsored by Delaware and Raritan Greenways. **Time:** All day **Fee:** Members, \$2; nonmembers, \$4 **Phone:** (609) 452-0525 **Location:** Hamilton/Trenton Marsh, Hamilton

28 Outdoor Adventure Expo Exhibits of equipment and clinics on various outdoor sports, including camping, canoeing, rock-climbing, mountain biking, kayaking and caving. **Time:** 10 a.m. to 3 p.m. **Fee:** Free **Phone:** (908) 842-4000 **Location:** Turkey Swamp Park, Georgia Road, Freehold Township

May

4 Chikahoki Falls Hike Guided moderate hike through Norvin Green State Forest. **Time:** 10 a.m. to 1 p.m. **Fee:** Members, \$3; nonmembers, \$4 **Phone:** (201) 835-2160 **Location:** Weis Ecology Center, Snake Den Road, Ringwood



4 Gardener's Day Perennials, herbs and small trees for sale, as well as advice from horticulturists. **Time:** 10 a.m. to 5 p.m. **Fee:** Free **Phone:** (908) 842-4000 **Location:** Deep Cut Gardens, Red Hill Road, Middletown

4 Spring Invitational Antique Show and Sale **Time:** 9 a.m. to 4 p.m. **Fee:** Adults, \$3; children under 12, free **Phone:** (908) 938-2253 **Location:** Fire Company No. 1, Atlantic Avenue and Route 34, Wall

4-5 Kite Days Spring farm festival, apple blossom tour, wagon rides, pony rides, food, music, kite making and flying. **Time:** Call for information **Fee:** \$5 **Phone:** (609) 924-2310 **Location:** Terhune Orchards, Cold Soil Road, Princeton

5 1830s Militia Muster and Game and Amusements Village's militia and games played by children and adults of Howell Iron Works Company. **Time:** 1 to 4 p.m. **Fee:** \$3 for parking **Phone:** (908) 938-2253 **Location:** Allaire State Park, Route 524, Farmingdale

5 Pet Fair Displays, demonstrations, vendors, face painting and a stray pet contest. **Time:** 1 to 5 p.m. **Fee:** Donations requested **Phone:** (908) 789-3670 **Location:** Trailside Nature & Science Center, New Providence Road, Mountainside

5 Sunrise Run-Bike-Run A transition race of a 4-mile run, a 13-mile bike race and another 4-mile run through Long Branch, Monmouth Beach and Sea Bright. **Time:** 8 a.m. **Fee:** Participants, \$20; spectators, free **Phone:** (908) 542-1642 **Location:** Seven Presidents Oceanfront Park, Ocean Avenue, Long Branch

Events

5 Wildflowers Discussion and slide presentation by Chris Petty, horticulturalist and naturalist, on spring flowers of the area. **Time:** 2 p.m. **Fee:** Free **Phone:** (201) 635-6629 **Location:** Great Swamp Outdoor Education Center, Southern Boulevard, Chatham.

11 Sheep Shearing Turn-of-the-century hand shears will be used to shear sheep. **Time:** 10 a.m. to 3 p.m. **Fee:** Adults, \$4; seniors and children 6-16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

11 Spring Flower Walk Along the Paulinskill Valley Trail. **Time:** 10 a.m. **Fee:** Free **Phone:** (908) 852-0597 **Location:** Routes 519 and 626, near Newton

11 Spring Invitational Festival of Fine Arts & Crafts Merchandise on display and for sale. **Time:** 10 a.m. to 4 p.m. **Fee:** Adults, \$2, children under 12, free **Phone:** (908) 938-2253 **Location:** Allaire State Park, Route 524, Farmingdale

11 27th Annual Manasquan River Canoe Race An eight-mile race with categories including solo, men's tandem, women's tandem, family tandem and kayaking. **Time:** 8 a.m. **Fee:** Participants, solo, \$13; tandem, \$26; spectators, free **Phone:** (908) 842-4000 **Location:** Howell Park Golf Course, Preventorium Road, Howell Township

