

NEW JERSEY Outdoors

\$4.25

Summer 1995



Discover the Bountiful Highlands • Investigate the Blueberry's Roots
Explore Sandy Hook • Visit the Howard Marine Sciences Center
Hunt at Private Preserves • Cast a Line for Weakfish

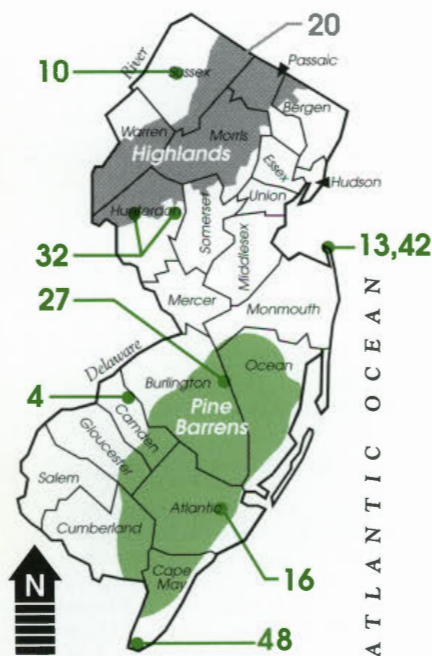
The metamorphosis of the monarch butterfly takes about three to five weeks in mid to late summer as it evolves from an egg to a caterpillar to a chrysalis to a butterfly.



Table of Contents

Story Locator

(Page numbers indicated)



Departments

- 2 Editorials
- 3 Mailbox
- 4 Afield
- 9 Marketplace
- 10 Profile
- 13 Research
- 36 Photo Essay
- 48 Gardens
- 53 The Library
- 54 Inside the DEP
- 56 Calendar of Events
- 62 Explorer
- 64 Wildlife in New Jersey

Covers

Front: A monarch butterfly feeds in moss roses in Piscataway. Learn how to attract butterflies to your home in "A Butterfly Bonanza" on page 48. Photo by Charles St. Charles III

Back: Photo by Rick Vizzi

Features

6 Scoping Out New Places to Hunt

by Russ Wilson

Looking for an alternative to wildlife management areas or leased land for hunting? Find out more about how private hunting preserves in the Garden State offer unique opportunities for small game.

16 Terrapins, Tires and Traps

by Roger Wood

At the turn of the century, diamondback terrapins were hunted extensively as a delicacy. But today, the biggest threats are coming from automobiles and crab traps. Learn about this secretive species and efforts underway to save it.

20 The Bonny Highlands

by John T. Cunningham

The Highlands region of northwest New Jersey is a critical area for potable water for many New Jerseyans. But it is also chock full of natural and historic treasures. Discover this natural wonder and learn about efforts to preserve it.

27 Wild Blueberries Tamed in the Garden State

New Jersey is the birthplace of the cultivated blueberry. Explore the roots of this tasty fruit — from Native American uses to modern research — in a tour of New Jersey's blueberry industry.

32 Get Ready to Go . . . Hot Air Ballooning

by Marybeth and Michael Brenner

Soar high above the state's landscape with this unique mode of transportation. Or keep your feet firmly planted on the ground and get an upclose look at these floating masterpieces during two annual festivals celebrating ballooning in New Jersey.

42 The Hook: A Blend of Natural and Historic Wonders

by Arline Zatz

During this traditional beach season, take a non-traditional look at a New Jersey institution. In addition to its beautiful beaches, Sandy Hook boasts a rich and diverse history, from its freshwater pond to its military outposts.

50 The Return of the Tiderunners

by Pete McLain

After a 15-year dry spell, weakfish are on a comeback in New Jersey's waters. Take this refresher course on the best ways to cast a line for this big fighter.

A surf boat used by lifeguards on Sandy Hook. Discover the natural and historic treasures of this unique peninsula beginning on page 42.





Christine Todd Whitman, Governor

New Jersey's Well of Plenty

The Highlands is one of New Jersey's most significant natural resources, and we're taking steps to ensure that New Jersey residents can continue to enjoy not only its natural beauty, but its vital water supply as well.

The Highlands, which spans more than 1,000 square miles in New York and New Jersey from the Hudson to the Delaware rivers, helps provide the water to quench the thirst of more than four million people a day. In the last year alone, we dedicated \$29.2 million to preserving open space in this region; we also support legislative efforts to include a new Green Acres bond issue on the November ballot to preserve more open space throughout the state.

Our latest acquisition, Copperas Ridge in Rockaway, is an excellent example of Green Acres initiatives and public/private partnerships. The Richard King Mellon Foundation of Pittsburgh, Pa., assisted by the Conservation Foundation of Arlington, Va., donated \$1 million to help make the purchase of this very special site a reality. Groups such as these will continue to play a key role in preserving the Highlands for years to come.

Another critical region of the Highlands, the 20,000-acre Sterling Forest tract which straddles New York and New Jersey, is also in jeopardy. Sterling Forest naturally cleanses the water for two million New Jerseyans for a song; replacing this natural watershed would mean building expensive treatment plants. That is why I have pledged \$10 million to purchase this valuable land in hopes that New York State and the federal government now will follow this lead.

Protecting the Highlands will strengthen both the environmental and economic health of our state. In addition to the water supply, the region plays a vital role in air quality and in recreational and scenic opportunities for tourism.

That is why it is critical to identify the resources of the area while integrating planning at all levels of government. For example, we should move toward integrated watershed planning to examine the cumulative affects of many smaller sources of pollution. While many smaller sources of pollution may seem insignificant when taken alone, together they can cause significant problems.

The Highlands is New Jersey's wellspring of plenty — from water to beautiful vistas to rich history. I intend to keep it that way.



Robert C. Shinn, Jr.,
Commissioner

Saving the Highlands — One Step at a Time

New Jersey recently took another step in preserving the precious Highlands with the purchase of Copperas Ridge in Rockaway Township.

Copperas Ridge is a good example of how it doesn't always pay to develop. Tucked within the tract's 2,500 acres are mountains, forested land, wetlands and streams — all of which help contribute to the state's drinking water supply. In fact, Copperas is located in the center of the Farney Highlands watershed, an area protected by public and private agencies

because it provides a vital source of drinking water for more than 2.5 million people.

