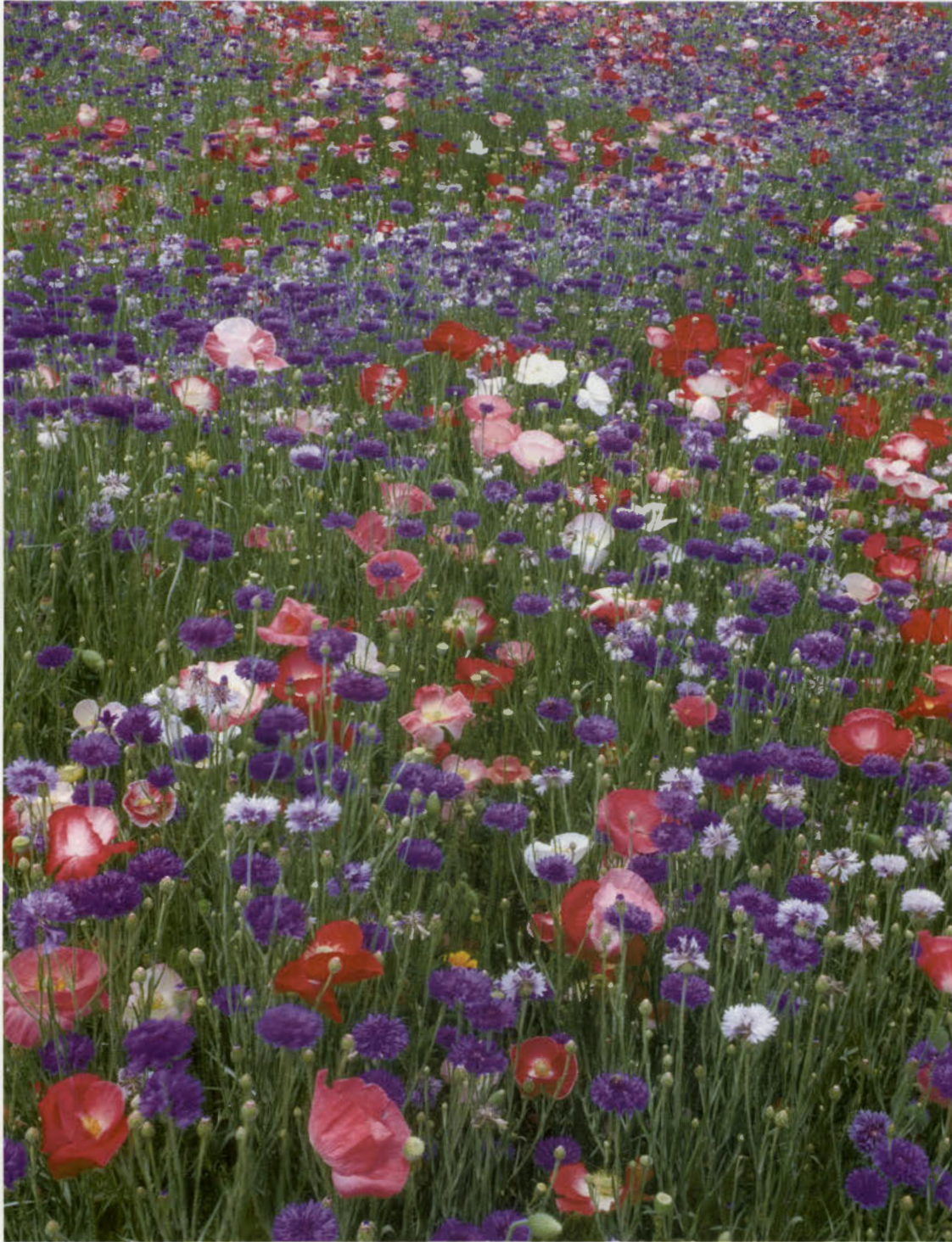


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# NEW JERSEY Outdoors

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Summer 1996



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New Jersey's Jurassic Park • Sedge Island Canoe Trips • Coastal Foxes  
Restoring the Natural Environment • The Immigration Triangle  
Backpacking Garden State Trails • Pump Up for Blowfish

The least tern and her chick are being threatened by foxes along the Jersey coast. Learn about efforts to save these rare birds from this predator in "Crafty Critters of the Barrier Islands," on page 32.



© CLAY MYERS

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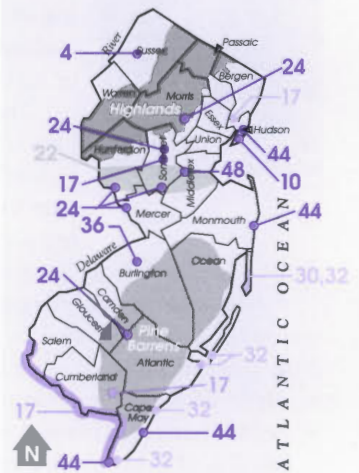
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**Front:**  
Wildflowers at Ortho-McNeil Pharmaceuticals in Somerset County have proven to be environmentally and economically beneficial. For more information on other projects to restore natural ecosystems, see "Turning Back Time" on page 17.  
© Photo by Charles St. Charles III

**Back:**  
© Photo by Robert Birdsall

# Editorials



Christine Todd Whitman, Governor

## Restoring the Natural Environment

Environmental restoration is a new field of ecology that creates or reconstructs damaged ecosystems. Through the use of this method, we can reclaim our natural heritage throughout the state and recycle unused property into productive open space.

The Estuary Enhancement Project, a cooperative effort between the Department of Environmental Protection and Public Service Electric & Gas (PSE&G) Company, is one case in point. The result of the need to balance energy requirements with the natural surroundings of the power plants, this plan calls for the preservation of 20,000 acres of the Delaware River Estuary.

A new water intake system at PSE&G's Salem Generating Station will reduce the number of fish killed when water is taken in the plant, and new fish ladders will help game fish species, such as weakfish and striped bass, reach spawning grounds on South Jersey rivers. In addition, converted salt hay farms once again will become homes for native plants and wildlife.

But this plan is only one of several efforts throughout the state. In South Jersey, a former mining operation has fallen silent; in its place four dozen rare and endangered plant and animal species, such as the joint vetch, the pine snake, the dotted skipper butterfly and the bald eagle, have found a home. Even a Central Jersey pharmaceutical company has found it more economically and environmentally beneficial to convert vast landscaped lawns into natural wildflower fields, creating an explosion of color and a home for birds in Somerset County.

In this heavily populated state, these projects and others have found a way to create new open space. Environmental restoration projects create breathing room for residents and new homes and refuges for our natural neighbors.



Robert C. Shinn, Jr., Commissioner

## Partners in Ecosystems Management

The Department of Environmental Protection has created a partnership with academia, government, private and non-profit groups in order to build a better environment for the future of this state.

Called the New Jersey Ecological Research Partnership, this group will provide a directory of environmental research to assist in developing solutions to the state's environmental needs. This collaboration will allow us to share information and build a consensus for decision making based on solid scientific information. As a result of this exchange, we can develop an efficient and effective environmental master plan to chart a course for the future of New Jersey.

Our first symposium led to the creation of a source book of research material on the Pinelands ecosystem. This guide, developed by scientists, local stakeholders, industry representatives and other interested parties, may be the first step for joint research projects, the development of habitat loss indicators and an impact assessment of water withdrawals from the Kirkwood-Cohansey aquifer.

We have used this same comprehensive approach to study the Highlands and hope to expand this blueprint for ecosystem management to other areas of the state in the future.

These efforts would not be possible without our "partners"—The Association of New Jersey Environmental Commissions, Rutgers University, The Nature Conservancy, U.S. Geological Survey, Princeton University, American Cyanamid Company, New Jersey Water Resources Research Institute, David Sarnoff Research Center, Trenton State College, Ramapo College, Stony Brook-Millstone Watershed Alliance and the Pinelands Commission. We invite other scientists, information gatherers and organizations to join our quest to identify, monitor and develop technological solutions to meet our goal of environmental protection.

State of New Jersey  
Christine Todd Whitman  
Governor



Department of Environmental Protection

Robert C. Shinn, Jr.  
Commissioner

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**New Jersey Outdoors**  
Summer 1996, Vol. 23, No. 3

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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**New Jersey Outdoors** (USPS 380-520) is a subscriber-supported magazine published by the New Jersey Department of Environmental Protection on a quarterly basis (Spring, Summer, Fall, Winter). Second-class postage is paid at Trenton, N.J. Subscriptions are \$15.00 for one year and \$26.00 for two years payable by check or money order to: **New Jersey Outdoors**, NJDEP, Bureau of Revenue, CN 417, Trenton, N.J. 08625-0417. Single issues, if available, cost \$4.25. **New Jersey Outdoors** welcomes photographs and articles but will not be responsible for loss or damage. No part of the contents of this magazine may be reproduced by any means without the consent of **New Jersey Outdoors**. Telephone: Circulation and Editorial: 609-984-0364; Subscriptions: 1-800-645-0038.

**POSTMASTER:** Send address changes to Editorial Office, **New Jersey Outdoors**, NJDEP, CN 402, Trenton, N.J. 08625-0402. Send old and new addresses and the zip code numbers. The Post Office will not forward copies unless forwarding postage is provided by the subscriber. Allow eight weeks for new subscriptions and change of address to take effect.

The views and opinions of authors do not necessarily represent the opinion or policies of the Department of Environmental Protection or the State of New Jersey.

**New Jersey Outdoors** is printed with soy ink on recycled paper that includes at least 10 percent post-consumer waste.

# Mailbox

## It's No Bull

I was just thumbing through some back issues of *NJO* and came upon an article by Ben Van Vliet in the May/June 1984 edition entitled "Eric: Hooked on Fishing." The article is about the exploits of Eric Avogardo and his love of fishing. Of particular interest was a list of New Jersey state freshwater fish records held by Eric. His records include rock bass, white perch, pumpkinseed sunfish and brown bullhead.

The record as listed for the brown bullhead was two pounds, one ounce, and it was caught in 1983 in the Passaic River. I have enclosed a copy of the August 1967 issue of *NJO*, "Record Brown Bullhead," which lists Robert Dorf as the state record holder with a 22-pound, 15-ounce fish he caught in Spring Lake on May 13, 1966.

His record was listed as the state record for several years in *NJO* until the 1984 issue when Eric's story appeared. The big question is, what happened to Mr. Dorf's record? Please check out this fishy story and let your readers know the facts.

Frank Bunday  
Union

*Editor's Note: The Division of Fish, Game and Wildlife says Robert Dorf's catfish had been identified as the wrong species. Dorf's was a channel catfish. Incidentally, the record for the brown bullhead now is held by Matt Angeles of Scotch Plains, who caught a three-pound, six-ounce specimen in the South Branch of the Raritan River.*

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

■ **A Cruising Guide to New Jersey Waters**, by Captain Donald Launer, published by Rutgers University Press, is a unique guide to boating on the state's east coast. This book provides information on navigation, anchorages, marinas, weather and shore-side activities, as well as safety tips and stories of maritime adventures from the past. Available for \$25.95 at local bookstores or from the publisher at 800/446-9323.

■ **The Century Plan**, published by the Trust for Public Land, is a plan for preserving 100 natural, scenic and recreational sites in the Barnegat Bay Watershed in Ocean County. Available for \$10 from the publisher at 201/539-9191.

■ **Discover the Hidden New Jersey**, by Russell Roberts, is a treasure trove of New Jersey stories that celebrate the unique heritage and importance of the Garden State. Available for \$18.95 at local bookstores or from the publisher at 800/446-9323.

■ **Gateway: A Visitor's Companion**, by John T. Tanacredit, Ph.D. with Curtis J. Badger, published by Stackpole Books, is a handbook on the national park that lies in New York and New Jersey. This book includes descriptions and illustrations of the plants, fish, amphibians, reptiles and birds that call the park home. Available for \$14.95 at local bookstores or from the publisher at 800/732-3669.

■ **Lifebirds**, by George Levine, published by Rutgers University Press, is a memoir on bird watching. From cranes to swifts to yellow throats to turtle doves, each chapter discusses how birds are entangled with the most ordinary and most important aspects of our lives. Available from \$24.95 at local bookstores or from the publisher at 800/446-9323.

■ **A Naturalist Along the Jersey Shore**, by Joanna Burger, published by Rutgers University Press, is a series of personal essays that intertwine the lives of a naturalist and wild creatures at the ever-changing edge of the ocean and land. Among the topics discussed are the mating dance of the fiddler crab, the dangers facing piping plovers, the swarming fish communities in the bays and estuaries, the trilling notes of Fowler's toads and the subtle green-gray of salt marsh. Available for \$18.95 at local bookstores or from the publisher at 800/446-9323.

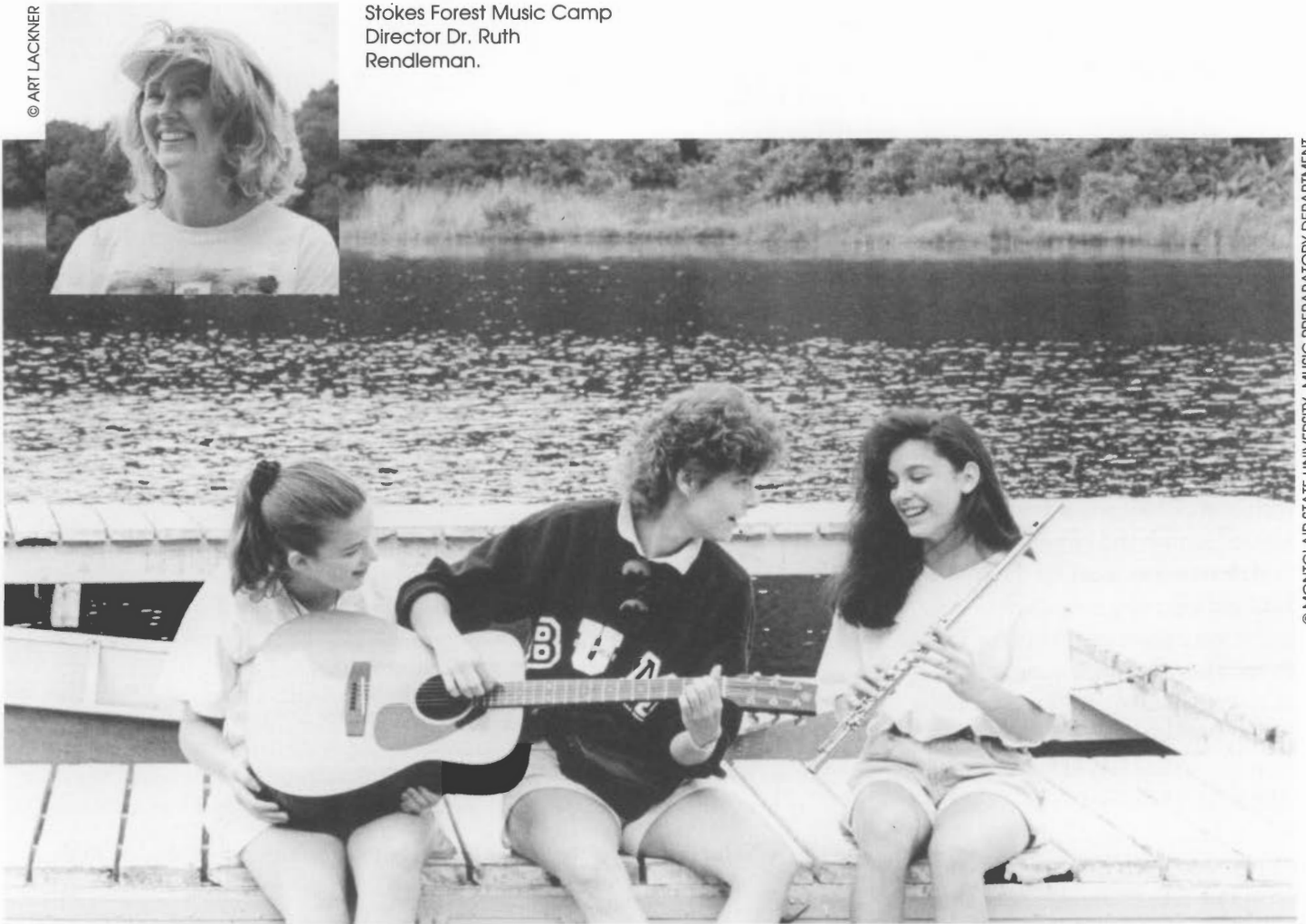
■ **NY-NJ Harbor Estuary Program (HEP)/New York Bight Restoration Plan Comprehensive Conservation and Management Plan** is a comprehensive plan for managing this unique ecosystem. The report contains more than 300 actions to protect water quality, living resources and habitats of the harbor area and the bight, as well as a draft monitoring plan using 35 environmental indicators. Available free from the DEP Division of Science and Research at 609/292-1895.

■ **Smile: A Picture History of Olympic Park, 1887-1965**, by Alan A. Siegel, published by Rutgers University Press, is a book that chronicles the evolution of Olympic Park, one of New Jersey's most beloved amusement parks, in Irvington. Take a cultural journey from its beginnings as a den of hedonism and intoxication in the 1880s to Essex County's most popular family entertainment in the 1950s and 1960s. Available for \$19.95 at local bookstores or from the publisher at 800/446-9323.

## 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 800/645-0038.

Stokes Forest Music Camp  
Director Dr. Ruth  
Rendleman.



Students practice with instructor Marla Meissner at the water's edge.

# *The Hills are Alive with the Sound of Music*

by Art Lackner

What's that sound from across the lake?  
It's a bird! It's a crane! It's a flute!  
A flute?

Well, if you happen to be strolling through Stokes State Forest this summer, it very well might be. For two weeks each July, the sounds of forest creatures and classical instruments mingle in the mountain air. And the result is a natural, enchanting blend.

The Stokes Forest Music Camp began four years ago with the arrival of Ruth Rendleman, Ph.D. — Music Preparatory Director at Montclair State University — and her flock of super musicians.

Camp is held at the New Jersey School of Conservation, nestled within the Sussex County forest. Here students enthusiastically hone their musical skills while developing a keen appreciation for the natural world.

And the result is magic.

Take the case of the nature song titled "To Be Wild."

Last year, inspired by the song, instructor Marla Meissner and her students set up different environments of sound.

Canoes sit high and dry as campers choose practice over recreation.

Violins, trumpets, flutes, even the kitchen staff on pots and pans, created a veritable orchestra. One set of instruments, through its unique sound, would send out a call (similar to a bird or coyote in nature), and a different group would respond. An accompanying text, or message, was read over the call and response sequence.

A piece called "Warriors of the Rainbow," created by Montclair's own Ting Ho, Ph.D, provided another unique marriage. Based on a Lenape legend, the piece began with the harmonious tribal life of the Lenapes, followed by the desecration of the environment when the Lenapes were forced to leave, and ended with a group of warriors from different backgrounds returning to make things right again. Through their instruments, the students focused on various emotions at different points in the text.

"When you were at the peaceful stage, there was less activity, a little more tonal," relates Meissner, an adjunct professor from Montclair State University and assistant director of the music camp. "When the devastation started to occur, you got more dissonance, more driving rhythm, and then with the promise of everything working out, more tonal, reminiscent of the beginning."

As part of their private lessons, Meissner says, students often sit quietly outside and listen to the birds or the rustling wind. Then they'll try to respond, or imitate, the particular sound.

"At first, they think it's kind of weird," she laughs, "but later become interested in the aural environment created."

## *The Music of the Mountains*

Music classes and lessons are taught primarily by Montclair State staff, who double as camp counselors. Personnel from the School of Conservation, which is affiliated with the university, conduct the environmental side of the curriculum.

The camp accepts 35 to 40 students each summer, who range in age from 10 to 18. There is a fee, but Rendleman says 75 percent of the students receive partial to full scholarships, based on need. The New Jersey School of the Arts recruits students and provides funding through school districts.

"Many of these kids are from the inner cities," says Rendleman. "While they all start out as 'decent' musicians, for some, this is their first exposure to the wilderness. But they learn quickly and, in just two weeks, make incredible progress, both musically and in their environmental knowledge."

John Kirk, Ph.D., director of the School of Conservation, sees long range benefits to this two-pronged program. "When Ruth came to me with her dream of a music camp, I suggested the environmental dimension. Ruth was so enthusiastic and responsive, it was just wonderful. Through their artistic skills, these kids can create something beautiful in their music with an environmental message. They can reach thousands of people."

Kirk also sees a positive effect on his staff. "We are working



© ART LACKNER

Outside one of the sleeping cabins, music teacher Mary Catherine Edwards works with campers.



© ART LACKNER

with children with an artistic orientation and, therefore, must adopt a more aesthetic approach to get our message across. Science can be scary, and with these kids, we try to use a softer approach. So it's a learning experience for us, too."

### *From Mozart to Mountain Climbing*

Campers divide their day among a variety of activities, with the heaviest emphasis on music. They practice, compose, perform in chamber ensembles, attend private lessons and practice some more. Between breakfast and mid-afternoon, they do little else. And they love it.

Consider this scene: at the camp is a clear mountain lake surrounded by cattails and pine trees. It's 2 p.m., 85 degrees, and the sky is cloudless. The campers have free time to spend boating, swimming or, if they choose, practicing their instruments. Well, believe it or not, on any given day, most youngsters will practice.

Environmental classes begin late in the afternoon. Over the two weeks, campers are taught about forestry, water ecology, wildlife, atmosphere, climatology and more. Kirk's staff conducts long hikes, teaching primarily in the field.

Inner city and suburban kids often are amazed and thrilled by the sight of deer, raccoons, opossums and even black bears in the woods. Last summer, a doe and her two fawns were regular visitors to the camp, coming as close to the children as domestic pets.

Country kids are equally impressed. Shaughn Maguire, 15, is a trumpet player from rural Newton. "It's really quiet and peaceful here," he says, "and the environmental workshops are fun."



© ART LACKNER

One of two fawns that visit the camp on a regular basis.

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The campers have free time to spend boating, swimming or, if they choose, practicing their instruments. Well, believe it or not, on any given day, most youngsters will practice.

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### *A Chorus Line*

Evenings are spent singing around campfires, performing concerts, watching movies and socializing in the cabins. There, campers pack up their classical instruments and plug in portable CD players. In the evening, the melodies of Mozart are replaced with rock music by Aerosmith, Nirvana and the Grateful Dead. At bedtime, pages of complicated sheet music are swapped for horror novels by Steven King and Dean Koontz.

"Yes, these are well-rounded American kids, with the same interests all the other kids have," Rendleman says. "And they get along well. Kids into music are very sensitive to each other. They help each other through homesickness and other problems."

Anton Aneson is a 15-year-old violinist from Linden. Last summer was his second at the camp. "You get taught a lot of music in just two weeks," he says. "The teachers are really nice, not like the teachers in school. You can joke around with them after class."

In addition to personal development, the camp also may provide students with the opportunity to present their music to an audience.

This summer, Rendleman hopes to line up a few concerts for the campers at nearby Peter's Valley Craft Village and for local churches. "We'd like to give the kids a chance to perform in front of a live audience," she says, "and we're sure the audience will like what they hear."

Rendleman points to a 50 percent return rate as proof of the program's success. Many of the children can't wait to return year after year. Sixteen-year-old Amalon Aneson (Anton's sister), who plays both violin and viola, has been with the program since its beginning.

"I like everything about it," she says. "It's a great experience. The first year, I couldn't read music very well. But I practice here eight hours a day and have advanced very rapidly. I also love learning about the ecosystem. It's balanced — music, nature, recreation — it's fun; it's the best."

For more information on the Stokes Forest Music Camp, call Montclair State University's Music Preparatory Department at 201/655-4443.

*Art Lackner is a freelance writer and photographer from Eatontown.*

# Puff, the Magic Fish

by Dusty Rhodes

"Oh, no, Grandpa, not again," wailed the young angler as she hoisted aboard a bizarre specimen that protested with a chorus of burps, chirps and erps.

The fish swelled like a balloon as the tanned and leathery old salt, perched at the boat's stern, chuckled instructions: "It's a keeper, honey, just put it in the cooler with the others."

The fish erped in vain as the youngster, heeding her mentor's advice, tossed the "balloon" into an ice chest containing several hefty look alike, now deflated to normal size.

"I thought we were going to catch weakfish," she grumbled. Her stomach lurched, no doubt protesting the notion of having to digest a living, inflatable meal.

Yes, *inflatable*. The very word had popped into her young mind earlier after the release of a few smaller puff-'em-up fish, as she called them. Gawking in fascination, she had followed their topside float until they finally expelled the air which stretched their scaleless, prickly hides. And despite her dismay, as one blowfish after another snatched her baited hooks, the youngster (had she been pushed to the point) would have acknowledged entertainment from the seagull's vain attempts at swallowing the "free" meals bobbing at the water's surface.

Such scenes are enacted every summer on the bays, coastal rivers and inlets along the New Jersey shoreline. Ubiquitous and indigenous, blowfish — or puffers, really — are a part of the summer festival of backwater angling. Love 'em or hate 'em, whenever you lower a baited hook, or even a crab pot, into the water during summer and early fall, you're at the mercy of these ravenous, yet decidedly magic, fish.