11-12 Carving and Wildlife Art Show and Sale More than 50 artists display and sell wood carvings, paintings, sculptures, etchings and drawings of North American wildlife. **Time:** 10 a.m. to 5:30 p.m. **Fee:** Free **Phone:** (908) 766-2489 **Location:** Somerset County Park Commission Environmental Education Center, Lord Stirling Road, Basking Ridge



11-12 Wool Days An old-fashioned demonstration of sheep shearing and border collies. **Time:** Noon to 3 p.m. **Fee:** Free **Phone:** (908) 842-4000 **Location:** Longstreet Farm, Longstreet Road, Holmdel

12 Annual Pine Creek Railroad's Model Railroading Day See model railroads and accessories. **Time:** Noon to 4 p.m. **Fee:** Free **Phone:** (908) 938-5524 **Location:** Pine Creek Railroad, Allaire State Park, Route 524, Farmingdale

12 Horse Ride Ride your own horse along the Paulinskill Valley Trail. **Time:** Call for information **Fee:** Free **Phone:** (908) 725-9649 **Location:** Call for information

12 Mother's Day Giveaway Get a free bag of cornmeal or flour during a visit to the mill. **Time:** 10 a.m. **Fee:** Donations accepted **Phone:** (908) 879-5463 **Location:** Cooper Gristmill, State Route 24, Chester

16-18 Paperweight Collectors Weekend Paperweight artists exhibit their work. **Time:** 10 a.m. to 5 p.m. **Fee:** Adults, \$6; seniors, \$5.50; students, \$3.50 **Phone:** (800) 998-4552 **Location:** Wheaton Village, Glasstown Road, Millville

17-19 New Jersey American Indian Center 11th Annual Pow Wow Native American culture, song, dance, food and crafts. **Time:** 9 a.m. to 9 p.m. (May 17); 10 a.m. to 10 p.m. (May 18); 10 a.m. to 6 p.m. (May 19) **Fee:** Adults, \$7; seniors, \$4; children 5-12, \$3 **Phone:** (908) 525-0066 **Location:** Ice Arena, Old Bridge Plaza, Old Bridge

17-19 Quilting Show Quilts on display; supplies, quilted items and refreshments. **Time:** 10 a.m. to 5 p.m. (May 17 and 18); 10 a.m. to 4 p.m. (May 19) **Fee:** \$5 **Phone:** (908) 842-5966 **Location:** Poricy Park, Oak Hill Road, Middletown

18 Maying at the Mill Plants, herbal crafts, afternoon tea and lecture by Dirdre Larkin of the Association for Horticulture at the Cloisters. **Time:** 10 a.m. to 4 p.m. **Fee:** \$12.50 **Phone:** (908) 782-7054 **Location:** Prallsville Mill, Route 29, Stockton

18 25th Anniversary Celebration of Chester Historical Society Historic craft demonstrations, antique appraisals and discussions, book signings, artists and children's events. **Time:** Call for information **Fee:** Donations accepted **Phone:** (908) 879-5463 **Location:** Cooper Gristmill, State Route 24, Chester

19 Garden Fair Plant sale and workshops by the Union County Master Gardeners. **Time:** Noon to 5 p.m. **Fee:** Free **Phone:** (908) 789-3670 **Location:** Trailside Nature & Science Center, New Providence Road, Mountainside

19 Thompson Park Day Arts and crafts sale, pony and wagon rides, entertainment, a pee wee run, food, a snake show, a climbing wall, demonstrations and more. **Time:** 11 a.m. to 5 p.m. **Fee:** Free **Phone:** (908) 842-4000 **Location:** Thompson Park, Newman Springs Road, Lincroft

23 Dusk Hike A night hike. **Time:** 8:30 to 10 p.m. **Fee:** Members, \$3; nonmembers, \$4 **Phone:** (201) 835-2160 **Location:** Weis Ecology Center, Snake Den Road, Ringwood



25 Millstone Dressing Millstones are taken apart and sharpened. **Time:** 1 p.m. **Fee:** Donations accepted **Phone:** (908) 879-5463 **Location:** Cooper Gristmill, State Route 24, Chester