The site is also home to diverse habitat that is critical to the survival of many animal and plant species, some of them in danger of becoming extinct. An old mine on the property is the only known New Jersey location for the Indiana bat, a federally-listed endangered species. In addition, the habitat provides an important home for bears, bobcats, beavers, coopers, hawks, turkeys and migratory birds.

By preserving Copperas Ridge as open space, we can contribute to the economy of local communities and their businesses through recreational opportunities. Copperas Ridge has been designated a wildlife management area under the auspices of the Division of Fish, Game and Wildlife and will provide such other outdoor activities as hiking, cross country skiing, birding and nature studies.

Copperas Ridge is a good investment in our future. The dividends from our purchase of Copperas Ridge are many and will reward us for years to come.

State of New Jersey
Christine Todd Whitman
Governor



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

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Mailbox

Another View of the Revolutionary War

Please accept this letter regarding the recent article on "Six Weeks of Crisis in the American Revolution," appearing in the winter 1995 issue. While the focus of the article features the critical days in late 1776 and early 1777 during which time Washington and his men turned the tide of the war, readers should also be aware of the many other sites in New Jersey associated with the War of Independence.

Amongst the many sites of the war to be found in New Jersey, from Bergen County to Cape May, Monmouth Battlefield ranks as one of the major battles of the American Revolution. Following the British evacuation of Philadelphia in June 1778, Washington's army set an intercepting line of march that brought both armies face to face at Monmouth Courthouse (present day Freehold). On that searing hot day of June 28, 1778, approximately 35,000 soldiers (and hundreds of their family members) were in Monmouth County.

The battlefield is preserved at Monmouth Battlefield State Park, and the battle itself is commemorated on the last weekend of June each year. We also would like to acknowledge the help and involvement of the living history community. Without these men and women, who don the clothing and personalities of our founding generation, the preservation and interpretation of our historic sites would be in jeopardy.

Richard S. Walling
Tennent

Editor's Note: Mr. Walling is the president of Friends of Monmouth Battlefield. This spectacular display of another crucial battle in the American Revolution can be seen on June 24 and 25. For more information, call (908) 462-9616.

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

Jersey Fresh — On Ice

I am particularly absorbed with the article on "New Jersey's Winter Crop: Harvesting Ice." (NJO, winter 1995). Undoubtedly, the Howell Living History Farm is one of the often-overlooked jewels in the crown of the Garden State's dynamic agricultural industry. It portrays, in a most effective manner, the origins of JERSEY FRESH farm products to thousands of school children and the general public.

The photographs were outstanding, catching the cold, crisp essence of the invigorating atmosphere of the ice harvest. With *New Jersey Outdoors*, one really didn't have to be there to experience it. Almost!

"The Ice Man Cometh," on the cover in the person of Pete Watson, Howell Farm's competent administrator, is testimony to the severe winter of 1993-1994.

The Mercer County Park Commission deserves honorable mention for its support and encouragement of the Howell Farm, a unique environmental asset to the Pleasant Valley area.

Chester Teller
Issaquah, WA.

Art or New Jersey Outdoors?

It is impossible in my mind to equate the mission (of *New Jersey Outdoors*) with the article, "Capturing New Jersey with Manipulated Polaroids" (NJO, winter 1995).

I would expect to see this article in a photography magazine. The fact that the author's name is not given, only the artist along with his name and address, suggests that if it were in a photography magazine, he would have paid the advertising rate, and notification of that fact would be duly noted.

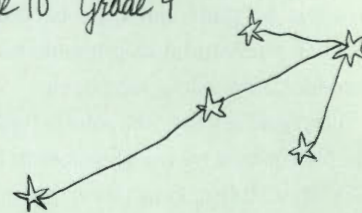
These six pages could have been better utilized in fulfilling the outdoor mission rather than promoting dubious art.

Richard W. Zaengle
Merchantville

The Arrow
One Christmas morning a kid got a bow and arrow for Christmas. He was shooting birds one day and the bird keeper got mad when the boy shot his arrow the bird keeper banished the arrow into the sky forever.

Brandon Couitt

Age 10 Grade 4



Exploring the Sky

Editor's Note: In the winter 1995 issue, we asked young readers to create their own constellation and accompanying myth from a series of stars drawn on a page. Here is an entry from Brandon Couitt, age 10, who lives in New Lisbon.

Editor's Note: Photographer Mark Thellmann offers a unique perspective on New Jersey's natural and historic treasures through the use of manipulated Polaroids. It is for that reason that his work was included in the spring 1995 issue.

A Home for Kittatinny

The office of Kittatinny Valley State Park, which was profiled in the spring 1995 issue of *New Jersey Outdoors* ("Kittatinny Valley State Park: A Stepping Stone through History"), is now located at the entrance to the park on Route 669 in Andover, 1.1 miles off of Route 206. The new telephone number is (201) 786-6445.

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 08625-0402. We reserve the right to edit letters for length and clarity.

Encounter with a Backyard Bandit

I spotted the intruder quite by accident. There was no reason to presume his guilt, but I was certain that this was the vandal responsible for the damage to my backyard pond.

Disregarding my own safety, I grabbed the broomstick we use to supplement the lock on a sliding glass door and bolted out onto the deck to confront it. My anger grew as my adrenaline pump

shifted into overdrive. My teenage son, still unaware of the cause, was only a few steps behind me, irresistibly drawn by the potential for action.

I raised the broomstick menacingly. The cowardly intruder already was retreating before me.

"It's a raccoon!" my son said, identifying the target of my anger.

It was a raccoon. And fortunately, this masked vandal continued to waddle away from the pond; I had no idea what I'd have done if, instead, it had turned to fight. It headed straight for one of the 12 mature oak trees that fill our small yard and climbed up about 25 feet, where it rested its bulk on a branch and waited to see what I would do next.

Like the raccoon, my son also wondered what our next move would be. Again, I had no idea.

It came down the tree when we entered the house and climbed back up



the tree when we came out. We repeated this Disneyesque dance step several times before we accepted the impasse. A telephone call to animal welfare did nothing to resolve this predicament, but I did learn something about raccoons and the law.