Why magic, you ask? What else would you call a fish which makes bait disappear so quickly?

## A Fishy Ball

In addition to losing bait, blowfish encounters can be painful in other ways, as I ruefully discovered one weekend while still a mere snip of a youth.

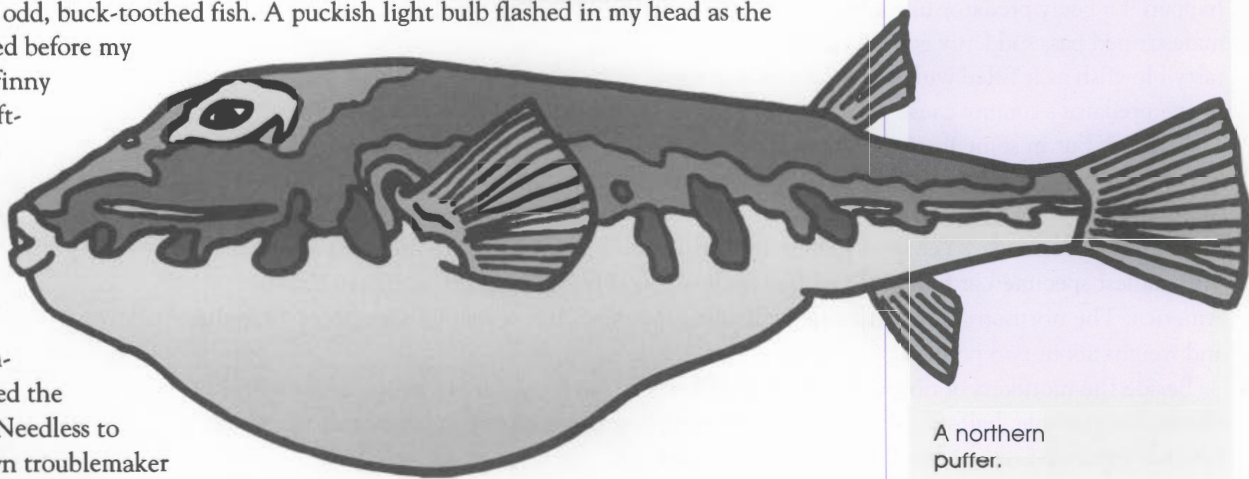
It was during a family crabbing outing on the Shrewsbury River when I first hauled aboard a pot containing an odd, buck-toothed fish. A puckish light bulb flashed in my head as the fish literally swelled before my

eyes. Tossing the finny and squeaking "softball" to my cousin seated forward, we launched an impromptu game of catch. The sport came to an

abrupt halt as a parental paw whacked the back of my head. Needless to say, that overblown troublemaker quickly was tossed over the side, while my cousin squealed at my discomfort.

Sadly — and to our gastronomic loss — all of our blowfish were tossed over the side for too many seasons. But my family eventually discovered one of the Jersey Shore's delightful secrets:

Tossing the finny and squeaking "softball" to my cousin seated forward, we launched an impromptu game of catch.



A northern puffer.

blowfish are excellent table fare, if one knows how to clean them. Once we had tumbled on to this bit of salty lore, only undersized puffers were released to swim and steal bait again.

But that was more years ago than I care to admit. For the past decade or so, backwater anglers had scant reason to worry about what they would do with their blowfish. An alarming decline in abundance had enthusiasts shaking their heads in wonder about how a fish, previously so plentiful, could veritably disappear. While the answer to that piscatorial conundrum lies somewhere in the sea, take heart in the knowledge that blowfish numbers are rising, and anglers once again can enjoy these tasty fish.

## A Family of Puffers

Blowfish belong to the puffer family (*Tetraodontidae*) which, according to the *Peterson Field Guides Atlantic Coast Fisheries*, contains 10 members. Named for their ability to swell by swallowing air when removed from the water, such fish resort to bloating to escape danger.

But it's not just air on which puffers "gorge." Although no angler has ever witnessed the event topside, puffers also swell with water when attempting to escape a predator down there where the fish play.

According to information published in 1981 by the National Marine Fisheries Service's Sandy Hook Laboratory, a puffer measuring, say, seven inches in length, can take on as much as 22.5 ounces of water. Relative to the original weight of the fish, that's a hefty weight gain of 308 percent!

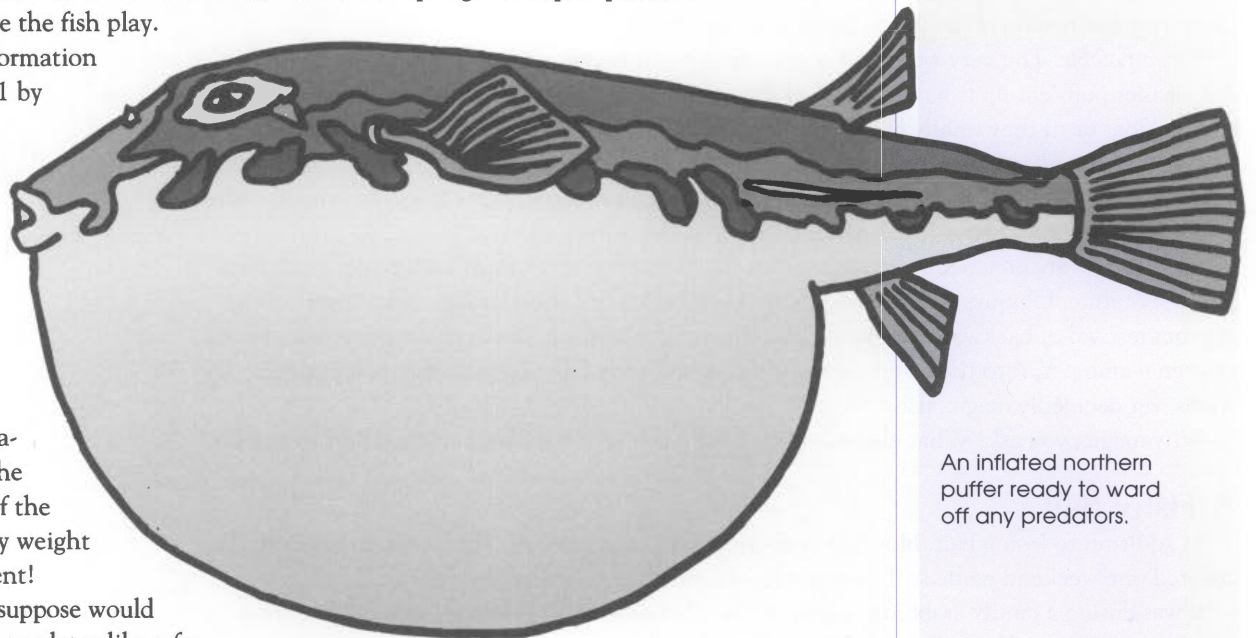
What do you suppose would happen if a beefy predator like a female striped bass suddenly gobbled down a tasty blowfish as it filled with water in a vain attempt at freedom? Would all that water sloshing in the predator's tummy cause a marine version of "I can't believe I ate the whole thing?"

Perhaps. But in some instances, the predator would have to be really huge. That's because two family members grow to lengths of two feet (the smooth puffer, a pelagic species found from Massachusetts to Argentina, and the oceanic puffer, a deep water inhabitant found from Newfoundland to Bermuda.) Yet most puffers are considerably smaller — like the sharpnose puffer, the smallest specimen at four and one-half inches, found from Florida to northern South America. The northern puffer, the one bedeviling Jersey anglers, grows to a length of 14 inches and weighs about two pounds.

Beside the monikers of northern puffer and blowfish, our local variety swims under a host of aliases; for example, balloonfish, bellowfish, blower, bottlefish, globefish, rabbitfish, sea squab (their commercial name), swell belly and swell toad.

With a range that extends from Cape Cod to Florida, northern puffers prefer to hug the bottom, but will move throughout the water column. Northern puffers prefer a sandy bottom, especially near natural or man-made debris, but also can be found over silt, mud, shells or gravel.

With scaleless skin and small, stiff prickles on its head and body, the northern puffer is



An inflated northern puffer ready to ward off any predators.

dark olive gray on top with greenish-yellow sides and six to eight dark bands or blotches. All that, set off by a white belly.

Noted for prominent choppers in an otherwise tiny mouth, northern puffers are actually toothless. The cutting edges are really the bones of the upper and lower jaws, which are divided in the middle, thus creating the illusion of incisor-like teeth. But let's not quibble over dental technicalities. It's sufficient to note that anglers should keep their fingers away from those powerful mouths capable of biting through the shells of crabs and other "hard" foods.

### Ringing the Dinner Gong

To the good fortune of backwater anglers, the northern puffer is seldom caught in water more than a few fathoms deep (a fathom is six feet). While they are found just outside inlets, they especially are fond of scouring bay and river bottoms for shrimp, crabs, sea worms and assorted bottom forage. But as virtually everyone who has ever dunked a line in a Jersey coastal river or bay knows, squid, clams or sea worms ring the dinner gong for blowfish. Since these fish are inactive at night, expect all feeding and catching to occur during daylight hours.

And speaking of attracting blowfish, here's a tip I gleaned from one of the old-timers who ply the backwaters in search of the tasty critter. According to this bewhiskered and grizzled waterman, whose aroma left no doubt about how he spent his summer days, clam chum or broken whole clams is the way to draw a virtual school of blowfish to your boat.

I reckoned he knew his business from the quantity of puffers he had on hand when I made his acquaintance, so I put his advice to work. Although I actually targeted other bay species, I discovered that clam bait and chum brought more blowfish to my boat than I really needed to see.

For more action, anchor during an outgoing tide at the mouth of a river or creek that feeds into a bay. The well founded hi-lo, two-rig is all you need, preferably with size four to six hooks. What better way to introduce a youngster to the joys of backwater angling!

### Beware the Poison

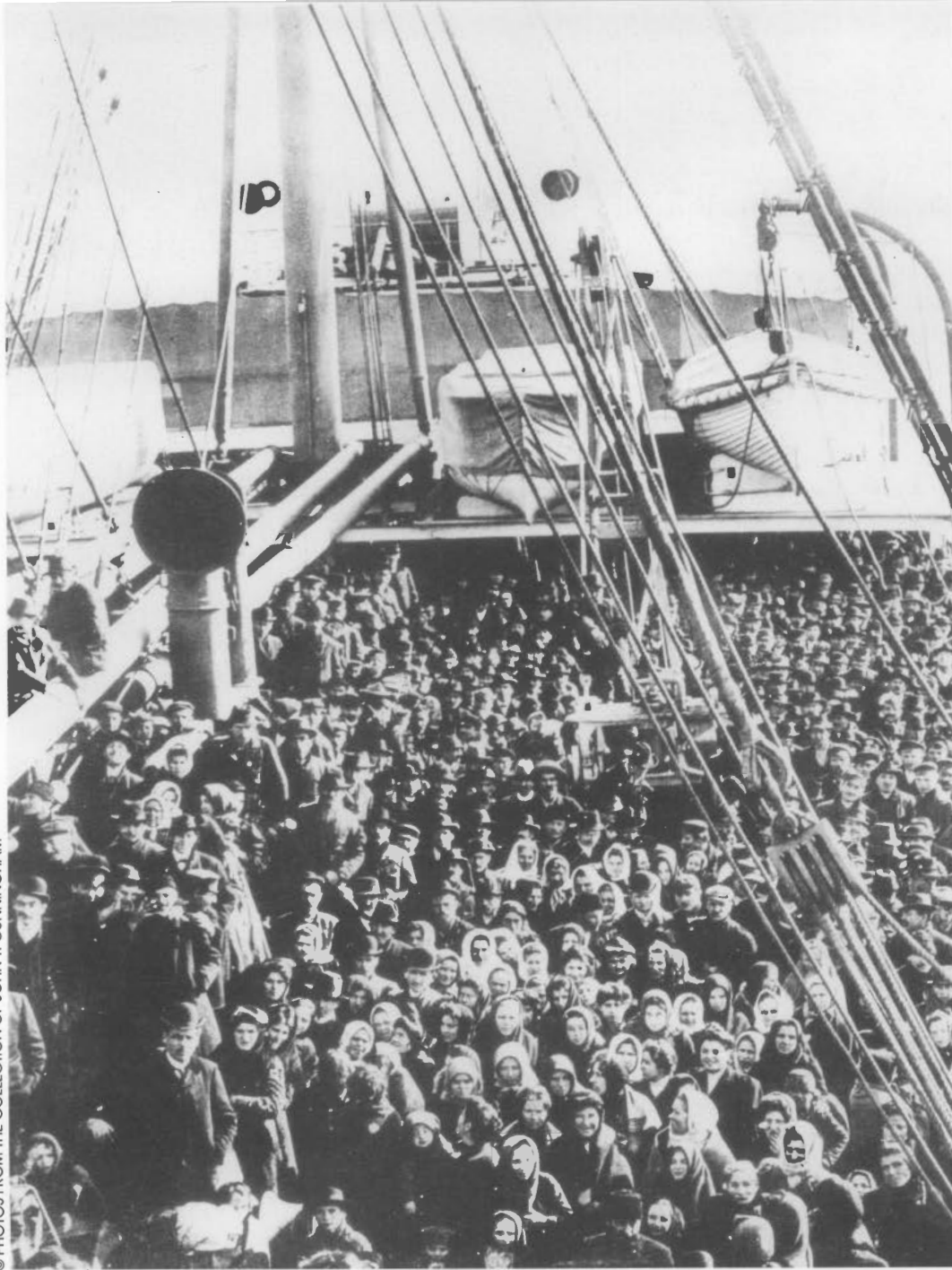
A word of caution about the aftermath of a successful blowfish trip. While the back meat is sweet, tasty and easily taken from the fish, beware of eating other body parts. Members of the *Tetraodontidae* family are capable of producing a powerful poison called tetrodotoxin, which is especially concentrated in skin, reproductive organs, liver and entrails. Although the tropical varieties of puffer are considered to be the most dangerous in this regard, eating only the flesh of the northern puffer is advised.

To clean a blowfish, just follow the instructions from *McClane's New Standard Fishing Encyclopedia*. Simply place the fish on a cutting table, belly down. While holding the head with one hand, cut through the backbone just behind the head. Now turn the fish over, maintaining the grip with your non-cutting hand. Press the knife butt against the backbone to anchor the fish and pull the head toward the tail, peeling the skin like a glove. Rinse the two back meat fillets and discard the remainder of the fish.

One final thought: if you intend to fish bait on a Jersey bay or coastal river this summer, bring along plenty. The blowfish are back and, at some point during the day, you can expect your fish attractant to quite literally go *puff*, made to disappear by a piscatorial master of magic.

Clam chum  
or broken  
whole clams  
is the way to  
draw a virtual  
school of  
blowfish to  
your boat.

© PHOTOS FROM THE COLLECTION OF JOHN T. CUNNINGHAM



# The Huddled Masses

by John T. Cunningham

As ships approached New York Harbor, immigrants were permitted to leave their cramped quarters in the hold to sample the fresh sea air on deck (top and left).

This immigrant from southern Europe carries his trunk full of earthly belongings on his shoulder (opposite page).



Day after day, week after week, year after year, little ferry boats shuttled between passenger-laden steamers in the harbor and Ellis Island. Once gangplanks hit the island, the immigrants rushed joyously ashore — running, skipping, dancing, singing and limping, if necessary. They were in America!

America! Such a country! A country with land so vast that states would offer it for \$1 an acre! Jobs so numerous that companies might pay laborers as much as \$1 a day! Places to live, food to buy, streets filled with excitement!

Enthusiasm had been rising since the first glimpse of the Statue of Liberty, its torch a shining symbol of freedom since 1886. Most understood Miss Liberty in terms of the sentiments expressed in the enduring poem written by Emma Lazarus in 1883 as she anticipated the arrival of the statue from France.

The Lazarus poem offered hope to “your tired, your poor, your



huddled masses yearning to breathe free.” America, she reassured them, was the open door to liberty. The sight of the statue had seemed a perfect transition from the Old Country to the new.

Joyous anticipation faded as each group of new arrivals merged into long lines of people waiting to be processed by stern-looking bureaucrats. As many as 5,000 Europeans passed through in a single day; all of them grew grim at rumors of impossible tests and quick returns to Europe for those rejected.

What had gone wrong? Nearly all of those in line had believed they would be welcomed with open arms. They had believed the alluring invitations that American industries, steamship companies, railroads, farm owners and big city officials had posted in the public squares of Italy, Greece, Russia, Slovakia, Serbia and elsewhere.

## Welcome to New Jersey

New Jersey became one of the first to issue such an invitation when, in 1880, the state’s Bureau of Statistics, urged on by then-governor George B. McClellan, sent this pleasant (if misleading) message to Italians and Greeks:

“Why should the immigrant go to Minnesota, where the climate is like Sweden, when he can secure a home in the southern part of New Jersey, where the climate is more like the south of France or the shores of the Mediterranean?”

By 1880, inviting “foreigners” to emigrate was almost as American as a 13-star flag. The first European colonizers sent recruiting letters home extolling the richness of the New World. Railroad and canal entrepreneurs used blarney to entice huge numbers of young Irishmen to build canals and railroads in the 1830s and 1840s. The amazing surge of industry

after the Civil War prompted recruiting posters to entice workers from foreign lands.

The broadsides promised cheap steamship fares, opportunities to buy land for a pittance, excellent jobs, fine homes and a magnificent way of life. If the information was shamefully untrue, the four-color posters at least had an aura of truth. Would Americans lie?

New Jersey needed hundreds of thousands of workers, to mine iron ore in Dover and dig clay in Middlesex; to run silk looms in Paterson and make bridge cable in Trenton; to coax southern New Jersey's sandy barrens into rich blossoms; to tend greenhouses and be parlor maids on the estates and in the mansions of the nouveau riche in Morris County; to pave city streets and to lay trolley tracks from Sussex to Cape May.

America's quest for workers coincided with Europe's worst economic and social periods before World War I. Collapse of age-old farms sent economies reeling. Russian pogroms against Jews drove millions of people from ancestral villages. Threats to force young men into Italian or Greek armies spread dread.

The exodus from Europe began as a slow trickle in the 1880s and swelled to a flooding torrent after Ellis Island was opened in 1892. About 18 million Europeans came to the United States during the height of immigration between 1890 and 1920. More than a half million of them settled permanently in New Jersey, giving the state the highest concentration of foreign-born people in the nation in 1920.

## The Road to America

Abandoning centuries of tradition was the most difficult task for an emigrant. Then came the walk to a port city, chiefly in Bremen, German; Liverpool, England; and Naples, Italy, along roads beset by highwaymen and con artists. They were in ports as much as 600 miles from home, uncertain about their futures, in limbo, citizens of no place on earth.

Crossings to America were nightmares. Emigrants were packed into dirty, foul-smelling holds in the bowels of ships, in steerage,



close to where the ship's steering mechanism lay. Food was terrible and scant, a blessing of sorts for those who almost immediately became seasick and remained so. (Steamship companies counted on that; the fewer who ate, the greater the profit.)

Toilet facilities were scandalously inadequate. Steerage passengers later told of using the same bowl for washing themselves and clothing, for drinking water or, more often, for vomiting. Illness and death stalked the lower regions of every ship.

Just as the voyage in degradation seemed beyond endurance, seagulls began trailing the vessels, signalling that land was nearby. Off Sandy Hook, a pilot came aboard to guide the ship through the Narrows, past the Statue of Liberty and into the harbor within sight of Ellis Island, "The Island of Hope, Island of Tears."



Doubt is etched on the faces of this Italian family (above) as they approach Ellis Island by ferry.

Immigrants struggle for a place at the rail (left) on the final leg of their journey to America.

Dutch children clutch their coveted tickets of admission to America (opposite page).





## Island of Hope and Tears

After the momentary joy at reaching Ellis Island, the frightened, thoroughly cowed newcomers moved toward the inspection hall in groups of about 30, a number chosen because that number fitted a ship's manifest. Smiles vanished; few pictures exist of smiling immigrants.

Most of the incoming adults looked fat, with good reason. Since they could bring in only what they could wear or carry, women and girls usually wore many petticoats, several dresses or blouses and a few sweaters. Males sweltered under as much clothing as possible. Everyone toted large bundles or battered suitcases, jammed with everything from Bibles to huge salamis (in case America had no such delicacies).

Unknown to the slowly-moving throng, testing began as the immigrants entered the line. Guards looked for any imperfections — a limp, eyes grown dim, a cough, stumbling. Any-

Doctors dressed in uniforms test for trachoma (above), a highly contagious and then incurable eye disease which led to instant deportation.

Since immigrants could bring in only what they could wear or carry, many of the women appeared greatly overweight because they wore layers of blouses, petticoats and dresses (right).

one suspected of illness or incompetence was shunted aside for a second look and on the rest of the line edged.

As the hopefuls weaved back and forth through passageways between rails, the sheer numbers of people caused delays, often as long as two or three hours.

Every delay heightened fears. The slightest pause sent rumors ricocheting through the crowd: We'll all be sent back. Our children will be put in orphanages. If you can't speak English, you'll go back. If you go back, your family must remain here.

One persistent fear was no rumor. The test for trachoma, a fearsome, highly contagious and then-incurable eye disease, was a straight win-or-lose proposition. Anyone with this condition had to be deported as soon as possible. There were no appeals.

Ultimately, each immigrant faced a uniformed (and in their minds, all powerful) agent who might by questioning say "in" or "out." The bureaucrat had no such power, but who knew that? The questioning was slight, even perfunctory, lasting about two minutes and consisting of little more than the questions asked in Europe before departure. There were 20 questions in all, including such things as name, country of origin, destination, relatives in the United States, who paid for passage and whether you had money, a job, a trade or a criminal record.

Two questions were perhaps incomprehensible, even in a native language: "Are you an anarchist?" and "Are you a polygamist?" Few were, in either case. More potentially threatening was the question, "Do you have a job?"

Since it was against immigration laws to entice a person with a job offer, a "yes" caused a major problem. However, since immigrants were not supposed to enter without a job, a "no" was just as bad. Nearly all immigrants knew the only answer was "I'm looking for work."

Single women also faced another hurdle: "What is your marital status?" Unmarried men were allowed to enter freely; unmarried females had to have an escort to get off the island. Many solved that problem by marrying a willing male immi-



grant eager to have a wife in the New World. As compromising as that might seem in today's world, most of the newcomers were from lands where arranged marriages were common.

Despite the fears, the doubts, the questioning and the answering, only about two percent of all emigrants were returned home, but two percent of 18 million is about 360,000 men, women and children, enough to inhabit a small city.

Home? Go back? Go back to where? Go back to what? Nearly all immigrants had sold or given away everything, left (or fled from) villages, walked for days or weeks to reach the port of embarkation.

"Home" elicited none of the warm, romantic feelings associated with the word. The rejects would not be returned to their villages, but to the port of departure. There they would be dumped ashore, far worse off than if they never had fled their homelands. The specter of deportation prompted many suicides on Ellis Island.



## The Train to Everywhere

Once cleared, many immigrants headed for New York City, but the great majority set foot on the American mainland at the handsome Victorian railroad station opened in 1889 by the Central Railroad of New Jersey (CRRNJ). Now owned by the State of New Jersey, the restored terminal is on the north end of Liberty State Park.

The CRRNJ's terminal has the size and classic elegance that newcomers could associate with a homeland town hall or cathedral. Inside, the 20,000-square-foot waiting room glowed under a broad skylight, augmented at night by then-new electric lamps.

More than eight million immigrants passed through the Jersey City terminal, segregated from the regular passengers. They stood on an unprotected dock in all kinds of weather, awaiting the call to board their westbound trains.

They tramped into the vast train shed, where vaulted roofs

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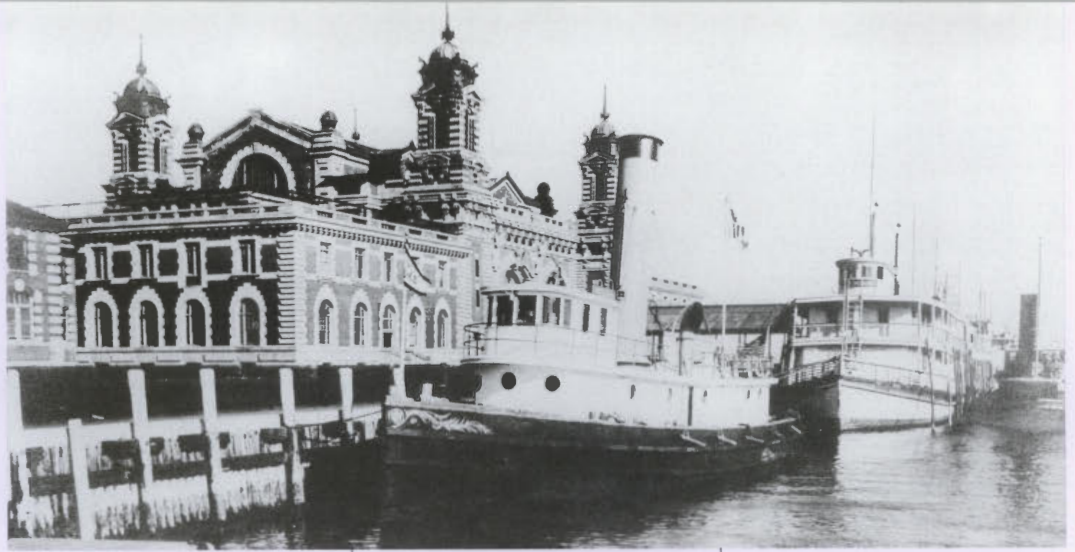
The "pens" in which immigrants waited for the verbal test. The test took two to three minutes; the wait could last hours or even days.