25-27 Annual Spring Juried American Indian Arts Festival 150 Native American artists and entertainers. **Time:** 11 a.m. to 6 p.m. **Fee:** Adults, \$7; seniors and children, \$3; children under 6, free **Phone:** (609) 261-4747 **Location:** Rankokus Indian Reservation, Rancocas Road, Westampton

25-27 New Animal Weekend New-born and newly acquired farm animals on display. **Time:** 10 a.m. to 3 p.m. **Fee:** Adults, \$4; seniors and children 6-16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

27 Exhibits at the CRRNJ Terminal (Through Sept. 2) Exhibits depicting transportation and immigration history, as well as the history of Hudson County. **Time:** 10 a.m. to 5 p.m. **Fee:** Free **Phone:** (201) 915-3411 **Location:** Liberty State Park, Jersey City

June

1 Bear Fair Fair with a nature theme. **Time:** 10 a.m. to 3 p.m. **Fee:** \$10 per car **Phone:** (908) 766-5787 **Location:** Scherman-Hoffman Sanctuary, Hardscrabble Road, Bernardsville

1 Black Powder Day Colonial period military demonstration and discussion. **Time:** 1 to 4 p.m. **Fee:** Donations accepted **Phone:** (908) 879-5463 **Location:** Cooper Gristmill, State Route 24, Chester

1 National Trails Day Celebration Activities at the Paulinskill Valley Trail. **Time:** 10 a.m. **Fee:** Free **Phone:** (908) 852-0597 **Location:** Footbridge Park, Route 94, Blairstown

1 Nature Crafts Design two different crafts and learn the origins and stories behind them. **Time:** 1 to 4:30 p.m. **Fee:** Members, \$4; nonmembers, \$5 **Phone:** (201) 835-2160 **Location:** Weis Ecology Center, Snake Den Road, Ringwood

1 South Jersey Canoe & Kayak Show More than 100 canoe and kayak models; free test paddling clinics, antique canoes and races. **Time:** 10 a.m. to 4 p.m. **Fee:** Free **Phone:** (609) 971-3085 **Location:** Ocean County Park, off Route 88, Lakewood

8 Bike Touring A slide presentation on the best places to tour by bike. **Time:** 2 p.m. **Fee:** Free **Phone:** (201) 635-6629 **Location:** Great Swamp Outdoor Education Center, Southern Boulevard, Chatham

8 Get Ready Metric Century A 50- to 100-kilometer bicycle race through rolling hills and flat land. **Time:** 8 a.m. **Fee:** Pre-registration, \$12; at door, \$15 **Phone:** (609) 848-6123 **Location:** Fort Mott State Park, Pennsville

8-9 Free Fishing Days Fish public waters of New Jersey without a license or trout stamp. Also free fishing classes offered at Pequest Fish Hatchery and Natural Resource Education Center in Oxford. **Time:** All day **Fee:** Free **Phone:** (908) 637-4125 **Location:** Statewide

9 Bluebirds A slide presentation and discussion by Blain Rotherhauser about eastern bluebirds in the state. **Time:** 2 p.m. **Fee:** Free **Phone:** (201) 635-6629 **Location:** Great Swamp Outdoor Education Center, Southern Boulevard, Chatham

14 Spring Stargazing Enjoy the night sky and learn about the spring stars. **Time:** 8:45 to 9:45 p.m. **Fee:** Members, \$2.50; nonmembers, \$3 **Phone:** (201) 835-2160 **Location:** Weis Ecology Center, Snake Den Road, Ringwood



15-16 Civil War Encampment & Battle Reenactment Civil War period displays, exhibits and locomotive chase and battle. **Time:** 10 a.m. to 4 p.m. **Fee:** \$3 for parking **Phone:** (908) 938-2253 **Location:** Pine Creek Railroad, Allaire State Park, Route 524, Farmingdale