Raccoons are territorial. My backyard was part of this creature's home, and the state law protects its "property" rights over mine — unless he was causing damage. Animal welfare explained that if the raccoon was not vicious, disoriented or confused — which could indicate rabies — then it might be menacing, but healthy. Neither county nor state animal control would trap and remove a healthy animal (although I could pay a private company to haul it away) because it would create a void — a neon-lit "Raccoon Vacancy" sign which could attract a menacing and sick raccoon.

I disregarded advice to ward off the intruder by putting ammonia around my property. I also disregarded the idea of concocting a garlic-based recipe to paint around the pond. Besides the smell, the runoff could wash into the water. Our masked landlord could then invite his friends to a dinner of goldfish in garlic sauce.

Instead of garlic, we took an uninformed shot in the dark and used chili powder. And, rather than sprinkling it around the pond, my son suggested putting it around the base of the oak tree. Once done, we withdrew to the house to watch the result of this offensive.

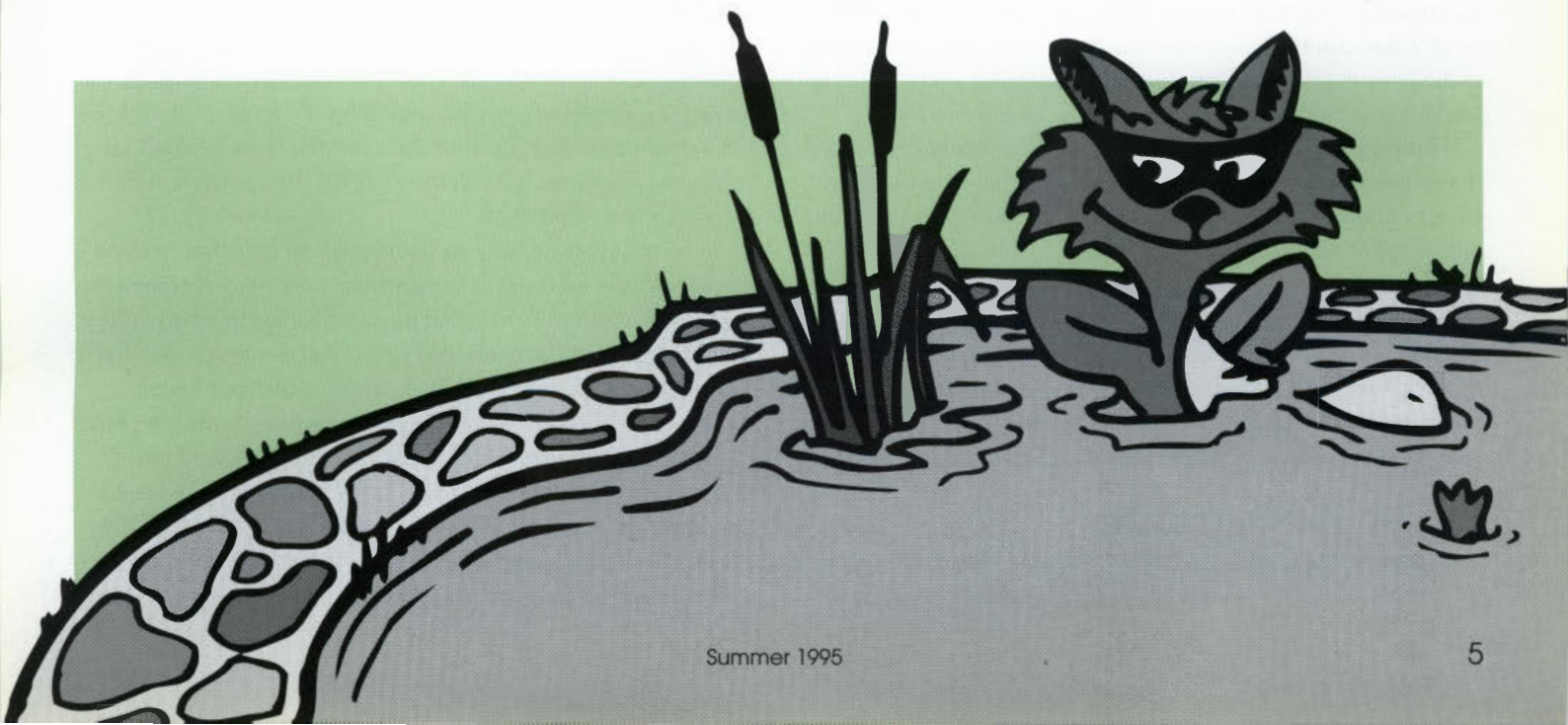
When he felt it was safe, the raccoon came down the tree. (It was obvious only in hindsight that we couldn't protect our pond by keeping him trapped up the tree forever.) It plowed through the chili powder barricade and made a bee-line for the pond. Totally oblivious to the fish, it

Raccoons are
territorial.
My backyard was
part of this
creature's home.

swam two laps, climbed out and lumbered away as we came out of the house. A moment later, it climbed the fence and was gone.

We had triumphed! We said nothing later that afternoon when a neighbor commented that he saw a raccoon up his tree.

by Joel J. Greenwald, a freelance writer from Cherry Hill



Scoping Out New Places to Hunt

by Russ Wilson

Birds are generally stocked in fields at the beginning of the hunt at hunting preserves (right).

Quail will often escape to the woods for cover (opposite page).

PHOTOS BY RUSS WILSON



It is estimated that more than 100,000 licensed sportsmen and sportswomen will take to New Jersey uplands when the 1995 small game season officially opens in November. But in these days of disappearing farmlands and sometimes crowded public hunting lands, it is getting harder and harder to find a place to hunt.

Hunting in New Jersey, at least hunting as many of us knew it as youngsters during the 1950s and in introducing the sport to our children in the 1970s, has gone the way of the two cent cup of coffee and the nickel candy bar.

Progress has indeed taken its toll. Although it seems like an eternity, I recall walking less than a half-mile from my home in the Oakhurst section of Monmouth County into unkempt fields that harbored thriving populations of cottontail rabbit and native bobwhite quail. Few people posted their land during those less trying times, and those who did were usually hunters themselves.