# The Immigration Trinity

No saga in American history is more important than the story of immigration. We are all immigrants or descended from immigrants: even Native Americans came here from what is now Siberia about 12,000 years ago.

No state has better reason to tell the immigrant story than New Jersey. It is centered in three structures in and around Jersey City — the Statue of Liberty, Ellis Island and the Central Railroad of New Jersey (CRRNJ) terminal in Liberty State Park.

Who “owns” Ellis and Liberty islands had been a matter of court dispute for more than a century. Ownership is really a



moot question except for battling state governments; the islands are both federally-controlled. But all three remain open to visitors, beckoning the children and grandchildren of immigrants to revisit their pasts.

Ellis Island, the first port of call for many immigrants, features exhibits, restored areas and educational opportunities around the immigration experience. It is open daily from 9 a.m. to 5 p.m. and is

accessible via the Circle Line-Statue of Liberty ferry from Liberty State Park in Jersey City and from Battery Park in New York.

The Statue of Liberty still welcomes visitors into New York Harbor. It also is accessible via the Circle Line ferry. For more information on Ellis Island or the Statue of Liberty, call 212/569-5755.

The CRRNJ terminal remains in all its splendor at

Ellis Island is one of the trinity of locations that made up the immigration experience.

the northern edge of Liberty State Park. From Memorial Day to Labor Day, it opens its doors from 9 a.m. to 5 p.m. as a museum with lectures, displays and touring exhibits. It is closed except for special programs during the rest of the year. For more information, call 201/915-3401.



A typical immigrant neighborhood.

*John T. Cunningham, a freelance writer from Florham Park and author of 34 books, won an Emmy in 1985 for “Dreams of Distant Shores,” a documentary on the immigration experience.*

covered an area more than four times the size of a football field. Steaming locomotives and long lines of cars came and went in the terminal’s 12 train berths.

Immigrants climbed aboard the worst cars the railroad could pull together, knowing that they were important to railroads because of the fare they paid or their potential to be menial laborers.

They were heading toward New Jersey’s cities or farms or to connections with other railroads on the way to Western plains, Rocky Mountain mines and orchards fanned by Pacific Ocean breezes.

Forgetting their own immigrant beginnings, most Americans scorned the foreigners, laughed at their clothes and resented their free spirits. Americans willingly believed immigrants had barged in to steal their jobs.

As soon as possible, immigrants shed “foreign” clothes for “American” dresses and haberdashery. They ignored the fatigue caused by long working hours and learned English in night schools. They saved and bought land. They wanted to be Americans.

They worked, they struggled, they fended off bigotry and tried to ignore openly-expressed hatred. Nearly all of them succeeded, becoming citizens (and with it, not incidentally, the right to wear United States uniforms in 20th century wars).

They became Americans.

**They became us.**



Wildlife and vegetation take over after a site is returned to the wild.

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# Turning Back Time

by Charles St. Charles III

Tentative songs of hidden birds announce the first rays of sun as night slowly gives way to day in Kearny. The chorus becomes louder as the morning light gets brighter. Soon, the birds leave their evening roosts and fly around young black locust, red maple and cherry trees and elderberry, bayberry and blueberry shrubs on a 16-acre woodlot.

These woods were not always a haven for birds. In fact, five years ago, the site was barely more than a barren field isolated between the New Jersey Turnpike and local roads. Weeds made up the majority of plants; there was more garbage than trees.

But even a barren field was an improvement over the area's previous use. Twenty-five years ago, trucks dumped loads of garbage at the location when it was known as landfill 15W. How has a barren, ex-landfill been transformed into a thriving woods? It is one of many sites in New Jersey being reborn through a new field of ecology called environmental restoration.

Unlike conservation and preservation, which try to manage and protect existing environments, restoration attempts to create or reconstruct areas that are no longer viable in their present state.

Environmental restoration activities can be divided into two major categories: restoration and creation. In restoration, the emphasis is on repairing a damaged environment so it can function as it did in the past. In creation, a new ecosystem is produced that is different from the system native to a site. Mitigation, which involves the construction or enhancement of an ecosystem to compensate for loss or damage to the environment, could involve restoration, creation or a combination of the two techniques.

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## Success-ion Stories

Steven Handel, an associate professor in the graduate program in ecology and evolution at Rutgers University, has been leading environmental restoration efforts at landfills. Handel noticed that many of these former dumping grounds were typically little more than sterile fields, unable to recover on their own.

These barren landscapes often contained patches of grass, weeds and some stands of reeds in wet areas, the result of seeds blown into the area. But there were very few trees or berry-bearing shrubs.

Handel created a way to help the process of natural succession, where grasslands are replaced by shrubs and trees and later grow into a mature forest, with red maple, oak and ash trees. The key to Handel's success has been the dispersal of seeds.

Once again, the landfill became host to rumbling trucks, but this time, instead of trash, the payload was topsoil and mulch. (With the help of the Hackensack Meadowlands Development Commission, free sources of these materials were found on construction sites.) Grass and a few hundred trees and shrubs were planted in the now rich, fertile ground.

The new trees and shrubs provided places to perch and food for birds. Species such as robins and starlings began to visit the site, bringing with them seeds from other locations — introducing new species, such as sumac, dogwood, sassafras, red cedar, blackjack oak and Virginia creeper. Soon the land had literally thousands of new seedlings pushing up through the soil.

In time, this site should follow the predictable process of succession, one where plants and animals working together create an ever evolving forest.

While this Kearny site needed a jump start to begin the process of recovery, other places do

To aid fish migration,  
a fish ladder will be  
constructed at  
this site.



© PSE&G ESTUARY ENHANCEMENT PROGRAM



A salt marsh meanders through South Jersey.

just fine on their own. In the case of the Warner Tract in Cumberland County, “restoration” simply was removing the remnants of a sand mining operation and letting natural succession progress. The Warner Tract is now part of the larger Manumuskin River Preserve, a site that encompasses nearly 3,500 acres of upland and freshwater intertidal marsh.

Since the early 1900s, sand had been excavated from a portion of the Warner Tract for use in glass and gravel. The operation was abandoned in the mid-1980s, leaving behind rusting sheds and multi-storied concrete and steel buildings.

The tract was a real bargain. The Nature Conservancy, an international organization with a mission to preserve plants, animals and natural communities by protecting the lands and waters they need to survive, bought the land in 1994 from Waste Management, Inc., which donated half the property to the organization. The group removed man-made obstacles, and in moved nature.

In just one year’s time, Pennsylvania sedges, pine tree seedlings and various shrubs have popped up in the areas once covered by buildings. The rest of the site continues to mature into one of the most secluded nature preserves in the state.

A meandering tidal stream cuts through extensive tidal marshes, dominated by wild rice and other grasses, sedges and rushes. The area, the best example of a freshwater tidal marsh in the state, is home to an exemplary population of sensitive joint vetch, a species designated by the federal government as one threatened with extinction. The Warner Tract also supports about four dozen rare and endangered species, including the pine snake, the corn snake, the dotted skipper butterfly and the bald eagle.

## Creating Paradise

Not all restoration projects involve weighty scientific issues or large tracts of land. Sometimes, it is done for economic or aesthetic reasons. That’s the case with Ortho-McNeil Pharmaceutical of Somerset County, which created a field of wildflowers in an effort to reduce the use of fertilizers and lawnmower emissions often associated with corporate landscaping.

At Ortho-McNeil, the breathtaking display of wildflowers, including poppies, cosmos, black-eyed Susans, prairie coneflowers and bachelor buttons, causes a sensation, often stopping traffic

## Grassroots Restorations

Throughout the country, environmental restorations often rely on volunteers and community involvement to get the job done.

In New Jersey, there are many ways for volunteers to get involved in improving ecosystems in their area. Whether it is collecting wild seeds for restoring a site, rebuilding the banks of a stream, planting trees and shrubs, performing species counts, protecting endangered shore birds during breeding season, removing old buildings or growing rare plants in home gardens to transplant to new sites, volunteers truly can say that they have made the world around them a better place.

If you are interested in volunteering for an environmental restoration project, contact The Nature Conservancy at 609/785-1735.

Canada geese are common species found at many restored sites.



© CHARLES ST. CHARLES III

## Mitigating Circumstances

This spring marked the ground-breaking of a project of national significance — the largest single wetlands enhancement effort in the country. Called the Estuary Enhancement Project, this effort is expected to enhance and/or preserve more than 20,500 acres (more than 32 square miles) of salt marsh and uplands along the Delaware River estuary region in New Jersey and Delaware. In the Garden State alone, approximately 14,500 acres will be affected.

The Delaware Estuary, where the Delaware River meets the tidal waters of the Atlantic Ocean, is one of the most fertile environments in the world. Cordgrass, rushes, reeds and sedges rise out of

the rich silt. Damselflies and dragonflies bask in the sun, occasionally darting off to snag a mosquito or to meet each other in aerial combat. Ribbed mussels and sea worms live at the base of grasses and reeds, filtering food out of the water. River herring and other fish forage for food here and, in turn, are preyed upon by herons, egrets and other commercial fish species, such as weakfish and striped bass. A wide variety of ducks either raise their downy ducklings in the marsh or pass through the area, as do shorebirds, on their long migrations. A widening V-shape in the water provides the telltale sign of the muskrat.

Public Service Electric &

Gas Company (PSE&G), in conjunction with the New Jersey Department of Environmental Protection, developed this enhancement plan as an extra layer of protection to compensate for the effects on fish from the cooling water intake system at the Salem Generation Station. In addition to installing state-of-the-art water intake technology to protect fish, the project will initiate a number of salt marsh enhancement activities, including returning salt hay farms to their natural state as tidal salt marsh, constructing fish ladders, removing the nuisance plant, Phragmites, and placing perpetual conservation restrictions on at least 14,500 acres of land.

Salt hay farms are areas that were diked by farmers

more than 50 years ago to cut off tidal flows in order to grow salt meadow grasses for use in packaging or as mulch. This diking restricts the flow of essential nutrients to the fish and animals of these wetland areas and prevents many species of fish and wildlife from using this area as habitat.

The plan calls for breaching many dikes, allowing close to 5,500 acres to once again become part of the tidal system. This will allow *Spartina* grass, a rich source of food and excellent habitat for fish, to grow. To improve an additional 3,300 acres, herbicides will be used to destroy *Phragmites*, an invasive, nuisance plant in the marsh ecosystem. This, too, will allow *Spartina* and marsh vegetation to flourish.

along adjacent highways as people pull over to get a better look.

And people are not the only ones that notice the flowers. The fields, with 12 birdhouses placed around the campus by local Boy Scouts, bring an influx of birds to the area.

The 30-acre field, a special mixture of 18 varieties of annual and perennial wildflowers, certainly has been a visual success. But it also has been an economic success. Since the program was introduced, mowing time at the facility has been reduced by at least 80 hours a week, the use of fertilizers has been cut in half and the use of pesticides had been eliminated in the meadow areas.

Environmental restoration can be a lot like the wildflower project. Initially, the results may be hard to see, but with a little work, the outcome is spectacular.

Rutgers University will host a national conference on environmental restoration on June 20-22. Entitled "Paved to Protected: Restoration in the Urban/Rural Context," this program will explore the many facets of restoration, including parks, wildlands, agricultural areas, suburbs and cities. The public is invited to attend. The cost is \$175. For more information, contact the Society for Ecological Restoration, 1207 Seminole Highway, Suite B, Madison, WI 53711 or call 608/262-9547.

*Charles St. Charles III is a freelance writer and photographer from Dunellen.*

To aid fish migration, PSE&G also is constructing five fish ladders — two in New Jersey and three in Delaware — to help fish navigate dams on some of the surrounding tributaries. Anadromous fish, those that migrate from the sea up a river to fresh water to spawn, depend on these tributaries to reproduce, but are often unable to return to traditional breeding grounds because of man-made dams. Fish ladders are devices that look like heating ducts with internal baffles that slow water as it flows through the ladder. These devices usually are attached at gentle slopes to the dam, or are built next to dams, to allow fish to easily swim up the ladder and into areas above the dam.

The ladders will expand

spawning areas and nursery habitat for fish, such as alewife and blueback herring. These species, known as river herring, are important in the food chain for recreational and commercial species, such as weakfish and striped bass. The ladders will be constructed in New Jersey at Alloway Lake in Salem County and Sunset Lake in Cumberland County.

Finally, the 14,500 acres of restored and preserved salt marsh and surrounding uplands have been placed under conservation restrictions through the project, allowing the land to remain in its natural state as a tidal marsh protected in perpetuity against development.

Public access and education also are big components of the plan. In addition to

hunting, fishing and trapping, much of the restored area will feature bird observation platforms with unobstructed views of the Delaware Bay and coastal wetlands, parking areas and environmental educational signs about the restored wetlands and its vegetation and wildlife. Some sites will feature nature trails and car top boat launches or boat ramps to provide access to the marsh and the bay. The Nature Conservancy has been retained by PSE&G to prepare and optimize public access opportunities at each of the sites.

PSE&G has developed management plans for the project, which describe how the work will be done, the levels of public access that will be permitted in restored or preserved areas and the

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Initially, the results may be hard to see, but with a little work, the outcome is spectacular.

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management of the public use facilities and natural resources at each site. These management plans were developed and are being implemented with input from PSE&G's Management Plan Advisory Committee, as well as from several community involvement groups and the DEP. These committees comprise well known scientists, regulatory agencies, public officials, community leaders and residents. The advisory and community involvement committees are helping to ensure successful implementation of the program to address the diverse needs of those who will be affected by the program.

For more information on the project, call the Division of Water Quality at 609/292-4860.

This ancient crane-fly, trapped in amber, was discovered in the central Jersey clay pits.

© PHOTOS BY D. GRIMALDI/AMERICAN MUSEUM OF NATURAL HISTORY



# Jurassic Park in Central New Jersey?

by Beth Kuhles

In the hit movie "Jurassic Park," scientists extract the blood of dinosaurs from ancient mosquitoes preserved in amber and create an island hideaway of prehistoric creatures from the DNA.

While the movie may have been an entertaining piece of fiction, the blood-sucking bugs from the era of *Tyrannosaurus rex* and *Brontosaurus* are not. In fact, the oldest specimen of a mosquito, as well as some of the oldest examples of a bee, flowers, a mushroom and a feather, have been found right here in central New Jersey.

New Jersey has "some of the world's most scientifically important amber sites," according to the American Museum of Natural History, which led an expedition to the Central Jersey sand and clay pits. The area has yielded fossils from nearly 100 species of prehistoric life from the Cretaceous Period, the so-called "Age of the Dinosaurs," dating from 65 to 100 million years ago.

The site, the exact location of which cannot be revealed to maintain its integrity, has been a hotbed of fossil discovery since the late-1970s and has attracted scientists from many universities, including Cornell University, the University of Pennsylvania and Rutgers University. In addition to the amber finds, other fossilized remains of flowering plants, some of the first of their kind, have been uncovered at the pit.

"We found tons of fossil plants," said Bill Gallagher, Ph.D., registrar of natural history at the New Jersey State Museum, who excavated the site 12 years ago while a graduate student at the University of Pennsylvania.

The clay pit is located along the Atlantic Coastal Plain, a geological band that runs from the Raritan River northeast to the

Delaware River. During the Cretaceous Period, most of New Jersey was under water, and this area was probably a coastal swamp with a tidal channel, says Gallagher. In fact, during this time, New Jersey was most likely a tropical or sub-tropical region.

Fossils of plants have been taken from this area for years, but the amber discoveries are particularly significant because the material preserves the entire specimen. Organisms trapped in amber, a prehistoric sap, provide a translucent glimpse into the past.

While New Jersey's amber tends to be brittle and clouded with debris, it contains some of the most scientifically significant fossils in the world.

Among the finds at the site are:

- The oldest mosquito fossil, which still is undergoing intensive study by the museum;
- The oldest biting black fly, which fed on the blood of vertebrates;
- The oldest moth found in amber, complete with a long curly tongue;
- The oldest bee, a specimen that may establish a crucial link in the history between flowering plants and insects;
- The oldest feather preserved in amber, representing the oldest terrestrial record of birds in North America;
- The oldest known mushroom in amber, with spores that can be seen through a microscope; and
- Some of the oldest ants, perhaps the ancestors of one of today's most prolific insects, with 14,000 living species.

Another special quality of amber is that it is one of the few substances that can preserve fragments of DNA over millions

## New Jersey Amber Now on Display at the American Museum of Natural History

Some of the amber containing ancient plants and insects from the Central Jersey site is part of a major exhibit at the American Museum of Natural History in New York City.

Called "Amber: Window to the Past," this display includes samples of organisms trapped in the ancient resin from all over the world, as well as its historic use as jewelry or artifacts.

The exhibit runs through Sept. 2. The museum is located on Central Park West at

79th Street. There is a special exhibit fee of \$5 for adults, \$4 for students and senior citizens and \$2.50 for children 12 and under in addition to general admission of \$7 for adults, \$5 for students and seniors and \$4 for children. For more information, call the museum at 212/769-5100.

Closer to home, several museums in the state have samples from the site.

The Rutgers Geology Museum, located at the corner of George and Somerset streets

in New Brunswick, has amber pieces (without plants or insects) and fossils on display. In addition, the museum has the tracks from a meat-eating dinosaur that were found nearby. The museum is open from 1 to 4 p.m. on Mondays and 9 a.m. to noon on Tuesday through Friday. Admission is free. For more information, call 908/932-7243.

The New Jersey State Museum also has amber in its collection as well as fossilized plants from the Central Jersey

area. Some of those specimens currently are under study. The museum will host an exhibit entitled "The Last Dinosaurs," which will include examples of amber as well as paleontological and geological evidence from the period. The exhibit will run through July 13. The museum is open 9 a.m. to 4:45 p.m. Monday through Saturday and noon to 5 p.m. on Sunday. Admission is free. For further information on the event, contact the New Jersey State Museum at 609/292-6300.

of years. In 1992, scientists from the American Museum of Natural History's Molecular Systematics Laboratories were able to extract DNA samples from a termite specimen from the Central Jersey pit to determine whether termites evolved into cockroaches. By comparing a DNA sequence from the termite to that of a roach, these scientists were able to refute any connection between the two species.

Plants found in the clay pit are of particular significance in that they provide unique insights into the origins of flowering species and the complex interactions between plants and insects. The appearance of these plants caused a dramatic transformation in the earth's ecosystem.

One of the major discoveries in Central New Jersey was a cluster of primitive oak flowers from 90 to 94 million years ago. The only known flowers preserved in amber from the Cretaceous Period, the oak cluster measures less than half an inch in length. It is expected to provide crucial information about the types of plants that have come to dominate the world.

In addition to the forerunners of modern plants and trees, the site has produced some "missing links." These small, three dimensional vegetation samples, which have become charcoal, are extinct, but carry common characteristics found in several modern day plant species. This may help scientists unlock the relationships between present day plants, say William Crepet, Ph.D. and Kevin Nixon, Ph.D. of the L.H. Bailey Hortorium at Cornell University in Ithaca, N.Y, whose research at the site is being funded by the National Science Foundation.

"This is an unusual opportunity to have a window into an

ecosystem in a critical time that remains an evolutionary mystery," Crepet says. "It is also an opportunity to look at the pollination biology of this group.

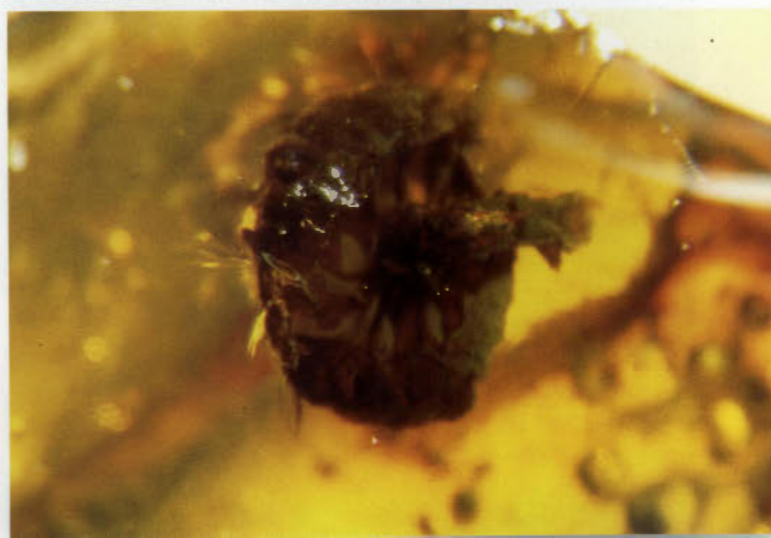
"This site is truly a unique place in terms of the diversity as well as the remarkably well preserved insects," Crepet says.

While the discovery of ancient plants, insects and evidence of birds has put New Jersey on the international map of scientific discovery, it is the prospect of what may still lie in wait below the sand and clay that has sparked the interest of others.

In the 1930s, not far from this site, a track of dinosaur footprints was found. With so much diversity already documented in the region, can dinosaur bones be far behind?

*Beth Kuhles is the editor of New Jersey Outdoors.*

The oldest known mushroom, dating from 90 to 94 million years ago, was found in New Jersey.



# Parsley, Sage, Rosemary and Time

by Colleen O'Dea

Oregano, parsley, mint, thyme, basil and other herbs that add spice to a meal are easy to get in any supermarket. But people living in the 18th and 19th centuries had no such luxury. The herbs they used were grown in their own gardens, not too far from the kitchen door.

Today, it's easy to get a taste of what their herb gardens were like, as well as pick up tips for modern-day herb gardening, by visiting one of the many historic sites around the state that have recreated kitchen gardens. While these gardens vary in their historical accuracy, they all are beautiful, fragrant and tasty and may encourage a visitor to forgo store-bought herbs for good.

"In general, these gardens were laid out symmetrically; that was predictable," says Jim Kurzenberger, historic preservation specialist at the Wallace House in Somerville. "What a person grew varied. Some staples were beans and squash, but the herbs used for flavoring differed. Some people liked some tastes better than others."

## The Wallace House

The Wallace House, which George Washington used as his winter headquarters in 1779, has a small herb garden with about a dozen varieties grown in the 1700s. Kurzenberger says he can't recreate the garden that was there because the state doesn't own the land where it was located.

"The garden would have to feed the family for a whole year," he says. "The area was huge; it had to be. It was their Pathmark and A&P for a whole year. They had to plan carefully and store as much as they could in crocks for the winter."

The Wallace garden includes chives, savory and two types of mint for flavoring; southerwood, hollyhock and lavender for fragrance; and tansy and rue, used as insect repellents. While most of the garden is green, the hollyhocks and lavenders provide color in late summer.

## The Johnson Ferry House

One of the most historically accurate gardens in the state is at the Johnson Ferry House in Washington Crossing State Park in Titusville. Until last year, this house, which Washington used as a temporary headquarters during his historic 1776 Delaware River crossing, had a garden that was a miniature replica of the one at Mount Vernon, Washington's Virginia home. But that's not the kind of garden a "middling well-to-do ferry farmer would have had," says Nancy Carter Ceperley, the site's interpreter. So it has been replaced with a 4,000-square-foot Dutch kitchen garden.

A Dutch kitchen garden at the Johnson Ferry House in Titusville.



About 30 varieties of herbs are grown at Rockingham in Rocky Hill.

An 18th century yeoman's garden would have included herbs, vegetables and perennial flowers.

© STONY BROOK GARDEN CLUB



An 18th century yeoman's garden would have included herbs, vegetables and perennial flowers. "The garden they would have had would have been bigger, but if you had 12 kids and slaves, you would have been able to grow more," says Ceperley. "Today, the labor is limited to just me."

The garden is enclosed by a stockade fence to keep out animals and is ringed with herbs, such as sage, so that rabbits and other animals are discouraged by the pungent tastes and aromas from foraging the inner vegetables. Inside the herb ring, salad greens and root vegetables grow in raised beds, which are easier to work by hand. A worn brick path winds through the garden, and benches face a center sundial.

Some of the herbs grown in the garden are: basil, in fragrant greens and purples; dill, with feathery, yellow flowers; caraway, its seeds growing daintily from thin stems in the shade; and anise, a sun-loving annual whose seeds reputedly aid digestion. The fruits and vegetables featured include strawberries, cucumbers, melons, cabbages and potatoes, as well as apple, peach and pear trees. Corn and flax, normally grown in fields further from the home, also have been planted.