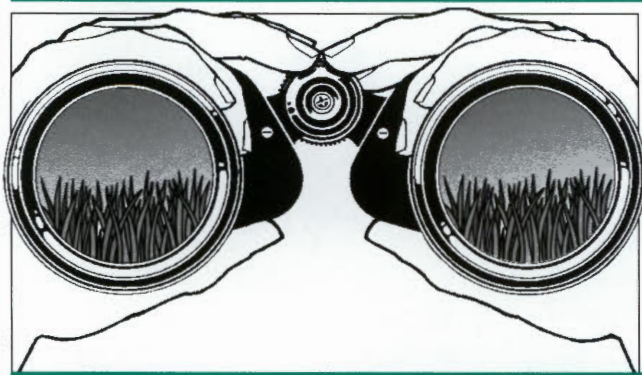
15 South Jersey Traditional Small Boat Festival and Sneakbox Rendezvous Bring your own traditional craft and swap with others. **Time:** 10 a.m. to 5 p.m. **Fee:** Free **Phone:** (609) 971-3085 **Location:** Berkeley Island County Park, off Route 9, Bayville

22 Beginning Spelunking Explore three caves. **Time:** 9 a.m. to 5 p.m. **Fee:** Members, \$7; nonmembers, \$9 **Phone:** (201) 835-2160 **Location:** Weis Ecology Center, Snake Den Road, Ringwood

22 Hike Along the Paulinskill Valley Trail. **Time:** 10 a.m. **Fee:** Free **Phone:** (908) 852-0597 **Location:** Routes 519 and 626, near Newton

23 Abolitionism in the 1830s Reenactment of an anti-slavery demonstration at the Howell Iron Works Company Village. **Time:** 1 to 4 p.m. **Fee:** \$3 for parking **Phone:** (908) 938-2253 **Location:** Allaire State Park, Route 524, Farmingdale

30 Independence Day, 1835 Recreation of holiday at Howell Iron Works Company Village. **Time:** Noon to 4 p.m. **Fee:** \$3 for parking **Phone:** (908) 938-2253 **Location:** Allaire State Park, Route 524, Farmingdale



Explorer

Hey, Explorer!

Build a "Garden State"

New Jersey became known as the "Garden State" largely because of its rich agricultural history. Today, you have an opportunity to add to that heritage through gardening. Imagine transforming a vacant lot into a green oasis with the help of your neighborhood friends and family.

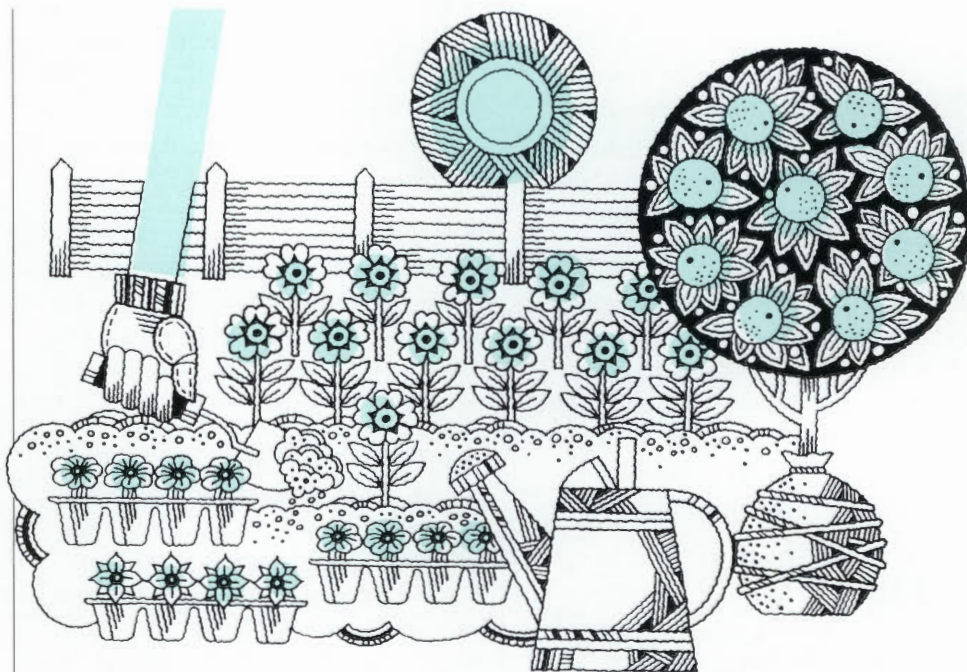
Whether you live in the city, the suburbs or the country, you can play a special role in your neighborhood. Growing and caring for plants, including flowers, vegetables, herbs, shrubs and fruit trees, provide hours of after school fun. And there are many other benefits, including:

■ **Beautifying the Neighborhood.**

Gardening helps improve the area where you live and allows you to help your community.