To Lease or Not to Lease

The days when one could stop at most any farmhouse along the rural road and be reasonably sure of getting permission to

hunt by simply asking the owner are but a fond memory of what once was and never will be again.

Farmers, taxed to the max and looking for whatever means of raising additional income they can find, are not so quick to grant hunting rights without some form of compensation. Most have discovered that hunting clubs, as well as individuals, are willing to pay — and pay well — to gain the exclusive right to a choice piece of property.

In recent years, leasing land on which to hunt has reached a level too costly for the average sportsman or woman. Anyone who doubts this fact has but to visit a real estate agent who handles leasing agreements between landowners and hunting enthusiasts.

Talk about sticker price shock. Some well-heeled hunt clubs pay as much as \$1,000 a year for hunting rights for a farm covering only a few hundred acres, much of it cleared for crops. And, with more and more farms that once were leased giving way to residential housing and industry, costs will, due to the law of supply and demand, continue to escalate.

There are, of course, the wildlife management areas. Now

numbering more than 80 and covering in excess of 250,000 acres, these undeveloped properties are managed under the able guidance of the New Jersey Department of Environmental Protection's Division of Fish, Game and Wildlife.

Many, but not all, are open to hunting and fishing, as well as other summer activities, such as biking and bird watching. Many management areas have the type of habitat preferred by cottontail rabbit, pheasant, grouse, squirrel and quail. While some may tend to be crowded on opening day or on weekends for more popular species, many offer great hunting opportunities on weekdays. Check with your local wildlife management area for the best times and species to hunt.

Hunting Preserves

If you can't afford to lease land and are looking for an alternative to wildlife management areas, there is a solution. Hunters can arrange a day of bird hunting on a commercially licensed hunting preserve. There are a number of preserves scattered throughout the state; most are open to the public.

It will cost you a few bucks to hunt stock ringneck pheasant, bobwhite quail or chukar (Hungarian partridge) on a preserve. However, when compared to leasing property and then having to stock pen-reared pheasants, which may cost as much as \$15 per bird, a day in the field at a well-managed preserve actually may prove to be a lot less costly in the long run.

The beauty of preserve hunting is that you almost are guaranteed to see birds and do some shooting. The exact number of birds will depend on how much you are willing to spend, what species you order — pheasant, quail or chukar — and whether you arrange for a half day or full day in the field.

John DeGregorio of Game Creek Hunting Farms in Woodstown provides a quality hunt, one that is geared to the on-the-go corporate executive or the blue-collar worker who doesn't have the time or the inclination to hunt county, state or federal-owned lands.

DeGregorio offers all sorts of hunts ranging from a half-day family-type hunt with guides and dog provided to a daylong hunt complete with breakfast, lunch and dinner.

I have gunned the Game Creek spread several times over the past ten years and have yet to come away disappointed. In fact, on more than one occasion, I've had the pleasure of introducing first-time hunters to this type of bird hunting experience and most expressed similar satisfaction.

One of the most extensive commercial shooting preserves in the state, Belleplain Farms Shooting Preserve in the town of the same name, has a 1,200 acre spread that's laid out so several parties can hunt in complete safety and never realize anyone else is utilizing the property.

"At Belleplain, you can enjoy a traditional field hunt, tower shoot or a round of sporting clays. It is also one of a very few shooting preserves in the state that offers on site gunsmithing



services and a full line of guns and ammunition," says preserve owner Nick Germanio.

A full-day hunt, for example, begins at 8 a.m. and ends at 4 p.m. The \$95 per person cost (1994 rates) includes four pheasants or six chukar or 10 bobwhite quail. Additional birds can be purchased for release at a cost of \$18 per ringneck pheasant, \$12 per chukar and \$6 per bobwhite quail. Hunters can use their own dogs or arrange for a guide and dog for an additional \$50 per day.

Introduction to Hunting

B & B Pheasantry and Hunting Preserve in Pittstown is as good a place as any I've found to introduce a son or daughter to upland game hunting. The fields are laid out nicely, the cover isn't too thick, and there's never a crowd.

Owners Benjamin and Brenda Beckage were among the first preserve operators in the state to offer half-day father and son hunts. What began more than a decade ago as a Christmas gift promotion has since blossomed into an annual affair for many

Author Russ Wilson poses with his dog, Barney, during a pheasant hunt.



mothers and fathers, sons and daughters, and husbands and wives, who share their first hunt at B & B Pheasantry.

"We have over 1,000 acres, all of it prime bird hunting cover," says Brenda Beckage. "We can accommodate as many as 20 hunters at a time and offer half or full-day field hunts, plus tower releases or hunting from blinds."

"Our major emphasis is on the field hunts," she adds. "The majority of our customers want to hunt ringneck pheasant, chukar partridge or bobwhite quail, but for those seeking a different experience, we also offer goose hunting."

Many bird hunters planning a day at a preserve bring their own shotgun, usually 12 or 20 gauge. However, for those new to the sport, rental shotguns are available at a modest fee. The only item required other than a supply of bird shot and a jacket having at least 200 square inches of blaze orange is a valid hunting license or one-day preserve permit. Permits are issued by the preserve owners.

A preserve hunt may not compare to the wild bird hunting I enjoyed as a teen or later as a father, but it is one way to instill a love of the sport and a sense of togetherness between a father and son or daughter.

Russ Wilson is a freelance outdoors writer who lives in Neptune.

Preserves for the Public

Following is a listing of hunting preserves in New Jersey that are open to the public.