Finally, there are some perennial flowers — red tulips, lavender irises, black-eyed Susans and roses — because "the Dutch loved beauty" and would have grown flowers to adorn their homes, says Ceperley.

While the garden is at its peak in May and June, something always is growing from mid-March through the first heavy snowfall. Such hearty perennial herbs as sage (eaten with turkey, on bread with butter or sprinkled in tea) and rosemary, with its green, needle-like leaves, grow most of the year. Each November, the house holds a harvest feast that includes the greens and herbs from the garden.

## Rockingham

Another attractive garden can be found at Rockingham, where Washington wrote his Farewell Orders to the Armies of the United States. This historic site, on Route 518 in Rocky Hill, has an 1,100-square-foot walk-through garden containing "mostly 18th century plant matter," says Margaret C. Carlsen, the site's historic preservation specialist.

It includes some 30 varieties of herbs that would have been used for fragrance and flavoring in the 1780s, including scented green thyme, yarrow's blooming yellow umbrellas and lamb's ear with cottony grayish leaves used as bandages. Most of the herbs bloom from spring through summer.

## Prallsville Mills

For a change of pace, there's an industrial garden at the Prallsville Mill on Route 29 in Stockton. One of only a handful of industrial gardens in the country, it is located on a site



© MARY JANE PETERCSAK

Bedstraw was important in cheese making, helping to curdle milk and make it yellow.

Hops (below) are used as a brewing agent in beer.

Clary sage (below, right) at Prallsville Mills.

featuring a grist mill, a granary, a stone linseed oil mill, a sawmill and a stable.

“All of the plants were or are used in industry for fragrance, medicinal purposes or dyeing,” says Wendy Richards, who oversees the garden.

The 800-square-foot triangular garden, which is tended by the Delaware Valley Unit of the Herb Society of America, includes some plants not commonly found at other historic sites, namely, alfalfa, rice, hops, cotton and bedstraw. While alfalfa and rice were revered for their nutritional value, hops commonly have been used as a brewing agent for beer. Cotton was very versatile; in addition to using its fibers in fabrics, its oils were used in food and soap manufacturing, and its seed meal provided soil conditioner. While one might imagine bedstraw for use in the stable, it actually was important in cheese making, helping to curdle milk and make it yellow.

The Prallsville industrial garden also features lavender, elderberry and coneflowers. Lavender oils were used in perfumes; dried plants and flowers found their way into soaps, powders and potpourri. Parts of the elderberry were consumed raw, pickled or in wines, jellies or preserves or used for cosmetics. Coneflowers aided in healing and immunizing against infection.

Holly and juniper, which stay green year-round, also had some fascinating uses. The wood of holly was popular in musical instruments and for inlay work. Juniper berries flavored gin and other liquors, but the plant also was used in veterinary medicine.

These and many other plants and uses are described in a pamphlet available on site. In addition, the herb society hosts an herb plant sale each spring.

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© MARY JANE PETERSAK





Green santolina with its yellow flowers and lavender are featured in the Prallsville Mills garden.

The Helen C. Branson Herb Garden in Haddonfield (below).



New Jersey's  
herb gardens  
offer a window  
on the  
state's past.

## The Tempe Wick House

The Tempe Wick House in the Jockey Hollow section of the Morristown National Historic Park has a large and colorful 4,800-square-foot garden adjacent to the mid-18th century red farmhouse. It provides a picture of what the farmer's garden would have included.

"A lot of research went into making sure anything that went into the garden was historical to the time," says Liz Hayden of the Northern New Jersey Unit of the Herb Society of America, which tends the garden.

It contains not just herbs, but also the vegetables the farmer would have grown to survive. Those include carrots, leeks, peas, beans, squash, pumpkins and broom corn, with feathery leaves that were used for sweeping. But the garden does not include, for example, tomatoes, because "people believed they were poisonous," says Hayden.

The garden's herbs are ones that would have been used either for flavoring, medicinal or household purposes. Some of the more interesting herbs include soapwort, used to clean fine linens, and lavender, which was put in pillows or linens to keep them smelling sweet. Among the earliest blooming of the flavoring herbs are masses of purplish-pink flowering chives, garlic and thyme.

Bright orange nasturtiums, which are both beautiful and edible, and daisies, used for dyeing, also are abundant, as are roses, many varieties of which are used for their scents.

While most of the plants are perennials, the herb society cultivates a number of annuals each spring, including basil, dill, parsley and flax, a tall plant with wispy blue flowers that was used to make linen.

## History and Herbs

Following is a list of some of the New Jersey historic sites with herb garden.

■ **Batsto Village  
Wharton State Forest**  
Hammonton, NJ  
609/561-0024

■ **East Jersey Olde  
Towne Herb Garden**  
Johnson Park  
River Road  
Piscataway, NJ  
908/745-4489

■ **Helen C. Branson  
Herb Garden**  
Greenfield Hall  
343 Kings Highway East  
Haddonfield, NJ  
609/429-7375

■ **Johnson Ferry House**  
Washington Crossing  
State Park  
Route 546  
Titusville, NJ  
609/737-2515

■ **Prallsville Mill**  
Delaware and Raritan  
State Park  
Route 29  
Stockton, NJ  
908/873-3050

■ **Rockingham  
Historic Site**  
108 County Route 518  
Princeton, NJ  
609/921-8835

■ **Tempe Wick House  
at Jockey Hollow**  
Morristown National  
Historic Park  
Tempe Wick and Jockey  
Hollow Roads  
Harding, NJ  
201/539-2085

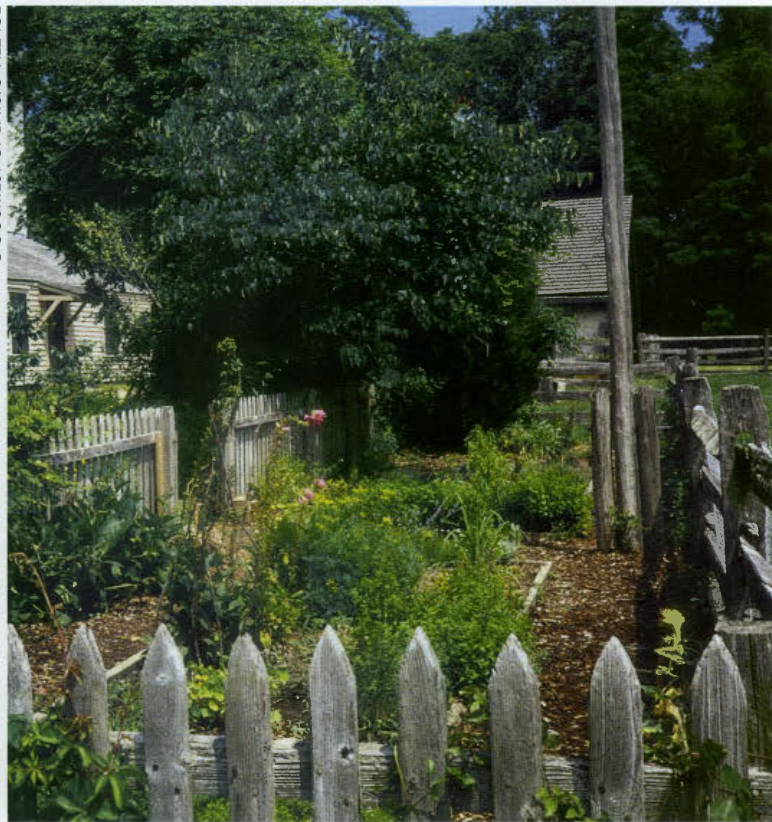
■ **Trent House  
Herb Garden**  
15 Market Street  
Trenton, NJ  
609/989-3027

■ **Wallace House**  
38 Washington Place  
Somerville, NJ  
908/725-1015

■ **Waterloo Village  
Herb Garden**  
Waterloo Road  
Byram, NJ  
908/347-0900



© WALTER CHOROSZEWSKI



© COURTESY OF BATSTO VILLAGE

## Batsto Village

In South Jersey, Batsto Village in Hammonton has a unique garden that recreates Victorian times. Judith Walton, an herbalist who has been transforming the small garden, says visitors can get a real flavor for the kinds of herbs that were used by the residents of the nearby mansion.

Iron was made into munitions for the Revolutionary War and the War of 1812 at the site. The restored village includes the iron master's mansion, workers' houses and outbuildings.

The 450-square-foot garden includes two formal beds transected by paths. The herbs generally grow along the inner edges. Outside are sunflowers, gourds and antique roses. Although most of the herbs are varied shades of green — from grayish through yellowish to intense grass green — there is color in the lavender, with its petite purple flowers, and foxglove, boasting purple, pink and white bell-shaped flowers on five-foot tall stems. The foxglove brings both beauty and healing; although it is known today as a source of digitoxin used in heart medicine, it previously was used as a purgative and to treat ulcers.

Among the unusual herbs found here are New Jersey tea, which at one time grew wild in the state, bronze fennel, scented geraniums and several types of thyme. Roses and peppermint are grown in pots, as in Victorian days, so that they can be brought indoors and “put at the height where Victorian ladies' skirts would brush against them and release their scent,” says Walton.

The garden reaches its peak flowering in June and July, but has something to show from May through October. All the herbs are marked, and Walton is working on a brochure to guide visitors.

New Jersey's herb gardens offer not only beautiful sights and smell, but also a window on the state's past, enriching a visitor's appreciation of history. And they're also laboratories where gardeners can learn how to best grow some of their favorite herbs, discover new uses for old favorites and find new herbs to add to their own kitchen gardens.

The Tempe Wick House at Jockey Hollow (left).

The garden at Batsto Village (right) recreates Victorian times.

*Colleen O'Dea is a freelance writer from High Bridge.*

# Exploring the Tidal Marsh by Canoe

by Diane Bennett

While New Jersey may be known for its canoe trips in the quiet, tea-colored Pinelands waters, along the fast moving rapids of the Delaware River or on the historic Delaware and Raritan Canal, a new and unique opportunity now is available along the coast.

For the past three summers, Island Beach State Park in Ocean County has been offering canoe trips to the surrounding sedge islands. Ospreys, peregrine falcons, black skimmers and oystercatchers are just a few of the inhabitants that make these tours exciting and memorable adventures. In addition to viewing an abundance of wildlife, participants are given the opportunity to tread for hard clams and seine to snare fish, crabs and other aquatic life.

These free trips, which are run on Tuesdays and Sundays from late June to the end of August, also provide an exciting paddling experience, one where canoeists with moderate experience

can tackle the pull of tides, shallow waters and nearly constant breezes. (Although the canoe trip is free, there is admission charge to the park.) Participants are equipped with a 17-foot canoe, paddles, life jackets and a waterproof bag for storing personal items.

The three-hour tour, which is led by park naturalists, is a lesson in tidal marshes and their ecosystems. In addition to basic safety instructions, paddlers are given a descriptive talk about the sedge islands, one of the most pristine and productive areas on the Northeast coast. The tour consists of three stops: a sandbar, where marine and wildlife abound; Little Bay, where participants can search for hard clams; and Horsefoot Slough, where peregrine falcons and a tern colony are in clear view.

## A Birder's Paradise

One-quarter mile west of Island Beach State Park is the sandbar, a bird watcher's paradise. As you approach, a profusion of cormorants, terns, gulls and oystercatchers erupts into flight. Not only are these diverse species a sight to behold, but the chorused clatter given off by these beautiful birds is a rare sound indeed.

After an invigorating paddle, the canoes are beached on the sandbar. A close look at an osprey nest reveals three or four young, carefully protected by their mother. The sedge islands boast the state's largest osprey population with 21 nesting pairs, providing many opportunities to observe this rare bird. It is a testament to the success of efforts by the Division of Fish, Game

Canoeing is a great way to get an up close and personal view of nature at Island Beach's sedge Islands.



© PETE MCCLAIN

and Wildlife's Endangered and Nongame Species Program (ENSP) to reintroduce this and other wildlife species to the area.

If calm winds prevail, black skimmers may amaze the group with their predatory skills and graceful movements. Coming within 50 feet of the sandbar, these birds skim the surface by extending their lower bills and snapping up small bait fish.

The sandbar is also home to the fiddler crab, the ribbed mussel and the air breathing melampus snail. Each one has its own fascinating story.

Fiddler crabs, which come out at low tide, are abundant here, numbering about one million per acre. They burrow into the sand, creating a network of holes that supplies oxygen to the surrounding sedge grass. Males have a large claw, which represents about 40 percent of their body weight; its sole purpose is to attract females.

Ribbed mussels embed themselves in the marsh. During high tide, when they are covered with water, they open their shells, feeding on material in the water. When the tide is low and they are exposed, their shells are closed for protection.

Melampus snails are fascinating studies in biological time clocks. During low tide, these snails live at the bottom of *Spartina* grasses, but just before high tide, they will move up the grass above the water line. Even when put in a new environment, they will make this mysterious journey as the tides ebb and flow.

The surrounding grasses provide the wetlands' life line. The grasses build the marsh by catching sediment from the passing tidal waters and by nourishing the marsh when they decompose. As a result of this natural process, these shallow waters support an abundance of life.

Seining is offered on the trip to show what species live in the tidal waters adjacent to the marsh. Each time the seine is brought to shore, curious eyes open wide as fish, crabs and grass shrimp frantically try to squirm out of the net. The blue claw crab defiantly raises its claws as a warning to those who may try to touch it. Silversides, summer flounders, killies, pipe fish and mud snails are scooped up into the net.

## The Little Bay of Plenty

To begin the trip to Little Bay, canoes are portaged across the narrow sandbar to reach the waterway on the other side. Heading in the direction of Barnegat Lighthouse, marsh wrens and other small birds quickly fly by when voices disturb the marsh's serenity. Oystercatchers, with their noisy ascent, also will take wing as groups round the bend.

Little Bay is a welcome sight, especially when the tide is coming in, making the paddling a little more demanding. Once ashore, clamming is the next adventure. Even those who don't like clams may succumb to the challenge of "treading," which is using your feet to detect the mollusks in the sandy bottom. Wearing water shoes is recommended and doesn't interfere with finding clams. About 10 are retrieved each trip,

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## The horseshoe crab has been here for 300 million years.

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although a clamming license is needed to keep them.

Once refreshed, the tour moves on, paddling within 30 yards of another osprey nest. The adults take flight, and the female circles the nest until the boats pass. The white silhouettes of egrets or the large dark outlines of great blue herons are common sights. Weaving a path through the sedge islands in a canoe or kayak helps one realize that simple pleasures are sometimes the most profound.

## The Horsefoot Slough

A sandbar marks the stop at Horsefoot Slough. The canoes are beached once again as the tour stops to enjoy Barnegat Bay. The water temperature is noticeably cooler here, and the current is much stronger. Even so, going for a quick tidal swim is a delight for many on the tour.

Horsefoot Slough is named for one of its inhabitants, the horseshoe crab (formerly known as horsefoot), which was harvested here for hog feed and fertilizer many years ago. The horseshoe crab has been here for 300 million years, but it remains virtually unnoticed until it becomes beached on land.

Within clear view is the peregrine falcon hacking tower. This bird, which has the ability to dive at 180 mph to catch its prey, also was reintroduced to the area by the ENSP. As with the osprey, the peregrine falcon serves as a reminder that human intervention can be successful and productive.

The tour heads for home by going east through the Horsefoot. Nests of ospreys line both sides, and the sharp cheep of adults is heard in passing. The shallow waters surrounding several of the sandbars often are visited by glossy ibises, which use their long bills to catch a meal.

The tour returns to the launch site where the equipment is collected, and the canoes are put back on the racks by the patrons. The day is still young, and the park has much to offer for those that want to lie on a beach, go swimming or just notice the natural beauty of a barrier island.

Information on canoe tours of the sedge islands is available at the Island Beach State Park Nature Center or by calling the park's main office at 908/793-0506. Pre-registration at the main office is necessary to assure a space on the tour.

*Diane Bennett is a science teacher from Barnegat and a sedge island tour guide.*



# Crafty Critters of the Barrier Islands

by Pete McLain

Crafty, swift, clever and cunning — all describe Mr. Red Fox, an animal that has challenged humans for thousands of years and usually comes out on top.

All these and more are particularly appropriate monikers for the red foxes of New Jersey's barrier beach islands. These small, dog-like mammals, with telltale red coats, black legs, pointed noses and ears and long bushy tails, have adapted to living in suburban areas. In addition to manipulating people for quick, ready made meals, these foxes are raiding another easy food source — colonies of beach nesting birds, including the endangered piping plover and least tern, which rear their young on bare, sandy beaches.

The debate continues to rage over what to do with the foxes of New Jersey's barrier islands. And New Jersey is not alone in its quandary over the battle between foxes and endangered beach nesting birds. Other eastern shoreline states, such as Massachusetts, Rhode Island, New York, Delaware, Maryland and Virginia, have been hit hard by foxes.

Here in New Jersey, the foxes are troublesome at Island Beach State Park, the Holgate and Little Beach sections of the Forsythe National Wildlife Refuge, the North Brigantine Natural Area, Corson's Inlet State Park, Whale Beach between Sea Island City and Strathmere and on the U.S. Coast Guard Training Center property at Cape May.

## From the Coast to Cities

Few mammals are as diverse in their habitats as the red fox. They range all over the Northeastern states, south to central Georgia and Mississippi and northwesterly to Wisconsin and Illinois. They live in woodlands, fields and marshes, along streams and even within the limits of some of the country's largest cities.

The red fox (*Vulpes fulva*), also known as the cross fox, silver fox, black fox and the silver-gray fox, weighs about 8 to 12 pounds and averages 42 inches in length. There are a number of color phases of the red fox, ranging from nearly black or gray to a dark coat tipped with white. Although males, called "dogs," are generally larger than females, both sexes display the same coloration patterns.

Late in winter, foxes start their barking, which precedes the mating season. About 52 days after mating — in late March and April — four to ten young are born in dens. Dens usually are constructed on a wooded or brushy slope, often in a remodeled woodchuck hole. The young remain in the den for five weeks, and both the male and female participate in feeding them. In late August, family ties are broken as young foxes begin to hunt on their own. They start breeding the following winter.

Foxes in New Jersey are trapped for their pelts, particularly during the "silver fox" coloration phase. Foxes also may be



Foxes leave telltale signs on the beaches of New Jersey (opposite page).

Foxes have several coloration phases, including this dark red coat tipped with black.

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The debate continues to rage over what to do with the foxes of New Jersey's barrier islands.

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hunted in the state, although there are restrictions for some barrier beach areas. Check the hunting edition of the *New Jersey Fish and Wildlife Digest* for the latest hunting regulations.

In nature, the fox is just another predator, learning to hunt and work for its food like most other wild creatures. It lives on small birds, small mammals, fruits and berries, although it occasionally takes a farmer's chicken if the opportunity presents itself. Its enemies are eagles, wolves, lynxes, fishers and people.

Disease and predation keep the fox population in check. But when man interferes with the balance of wildlife populations and habitats, the equation changes, creating a wildlife nuisance.

### A Fox's Best Friend

Such is the case at many of the state's barrier island beaches. The recent drastic increase in the fox problem along the Jersey coastline has been due largely to foxes learning and adapting to human contact, looking to people as a ready and reliable food source.

David Jenkins, principal nongame zoologist with the Division of Fish, Game and Wildlife's Endangered and Nongame Species Program, says foxes have learned not only to tolerate humans, but also to follow in their footsteps.

In the past, shoreline foxes were content to subsist on their natural foods, occasionally picking up people's leftovers and garbage. But it didn't take too many generations of foxes to learn that, with a little flirting and some cute tricks, people would open ice chests, toss cookies or dog biscuits their way or deliver food on a regular schedule.

Some enterprising foxes quickly learned they could visit the back porches of beach homes and expect to find a daily meal of dog food or fried chicken. Last Thanksgiving, the superinten-

dent of Island Beach State Park even lost his turkey leftovers to a local fox when the bird was put on the back porch to cool.

Surf anglers are quick to give a hungry looking fox some of their fish bait, and some picnickers even feed the animals from the family beach blanket. As a result, some foxes sneak up on picnic blankets when they are left unattended or when the patrons are not looking and help themselves.

There is no question that foxes are interesting and somewhat captivating wildlife. They are smart enough to know a good thing when they find it, and their young learn early that it's easier to beg a piece of Kentucky Fried Chicken than to catch an elusive mouse or rabbit.

Bill Vibbert, superintendent of Island Beach State Park, which is the home of more than 20 red foxes, reports that the foxes have taken over the roadside edge as begging territory during the spring, creating the constant problem of "fox jams."

When park patrons see a red fox along the road, they pull over to get a closer look as the fox walks toward the car. Following the first "oohs" and "ahs," the picnic lunch is open, and food flies out the car's window. The next driver sees the fox and skids to a stop, successive cars see the action, and soon a dozen drivers may be partially blocking the well traveled road as their occupants catch a glimpse of their first wild fox.

### Outfoxing the Fox

When this chow line stops or when humans are not present, foxes supplement their diets by roaming the sandy beaches and catching migrating plovers and terns, destroying nests by eating eggs, chicks or adult birds. The fox is a serious predator.

Thwarting the fox predation requires a major effort by federal and state wildlife biologists, who have worked long and hard trying to fool old Reynard by designing various enclosures to protect the nests and also by passing laws and regulations to protect the beach nesting birds from people.

People are considered a problem in beach nesting bird areas. They frequently run their dogs and hike the beach, which results in frightening and scattering broods of plovers, which make them more susceptible to predation, according to Jenkins.

Recently, plover biologists and wildlife control experts from several eastern states met to discuss fox predation problems and possible remedies.

One such remedy is to install wire fence enclosures, four feet high with netting on top, around the piping plover nests. This has been partially effective in keeping the foxes at bay until the chicks hatch. Then it's fox feeding time again when the young plovers leave the enclosure.

But some foxes have learned to dig under the enclosures, and others have been observed leaping on top of the fencing and bouncing on the net until it collapses, and they land inside. Some biologists feel that the foxes learn to recognize the enclosure as a challenge for a free meal.



© JAMES SCHUGSTRA



© HERB SEGARS

Foxes have learned to rely on humans for a ready food source (opposite page).

A fox at sunset at Island Beach State Park (far left).

A fox eating a fish at Island Beach State Park (left).

State and federal wildlife biologists would like foxes to adhere to this sign (below).

Low electric fences around the nesting area have been tried, but the foxes quickly learn to avoid touching the wire and either dig under or jump over it.

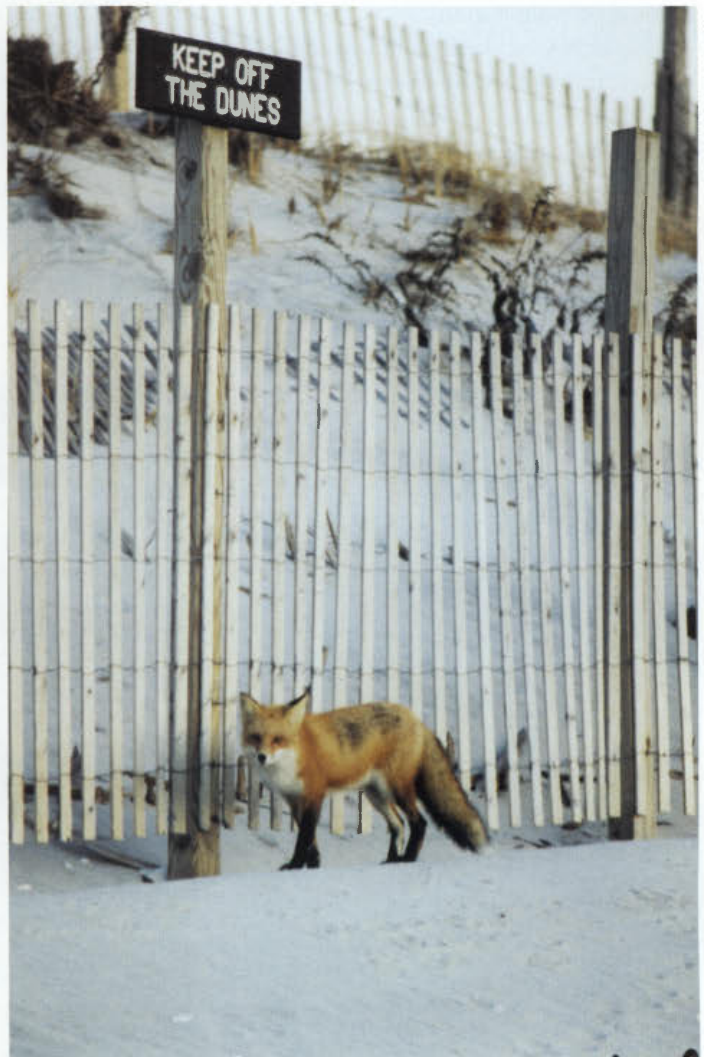
Vinny Turner, a wildlife biologist at the Edwin B. Forsythe Refuge, reports that in the winter of 1988-89, a paid trapper removed 40 foxes from the Little Beach section of the refuge. The following spring and summer, the piping plovers showed a remarkable increase of 13 nesting pairs, up from three pairs observed the previous year.