■ **Caring for Living Things.**

You can learn how to grow and care for plants. You also can discover more about science and nature and how you are connected to the earth.



■ **Finding a Safe Place to "Hang Out."**

The garden is a great place to meet new friends and to talk about things that are important to you.

■ **Learning Success.**

When your plants grow and flourish, you can share your accomplishments with others, including the fruits (or vegetables) of your labor.

For more information about urban gardening projects, call Isles Greening Program at (609) 393-5656. To learn more about many different types of gardens, read "A Piece of Paradise in Morris County" on page 16.

by Marvin Ross of the Department of Environmental Protection's Environmental Education Unit and Lisa Muentener, project coordinator for the Environmental Education Unit at Isles, Inc.

Protecting Plants with . . . Plants

When planting a vegetable garden outdoors, beware of pesky pests that may devour your precious produce. But before you reach for a can of pesticide, here are a few tips to naturally repel bugs.

■ Some insects, when given a choice, will feed on one plant over another. Therefore, plant their favorites next to your favorite vegetables (such as radishes near corn and dill near tomatoes) to protect them from bugs.

■ Some plants have the ability to repel certain insects. You can plant garlic next to vegetables (or roses) to fend off Japanese beetles, aphids, vegetable weevils and spider mites; basil helps ward off tomato horn worms; and marigolds, planted near such vegetables as zucchini and cucumbers, discourage cucumber beetles.

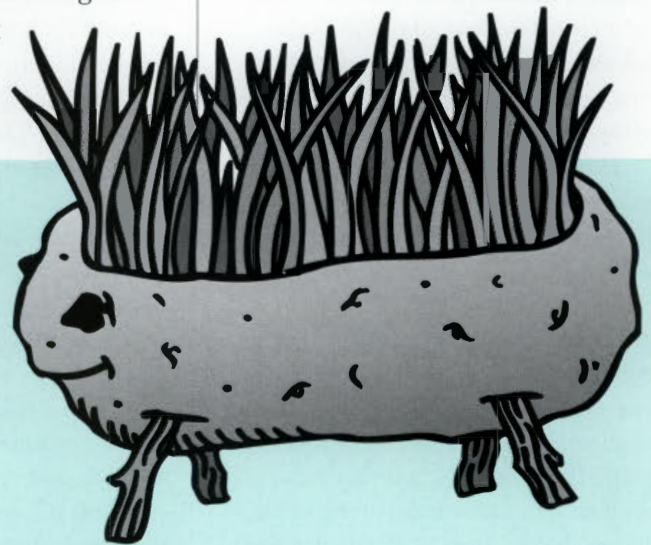
■ Rotate your vegetables to reduce the pest infestation from year to year. Many bugs will lay their eggs in the fall and feed upon the same vegetable when they hatch in the spring. If the vegetable is located a few feet away, they will have to crawl to the plants and may become prey for birds and other insects along the way.

■ Mix up your garden. Instead of planting vegetables in a straight row, intermingle different plants. That way, insects will not have a feast spread out before them; making them search for their favorite vegetable may discourage them from eating it.



A Potato Porcupine

Not only can you garden outdoors, but indoors as well. Here is a simple activity you can try when the weather is still too cold for outdoor planting.



You will need:

- ☐ A large potato
- ☐ Twigs or toothpicks
- ☐ Two whole cloves
- ☐ Grass seed
- ☐ Soil
- ☐ A spoon

1. Use the spoon to hollow out one side of a potato.
2. Fill the hole with soil and sprinkle grass seed in it.
3. Stick twigs or toothpicks on opposite sides of the potato to make legs.
4. Position the cloves for eyes.
5. Keep the soil moist and, in a few days, you will see the porcupine sprout its quills. In about two weeks, it will look really fluffy.
6. You can create other types of "fuzzy" animals by using more than one potato, by adding more twigs or by digging several planting holes in the potato.