■ **B & B Pheasantry and Hunting Preserve**
RD 3, Box 19
Pittstown, NJ 08667
(908) 735-6501

■ **Belleplain Farms Shooting Preserve**
346 Handmill Road
Belleplain, NJ 08270
(609) 861-2345

■ **Buttonwood Game Preserve**
810 Harmony Station Road
Phillipsburg, NJ 08865
(908) 454-8377

■ **Erbe's Game Farm**
RD 3, Box 2731
57 Sharon Station Road
Allentown, NJ 08501
(609) 259-7697

■ **Game Creek Hunting Farms**
RR #2, Box 195
Woodstown, NJ 08098
(609) 769-0038

■ **Gilbertson's Game Bird Farm**
Sooya Landing Road
Port Republic, NJ 08241
(609) 652-1939

■ **M & M Hunting Preserve**
Hook and Winslow Roads
Pennsville, NJ 08070
(609) 935-1230

■ **Meadow Grove Sportsmen**
669 Alanon Road
Ridgewood, NJ 07450
(201) 612-9402

■ **Oak Lane Farms**
Dutch Mill Road
Piney Hollow, NJ 08344
(609) 697-2196

■ **Pineland Outfitters**
29 Dock Street
Parkertown, NJ 08087
(609) 294-1355

■ **S & R Farms Gun Dog and Hunt Club**
609 Fulton Street
Millville, NJ 08332
(609) 935-8077

■ **Schnetzer Farms Game Preserve**
RR2, Box 686
Mountain View Road
Asbury, NJ 08802
(908) 689-4907

■ **Wing & Shot**
64 Fern Street
Browns Mills, NJ 08015
(908) 758-9480

Marketplace



- Sweat Shirt featuring the *New Jersey Outdoors* logo of the threatened great blue heron at sunrise. Cotton/polyester blend.
- *New Jersey's Endangered Species T-shirt* featuring a bobcat, corn snake, piping plover, peregrine falcon, eastern tiger salamander, bog turtle, shortnose sturgeon and blue whale as well as several rare plants. Also including the *NJO* logo. Cotton/polyester blend.
- *Fin Whale at the Jersey Shore T-shirt* also featuring the *NJO* logo. Cotton/polyester blend.
- *Canvas Carry-all* featuring the *NJO* logo.
- *Baseball Hat* featuring the *NJO* logo. Cotton twill. One size fits all.
- *Ceramic Mug* featuring the *NJO* logo. White only.
- *Colorful Poster* (shown below) featuring fall leaves. 2' x 3'.



NJO Marketplace Order Form (Summer '95)		Adult Sizes/Quantity					Total Quantity	Total Price
		S	M	L	XL	XXL		
<input type="checkbox"/>	Sweat Shirt (\$24.95)							
<input type="checkbox"/>	Endangered Species T-shirt (\$12.95)							
<input type="checkbox"/>	Fin Whale T-shirt (\$12.95)							
<input type="checkbox"/>	Canvas Carry-all (\$9.95)							
<input type="checkbox"/>	Hat (\$10.95)							
<input type="checkbox"/>	Ceramic Mug (\$4.95)							
<input type="checkbox"/>	Poster (\$3)							
Product sales help support NJO								
Merchandise Subtotal								
Shipping (see chart below)								
TOTAL AMOUNT DUE								
Shipping & Handling Chart								
Orders up to \$3.00 Add \$2.00								
\$3.01-\$10.00 Add \$3.50								
\$10.01-\$15.00 Add \$3.95								
\$15.01-\$25.00 Add \$4.95								
\$25.01-\$35.00 Add \$5.75								
\$35.01-\$50.00 Add \$6.75								
Orders over \$50.00 Add \$7.50								

Name _____

Address _____

City _____

State _____ Zip _____

Phone (____) _____

Send order form with check or money order payable to: New Jersey Outdoors, DEP Bureau of Revenue, CN 417, Trenton, NJ 08625-0417. (Allow 3-4 weeks for delivery)

Profile

Becoming an Outdoors- Woman

Donna Bramlett, a researcher from Plainsboro, had skied and backpacked, but she always longed to try some of the sports traditionally participated in by men.

So when she saw a weekend workshop in New York State offering a shooting course, she signed up with a friend. And, after taking a prerequisite lesson in firearms safety, she was out in the field shooting at clay birds.

"It was fun and a lot different than I thought," says Bramlett, who shot with a youth-sized gun because the adult gun was too big and bulky for her petite stature. "It was also more difficult than I thought."

Bramlett's instructor on the shooting course was an ardent hunter, excellent marksman — and a woman.

"She was confident, an avid hunter, and she made you feel that it wasn't a strange thing that a woman was doing this," Bramlett says.

Welcome to *Becoming an Outdoors-Woman*, a movement that is spreading across the country to break down the barriers for women in participating in outdoor activities.

"*Becoming an Outdoors-Woman* is an opportunity for women to have fun, improve their knowledge and learn hands-on skills so that they can develop the confidence to participate in fishing, hunting and other outdoor ventures," says Cindy Kuenstner, chair of New Jersey's planning committee and a hunter education administrator with the Department of Environmental Protection's Division of Fish, Game and Wildlife (DFG&W).

Marianne Hochsweider poses with her catch of the day — a rainbow trout.



AL VANY, DIVISION OF FISH, GAME AND WILDLIFE

Although several courses offered focus on skills for hunting and fishing, the workshop also provides opportunities in related fields, such as canoeing and kayaking, outdoor photography, outdoor survival skills, reading wildlife signs, camping and backpacking.

"This provides activities and educational programs for all women," says Dr. Christine Thomas, a professor of resource management at the University of Wisconsin-Stevens Point, who founded the movement in 1991. "There's a bottled up need out there and basically women were just waiting for the opportunity."

To date, the program has served 3,500 participants nationwide. This year, New Jersey will join 25 other states, as well as a Canadian province, in providing weekend workshops to teach women outdoors skills. New Jersey's weekend is spearheaded by the New Jersey DFG&W.

"(These workshops) give women the opportunity to learn these skills when they don't have any other place to learn them or anyone else to learn them from," says Kelly Stang, chair of the *Becoming an Outdoors-Woman* planning committee in New York. "It gives them confidence and lets them see other women are doing these activities and that they are not weird or unusual because they want to hunt or fish."

Breaking Down Barriers

The inspiration for *Becoming an Outdoors-Woman* developed from a conference in Wisconsin in 1990. Here they identified barriers women felt toward participating in hunting and angling, including outdoor clothing that does not fit properly and equipment that is not the right size. In addition, fishing and hunting are male-dominated traditions that often limit women's participation in these activities.

Another barrier to outdoor activities

Cindy Kuenstner, chair of New Jersey's event, teaches a firearms safety course.

is the urbanization of the American culture. Most people no longer have a connection to the land or a true understanding of where food comes from. Most people are used to seeing meat in its prepared state in the supermarket, not as it is taken through the process of being raised on a farm, slaughtered and prepared as food.