The U.S. Department of Agriculture Animal Damage Control personnel and federal and state biologists feel that it may be necessary to remove the foxes. Foxes could be trapped and released miles away or possibly destroyed where they are a concentrated nuisance. However, the public may object to a major fox control program as many people would rather see the foxes than the beach-nesting birds.

The present conflict between the red fox and the beach nesting birds is far from resolved. There is little question that there will need to be a major public education program to inform people that feeding wildlife, any wildlife, is not in its best interest. Wildlife carries disease, including rabies, that can be transmitted to humans. In national parks, it's illegal to feed wildlife, and fines are imposed on those individuals apprehended. Unfortunately, feeding wildlife seems to be the popular thing to do in many parks and public areas. It may be necessary to enact strict laws and restrictions on feeding wildlife in many urban and public use areas.

At present, the battle lines are drawn between beach loving foxes, the beach nesting birds and the wildlife biologists who are trying to outfox the fox. Based on experience, I'll put my money on the foxes.

*Pete McLain is a freelance outdoors writer from Toms River.*



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# SURVIVAL OF THE F

by G. Russell Juelg

On Thursday, July 6, 1995, my wife Linda and I walked away from civilization to spend six days “surviving” in the Pine Barrens. During our expedition, we discovered a South Jersey wilderness far from barren.

For six days and six nights, we did not see another human being. We didn't take a tent, backpack or food. We carried canteens, a sheath knife and, in our pockets, some “luxuries” recommended for a basic survival kit — notably, insect repellent, matches and water purification tablets.

Although we were in self-imposed exile, the Pine Barrens provided a good test for survival skills. After all, it is the largest stretch of wilderness on the mid-Atlantic seaboard. Within its 2,000 square miles — most in South Jersey and covering nearly one-fifth of the entire state — one can explore upland pine/oak forests, the curious “dwarf” or “pygmy” forests and the magnificent old cedar swamps.

Our survival campsite was within the Woodford Cedar Run Wildlife Refuge in Medford Township. We confined ourselves to a twenty-acre plot, consisting mostly of forested, sandy high ground, with access to two fast-flowing streams, several marshy areas and a stand of tall cedars.

## Give Me Shelter

Survival in the Pine Barrens — and, in fact, most wilderness situations — has its own set of priorities. Absent any medical emergencies, the first things to consider are shelter, fire and food.

Hypothermia is the most immediate threat to your well-being, and it can be brought on even in warm weather by rain and wind. Even in the height of summer, we would find out about this firsthand.

We found a small clearing with grass and moss, surrounded by pitch pines, chestnut and white oak trees, as well as thickets of huckleberry. A white oak sapling served as an upright, and a nearby fallen tree, straight and slender, provided the ridge pole. After lashing the ridge pole to the upright with swamp maple roots, we laid on the “ribs” to form an A-frame.



© G. RUSSELL JUELG

# ATTEST

We spent more than five hours building our shelter. You have to gather a lot of leaves to cover the frame to insulate you from the cold and to prevent rain from soaking through the walls. More leaves are needed to fill the inside to keep you off the ground and to build yourself a cocoon.

Despite our best efforts and two-foot thick walls, the cold crept in our hut. By Tuesday, heavy rain had blanketed the area and, by morning, we were damp and shivering.

## Potable Water

The second priority in wilderness survival is to find safe drinking water. There's plenty of water in the Pine Barrens. The immense aquifers just below the sand hold trillions of gallons of pure water. Many streams and rivers flow through the area year-round, most with the characteristic, tea-colored "cedar waters," darkly stained with iron ore, tree bark and leaves.

In addition, lakes, ponds and natural wetlands dot the landscape, and, although this water is usually pure, you never should assume it's safe to drink. Bacteria, parasites, viruses and industrial pollutants may be lurking even in the most "pristine" surroundings.

Although we had water purification tablets, we wanted to experiment with how to purify water if we were caught totally unprepared. In such a situation, the best you can do is boil your water — assuming you can come up with a suitable container.

We practiced making containers from natural materials. We had studied the use of birch bark by the indigenous people of this area and had selected two types of containers for our experiment: one cone-shaped, the other, a rectangular dish. In theory, you can drop hot stones in the water in these containers and gradually bring the water to a boil.



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To be honest, we didn't have much luck. First of all, it proved impossible to find a suitable birch tree with bark free from holes and other defects; our containers were destined to leak. Secondly, the bark we did find was pretty hard to manipulate, being far less pliable than we thought (although it helps to heat up the bark while you're working with it.) Thirdly, the small trees we used left us with correspondingly small containers, hardly big enough to hold a decent amount of water, much less hot stones. In the end, we concluded that making a water-boiling container "from scratch" in the wilderness is a pretty tough job.

## Fire

Fire-making is the third priority in wilderness survival. For warmth, for

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Hypothermia is the most immediate threat to your well-being, and it can be brought on even in warm weather by rain and wind.

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Author G. Russell Juelg pokes his head out of a leaf-covered shelter (opposite page).

Linda Juelg outside the shelter by the fire (above), which was used for warmth, cooking, boiling water and comfort.




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Teaberry leaves provided both a pungent wintergreen flavor as well as a pain-relieving substance.

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A Pine Barrens tree frog sits atop wild blueberries (left) in the Pine Barrens.

Water purification tablets (opposite page) are a key component of a basic survival kit.

cooking, for boiling water and just for psychological comfort, a fire gives the survivor a wealth of advantages.

Although we used fire mainly for drying our clothes and for warmth during chilly evenings and mornings, we also enjoyed sitting by the glowing embers after dark, listening to whippoorwills and owls and making our plans for the next day.

Since we carried matches in small, watertight containers, we didn't worry about making fire. Even after Monday night's hard, steady rain, we still had dry material from inside the hut to use for tinder and kindling.

### The Forest's Food

After we had secured shelter, water and fire, we started thinking more about food. Our plan was to forage for

wild plants and catch fish. We ruled out trapping; taking wild animals out of season is, of course, illegal, except in a genuine emergency.

As for the edible plants, we had pretty good variety. Blueberries were just reaching their peak. Linda especially liked the distinctive, tart flavor of the wild highbush blueberry, even though it took 25 handfuls to make a meal. I, on the other hand, preferred the exceptional sweetness of the low blueberry and the black highbush blueberry, as well as black huckleberries.

Bracken fern fiddleheads, the young, fist-shaped structures of the uncurling fronds, provided delicate flavor and tender texture. Young acorns from scrub oaks, on the other hand, tasted like bitter walnuts. While they definitely were

not a favorite food, we knew they were high in nutrition. Similarly, wild carrots were tough and dry, but smelled and tasted just like the store-bought variety.

Young greenbrier sprouts were a special treat, although they were scarce in mid-summer. The tender growth from these tough, thorny vines tastes as pleasant as raw asparagus stalks. Teaberry leaves provided both a pungent wintergreen flavor as well as a pain-relieving substance, a welcome relief for our sore back muscles from building our shelter.

It was a good thing we had so many choices, because fishing went very badly. We hadn't brought any fishing tackle with us. We made hooks from hardwood stems and lines from dogbane fibers. The hooks are easy. You can whittle one in about five minutes.

Making the line is a lot harder.

First, we had to find dogbane stalks, a wild herb with strong, branching stalks and long, slender seed pods. The old dry stalks from the previous year provided a good start. Next, we had to separate the fiber from the stalk. Then we had to twist the fibers together using a technique called "reverse-wrapping" to make a thick, pliable cordage strong enough to catch a largemouth bass.

After three hours of reverse-wrapping and splicing together a four-foot piece of line, we set out for our fishing holes. We found two good places to fish, with bass and pickerel lying in the shallows and slowing swimming along the banks. (There is a state advisory on consuming bass and pickerel caught in the Pine Barrens because of elevated mercury levels.) The streams were about 10 feet wide and 6 feet deep on these stretches.

But during our hike, we lost our line. We never found enough dogbane to make another; even our crude attempts to fish by hand, using crickets and grubs, was unsuccessful. We probably could have speared fish rather easily, but the game laws don't allow it.

This made us work harder at finding edible plants. We also came across quite a few snakes, frogs and bird eggs, which, in a genuine emergency, we could have added to our menu.

While foraging for blueberries and ferns along a stream bank, we found a bird's nest, tucked in the fork of a branch eight feet off the ground. It was beautifully constructed and full of bright blue eggs. Several northern water snakes came with easy reach, and, on one occasion, I nearly stepped on a hognose. The snake slid quickly away, then lay several yards away with his neck flattened like a cobra.

Food was the item most people asked about when we got back, but for us, it really was the last priority. Shelter, water and fire kept us occupied. We also fit into our schedule a daily hike to the stream for a bath and for washing clothes and spent several hours every day just watching birds and talking by the fire.

On our daily hike, we crossed an upland area with thick stands of mountain laurel and followed a deer trail into a boggy area bordering the stream. In a small, secluded clearing, we made a fire and a simple rack for drying cloths. The

smoke was handy for holding off the biting flies and mosquitoes while we finished our chores.

Everywhere were signs of animals: tracks and droppings from deer, raccoon, opossum, fox and squirrel. But it was the birds that were our chief entertainment.

In the first hints of morning light, the final calls of the owls and whippoorwills overlapped the first piping notes of the wood thrush and the "drink-your-tea" calls from the towhee. Gradually, the rest of the daytime birds chimed in: the catbirds with their jumbled songs, the ovenbird, calling "Teacher! Teacher! Teacher!" We heard and watched brown thrashers, crows, yellowthroats and many warblers. Then, with every twilight, we sat quietly by the fire, listening until we heard the whippoorwills again.

The mystery of wildlife is what draws us to explore the Pine Barrens. Its unique, rugged beauty and the constant struggle for existence certainly make it one of New Jersey's most valuable resources.

Our six-day struggle, as it turned out, was far less dramatic than one might expect. Neither of us felt anxious or deprived. We had prepared ourselves for the trip, and part of that preparation was to adopt an attitude of being satisfied and grateful for whatever nature provided us.

That doesn't mean we weren't looking forward to getting back home. By the end of day six, we had a new list of priorities. We planned to take a hot shower, open a bottle of wine and have roast chicken, mashed potatoes and garden-fresh green beans for supper. And that is exactly what we did.

*G. Russell Juelg is a freelance writer from Indian Mills and an instructor of wilderness survival training at the Woodford Cedar Run Wildlife Refuge.*



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# New Jersey's Outdoor Artisans

Story and photos by Oliver Shapiro

Carpenters. Secretaries. Artists. Bookkeepers. Sculptors. Roll them all together and what do you get? Today's taxidermists.

Preserving fish and game for display dates back to the 17th century in the Netherlands, but it wasn't until 1791 that the practice began in the United States. There are an estimated 75,000 taxidermists in the United States, and the practice still thrives in New Jersey. Some practitioners are full-time professionals, while others work part-time out of their basements or garages. Most of them produce outstanding trophies that any hunter, angler or nature lover would be proud to possess.

The majority of work done by taxidermists in this state consists, as you might expect, of North American fish and game, especially those legally harvested in New Jersey. A number of specimens taken in other states, such as bear, elk and moose, as well as an occasional exotic species from overseas, are sometimes encountered.

"Ninety-nine percent of my work is North American game," says Nick Sierchio of Caldwell Taxidermy in Fairfield. "Maybe 50 to 60 percent of that is deer heads, and another 20 or 30 percent comes from pheasants, waterfowl, turkeys and small game like squirrels. The rest are fish, which usually come in the spring and summer."

Sierchio has been producing mounted specimens for almost 45 years, and a visit to his work-

Shoulder deer mounts in the final phase of preparation (right).

Taxidermist Nick Sierchio (below) discusses the "customization" of forms for deer mounts.



shop is an education in anatomy and creativity. As you pass through the entrance area, you're greeted by two full-body bear mounts — a grizzly and a black bear. Bass and trout are caught forever in mid-leap on wall plaques, a coyote lurks in a nearby corner, and a Dall sheep peers down at you from the wall.

In the work area, deer "forms," plastic reproductions of deer heads and necks over which processed skin will be placed, abound. Many of them already have the rack (antlers) attached while the skin is going through a preservation process. Overhead, in a metal rack affixed to the ceiling, are rows and rows of antlers — mostly deer, with a few moose and other species in the mix.

Deerskins are in various stages of preparation, and some pheasants just have been skinned and are ready to start the drying and preservation steps.

"When the deer first comes in," Sierchio explains, "you have to check it to see what kind of shape it's in. Then you take its measurements and skin it. The skin has to be cleaned and salted, then tanned."

Although Sierchio can do his own tanning, a process by which hides and skins are made into leather, he usually elects to send them to a commercial tannery to be processed.

After the skin comes back, which can take as long as four or five months, he selects a form closest in size and shape to the original specimen. In the past, these forms were created on an individual basis by the taxidermist, but today many practitioners purchase pre-made forms from a supplier. A surprising variety of such pre-fab forms are made for whitetail deer, typically in a dozen or more sizes, shapes and positions.

Often the form must undergo additional custom shaping, for example, shortening or lengthening the muzzle or reshaping musculature, before it's ready for the skin. Such customization, according to Sierchio, is necessary on more than half of the deer. Antlers and artificial eyes are attached, and the entire preparation is fine tuned as necessary.

Preparing trophies from large animals can range in price from about \$225 for a deer shoulder mount to several thousand dollars for full body mounts of more exotic species, such as bison or bears, according to an informal survey of state taxidermists.

## Fins and Feathers

While many mammals are handled in a similar fashion, birds have special considerations. Like mammals, they must be skinned, but they are not tanned. Instead, they are cleaned, dried and preserved, with special attention given to the feathers. Improperly dried skin can result in a poor paint job, skin shrinkage and general deterioration of the mount's appearance.

Another method used on small or delicate specimens, such as perch, turkey heads or weasels, is freeze drying. The fish or animal is soaked in a solution and injected with chemicals, then placed in a freeze drying machine. This allows all the moisture to be extracted from the specimen without the need for dissection. The only artificial material needed is glass eyes, although the process does eliminate colors, which must be touched up with paint, says Greg Crain, the executive director of the National Taxidermists Association.

Fish are another popular species for display. Frank Mauriello, of Fin, Fur and Feathers in West Caldwell, does most of his business in fish mounts. Displayed in his workshop are largemouth bass, Chinook salmon, trout, bluegill, crappie, hybrid striped bass, white perch, channel catfish, sailfish and mackerel.

For fish, there are generally three options — a fish mount, freeze dried (for smaller specimens) or an artificial replica.



Racks of antlers hang in Sierchio's workshop (above).

Birds and fish are on display at Frank Mauriello's Fin, Fur and Feathers in West Caldwell (below).





Some of the more unusual mounts include this hedgehog (above).

A shoulder mount deer form, to which the antlers and prepared skin will be attached (below).



Like the other specimens, fish mounts use the skin of the species, which is placed over a form. However, this often is difficult for catfish and many saltwater varieties because the high oil content makes it hard to thoroughly dry the skin. This makes painting and long-term preservation of the specimen chancy.

For those species, and others caught in “no kill” lakes or streams or by the “catch and release” option, artificial replicas are becoming more popular. Using photographs as well as length and girth measurements supplied by the angler, the taxidermist selects from a variety of fiberglass forms and paints a realistic representation of the fish.

Fish mounts generally are cheaper than mammals or birds, typically costing about \$8 an inch for a mount or about \$10 an inch for a fiberglass replica. But prices do vary substantially from one shop to another.

Sportsmen and women looking to have that once-in-a-lifetime trophy preserved are well advised to observe several taxidermists’ work before deciding where to entrust his or her specimen.

In addition to making accurate, true-to-life reproductions, taxidermists often find themselves producing fictional or novelty items. Mauriello has a white perch with the pattern of the American flag mounted in his shop, as well as a pair of bookends featuring the head and tail of a salmon. Some people request wall racks with deer hooves for pegs, and Mauriello recalls once seeing two rabbits perched over a chessboard.

## Taxidermy Dos and Don’ts

Although taxidermists are not required to be licensed by the Division of Fish, Game and Wildlife in New Jersey, there are rules and regulations governing the practice. Only those specimens legally harvested in season are permitted to be mounted. (It is illegal to possess the remains of any nongame or endangered species without a permit.) In addition, any animal that is required to be registered in the state (e.g., deer, beaver and otter) must have the identification tags remain with the carcass or hide until final mounting.

Any taxidermist handling migratory birds must be licensed by the U.S. Fish and Wildlife Service. Laws prohibit the sale of most trophies from indigenous wildlife, such as deer, bear, waterfowl and other game birds, to a third party. For more details on these laws, check the January and August editions of the *New Jersey Fish and Wildlife Digest*.

Despite these stringent regulations, many of those practicing taxidermy in New Jersey are self-taught. For those interested in getting started in the craft, there a number of options.

According to Sierchio, some taxidermists take on apprentices toward the end of their careers to pass on their knowledge and experience.

Schools also are available, most by correspondence. Sierchio estimates that two years of instruction and experience are needed to become familiar with the materials and procedures. Mauriello says he has supplemented his own training with some of these correspondence courses and finds them valuable.

Dan Wyant, of Dan Wyant Taxidermy in Clinton, suggests getting involved in the Garden State Taxidermy Association, which will hold its annual event and competition at the Holiday Inn in Phillipsburg on July 19 and 20. There, budding taxidermists can observe other people’s work, learn about their craft from more experienced practitioners and attend instructional seminars.

## The Tools of the Trade

Surprisingly, the taxidermist’s tool collection requires little in the way of specialized equipment. Some devices include fleshing tools to remove fat and tissue from animal skins and painting equipment, such as airbrushes. Both Mauriello and Wyant consider their airbrushes absolutely necessary to obtain satisfactory finishes on their specimens.

Not only are airbrushes and painting equipment critical to add color to fish mounts, they also are used to make the head, feet and bills of some species more lifelike. On mammals, the eyes, nostrils, lips and ears can be improved and enhanced. The hair on mammals or feathers on birds also can be



A largemouth bass (far left) hangs in Mauriello's shop.

An eastern gray squirrel, captured in a natural pose.

re-dyed with paint. In addition, airbrushes come in handy for providing realistic habitat bases.

The art of taxidermy is ever changing. Mauriello says he has seen an increased use of artificial materials, including antlers, duck or goose bills and even turkey heads. "Fiberglass fish mounts have picked up a lot," he says.

Suppliers and practitioners also are getting more specialized in their crafts. As a result of the competition, taxidermy, in general, has reached new heights of precision, realism and artistry.

"The material is more realistic," says Sierchio. "It lends itself better to realistic mounts. The results are being received a lot more as a work of art, rather than just a stuffed deer head. The profession is going strong — I'm busier than ever."

Wyant concurs. "Anybody who thinks of taxidermy as being antiquated or crude should give it a second look," he says. "It's much more of an art, a realistic representation of a specimen. People's perceptions are progressing, and it is beginning to be received as an art."

For more information about the Garden State Taxidermy Association, call John Ballman at 201/779-7287. The National Taxidermists Association can be reached by writing to 108 Branch Drive, Slidell, LA. 70461 or by calling 504/641-4682.

*Oliver Shapiro is a freelance outdoors writer from Passaic.*

## Tips for the Best Trophy

It's critical to handle your trophy properly between the time you harvest it and the time you get it to the taxidermist's shop. Damaged or spoiled animals make the job more difficult and often can have a lasting effect on the quality of the final mount.

In all cases, the sooner you can get the animal to the taxidermist, the better. Taking photographs right after the specimen has been harvested can help produce the most lifelike results, especially in the case of fish.

Here are a few tips for handling specific species.

■ **Fish** Be sure to take length and girth measurements and photographs of the fish as soon as possible, as colors will change rapidly once it is out of water. Rub the fish with Borax or coarse salt to help retain the color. Wrap it in a wet cloth or towel, place it in a bag and freeze it. If the fish is unable to be frozen shortly after being caught, gut it, but make sure that one side remains intact.

■ **Large mammals (e.g. deer)** As soon as the animal has been harvested, a hunter should decide if it will be

mounted so that precautions, such as minimizing dragging or unnecessary cuts, can be taken. Specimens should be kept frozen or at cool temperatures, preferably below 40 degrees Fahrenheit. If there are unavoidable delays in reaching the taxidermist, it may be necessary to skin the animal and thoroughly salt the skin. This is done by cutting around the body just behind the shoulders; making an additional cut up the back of the neck, stopping at the ears; cutting the neck off close to the skull; and peeling the skin off the neck. Place the head and skin in a plastic bag and freeze.

■ **Birds** Put the specimen in a plastic bag, taking special care not to disturb the feathers. This can be done by forming a funnel from newspapers and placing the bird in head first or by placing the bird into a woman's stocking. Put the wrapped bird in the freezer. In the case of turkeys, it is important to get the bird to the taxidermist as soon as possible as they deteriorate quickly.

■ **Small mammals** Handle in a manner similar to birds; simply place in a plastic bag and freeze.

# On the Front Line Against

# Beach Erosion

An artificial reef is tested in a wave tank at the Davidson Laboratory (below).

Beach erosion at Cape May Point following the Blizzard of '96 (right).

By Dory Devlin

When major storms hit, most New Jerseyans worry about flooding basements or digging out of snow-covered driveways. But Michael S. Bruno and the other ocean engineers at Stevens Institute of Technology worry about 127 miles of fragile, ever-shifting coastline along the Jersey Shore.

Stevens' Davidson Laboratory is among those on the front line in the state's battle to stem erosion of its beaches, the jewel in a multi-billion dollar tourism industry. A long-standing union between the Department of Environmental Protection (DEP) and the ocean engineering experts at Stevens was strengthened in 1992 with the creation of the Shore Protection Fund. Two percent — or about \$300,000 of the state's annual \$15 million shore protection appropriation — goes to the Coastal Protection Technical Assistance Service (CPTAS) at Stevens' Davidson Laboratory for research and to train state, county and municipal engineers on beach erosion. The rest of the funding is used for projects such as beach replenishment and dune construction.

"It's a great marriage," says Bernie Moore, administrator of DEP's Engineering and Construction Group, who has high praise for Bruno and the researchers at Stevens.

Inside the Hoboken laboratory is the largest university wave tank system in the nation. It includes two tanks — one measuring 320 feet long, 12 feet wide and 6 feet deep, the other 75 square feet and 5 feet in depth. The tanks simulate wave conditions at the Jersey Shore, assisting the researchers in their quest to find the right mix of protective measures to lessen the blows dealt by cruel coastal storms.

It's there that an artificial reef designed by the Flemington-based Breakwaters International Inc. was tested before three were installed offshore in Avalon, Cape May Point and Belmar/Spring Lake, beginning in 1993.

So far, the success of the reefs has ranged from limited to dramatic, says Bruno, director at the Davidson Laboratory, which is monitoring the program. The reefs have aided in reducing sand loss as well as cut the wave heights by 20 percent.

The "reef" is made of interlocking pre-cast concrete pieces; each section weighs 21 tons. The reefs, which stretch about 1,000 feet long, are placed 300 feet offshore. Each cost the state about \$600,000 to install.

## The Avalon Experiment

The first reef was put in place in Avalon in July 1993. While Stevens' researchers have found no adverse effect on the beach there, Bruno says there hasn't been the anticipated level of success either.

"We went into it knowing it was an experiment," he says. Like other protective measures, such as sand replenishment, it's not a

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## Once nestled between Cape May Point and the City of Cape May, South Cape May Point washed away in 1944.

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cure-all, Bruno adds. "We've learned a lot."

Artificial reefs, also called breakwaters, are designed to reduce wave energy and slow the impact of waves on the shore. During a storm, the reef, if effective, also reduces the movement of sand offshore.

The Avalon reef is secured to a jetty on the north end and open on the south side. Researchers had questions about the performance of a reef unattached on one end, and the answers weren't good.

"The beach behaved as if the reef wasn't there," says Bruno. Sand washed away at that end, where the reef also settled four feet into the sand, leaving only a few feet standing above the ocean floor.

### Creating New Beachfront

But in Cape May Point, the results have been encouraging. "There, the beaches have actually grown, even though the reefs are not designed to do that," says Bruno. "It's done this in a really aggressive environment."

Cape May Point was chosen as one of the three experimental sites because, as the southernmost point of the state, it faces due south at the mouth of the Delaware Bay, where there are very strong cross currents because of the nearby Atlantic Ocean.

"It's a very turbulent area," says Bruno. "Erosion here is very pronounced."

So much so that a neighboring town — South Cape May Point — no longer exists. Once nestled between Cape May Point and the City of Cape May, South Cape May Point washed away in 1944, says Cape May Point mayor, Malcolm Fraser.

And, in the early 1920s, more than two blocks of the City of Cape May also disappeared into the ocean. Beach Drive, Diamond Avenue and part of Crystal Avenue are gone because of beach erosion.