Wildlife in New Jersey

The Red What?

On a warm fall day, a salamander larva makes its way to the shore of a quiet pond. It has spent most of the spring and all summer feeding and growing in the still waters and now is ready to make a dramatic change in appearance, one of several it will undergo throughout its lifetime. Not only will the larva's body change, but so will its name. The red-spotted newt larva transforms into the red eft.

Until its life cycle was understood, the red-spotted newt and the red eft were thought to be two entirely different species of salamander. It now is known that the terrestrial (land dwelling) red eft is actually the sub-adult, or juvenile stage, of the red-spotted newt.

When the larval newt changes into the red eft, it loses its gills and develops lungs for breathing air. The dull brown coloration becomes a brilliant red to red-orange with a yellow underside. It may be speckled with several small, deep red spots surrounded by black circles.

This brilliant new coloring makes the red eft very easy to see. Yet this brightness provides it with protection by warning predators that the red eft's skin is toxic and distasteful. The skin produces toxins that burn and irritate the membranes of would-be predators. These toxins even are capable of killing small animals. Because of this special adaptation, the red eft, unlike other salamanders, can wander about safely during the daytime. Most salamanders stay hidden until the cover of night.

The red eft is not without enemies, however. Skunks are known to rip apart a red eft to feed on its innards, avoiding the toxic skin.

The eft lives in moist forests of old growth trees, particularly preferring hemlock groves. It is most often seen during or after rains, for it seems to like both high humidity and daylight hours. For one to three years, it prowls the

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forest in search of food such as worms, slugs, spiders and small insects.

After its time as a land-dwelling salamander, the red eft makes yet another change in its appearance. The rough, dry skin of the eft becomes smooth and slippery, similar to the larval stage. This smooth skin allows oxygen to be absorbed from the water. The bright red color changes back to a dull olive to dark green. To aid it in swimming, the tail grows broader and flatter to act as a rudder.

The eft now is ready to return to the quiet pond in which its life began as an egg. Here it will live out the rest of its life and be known as an adult red-spotted newt.

Adult red-spotted newts are active most of the year and often are seen swimming beneath the ice of ponds and streams. They consume a variety of aquatic invertebrates such as worms, small snails, small amphibians and their eggs. They actively may seek out the spawning sites of fish to feed on their eggs as well. Newts may grow to a length of four inches or more, while efts are much smaller.

Red-spotted newts/efts range from central Georgia and Alabama,

northward to southern Canada and as far west as the Great Lakes. Adults seek still waters such as ponds, shallow lakes, marshes and quiet streams. Clean water with lots of submerged vegetation is preferred.

The reproductive cycle of the red-spotted newt begins in the spring with an elaborate courtship ritual performed in water. In preparation for the courtship, the hind legs of the male newt become enlarged, and black horny structures appear on the inner thighs and tips of the toes. These enable the male to better grip the female during their courtship.

When male and female are ready, the male will seize the female and a ritual of swimming, clasping and tail-fanning takes place. The male stimulates the female by stroking her with his chin and cheeks. Fertilization is internal, but only after the female picks up the spermatophore with her reproductive vent from the pond bottom where the male has deposited it.

The red eft/red-spotted newt is an amphibian. As such, it plays a vital role in its ecosystem by eating insects and other small animals. It is sad to note, however, that many of our amphibians are slowly disappearing. While depletion of the ozone layer is suspected of affecting the reproduction of various species, it is pollution and the destruction of wetlands and woodlands that most threaten the survival of the red-spotted newt.

by Carole Skwarek, a naturalist at the Division of Fish, Game and Wildlife's Pequest Trout Hatchery and Natural Resource Education Center





A fox prowls the beaches at Island Beach State Park. To find out about the impact foxes are having on coastal habitat, see the summer issue of *New Jersey Outdoors*.

Coming Soon

Foxes: Friend or Foe?
Exploring Historic Graveyards
A Camp on Your Back
The Huddled Masses of Ellis Island
Canoe Sedge Islands
Survival Trek Through the Pine Barrens
Preserving Your Trophy
Pump Up for Blowfish