"A generation ago, everybody had someone on the farm," Thomas says, adding that even during a poll of her own 60 students in Wisconsin, only one had a relative in farming.

The other phenomenon that is occurring is an increase in single parent families, 80 percent of which are headed by women. Many of these women were never exposed to or interested in outdoor activities or had little money to pursue them.

"We are raising a whole generation of kids that don't have the opportunity to do these things," says Thomas. While

"It lets them see other women are doing these activities and that they are not weird or unusual because they want to hunt or fish"

— Kelly Stang

outdoor skills are often passed from a father to his son, that is not generally the case for a father or mother to a daughter.

Courses offered at these workshops attempt to break down those obstacles. Although there are male instructors, and

COURTESY OF CINDY KUENSTNER, DIVISION OF FISH, GAME & WILDLIFE



Profile

men are welcome to participate, for the most part these weekends are run by women for women.

"It was a congenial atmosphere," says Lynda Baydin, a family law attorney from Morristown who took courses in shooting and fly fishing at the New York State workshop. "The instructors were experienced, competent people."

Cooperation, Not Competition

Women instructors help to foster a cooperative atmosphere, not one of competition. Instead of the pressure to shoot the most clay birds or hit the bull's-eye, the emphasis is on learning new skills and sharing in one another's successes.

"It's a different feeling when they have female instructors," says Stang, a fish and wildlife technician with the New York State Department of Environmental Conservation. "They become role models, especially in the courses that are more traditionally male, like shooting,

hunting and trapping."

Once during a program in Arkansas, Thomas was helping a woman on the rifle range. The woman began to shake. "I'm terrified of this gun," she confessed.

Thomas soothed the woman and told her she didn't have to shoot if she didn't want to. Explaining that nobody would get hurt and that the gun's kick was not bad, Thomas walked the woman through her first shots. Three of them landed on the target. The woman grinned from ear to ear and was soon loading the gun herself, shooting and checking her targets.

"She gave me a hug and thanked me for the opportunity," Thomas says. "She was able to have fun and overcome her fear."

As a result of these workshops, women become more independent, more confident, and many are able to share the wilderness experience as an equal partner with their spouses or a male friend.

In addition to their confidence, women also gain a new appreciation and understanding for the work of natural resource management organizations.

"Women who are more involved in

outdoor activities are more interested in environmental protection," Thomas says.

While Thomas says she does not expect to change the world with her workshops, she is making progress one woman at a time.

Thomas remembers walking around the grounds during the Arkansas *Becoming an Outdoors-Woman* weekend. Suddenly, there was a commotion at the lake when a 60-year-old woman began screaming and hollering with glee as she landed her first fish.

"Here's a person who lived six decades and never caught a fish," says Thomas.

At the same conference, a woman in her 50s finally declared herself "liberated." After a lifetime of fishing, she wanted to learn how to trailer and launch a boat so she could take herself on an expedition.

Thomas often gets notes and pictures from the women who participated. One recent picture shows a woman, clad in blaze orange hunting gear, standing next to a six by six bull elk (one with six points on each of its antlers).

"I still can't believe I really did it," the woman says in her accompanying letter. "I would have never done that in my lifetime if it had not been for this opportunity."

And opportunity is what these workshops supply — the opportunity to become an outdoors woman.

Becoming an Outdoors-Woman will be held September 15-17 at Montclair State College's School of Conservation in Stokes State Forest, Branchville. The cost is \$125 and includes course materials and equipment, lodging and meals. For more information, contact:

Becoming an Outdoors-Woman
NJ Division of Fish, Game
and Wildlife
386 Clarksburg-Robbinsville Road
Robbinsville, New Jersey 08691
or call (609) 259-3347.

A woman fires a muzzleloader at the Rockport Pheasant Farm Open House.



DIVISION OF FISH, GAME AND WILDLIFE

Research



PHOTOS BY CHARLES ST. CHARLES III



This flume tank (left) has a bank of lights to simulate daylight.

The James J. Howard Marine Sciences Laboratory (above) is located on Sandy Hook.

A Window on New Jersey's Waters

It is the kind of high-tech laboratory you expect to see in a science fiction film.

The stage is set with sparkling clean floors, mysterious pipes leading from one room to the next and lights that dim to mimic the time of day and the season. Behind glass doors, scientists in white lab coats run experiments with gleaming new equipment, and computers are everywhere. Video cameras record each room from several different angles, while back in the audio-visual center, every inch of the laboratory is on display.

The story begins to unfold as you walk into a large two-story room with a

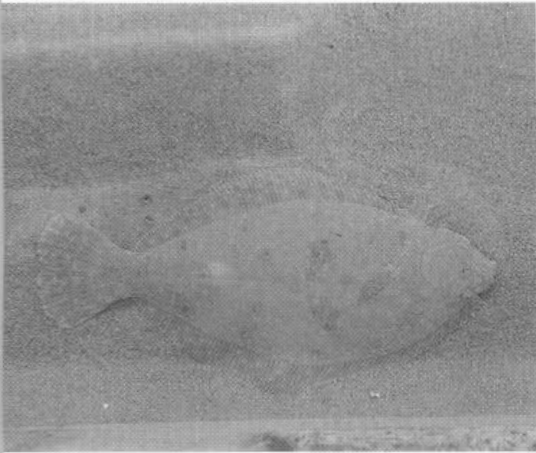
32,000-gallon research aquarium, which is visible from above or through eight windows near the bottom of the tank. Perhaps this is a "creature from the deep" movie. In that tank, one might envision some sort of sea monster, which frantic marine biologists are trying to identify. As you peer through one of the observation windows into the murky sea water, there is no way to be certain what to expect . . .

Creatures from the Deep

At the new James J. Howard Marine Sciences Laboratory in Sandy Hook, they

haven't captured anything resembling a leviathan or the Loch Ness monster, but they have a fairly extensive sampling of the marine life inhabiting the waters of the Jersey Shore. The facility, still in the final stages of completion, can hold, store and study specimens from the waters around New Jersey at a capacity that rivals some of the best marine laboratories in the country.