During storms last summer and the Blizzard of '96, the beaches protected by the reef lost a minimal amount of sand, while the other Cape May Point beaches were hit hard, says Fraser, a 1951 Stevens alumnus. "We're sold," he says. "It did the job."

City leaders were so confident in the reef's ability, they turned down the state's plan to add sand to the beach to see how the reef would perform without added fill. The experiment proved successful. "The beach has grown both vertically and horizontally" since the reef was installed in May 1994, he says.

### Pounding Surf, Drifting Sand

A stretch of beach at the Belmar/Spring Lake border was chosen as the third site because it has been pounded in storms, particularly the October 1991 Halloween storm that nearly collapsed the sea wall.

"We knew it was rough there, but we didn't know how rough until we began our research," says Bruno. It has been difficult for them to find two to three days together when it is safe to do underwater research because of the severe waves. The rough conditions have precluded any definitive research results yet on this reef, which was installed at the end of August 1994.

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Still, there are some signs of encouragement. Since the reef was put in place, "we haven't seen waves hitting the sea wall," says Bruno. And, in the January blizzard, the reef took a beating, but emerged intact.

One unanticipated bonus, says Bruno, is that the reefs have become successful habitats for sea life. Diving with graduate students to study the Belmar/Spring Lake structure, Bruno discovered mussels, starfish, eels, lobsters and many varieties of fish making the reef home.

"You'd be hard-pressed to find a square inch not covered with mussels," he says. "It's really amazing. If you had good visibility, you would swear you were in a reef somewhere off the Florida Keys."

Though the monitoring project is far from over, Bruno says he is convinced the artificial reef technology can be used effectively. "When we come out of this study, we want to be able to say to the state, 'If this is the technology of the future, then this is the type of site where it will work best,'" says Bruno.

## Sand Hot Spots

While the artificial reef program gets a lot of attention, it is only one of several ongoing beach erosion research projects at Davidson.

The lab continues to work with the Army Corps of Engineers and the state to analyze beach nourishment programs. The state is committed to replenishing beaches, despite the expense and the fact that nature will wash away much of that sand.

"You've got to get the fill," says Moore. The reefs, he says, can help beaches hold the added sand longer.

The Army Corps and the state have been working on a \$46 million section of the beach replenishment program between Asbury Park and Manasquan. The entire restoration project, the largest of its kind in the nation, is expected to take a decade to complete and will add 100-foot wide beaches from Sea Bright to Manasquan.

Despite concerns that the Army Corps was considering ending its beach replenishment program, Moore says the Corps has committed to complete this project.

The lab's staff of 25, plus 20 graduate and undergraduate students, work on computer models to determine the "hot spots" along the shore where erosion is at its worst.

Because of the Davidson research, the state has retreated from a reliance on seawalls, jetties and groins to capture sand along the coast. Instead of retaining sand, in many places these engineering structures starved neighboring beaches by trapping sand at one beach.

"For the first time, you're seeing the removal and shorten-

A section of the artificial reef is lowered into the ocean at Belmar (opposite page).

Mussels flourish on the artificial reef (right), including this earlier above the surface version at Sea Isle City.

ing of jetties and groins," says Bruno, referring to structures built perpendicular to the shore.

Rather, a greater emphasis has been placed on creating dunes along the coast to provide another line of defense against storms. Researchers at Davidson are working on devices to improve dune survival, including the construction of a dune with a concrete or clay core. Buried just beneath the sand in the dunes' slopes would be stone-filled marine mattresses.

Researchers also are studying different types of dune vegetation that can help hold sand in place.

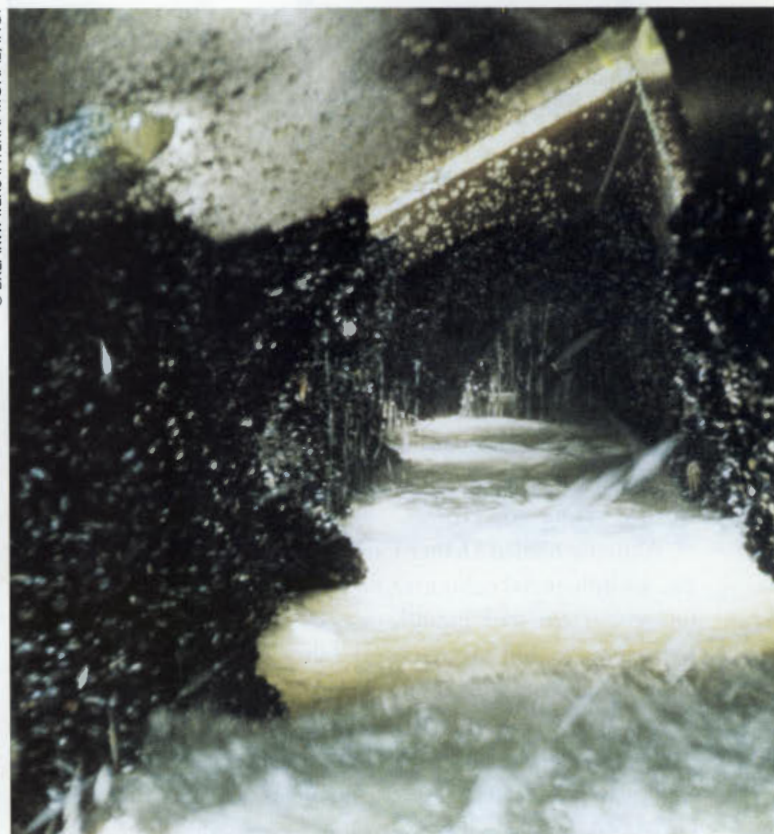
And the lab is testing erosion control disks that catch sand beneath the surface before it is washed away offshore and a de-watering system, a submerged well system that operates much like a French drain, which uses a system of underground pipes to reroute water.

Since New Jersey made a commitment to find new technologies to preserve the shore following the devastating December 1992 storm, the state has emerged as a forerunner in coastal research. And the Davidson Lab fields a lot of calls from other states and countries wanting to know what's happening in New Jersey.

"In a short period, New Jersey went from the bottom of list of states looking at new technologies to number one," says Bruno. "When we travel to conferences, we find other places are looking to New Jersey."

*Dory Devlin is freelance writer from Basking Ridge.*

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The park sits on a steel and reinforced concrete shelf supported by 58 concrete pillars.

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Stones from the Delaware & Raritan Canal were used for this monument honoring Frank Deiner Sr., which serves as the centerpiece of the park.

# A Bridge over Troubled Traffic

by Laurel Van Leer

Noisy gulls swoop through the air searching for lunch and a landing zone. Sun worshippers, wearing little more than sun screen, alternate between catching some rays or a Frisbee. Others bask in the shade with Shakespeare, Newton or Doonesbury. The basketball court, if not the chess tables, are full.

It's summertime at "Deiner Beach," an oasis of serenity above the bumper-to-bumper traffic of Route 18, a Central Jersey highway serving Rutgers University and the city of New Brunswick. The closest beach is a gulls-only sandbar in the middle of the Raritan River, but visitors here don't let reality intrude upon a good thing.

Actually named Deiner Park, after the late Frank Deiner Sr., an influential columnist for the former *Daily Home News* newspaper, the park literally does sit above Route 18. While more than 75,000 cars pass under the park each day, park goers barely hear the traffic, and motorists remain oblivious to activities going on overhead.

The two worlds are separate by design.

The park was built in 1982 specifically to shield Rutgers University from the highway. Grassy lawns, flower beds, a pic-

nic grove, flowering shrubs, leafy trees and a spectacular view of the Raritan all serve to divert the senses from the highway underneath. In fact, if the white concrete walls of the shrub planters did not look so strikingly like highway dividers, it would be hard to believe the park is a creature of the state Department of Transportation.

## Preserving the Canal

In the 1970s, plans to extend Route 18 through New Brunswick and across the Raritan River created several problems. The best route for the highway called for paving over a portion of the historic Delaware & Raritan Canal, a water-based transportation network that once ran in the shadow of what is now three Rutgers dormitories.

Citizen activists opposed paving the canal and tow path, which many used for nature walks, jogging and bicycling. They claimed New Brunswick, a tightly packed urban area, did not have enough open space. University officials and students opposed building a major highway so close to student housing. In addition to noise and exhaust fumes interfering with studying and

causing health problems, there was a concern over the possibility of mischievous students wreaking havoc on passing motorists.

The DOT's solution was a shelf park, complete with nearly \$1 million in landscaping. Such a park is the first in New Jersey and rare elsewhere across the country. The new 4.5-acre elevated park would replace and enhance the lost recreational space of the canal tow path, DOT officials said. It also would be a healthy buffer between Rutgers students and the highway.

## The Shelf over Route 18

Today the park sits on a steel and reinforced concrete shelf supported by 58 concrete pillars. The canal, mostly unknown to the current generation of students, now flows through a culvert under the highway. A monument to Deiner is constructed of canal stones hauled to the park by his son, Frank Jr.

Deiner Park also has its own bridge number, DOT 1237-156, and its own rules.

As a shield, the park has been a success, but keeping it clean and green is a continuing challenge to park officials.

Most park managers don't have to consider weight load when planning events or contemplating changes in landscaping, says Rutgers Facilities Manager Earl Smith. At Deiner Park, it's all part of the job.

Want to plant more trees? Better figure out how much they'll weigh at maturity, how much potted soil they'll need to spread their roots and if they can stand up to extreme weather conditions.

At Deiner, the solution has included American red flame maple and American horn bean trees, hearty varieties in relatively small packages.

Weather is a tricky part of gardening at Deiner Park.

Most outdoor gardens planted in containers, albeit large ones, are rooftop gardens. Potted plants are prone to drying out

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Such a park is the first in  
New Jersey and rare elsewhere  
across the country.

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in the summer heat and freezing in the winter cold.

Deiner Park is "like planting a rooftop garden on a parking deck," says Roy De Boer, a professor of landscape architecture at Rutgers.

Summer heat bakes and dries the dirt more than in traditional parks. Many of the plants need hand watering.

"Those plants need a lot of tender loving care during the drought weather," De Boer says.

In sharp contrast, winter can mean a deep freeze at the shelf park. Unlike a rooftop garden, where a heated building can keep a planted area relatively warm, the shelf park is more like a bridge. Remember those signs that say "bridge freezes before road?" That's because cold air blows both above and below a bridge, putting a deep freeze on what's in between. At Deiner, that's soil and plants. In reverse, as the air warms, the deck park "melts" faster than the ground or a rooftop garden.

Most gardeners get one, maybe two, freeze/thaw cycles each winter, says De Boer. Deiner is sure to get several each winter, tricking plants into starting spring growth only to be frozen again. This puts tremendous stress on plants.

Deiner Park has found several species that work well under these harsh conditions, including dwarf rhododendrons, azaleas, Japanese holly, privet bushes, arbor vitae and cotoneasters.

Snow also get unique treatment at the park. During snowstorms, including the Blizzard of '96, the park is an unsullied winter wonderland. It is untouched by snow plow blade or ice melting chemicals. That's not for love of snow and ice, says Smith. "It's just safer for the park that way."

Mountains of plowed snow could produce unstable weight loads. Salt and other chemicals would corrode the cement supports.

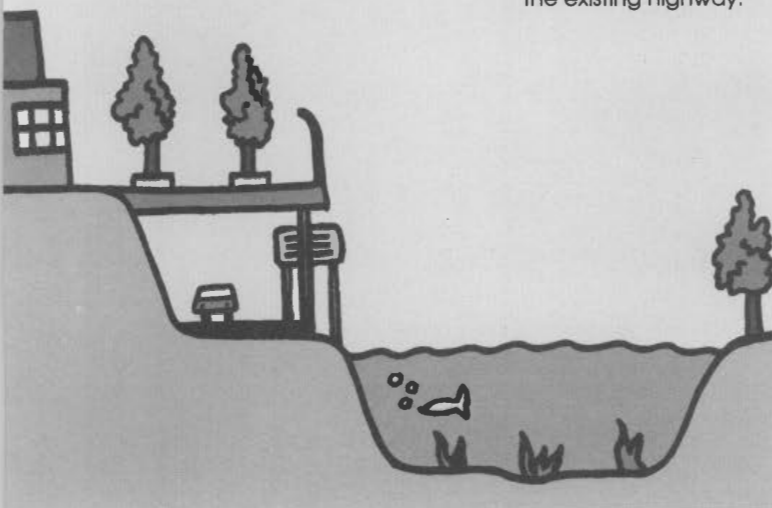
But neither rain, sleet, snow nor hail keeps Deiner Park from its appointed mission. It has become a haven for Rutgers students in a sea of crowded campus life and for the homeless seeking quiet solitude.

Here is an oasis in a hectic city, where "beach" rules are for the basketball players, and the hum of Route 18 traffic seems miles away.

Deiner Park is located off George Street in New Brunswick. For more information, call Rutgers University Recreational Services at 908/932-8204.

*Laurel Van Leer is a freelance writer from East Brunswick.*

This is a cross section showing how the park was designed to cover the existing highway.



# Dearly Departed: Gone but not Forgotten

New Jersey — historical, diverse and inviting — spreads out along the Atlantic coastline. Water rushes past townships and cities and then is gone, on a never ending quest to the sea. The wind rustles through the trees, whistling a haunting melody, and then falls silent. Like humans, the life cycle of the earth is ebbing and flowing, beckoning us to contemplate just how much life has changed.

Perhaps nowhere is the transitory nature of human existence more vividly evident than in the vast, aging graveyards of our forebears. Often these somber spots lie decaying and forgotten amidst a veritable sea of plant life. Frequently, a few descendants of those whose remains are laid to rest beneath its hallowed ground live nearby. But, in some cases, the entire makeup of a region's population has changed over the years, with old families dying off or moving away.

When such a transition does occur, the graves often receive an inadequate amount of care. Monuments crack with age and weather and, inevitably, become illegible. In time, grass and weeds grow so thick that not a single headstone can be seen. Eventually, the markers topple over and sink passively into the ground. A digestive earth soon swallows them whole, as they become mere foundations for soil, dead leaves and

fallen limbs. Nature is unrelenting and, if left unchecked, will take control of all that is unguarded.

On one particular visit to the Garden State, I journeyed east of the New Jersey Turnpike, some distance from the community of South Brunswick. There, I happened upon a few memorable tomb-

stone epitaphs. One, over the remains of a mother and her daughter, offered a rather unique parallel:

*"Mammy and I together lived  
Just two years and a half;  
She went first — I followed next  
the cow before the calf."*

I have come to realize that epitaphs, like those who compose them and take the time to read them, are only temporary. Therefore, in order to preserve our vast heritage, it is essential that we act before it is too late. Whether it be for the sake of gaining a bit of insight into the life and times of a specific relative or to establish a more accurate perspective of an area's history, perusing tombstone literature can be an extremely rewarding pastime.



This unique gravestone can be found at the Bevans Dutch Reformed Church and Graveyard in the Minnisink area.

## A Personal Journey

Such was the case with one branch of my own family tree, planted in central New Jersey more than 200 years ago. After much meticulous research, I happened upon a weathered, marble stone, leaning rather precariously to one side, within a small country graveyard. Protected by a rusting wrought-iron fence, the burial place was submerged totally in wildflowers. There, just a few miles from New Brunswick, where my great-great-great grandfather had lived and died, a nearly illegible inscription offered far more insight than I could have hoped to find:

*"Dr. Thomas Wd Fossett  
Born 1813  
9th son of Obil  
Grandson of John Fossett  
and  
Great, great, great grandson  
of Patrick of Ireland  
John's mother was Scotch  
I am over 80 years of age."*

These headstones trace some of the history of the Bevans family at a Minnisink area cemetery.

Amazingly, I had not only found valued information about a single forgotten relative, but I had stumbled upon leads concerning three previous generations of the Fossett family. Needless to say, I was elated with my good fortune.

I had begun the search for my family heritage some eight years ago. While traveling through the southern portion of New Jersey, I spent countless hours visiting a number of cemeteries. Eventually, I began to copy, trace, photograph and make rubbings of epitaphs that I found.

A dozen miles or so from Vineland, for example, I discovered a slate stone commemorating one Charles Miller. Its unique verse expressed the sentiment that the living are not always certain of their origin or their final destination:

*"I came I know not whence,  
I go I know not whither."*

Further south, near Woodbine, I discovered a marker that blatantly pointed toward the suspected destination of the departed. Below an etched finger, pointing in a downward direction, were the following telling words:

*"Gone home to be reunited with his father."*

Later, while visiting the coastal hamlet of Tuckerton, I made a point to browse through nearby burial grounds. On one monument, far too weathered to photograph, I found an intriguingly blunt verse that spoke of the hostile union between Ruth Wilkinson and her husband Obadiah.

*"Their warfare is accomplished."*



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© VISTA PHOTO

## Unlocking the Mystery

If you are inclined, as I am, to conduct research within the peaceful confines of old cemeteries, you will discover that worn and weathered gravestones are often quite difficult to decipher. In fact, it may be necessary to do a tracing or rubbing of the stone's surface.

In simple terms, epitaph tracing is a temporary method of re-drawing individual letters on a grave marker. In fact, I once used this very method on an aging stone standing over the grave of a Hackettstown youngster. Since the stone's dark color caused the weathered inscription to blend with the background, I was initially unable to read much of anything. However, I solved the problem by using a tracing method, learned many years earlier in a grammar school art class, which more recently had been adapted to fit my personal needs.

First, I went to the local art supply store and bought a box of ordinary white chalk. Returning to the graveyard, I began to trace the course of the lettering with my fingertips, followed close behind by the soft point of the chalk. Though I could not decipher the entire inscription, the name "Johnny Thompson" slowly began to appear, followed by a curious message:

*"The cherry tree of luscious fruit  
Beguiled him too high.  
A branch did break and down he fell  
And broke his neck."*

Since that time, I have experimented with many other methods of salvaging tombstone inscriptions. When, for example, the tracing method will not suffice, I might do a simple surface shading instead. Using the side (not the point) of a fat piece of chalk — and only a slight amount of pressure — I cover the stone's entire surface. This tends to produce the opposite effect of tracing, with the letters standing out against the chalked background.

Regardless of your personal preference, rest assured that the chalk will not damage or deface the stone in any permanent fashion, for it easily can be eradicated with a damp cloth or simply will wash away during the next heavy rainstorm.

The first time that I employed the shading method was during an investigation of the Baptist Churchyard, nestled in the village of Hamilton

Square. There I came upon an inscription detailing the tragic death of a four-year-old member of the Cubberley family, who had died in 1843:

*"The boiling coffee did on me fall,  
And by it I was slain  
But Christ has brought me liberty  
And in Him, I'll rise again."*



© J.J. RAJA

There is one other method that may be used to read deteriorating inscriptions in shaded areas. Take a mirror and move it to reflect sunlight at various angles on the stone. Words that may have been obscured when darkened suddenly become clear in the light.

## Life is an Epitaph

Through epitaph collecting, you will find that a rich sense of the past can be gained with a minimal amount of time and effort. During my expeditions, I have found that some New Jersey citizens choose extremely brief commemorations, while others are often quite willing to express lengthy renditions. On one tombstone, found in eastern Sussex County, I read the following brief, yet profound, message:

*"I am not afraid to die."*

Left unattended, many markers are swallowed by Mother Earth, like this one at Metuchen Cemetery (opposite page).

This iron casted marker (below) is found in the Bevans Dutch Reformed Church and Graveyard.



© VISTA PHOTO

## A Historical "Sketch"

If you should decide to start a permanent collection of epitaphs, here is the best way to ensure a keepsake that may well outlive the tombstone itself.

First, you should purchase large sheets of paper from your local office or art supply retailer. I have found that plain wrapping paper, drafting paper or 20-weight bond typing paper all seem to work quite well. Your best choice, however, is paper with a 25 percent cotton fiber content, since its texture copies the finished rubbing neatly and holds up to more than a slight amount of abuse. In any event, avoid using onionskin and erasable bond. Not only are they much too thin to stand up to the rough surface of the stone, but they inevitably will smear.

After you have found a suitable inscription, measure the entire face of the stone. Then carefully trim the paper to the correct size, leaving enough excess to bend around the marker's edge. Next, hold it flat over the face, folding it around all edges, and use masking tape to attach it temporarily to the sides and top of the stone.

When practicing your new-found hobby, you should come equipped with a number of essential tools. Since tombstones sometimes settle, topple or become submerged, you should bring a small trowel and grass trimmers for excavation. A good, soft-bristled brush also will come in handy for clearing bits of dirt clinging to the surface. Under absolutely no circumstances, however, should you ever clean the surface of the headstone with a wire brush; it will scratch and mar beyond repair.

Now, using a dull-sharpened, soft lead pencil, colored chalk, black charcoal or a piece of marking crayon (the type that shippers use on cardboard boxes or wooden crates), rub the surface of the paper in an even, back-and-forth motion. Make certain not to use too much pressure. After all, you don't want your creation to be filled with unsightly punctures. Gradually, if done correctly, the entire inscription will be transferred from the stone to the paper.

Next, gently remove the masking tape while holding your rubbing in place, taking care not to tear or wrinkle the corners. Special attention should be taken not to brush up against or touch the surface of your work, since clothing and oily skin tend to smudge the finished product.

In order to protect your rubbing from damage that handling can inflict, you'll want to give it a light coating of hair spray, which will act as a temporary non-smearing agent. First lay it face up on a flat layer of newspaper. After shaking well, hold the nozzle four to ten inches from the rubbing. Lightly mist the surface with long, smooth, parallel strokes. In order to avoid leaving untreated areas, make sure to overlap about one-half of each preceding stroke as you spray. Finally allow a few minutes drying time before handling the rubbing.

If you want to make absolutely certain that your artwork will last, you can employ a number of other protective measures. For example, you might invest in acid-free paper and a fixative, such as Defthand clear polyurethane spray. It contains no dangerous fluorocarbons, lead or benzene, and it is non-toxic when dry.

Before beginning, you should switch from standard spray to a thinner fan spray by simply rotating the valve tip one-quarter of a turn. Please keep in mind that a much longer drying time of about six hours is needed and that the entire procedure should be done twice for optimal protection.

On another, just a few rows over, in memory of Peter Asbury, was a far more lengthy inscription:

*"I have chosen to have my ashes placed here because I revere this ancient cemetery and the historic church across the way by which it is governed. And I have selected the rough boulder which marks this spot because it was found imbedded in the trail leading through the woods on my own Sunshine Hill, where I have passed so many happy years, and because my dog Teddy and I have walked it so often."*

Occasionally, an inscription will reward you immensely with a brief glimpse into the life and times of the dearly departed. Near Lakewood, for example, I found the following compelling words commemorating Ruth Estelle:

*"Death did to me  
Short warning give,  
Therefore, be careful  
How you live.  
My weeping friends  
I leave behind —  
I had not time  
To speak my mind."*

So intrigued was I to uncover the meaning behind the mysterious message that I decided to investigate the matter further. Eventually, after a good deal of digging through records, I found a copy of an aging newspaper tucked away in a local library. A brief article detailed Ruth Estelle's tragic and untimely death. She "was purposefully shot near her parent's home, by a jealous suitor."

If nothing else, the inscription proved that epitaphs can, indeed, expose bits and pieces of our fragile lives.

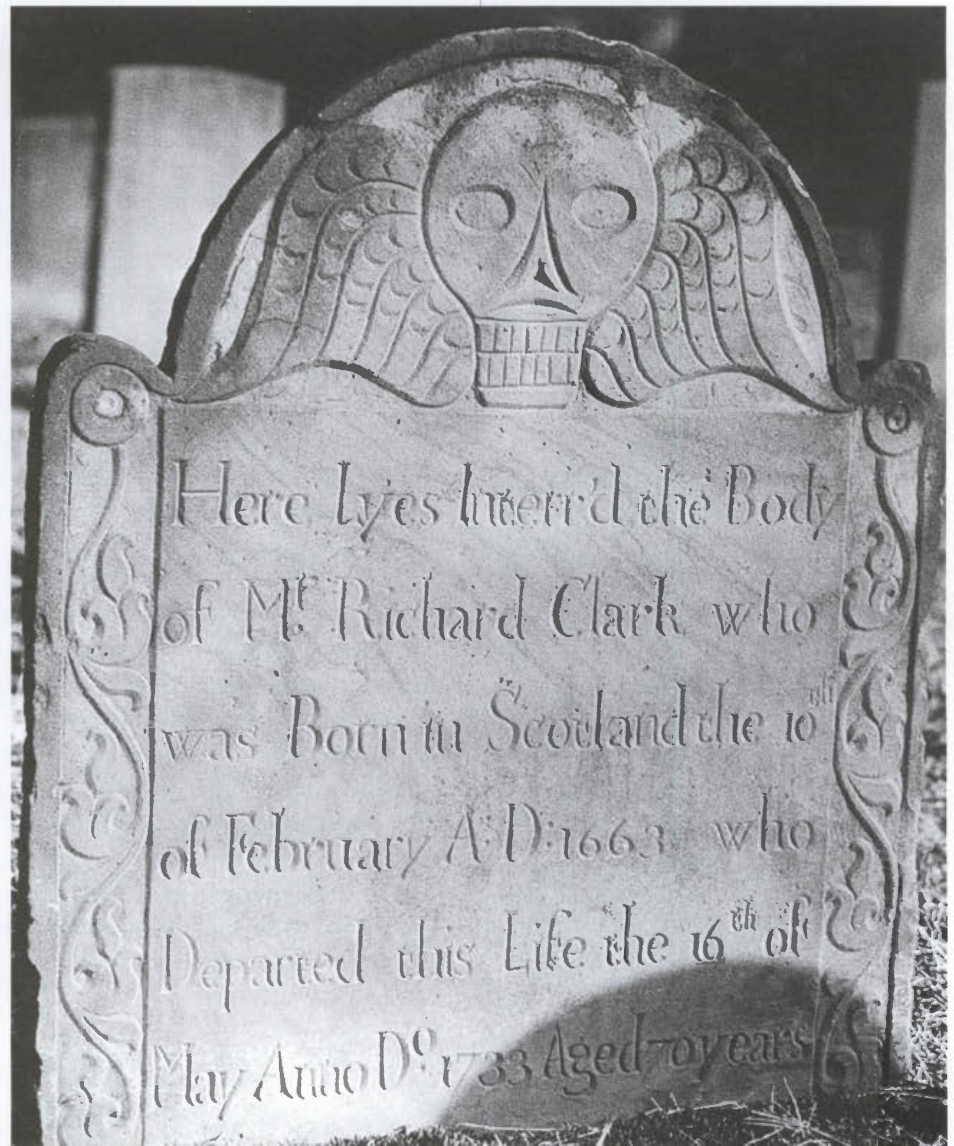
*Louis S. Schafer is a freelance writer and author from Weidman, MI.*

Headstones provide a glimpse into a person's past and personality, like this one at Old Tennent Church in Tennent.

## The Dos and Don'ts of Gravestone Rubbing

While gravestone rubbings provide glimpses into the past, there are some general guidelines to assure that the headstones can be preserved for generations to enjoy and discover in the future. Here are a few simple tips to follow.

- Limit rubbings to sound headstones; if the marker is fragile, choose another one.
- Clean the stone with a soft bristled brush; do not remove lichens or moss that may be growing on the marker.
- Amply cover the entire image with paper; do not mark the stone. Use masking tape only on the back of the stone and be sure to remove all paper and tape before leaving.
- Avoid rubbing marble or coarse textured stones; coloring agents may bleed through the paper. The best rubbings are produced by slate stones with inscriptions that are not deeply carved.



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A backpacker has set up camp on one of New Jersey's wilderness trails.

# Carrying Camp on Your Back

by Cheryl Baisden

The path to Pinwheel's Vista is laced with precarious stream crossings, steep ascents and tricky turns, a combination that could pose a challenge to any hiker. Strap 25 or 30 pounds to your back and tackle this spectacular stretch of the Appalachian Trail, and "challenge" doesn't come close to describing the experience.

For the seasoned backpacker, the 8.3-mile trek south from State Line Trail to the crest of Wawayanda Mountain may have the drawback of being quite a bit more congested than a trip through Death Valley, but the experience is exhilarating nonetheless. For the relative newcomer to this rugged sport, the knowledge that a breathtaking overlook of the Catskills, Shawangunks, Kittatinny Ridge, Pochuck Mountain and Vernon Valley awaits them at Pinwheel's Vista may be the only thing that keeps them going.

"You see, the stress isn't in the back and legs like you might expect," explains Philip Iapalucci of Moorestown, backpacking chairman for the South Jersey Outdoors Club. "It's in your lungs and your psyche. Most people put 30 pounds on their back and start heading uphill, and they swear they're never gonna make it. The thing is, that it's not that those people are suffering any more than I am, it's just that I know I'm going to make it because I always have."



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## Toughing It Out

The psychological stress and physical discomfort associated with backpacking is what has kept participation in this age-old sport relatively low, longtime backpackers agree. The South Jersey Outdoors Club, boasting 1,900 members, estimates that no more than 100 of their outdoor enthusiasts are backpackers.

"You do a lot of climbing and hiking, and at the end of the day, you can't settle in," says Iapalucci. "Instead, you have to put up your tent, get your sleeping gear out, cook dinner, wash, clean. And, you have to have a good time doing all of it. A lot of people really aren't happy with the idea of eating outside, sleeping on the ground and then getting up and hitting the trail again."

And getting back out on the trail day after day is the goal of this grueling pastime, where hikers haul everything they need on their back and spend at least the weekend trekking through the terrain.

"Backpacking doesn't mean strapping a pack on and heading out for a day with a few snacks and some water," notes frequent backpacker John Jenkins of Mansfield Township. "That's hiking. The difference between the two is that when you hike, you walk for eight or 10

hours, and then you get back in your car and head home or find a motel somewhere. Backpacking is when you head out with everything you'll need to survive on your back, and you hike that way for days on end."

Setting up camp involves pitching a tent, establishing a small cooking area and, if desired, building a manageable fire (where permitted.) Make sure to settle in a spot that is off the hiking trail and is not in a low lying area.

"What you don't want to do when you set up camp is follow the old tradition of digging a trench around the tent to keep rain away," says Jenkins. "That's one of the fastest ways to damage the environment. Just select a high spot, and you'll stay dry."

A weekend backpacking trip usually encompasses 10 to 20 miles, while a week-long trek can run from 50 to 70 miles. The standard distance is around

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Many backpackers  
resort to water  
provided by nature.

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eight miles over eight or nine hours, although diehard backpackers determined to hike the Appalachian Trail have been known to do 25 to 30 miles in a day.

"Of course, backpacking like that amounts to trudging from one point to another, as quickly as possible," says Jenkins. "There's no real planning in it. It's just a goal they're out to accomplish."

## Beginner's Backpacking

While advanced backpackers prefer western settings to test their endurance and explore a variety of terrain, in general, location is not terribly important, Iapalucci says. Challenging trails can be found throughout the eastern region, although New Jersey's backpacking opportunities are viewed as being primarily beginner-oriented.

The flat, well marked sandy trails through the Pine Barrens, laced with pitch pine lowlands, cedar swamps and more than 1,000 species of plants and animals — 93 of which are considered endangered — are the best places for beginners to start. There, where the alert hiker can catch sight of a hawk hovering overhead or the sudden burst of color from a wild orchard, the temperatures are moderate year-round, and water is plentiful. Additionally, while the heavily wooded region provides backpackers with a sense of isolation, its close proximity to civilization makes it relatively difficult to become lost.

"If worse comes to worst, you always know that if you head in a straight line in any direction, you'll come to a road and civilization," says Iapalucci.

The Appalachian Trail, where hiking is far more rigorous than the sandy soil of the Pine Barrens, is viewed as a spot for the novice backpacker. While the terrain can be extremely challenging, the traffic on the trail is rather heavy, so help is always readily available. Advanced backpackers see the steady flow of traffic along the Appalachian Trail as a serious drawback, since the main purpose of the sport is to escape civilization and live within the landscape.

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"If you put a little  
thought into the  
meals, it's almost like  
eating at home."

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— Philip Iapalucci

Still, outdoor enthusiasts consider the scenery along the Appalachian Trail to be among New Jersey's finest. From overgrown fields, rich green cow pastures and valleys to thick woodlands, rocky ledges, cliffs and mountains, the state's portion of the 2,150-mile footpath offers a diversity of terrain.

## Gearing Up

Regardless of his or her level of experience, every backpacker needs the same assortment of gear to safely and comfortably complete a trek, even if it's just through a stretch of the Pine Barrens.

"You know, a lot of people don't realize that if you break an ankle, get appendicitis, run out of water or get lost out there, you're in real trouble," says Iapalucci. "Even when you're well-prepared, something unforeseen can happen. You never can tell."

Equipment needs include a high quality backpack, a lightweight sleeping bag and tent, a gas stove and cookware, a water filter, a basic Swiss Army knife, food and water, a whistle to summon help in case of emergency, a first aid kit and clothes appropriate for the weather conditions. Bug spray also is recommended if hiking in July or early August, although experienced backpackers recommend staying off New Jersey's trails during insect season.

"Fortunately for today's backpacker, things have changed a lot when it comes to technology," says Jenkins. "Everything is lightweight now, so you don't have to carry anywhere near the

load you were once forced to haul."

Iapalucci says there are two requirements to being properly prepared. "You've got to travel light, and you've got to have enough food for six, seven, eight days. It's an interesting dichotomy."

In New Jersey, where water supplies are relatively easy to find, carrying two quarts of water, along with a water filter, is sufficient, notes Jenkins.

Many backpackers resort to water provided by nature. The least expensive way to purify water for drinking is through the use of iodine tablets, which can be purchased at outdoor outfitters.

For those turned off by the taste of iodine, regular backpackers recommend a micro-filter pump, which uses a nozzle to draw water from any stream and then pumps it through a treated screen and into a drinking container. Naturally, water also can be purified by boiling it.

## The Icing on the Cake

The best advancement in backpacking can be found on the shelves of any grocery store, experienced backpackers readily agree.

Freeze-dried food once was viewed as the only real option for backpackers, but the cardboard taste of everything from spaghetti sauce to brownies left hikers hungry for finer fare. Dried noodle products and dry soup mixes, available at any grocery store, have since taken the place of those foods for many hikers, while others with a more sophisticated palate have found more creative cooking techniques.

"I eat very well when I'm out backpacking," says Iapalucci. "My favorite meal is penne with anchovies and garlic. None of the ingredients weigh much, and I use the oil from the anchovies on the pasta. If you put a little thought into the meals, it's almost like eating at home, and that makes the whole experience a lot more pleasurable."

*Cheryl Baisden is a freelance writer from Collingswood.*

# Events



## June

**18-21 Junior Naturalist Summer Starter Camp** Children participate in nature adventures in various habitats at the sanctuary. **Time:** 10 a.m. to 2 p.m. **Fee:** \$75 **Phone:** 609/261-2495 **Location:** Rancocas Nature Center, Rancocas Road, Mount Holly

**22 Innertubing the Pine Barrens** Two-hour trip on the Wading River. Bring your own tube. **Time:** 10:30 a.m. **Free** **Phone:** 609/267-7052 **Location:** Harrisville Lake, Route 679, seven miles north of New Gretna.

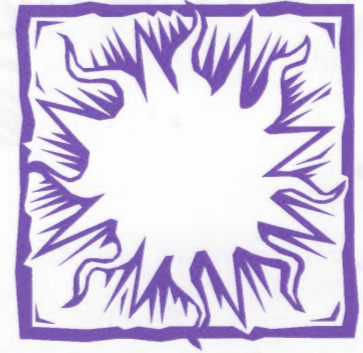
**22 Moms, Pops and Tots Summer Sensations** (Also Aug. 10) Stories, crafts and other activities relating to the five senses. For children ages 3-5. **Time:** 10 to 11 a.m. **Fee:** \$3 for one parent and child; \$3 for each additional child (Preregistration required) **Phone:** 201/891-5571 **Location:** James A. McFaul Environmental Center, Crescent Avenue, Wyckoff

**22 Pond Life at Whitesbog** Guided hunt for organisms in Pinelands waters. **Time:** 3 p.m. **Fee:** Individual, \$4; family, \$9 **Phone:** 609/893-4646 **Location:** Whitesbog Village, Route 530, Browns Mills

**22-23 Dairy Days** (Also Aug. 10) Churn butter and separate cream by hand the old-fashioned way. **Time:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6-16, \$2 **Phone:** 201/326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

**22-23 International Food & Wine Festival** New Jersey wineries offer finest wine for tasting, wine cellar tours, grape stomping, wine seminars and live entertainment. **Time:** Noon to 5 p.m. **Fee:** 21 and over, \$10; 20 and under, \$3 **Phone:** 908/475-3671 **Location:** Cream Ridge Winery, Route 539, Allentown

**22-23 People Powered Days** Learn about old-fashioned carpentry tools operated by hands and feet. **Time:** 1 to 4 p.m. **Fee:** Donations accepted **Phone:**



908/879-5463 **Location:** Cooper Mill, County Route 513, Chester

**23 Aeolium Barrier Beach Transect Walk** (Also daily through Sept. 2) Ninety-minute program on forces affecting barrier beaches and a walk from bay to beach. **Time:** 11 a.m. **Fee:** \$6 weekdays; \$7 weekends **Phone:** 908/793-0506 **Location:** Island Beach State Park, Seaside Park

**23 Bay Salt Marsh Canoe/Kayak Tour** (Also every Sunday and Tuesday through Sept. 1) Three-hour tour of salt marsh ecology. Some experience required. **Time:** \* **Fee:** \$8 (Sundays); free (Tuesdays) Reservations required **Phone:** 908/793-0506 **Location:** Island Beach State Park, Seaside Park

**23 Summer Bathhouse Nature Programs** (Also daily through Sept. 2) Hour-long walks/programs on various topics. **Time:** \* **Fee:** \$6 (weekdays); \$7 (weekends) **Phone:** 908/793-0506 **Location:** Island Beach State Park, Seaside Park

**29 Bonfire on the Beach** Songs, stories, games, skits and a bonfire along Great Egg Harbor. **Time:** 7:30 p.m. **Free** **Phone:** 609/645-5960 **Location:** Camp Acagisca, Route 559, Mays Landing

**29 Milling Around** (Through July 7) Discover the mills of the United States. **Time:** 10 a.m. to 4 p.m. (except Wednesdays and Thursdays) **Fee:** Donations accepted **Phone:** 908/879-5463 **Location:** Cooper Mill, County Route 513, Chester

**29 13th Annual Whitesbog Blueberry Festival** Nature tours, Pinelands music, crafters and artists; blueberry themed games and a cross-county run. **Time:** Noon to 5 p.m. **Fee:** \$5 per car; \$12, run (preregistration); \$15, run (day of race) **Phone:** 609/893-4646 **Location:** Whitesbog Village, Lebanon State Forest, Browns Mills

## Events

### July

**1 Osprey Express Van Tour** (Also every Saturday and Sunday through August) See the ospreys of Long Beach Island. **Time:** 2 to 3 p.m. **Free Phone:** 908/270-6960 **Location:** Cattus Island County Park, Cattus Island Boulevard, Toms River

**2 Stories by the Sea** (Also every Tuesday through Aug. 27) Story hours for children ages 3-7. **Time:** 2 to 3 p.m. **Free Phone:** 609/492-0222 **Location:** Alliance for a Living Ocean Office, Center Street, Beach Haven

**4 Independence Day Picnic** Picnic and games on the lawn. **Time:** Noon to 3 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6-16, \$2 **Phone:** 201/326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

**6 Craft Day by the Bay** **Time:** 10 a.m. to 4 p.m. **Free Phone:** 609/494-3107 **Location:** Harvey Cedars Bible Conference, Cedars Avenue, Harvey Cedars

**6 Ferns and Flowers at Big Spring** Explore the limestone valley near Andover and look for ferns and wildflowers with the New Jersey Audubon Society. **Time:** \* **Fee:** Members, \$6; non-members, \$8 **Phone:** 609/261-2495 **Location:** \*

**6-7 America's Birthday Bash Pro/Am Volleyball Tournament** Novice to professional competitions for men, women and mixed. **Time:** All day **Free Phone:** 908/506-9449 **Location:** 16th to 19th avenues and the Beach, North Wildwood

**7 Bolter Demonstration** Operation of old-fashioned flour sifter at the mill. **Time:** 1 to 4 p.m. **Fee:** Donations accepted **Phone:** 908/879-5463 **Location:** Cooper Mill, County Route 513, Chester

**7 Founder's Day** Celebrate the birthday of Allaire Village's founder. **Time:** 10 a.m. to 4 p.m. **Fee:** \$3 for parking **Phone:** 908/938-2252 **Location:** Allaire Village, Route 524, Farmingdale

**7 Pressed Flower Demonstration** **Time:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6-16, \$2 **Phone:** 201/326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

**10 Alliance for a Living Ocean Eco-Tour of a Barrier Island** (Also every Wednesday and Friday through Aug. 23) Environmental, hands-on tours of Long Beach Island. **Time:** 9 a.m. to noon **Fee:** \$10 **Phone:** 609/492-0222 **Location:** Southern Ocean County Chamber of Commerce, 9th Street, Ship Bottom

**10 Three Days in the Life of a Victorian Family** Lecture and demonstration. **Time:** 7 p.m. **Free** (Preregistration required) **Phone:** 609/890-3630 **Location:** Kuser Mansion, Newkirk Avenue, Hamilton

**11 Planetarium Shows** (Also every Thursday through August) Current sky shows or laser light shows. **Time:** 1 p.m. **Fee:** Planetarium, \$3; senior citizens \$2.55; laser shows, \$3.25; senior citizens, \$2.75 **Phone:** 908/789-3670 **Location:** Trailside Nature & Science Center, New Providence Road, Mountainside

**11 Twilight at the Bay** Music, touch tank, mystery guests and lots of fun. **Time:** 7 to 8 p.m. **Free Phone:** 609/492-0222 **Location:** Taylor Avenue at Bay Beach, Beach Haven

**13 Evening Nature Walk through the Pines** Discover creatures of the evening. **Time:** 8 p.m. **Fee:** Individual, \$4; family, \$9 **Phone:** 609/893-4646 **Location:** Whitesbog Village, Route 530, Browns Mills

**13-14 School Days** Find out games played, subjects taught and textbooks used more than 100 years ago. **Time:** 1 to 4 p.m. **Fee:** Donations accepted **Phone:** 908/879-5463 **Location:** Cooper Mill, County Route 513, Chester

**14 Butterflies** Lecture on butterflies for your garden. **Time:** 3 p.m. **Fee:** \$3 **Phone:** 201/962-9534 **Location:** New Jersey State Botanical Garden at Skylands, Ringwood State Park, off Sloatsburg Road, Ringwood

**14 Story Teller** Unusual and delightful stories. **Time:** 2 p.m. **Free Phone:** 908/879-0566 **Location:** Kay Environmental Center, Pottersville Road, Chester

**14 Sunday in the Park** Hamilton Township Cultural Affairs Commission 10th Anniversary Gala Celebration. **Time:** 2 p.m. **Free Phone:** 609/890-3630 **Location:** Kuser Mansion, Newkirk Avenue, Hamilton

**15 Inherit the Earth** (Also every Monday through Aug. 12) Field trips for children ages 8-12 and their families. **Time:** \* **Fee:** \* **Phone:** 609/492-0222 **Location:** Alliance for a Living Ocean Office, Center Street, Beach Haven

**17 Evening Mansion Tour and Video Evening** Two videos on doll collecting. **Time:** 6 p.m. **Free** (Preregistration required) **Phone:** 609/890-3630 **Location:** Kuser Mansion, Newkirk Avenue, Hamilton

**19 Beschen-Callahan Memorial Life-guard Races** Beach patrols from the Wildwoods and Cape May compete in activities including rowing, running, swimming and surf dash. **Time:** All day **Free Phone:** 609/522-7500 **Location:** 15th Avenue and the Beach, North Wildwood

**20 Indian Ways** Games, crafts and foods that were a part of the everyday lives of Lenape Indians. **Time:** 1 to 4 p.m. **Free Phone:** 908/879-0566 **Location:** Kay Environmental Center, Pottersville Road, Chester

**20 Space Day** Workshops, exhibits and planetarium sky shows to celebrate America's achievements in space. **Time:** 9 a.m. to 4:45 p.m. **Fee:** Exhibits, free; planetarium shows, \$1 **Phone:** 609/292-6308 **Location:** New Jersey State Museum, W. State Street, Trenton

**20 Threshing Demonstration** (Also Aug. 3-4) 19th century thresher separates grain from straw. **Time:** 1 to 3 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6-16, \$2 **Phone:** 201/326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

**20-21 Small Loom Weaving** Looms used to produce belts, tapes and other small items in the 19th century. **Time:** 1 to 4 p.m. **Fee:** Donations accepted **Phone:** 908/879-5463 **Location:** Cooper Mill, County Route 513, Chester

**21 Nature Hikes** (Also Aug. 18) The New Jersey Audubon Society leads hikes in Norvin Green State Forest. **Time:** 1 to 4 p.m. **Fee:** Members, \$3; non-members, \$4 **Phone:** 201/835-2160 **Location:** Weis Ecology Center, Ringwood

**21 19th Century Craft Guilds Open House** Demonstrations. **Time:** Noon to 4 p.m. **Fee:** \$3 for parking **Phone:** 609/938-2253 **Location:** Allaire Village, Route 524, Farmingdale

**21 Harvey Cedars Arts and Fine Crafts Festival** Exhibition and sale. **Time:** 10 a.m. to 5 p.m. **Free Phone:** 609/494-3107 **Location:** Municipal Recreation Grounds, Long Beach Boulevard and W. Salem Avenue, Harvey Cedars

**27 Antique Show and House Tour** Quality furniture and accessories. **Time:** 1 to 6 p.m. **Fee:** \$5 **Phone:** 201/445-8311 **Location:** The Hermitage, North Franklin Turnpike, Ho-Ho-Kus

**27 Christmas in July** Boats decorated for Christmas and a visit from Santa. **Time:** All day **Free Phone:** 800/882-7787 **Location:** Beach Canal and Inlet, North Wildwood

**27 Pine Barrens Van Trip** An introduction to the plants, animals, history and scenic beauty of the New Jersey Pine Barrens. **Time:** 7 a.m. **Fee:** \$20 **Phone:** 609/261-2495 **Location:** \*

**27 Woodstown Village Fair** Local artists and artisans. **Time:** \* **Free Phone:** 609/769-2200 **Location:** Downtown Woodstown

**27-28 Mid-Summer Antiques and Collectibles Show and Sale** **Time:** 10 a.m. to 5 p.m. **Fee:** Adults, \$6.50; seniors, \$5.50; students, \$3.50 **Phone:** 800/998-4552 x2756 **Location:** Wheaton Village, Glasstown Road, Millville

**28 Historic Herbs & Jellies** Demonstration. **Time:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6-16, \$2 **Phone:** 201/326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

**29 Feathered & Furry Friends of the Sea** (Through Aug. 2) Week-long program about penguins, whales, seals and other aquatic birds and marine mammals. For children ages 6-12. **Time:** 8:30 a.m. to 4:30 p.m. **Fee:** Members, \$185; non-members, \$225 (Preregistration required; limited enrollment) **Phone:** 800/616-JAWS **Location:** New Jersey State Aquarium, Riverside Drive, Camden

**30 The Resorts Lifeguard Championships** Beach patrols from North Wildwood, Stone Harbor and Strathmere compete. **Time:** All day **Free Phone:** 800/882-7787 **Location:** 15th Avenue and the Beach North Wildwood

## August

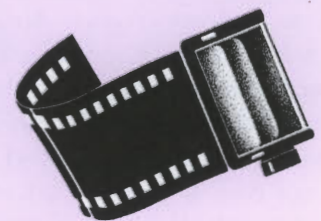
**2-4 Magic of Alexandria Balloon Festival** 75 to 100 hot air balloons, air show, concerts, food, crafts and entertainment. **Time:** 3 to 11 p.m. (Aug. 2); noon to 11 p.m. (Aug. 3); noon to 8 p.m. (Aug. 4) **Fee:** Pre-purchase, \$9; at door, \$12 **Phone:** 908/735-0870 **Location:** Alexandria Field Airport, Pittstown

**3-4 Salem County Fair** **Time:** \* **Free Phone:** 609/769-0414 **Location:** Cowtown, Pilesgrove

Enter as Often as You Like!