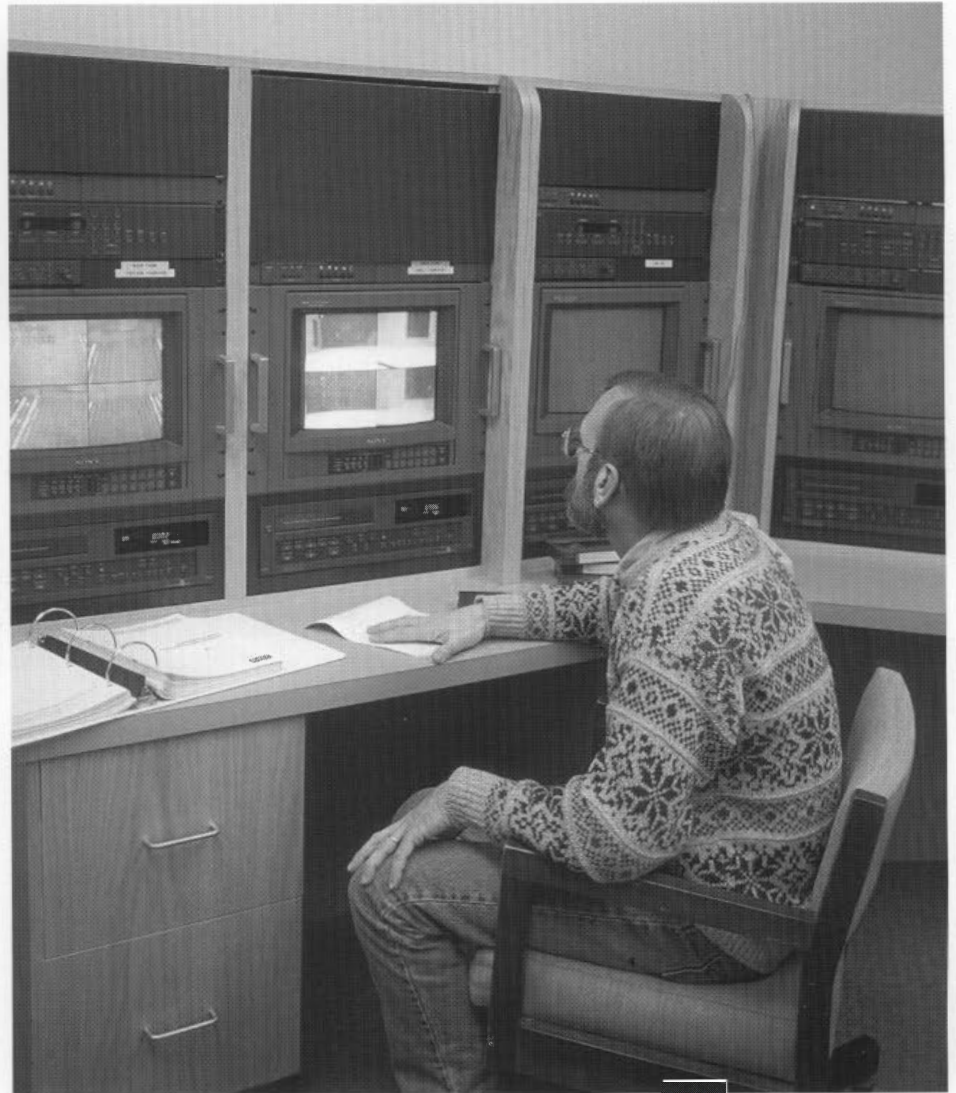
The Howard Lab is modern in every sense of the word, a sharp contrast to the old post hospital at Fort Hancock that housed the scientists and administrators of the facility less than a decade ago. It is equipped with the latest technology, including an electron microscope and an explosion-proof labora-



A fluke (above) is camouflaged in sand at the bottom of a research tank.

A researcher monitors activities in the fluke tank with screens (right) and video cameras.

A sea worm (opposite page, bottom) is examined through a special microscope, which displays the image on a nearby monitor (opposite page, top).



tory, and is home to studies ranging from fisheries ecology to analytical environmental chemistry experiments.

The huge aquarium and many of the research tanks are fed by water from Sandy Hook Bay. The water is pumped into the facility through a complex network of pipes and can be adjusted to provide cold, warm or ambient temperatures. The lights, too, can be set to replicate natural light cycles and patterns.

The work at the laboratory focuses on three main areas of study — fisheries ecology, habitat processes and environmental chemistry. The scientists here not only study the materials found dissolved in the water and stored in the flesh of various fish, but also

the habits and patterns of fisheries.

The Fish Ecology Program examines the relationship between fishing and habitats as well as the populations of various aquatic species. Fishing not only removes certain species, but also an integral part of marine ecosystems. Therefore, it is necessary to determine the effects of fishing and safe fishing levels in particular areas.

In the Habitat Processes Program, researchers are trying to determine the factors that allow fish to reach maturity. This includes studies on the effects of habitat degradation and investigations of the types of habitats that are successful in producing adult fish.

The Environmental Chemistry Pro-

gram studies the effects of flood plain runoff in the Passaic River, a heavily industrialized area of North Jersey. Samples are collected from New Jersey's bays and coastal waters throughout the year. Some samples are analyzed for metals — both natural and those caused by pollution.

Game Fish Studies

Dr. Sam Wainwright and Ken Able, of Rutgers University's Institute for Marine and Coastal Sciences, and Anne Studholme and Anthony Calabres, of the National Marine Fisheries Service, are conducting a comparative study of three estuaries — the Great Bay, the Hudson/Raritan and the Long Island Sound — to determine the effects of habitat degrada-

The goal has been to maintain the shore as a safe and exciting part of our state culture.