# 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*.

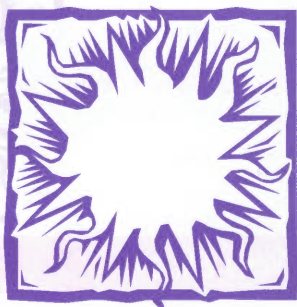
■ **How:** Each entry must be accompanied by the photographer's name, address, daytime phone number, caption (including location and description of shot, date taken and names of any people featured in the photo), and signed releases from each person featured. All entries become the property of the Department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

Send Entries to NJO Contest '96, CN 402, Trenton, NJ 08625-0402

## Events

**4 1930s Temperance & Charitable Society Fair** Reenactment of 19th century demonstrations against demon rum and other socially-conscious issues of the time. **Time:** 1 to 4 p.m. **Fee:** \$3 for parking **Phone:** 609/938-2253 **Location:** Allaire Village, Route 524, Farmingdale

**4 Jersey Fresh Festival** Outdoor exhibits, craft show and entertainment. **Time:** Noon to 7 p.m. **Fee:** \* **Phone:** 609/794-4011 **Location:** Giampietro Park, Landis Avenue, Vineland



**5-9 The State of the Earth** Week-long program about rain forests, endangered species and conservation. For children ages 6-12. **Time:** 8:30 a.m. to 4:30 p.m. **Fee:** Members, \$185; non-members, \$225 (Preregistration required; limited enrollment) **Phone:** 800/616-JAWS **Location:** Ocean Base Atlantic, New Jersey State Aquarium, Riverside Drive, Camden

**9-16 Cloth Bag Exhibit** Evolution of cloth bags from holding flour or salt to clothing. **Time:** 10 a.m. to 4 p.m. (except Wednesdays and Thursdays) **Fee:** Donations accepted **Phone:** 908/879-5463 **Location:** Cooper Mill, County Route 513, Chester

**10 Bridgeton Zoo Ride** A 25-, 50- or 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:** Schalick High School, Centerton

**10 Hawks of New Jersey** Presentation. **Time:** 2 p.m. **Fee:** \$3 **Phone:** 908/879-0566 **Location:** Kay Environmental Center, Pottersville Road, Chester

**10-11 Captain Morgan Big Shot Volleyball Tournament** All skill levels compete. **Time:** 8 a.m. to 6 p.m. **Free Phone:** 516/728-0397 **Location:** Lincoln Avenue and the Beach, Wildwood

**10-11 Jersey Fresh Food & Wine Festival** New Jersey wineries offer their finest wines for tasting, wine cellar tours, bare-foot grape stomping, wine seminars and live entertainment. **Time:** Noon to 5 p.m. **Fee:** Ages 21 and over, \$10, 20 and under, \$3 **Phone:** 908/475-3671 **Location:** Matarazzo Farms & Four Sisters Winery, Route 519, Belvidere

**11 Teasel and Apple Doll Making Demonstration** **Time:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6-16, \$2 **Phone:** 201/326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

**12-16 Mighty Mollusk** Week-long program about a few of the 100,000 different species of animals that grow their own shells. For children ages 6-12. **Time:** 8:30 a.m. to 4:30 p.m. **Fee:** Members, \$185; non-members, \$225 (Preregistration required; limited enrollment) **Phone:** 800/616-JAWS **Location:** New Jersey State Aquarium, Riverside Drive, Camden

**13 Perseid Meteor Watch** Planetarium show following meteor watch. **Time:** 9 to 11 p.m. **Fee:** \$3 **Phone:** 908/789-3670 **Location:** Trailside Nature & Science Center, New Providence Road, Mountainside

**13-14 Victorian Christmas Decoration Making** Demonstration and video program. **Time:** 7 p.m. **Free** (Preregistration required) **Phone:** 609/890-3630 **Location:** Kuser Mansion, Newkirk Avenue, Hamilton

**13-16 Birds, Beasts, Blossoms & Boats** Out-of-doors activities, crafts, animal care, bird watching, nature studies and dry land boating for children. **Time:** 10 a.m. to 3 p.m.; grades K-2 (Aug. 13-14); grades 3-6 (Aug. 15-16) **Fee:** \$45 **Phone:** 201/445-8311 **Location:** The Hermitage, North Franklin Turnpike, Ho-Ho-Kus

**17 Preparing the Feed** (Also Aug. 24) Demonstration of corn shellers, fodder choppers and feed grinders. **Time:** 1 to 3 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6-16, \$2 **Phone:** 201/326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

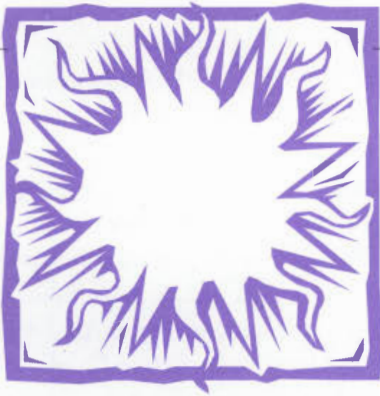
**17 Reptiles and Amphibians** Games, crafts and live animals. **Time:** 1 to 4 p.m. **Free Phone:** 908/879-0566 **Location:** Kay Environmental Center, Pottersville Road, Chester

**17-18 Bluegrass & Peach Festival** Live bluegrass music, crafters, watermelon seed spitting contest. **Time:** Noon to 7 p.m. **Fee:** Adults, \$6; children under 12, \$4 **Phone:** 908/475-3671 **Location:** Matarazzo Farms and Four Sisters Winery, Route 519, Belvidere

**17-18 Sewing Machine Days** Foot powered sewing machines from the 19th and early 20th centuries. **Time:** 1 to 4 p.m. **Fee:** Donations accepted **Phone:** 908/879-5463 **Location:** Cooper Mill, County Route 513, Chester

**19-23 Aquatic Architecture** Week-long program to explore wetlands, coral reefs, deep sea vents, swamps and other environment of the underwater seascape. For children ages 6-12. **Time:** 8:30 a.m. to 4:30 p.m. **Fee:** Members, \$185; non-members, \$225 (Preregistration required; limited enrollment) **Phone:** 800/616-JAWS **Location:** New Jersey State Aquarium, Riverside Drive, Camden

**23-25 6th Annual American Indian Powwow and Western Festival** Crafts, storytelling, exhibits, Native American dance, flint knapping, teepee village, living history, demonstrations, lectures and more. **Time:** 5 to 9 p.m. (Aug. 23); 10 a.m. to 9 p.m. (Aug. 24); 10 a.m. to 6 p.m. (Aug. 25) **Fee:** Adults, \$7; children 6-12, \$2; under 6, free **Phone:** 908/370-5299 **Location:** NJ Vasa Park, Budd Lake



## September

**24 8th Annual World Waterslide Competition** Locals compete for national title and prizes. **Time:** All day **Fee:** \* **Phone:** 609/522-3900 **Location:** Mariner's Landing Pier, Schellenger Avenue and the Boardwalk, the Wildwoods

**24-25 Memorabilia Days** Irons, toys, games and other household items used decades ago. **Time:** 1 to 4 p.m. **Fee:** Donations accepted **Phone:** 908/879-5463 **Location:** Cooper Mill, County Route 513, Chester

**24-25 Wildwood Classic Cup Sailing Regatta** Premier Hobie Cat race. **Time:** All day **Free** for observers **Phone:** 609/861-5674 **Location:** Oceanfront, Wildwood Crest

**25 German Paper Cutting Demonstration** **Time:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6-16, \$2 **Phone:** 201/326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

**26-30 Dangers of the Deep** Week-long program on sharks, sea snakes and scorpionfish. For children ages 6-12. **Time:** 8:30 a.m. to 4:30 p.m. **Fee:** Members, \$185; non-members, \$225 (Preregistration required; limited enrollment) **Phone:** 800/616-JAWS **Location:** New Jersey State Aquarium, Riverside Drive, Camden

**31 The Full Moon Shorebird Walk** Guided walk in search of shore birds. **Time:** 7 p.m. **Fee:** Individual, \$4; family, \$9 **Phone:** 609/893-4646 **Location:** Whitesbog Village, Route 530, Browns Mills

**31 Sheep Dog Trials** (Through Sept. 2) Border collies demonstrate skills in herding sheep. **Time:** 10 a.m. to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6-16, \$2 **Phone:** 201/326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

**1 1830s Parlor Games & Outdoor Amusements** Various indoor and outdoor games of the 19th century. **Time:** 1 to 4 p.m. **Fee:** \$3 for parking **Phone:** 609/938-2253 **Location:** Allaire Village, Route 524, Farmingdale

**2 Election Day in the 1830s** Reenactment of the vote. **Time:** Noon to 4 p.m. **Fee:** \$3 for parking **Phone:** 609/938-2253 **Location:** Allaire Village, Route 524, Farmingdale

**2 Hike** A 5-, 7-, or 10-mile hike along the Paulinskill Valley Trail. **Time:** 10 a.m. **Free** **Phone:** 908/852-0597 **Location:** Footbridge Park, Route 94, Blairstown

**7 4th Annual New Jersey Storytelling Festival** Traditional and contemporary stories for all ages. **Time:** Noon to 4 p.m. **Fee:** Adults, \$5; children under 14, \$3 **Phone:** 609/938-2253 **Location:** Allaire Village, Route 524, Farmingdale

**7 Reptiles** Care and handling of reptiles. **Time:** 2 p.m. **Fee:** \$3 **Phone:** 201/635-6629 **Location:** Great Swamp Outdoor Education Center, Southern Boulevard, Chatham

**7-8 Fourth Annual Sportsmen Field Day** Hunting seminars as well as state field day championships in archery, muzzleloading and shotgun shooting. **Time:** All day **Fee:** Free admission; nominal shooting fees **Phone:** 609/735-7088 **Location:** Fort Dix Rod & Gun Club Grounds, Range 14, Fort Dix, Burlington County

**7-8 Grind-a-thon Times** See the operation of 2,000-pound grindstones. **Time:** 1 to 3:30 p.m. **Fee:** Donations accepted **Phone:** 908/879-5463 **Location:** Cooper Mill, County Route 513, Chester

**7-8 Sandy Hook Shore Heritage Festival** The food, music, crafts and history of Sandy Hook and the Jersey Shore. **Time:** 11 a.m. to 6 p.m. **Fee:** \* **Phone:** 908/872-5970 **Location:** Fort Hancock, Parade Grounds, Sandy Hook

**8 Grandparent's Day** Games and hand-cranked ice cream. **Time:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6-16, \$2 **Phone:** 201/326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

**8 Railroaders Day** Shop tours, live music, exhibits and displays, plus steam and diesel train rides. **Time:** Noon to 4:30 p.m. **Fee:** Free, \$2.50 for train rides **Phone:** 908/938-5524 **Location:** Pine Creek Railroad, Allaire State Park, Farmingdale

**11 Reproducing Victorian Clothing** Lecture and demonstration. **Time:** 7 p.m. **Free** (Preregistration required) **Phone:** 609/890-3630 **Location:** Kuser Mansion, Newkirk Avenue, Hamilton

**13-15 Becoming an Outdoors-Woman (North)** Weekend workshop includes hands on experiences for women in backpacking, camping, canoeing, kayaking, orienteering, birdwatching, fishing, hunting archery, firearms shooting, outdoor survival and more. **Time:** Noon Friday to 1:30 p.m. Sunday **Fee:** \$125 includes lodging, meals, equipment and instruction **Phone:** 609/629-7214 **Location:** School of Conservation, Walapanne Road, Branchville

**13 Paul and Katherine Stankard Exhibit and Sale** (Through Oct. 13) Paperweights and painting. **Time:** 10 a.m. to 5 p.m. **Free** **Phone:** 800/998-4552 x2756 **Location:** Wheaton Village, Glasstown Road, Millville

**14 Pioneer Days** Games, crafts, food and tools used by Dutch pioneers. **Time:** 1 to 4 p.m. **Free** **Phone:** 201/635-6629 **Location:** Great Swamp Outdoor Education Center, Southern Boulevard, Chatham

**14-15 Fall Wine & Cheese Classic** New Jersey wineries offer finest wines for tasting, cellar tours, grape stomping, wine seminars and live entertainment. **Time:** Noon to 5 p.m. **Fee:** \$10, age 20 and over; \$3, age 20 and younger **Phone:** 908/475-3671 **Location:** Waterloo Village, Stanhope

**15 Butterflies** Time: 2 p.m. Free Phone: 201/891-5571 Location: James A. McFaul Environmental Center, Crescent Avenue, Wyckoff

**15 Cider Pressing** (Also Sept. 22 and 29) Time: 1 to 4 p.m. Fee: Adults, \$4; seniors, \$3; children 6-16, \$2 Phone: 201/326-7645 Location: Fosterfields Living Historical Farm, Kahdena Road, Morristown

**15 Hike Manasquan Reservoir Trail** Easy, 5-mile hike on a scenic perimeter trail. Time: 10:15 a.m. Free Phone: 609/267-7052 Location: Boat Ramp, Windeler Road, Howell Township

**21 Annual Fall Night Run** Ride the rails and bring your lanterns. Time: 6 p.m. Fee: Free, fee for train rides Phone: 908/938-5524 Location: Pine Creek Railroad, Allaire State Park, Farmingdale

**21 Jersey Devil Century** A 25-, 50-, 75-, 100- or 125-kilometer bicycle race through rolling hills and flat lands. Time: 8 a.m. Fee: Preregistration, \$12; at door, \$15 Phone: 609/848-6123 Location: Parvin State Park, Elmer

**21 Jersey Shore Sea Kayaking & Bay Canoeing Show** Beginners clinics, test paddling, bay canoeing clinic, demonstrations, manufacturers, nature cruises, rolling clinic and accessories. Time: 10 a.m. to 4 p.m. Free Phone: 609/971-3085 Location: Berkeley Island County Park, Bayville

**21 Seafarer's Celebration** Crafts, food vendors, music, pony rides and fireworks. Time: All day Free Phone: 609/522-7446 Location: Sunset Lake, Wildwood Crest

**21 Whitesbog Cranberry Harvest Tour** (Also Sept. 27) Slide show and tour. Time: 9 a.m. to noon Fee: Individual, \$5; family, \$10 Phone: 609/893-4646 Location: Whitesbog Village, Route 530, Browns Mills

**21-22 Sixth Annual Fall Festival** Crafts, music, food, pony and hay rides, butterfly tent, plants and produce sales and other family fun activities. Time: 10 a.m. to 5 p.m. Fee: \$5 per car Phone: 201/891-5571 Location: James A. McFaul Environmental Center, Crescent Avenue, Wyckoff

**22 Flowers You Can Eat** Lecture and demonstration. Time: 3 p.m. Free Phone: 201/962-9534 Location: New Jersey Botanical Garden at Skylands, Ringwood State Park, off Sloatsburg Road, Ringwood

**22 Potato Harvest** Old-fashioned harvesting techniques. Time: 1 to 3 p.m. Fee: Adults, \$4; seniors, \$3; children 6-16, \$2 Phone: 201/326-7645 Location: Fosterfields Living Historical Farm, Kahdena Road, Morristown

**25 Making Victorian Lampshades** Lecture and demonstration. Time: 7 p.m. Free (Preregistration required) Phone: 609/890-3630 Location: Kuser Mansion, Newkirk Avenue, Hamilton

**27-29 Wheaton Village Arts & Crafts Festival** Juried show. Time: 10 a.m. to 5 p.m. Fee: Adults, \$6.50; senior citizens, \$5.50; students, \$3.50 Phone: 800/998-4552 x2756 Location: Wheaton Village, Glasstown Road, Millville

**28 Blacksmithing** Iron will be wrought using a coal fired forge. Time: 1 to 4 p.m. Fee: Donations accepted Phone: 908/879-5463 Location: Cooper Mill, County Route 513, Chester

**28 Corn Husking** Pick and husk this year's corn crop by hand. Time: 1 to 3 p.m. Fee: Adults, \$4; seniors, \$3; children 6-16, \$2 Phone: 201/326-7645 Location: Fosterfields Living Historical Farm, Kahdena Road, Morristown

**28 Fall Harvest Moon Walk** Hike through white sand trails and abandoned bog roads. Time: 7 p.m. Fee: Individual, \$4; family, \$9 Phone: 609/893-4646 Location: Whitesbog Village, Route 530, Browns Mills

**28 Skylands Association 20th Anniversary Celebration** Dinner dance honoring achievements at the New Jersey State Botanical Gardens. Time: 6 to 11 p.m. Fee: \* Phone: 201/962-9534 Location: New Jersey Botanical Garden at Skylands, Ringwood State Park, off Sloatsburg Road, Ringwood

**28-29 Apple Days** Live country music, wagon and pony rides, crafts show and sale, pick-your-own apples and pumpkins, corn stalk maze, make your own scarecrow and more. Time: All day Fee: \$5; children under 3, free Phone: 609/924-2310 Location: Terhune Orchards, Old Soil Road, Princeton

**28-29 Old Time Barnegat Bay Decoy and Gunning Show** More than 400 exhibitors, antique decoys, new decoys, duck calling and more. Time: 8 a.m. to 5 p.m. Free Phone: 609/971-3085 Location: Tip Seaman County Park, Pinelands High School, Pinelands Middle School, Tuckerton

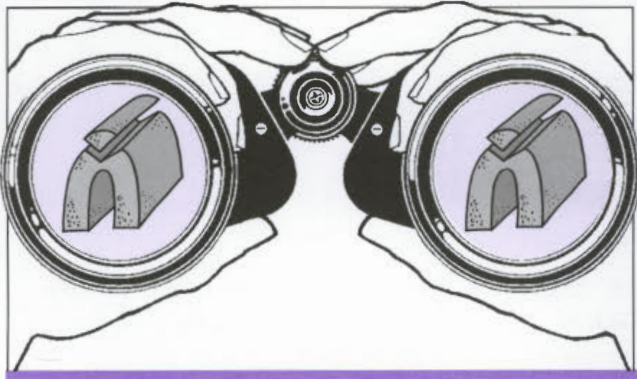
**29 Apple Cidering** History of apple cider; demonstration. Time: 2 p.m. Free Phone: 201/891-5571 Location: James A. McFaul Environmental Center, Crescent Avenue, Wyckoff

**29 15th Annual Harvest Festival** Colonial crafts, live music, Revolutionary War encampment, kids' games, entertainment and food. Time: 1 to 5 p.m. Fee: \$3 donation Phone: 908/789-3670 Location: Trailside Nature & Science Center, New Providence Road, Mountainside

**29 40th Anniversary of the Morris County Park Commission** Free bag of flour or cornmeal to first 40 families. Time: 10 a.m., to 4 p.m. Fee: Donations accepted Phone: 908/879-5463 Location: Cooper Mill, County Route 513, Chester

**29 Rockport Pheasant Farm Open House** See where 50,000 pheasants are raised for public stocking. Time: 10 a.m. to 5 p.m. Free Phone: 908/637-4125 Location: Rockport Pheasant Farm, Rockport Road, Hackettstown

**29 Women in the Field** Women can go on a waterfowl or upland gamebird hunt or shoot at sporting clays. Time: \* Fee: \$35 Phone: 609/629-7214 Location: Pennsville



# Explorer

## How Do Wetlands Work?

by Heatherlyn Herrick

What are wetlands? Are they areas that hold water when it rains or where puddles form? No, these are “temporary wetlands.” Wetlands are areas between the land and the water, where the water table is generally at or near the surface, or the land is covered by shallow water. To be called a wetland, an area must have soils that are saturated with water or periodically flood and an abundance of plants that can live in wet soils or water. Ponds and lakes less than six feet deep also may be considered wetlands.

Wetlands may occur along the edges of rivers, streams, lakes and ponds; in low-lying woods or fields; in highway ditches built to collect rainwater from the road; or even on mountains and hillsides where snow melt and rainwater constantly run.

Surface water, ground water and precipitation can contribute water to wetlands. When it rains, much of the water that hits the ground runs over the surface of the land, until it eventually collects in low areas, such as ponds, rivers or lakes. If the water saturates surrounding land, wetlands may form.

Wetlands also are formed and fed by ground water seepage from uplands and from waterways. Some wetlands are located where the ground water level is above the surface of the land. When the ground water level drops, the wetland seems to disappear (unless it is fed by surface water). In this circumstance, any water that enters the now dry wetland will be absorbed by the ground below.

Wetlands perform several important functions. Some can serve as buffers against flood damage, absorbing volumes of water so that the crests and surges of floods are moderated, and property in downstream areas is safeguarded. Some can purify polluted water. Other wetlands are responsible for the incredible productivity of the ocean and serve as habitat for many kinds of fresh and saltwater animals.

To find out more about wetlands in tidal areas, read “Exploring the Tidal Marsh by Canoe” on page 30. To discover how wetlands in South Jersey are being restored and rebuilt, read “Turning Back Time” on page 17.

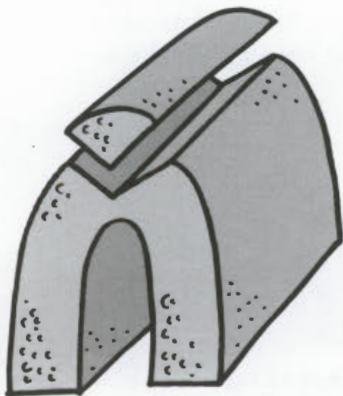


Diagram 1

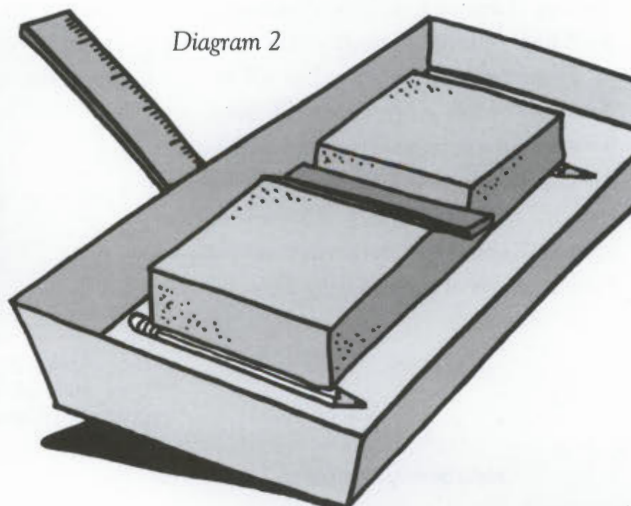


Diagram 2

## Make Your Own Wetlands

You can create your own wetlands from a few simple household items. You will need: plain tap water; colored water; pencils and a ruler; an aluminum tray; a measuring cup; a large, light colored sponge; and a strip of cardboard.

1. Fold the sponge in half. Cut out a strip as shown in Diagram 1, but be careful not to cut the sponge in half.
2. Use the cup to pour a shallow layer of plain water in the bottom of an aluminum tray.
3. Place the sponge in the tray with the cutout part facing up (see Diagram 2). The sponge, like soil, absorbs the water.
4. Press down on the sponge. Did water gather around your finger? If it did, you have created a wetland. If it didn't, add more water to the pan until water appears when the sponge is pressed.
5. Cut the cardboard strip to fit in the bottom groove of the sponge. The groove represents a stream; the cardboard will be the bed of the stream.
6. Place the sponge on two pencils in the tray. Prop the tray up slightly on one side with the ruler as shown in Diagram 2.
7. Using a measuring cup filled with colored water, slowly pour the liquid into the “stream.” Did the colored water stay in the stream? Did it spread to the sides, seeping into the surrounding “land area?” Did any of it go through the sponge into the tray?

Heatherlyn Herrick is with the Department of Environmental Protection's Environmental Education Unit.

# The Cottontail Rabbit

by Joseph M. Penkala

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The eastern cottontail rabbit was part of the landscape when the first European settlers arrived in New Jersey. Since then, their population has increased significantly, thanks to the land clearing and agricultural practices of our forebears.

Cottontails live throughout New Jersey, although their densities vary by area. Their coats range from reddish-brown to gray along the back and sides with a white underbelly. The underside of the tufted tail is prominently white, hence the name "cottontail." At maturity, these rabbits measure 14 to 19 inches in length and weigh between 2.5 and 3 pounds. Females are slightly larger than males.

The cottontail rabbit is an "edge species," meaning it usually is found where different types of cover merge, rather than in an area with a single landscape. The home range of a rabbit is small, usually less than an acre. It prefers areas containing brush piles, briars, hedgerows, swamps, orchards, abandoned fields and fallen timber. This varied vegetation provides food, shelter and places to hide.

Rabbits are strictly plant-eaters, consuming greens, corn, tree bark, buds and seeds. In the spring and summer, plants are their main food. During the winter, the bark of shrubs and trees makes up the major portion of their diet. They get most of their water by eating succulent plants, although they occasionally may drink water.

The cottontail is widely regarded as a prolific species. In a five-year period, a single pair of cottontails and their offspring can produce as many as 350,000 rabbits.

Breeding may begin as early as January and extend into November, but it normally runs from February through September. Since the gestation period is 28 to 30 days, and the female is capable of mating on the same day she gives birth, it is possible for her to have as many as seven litters per year. However, these rabbits average three or four litters annually, with four or five young in each.

Their nests are fur-lined, shallow depressions made of grass and leaves. The young are born blind and without fur and weigh less than an ounce. At the end of the first week, their eyes are open. At about ten days, they are fully furred, weigh approximately four

ounces and can forage for themselves. By that time, the female is expecting another litter.

If the cottontail has such a high reproductive rate, why aren't we overrun with them? The reason is their high mortality rate. The life expectancy of a cottontail at birth is about four months. Prospects are a little brighter for those who survive to leave the nest; they live an average of 11 months. Individuals may survive four or five years, but that is unusual.

The population is low in February and peaks in July. Between August and March, 80 to 85 percent of the population is lost to predators, disease, weather, automobiles and hunting. The remaining 15 to 20 percent is sufficient to re-populate the species.

Cottontail rabbits are game animals in New Jersey and may be taken with a shotgun. The season generally runs from December through February, but check the *New Jersey Fish and Wildlife Digest* for the exact dates.

Cottontails also are mistakenly sought as pets. Each year, the Division of Fish, Game and Wildlife receives many calls from people who have taken the young from their nests, fearing they have been abandoned. Females generally return at nightfall to feed the young. The best advice is to leave them where they are. Wild rabbits never really become tame and usually die when caged.

*Joseph M. Penkala is a regional superintendent for the Division of Fish, Game and Wildlife.*





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