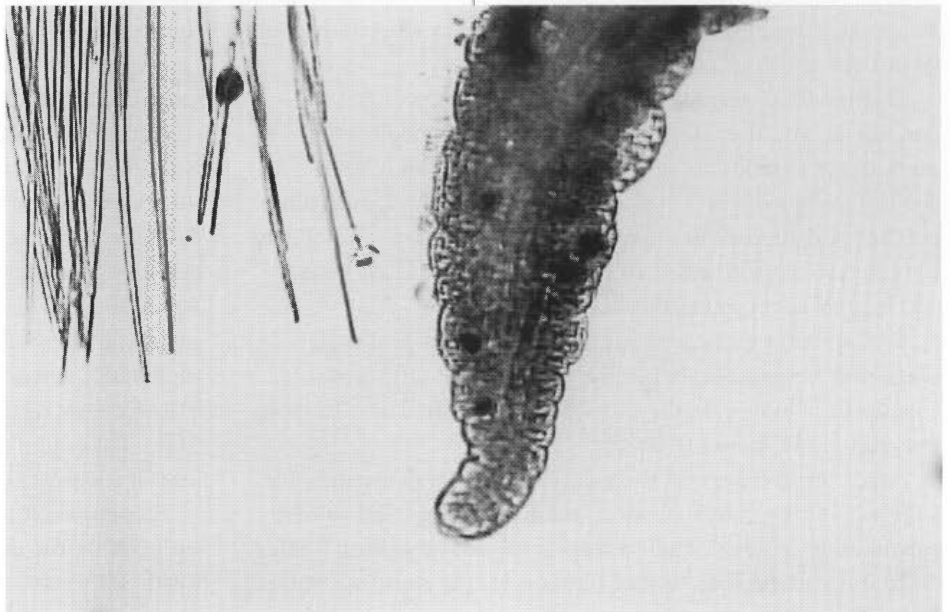
tion on the successful survival of young fish important to both the commercial and recreational fisheries.

The Great Bay Estuary near the Mullica River is considered a pristine body of water, while the Hudson/Raritan Estuary off the coast of Sandy Hook suffers from heavy industrial degradation, and Long Island Sound exhibits a gradient of pollution, increasing toward the western end. This three-year study will focus on two species of game fish, winter flounder and tautog, that are common to each of these areas and the variety of fish which use inshore estuaries for spawning.

The study will also determine what niches within these inshore estuaries, such as areas filled with eel grass, marsh creeks or unvegetated areas, are most successful in helping young fish reach maturity.

Another study, conducted with Able, director of the Rutgers Marine Field Station in Tuckerton, will investigate the effects of platform structures, such as piers, on fisheries in the Hudson River. This study will look at the distribution and abundance of young fish on both sides of the river — by Pier A and the Weehawken Ferry Tunnel on the New Jersey side and near Pier 40 and the Holland Tunnel ventilator shaft on New York's shores. The growth of young fish is an excellent indicator of water quality.

Back at the lab, more controlled experiments are undertaken. Scientists, especially those in the Fisheries Ecology Program, can design studies and run them with restricted parameters. Unlike field studies, these in-house experiments, which utilize the carefully controlled conditions of water temperature



and computer-operated lighting cycles, have fewer unknown factors to influence the outcome.

In the laboratory, researchers can control the amount of pollutants and trace metals in the water, prevent the loss of fish to anglers and underwater predators and provide predictable weather.

The Howard Marine Sciences Laboratory is a cooperative effort between New Jersey and the National Oceanic and Atmospheric Administration. The \$19 million facility was funded through direct state grants, state bonds and contributions from the Port Authority of New York and New Jersey.

Studholme, of the Environmental Assessment Branch of the Howard Lab,

wants the public to know about the work being conducted at the facility. She says that since the laboratory first began operating in the 1960s, the goal has been to maintain the shore as a safe and exciting part of our state culture.

"We're serving the needs of the people, as far as fish and recreation go," Studholme says. "We're going to do the best we can to protect these resources."

by Paulette McKay, an intern from Yale University

Terrapins, Tires and Traps

by Roger Wood

Diamondback terrapins are innocuous denizens of New Jersey's salt marshes. Often unseen by people because of their cryptic habits, they are excellent swimmers, spending virtually all of their lives in the water or lurking amongst marsh vegetation in the inter-tidal zones.

At the turn of the century, these denizens of coastal waters were in jeopardy when they were hunted as a food delicacy. But today, the biggest threats come not from the palate, but from tires and crab traps.

Diamondback terrapins are the most celebrated of American turtles, and they have the most variation in colors and markings of perhaps any turtle species in the world. Their shells may be a series of concentric grooves and ridges or have patches of light and dark markings, which may range from gray to brown to black to green to yellow to orange. Their heads and legs are often spotted or flecked.

Females grow considerably larger than males, and their shells may range from six to nine inches when fully grown. The shells of males, on the other hand, may grow only four- to five-and-a-half inches in length.

Adult terrapins spend their days in the marsh foraging for a variety of tiny clams, mussels, snails, minnows and similar carnivorous delights. Their fondness for mud-dwelling fiddler crabs is comparable to that of humans for pizza and ice cream. Like ospreys, terrapins are among the top carnivores in the state's coastal salt marshes.

The only time terrapins ever emerge into clear view is to bask (often in aggregations) on sunny mud banks or, in the case of gravid females, to nest. During the nesting season, adult females must find a place above the high tide line in which to dig their nests and deposit their eggs. Here in New Jersey, a nesting terrapin will typically lay between 8 and 12 eggs in a single nest. In many cases, an individual female may lay at least two clutches of eggs each nesting season, a period of five to six weeks usually beginning in the first few days of June and continuing through early to mid-July.

But despite the rather prodigious reproductive efforts of female terrapins, only a very small fraction of the eggs laid annually survive to become adults. Most of the eggs are dug up and eaten by a variety of predators (including foxes, skunks, raccoons and crows), and those relatively few hatchlings that survive incubation are then subject to further intensive predation by crabs, fish and various species of birds, ranging from gulls to bald eagles.

In reasonably pristine marshes, terrapins can actually be rather abundant, even though their presence may not be readily apparent. However, in New Jersey and throughout most of the rest of their geographic range from Massachusetts to Texas, terrapins have had a poor history of interactions with humans for more than a century. As a consequence, once-abundant terrapin populations have become greatly reduced in numbers.

Gastronomic Delicacies

Initially, through the late 1800s and early 1900s, terrapins were the victims of an exotic food fad. Terrapin stew and soup were widely regarded as highly desirable, gastronomic delicacies. Severe over-hunting rapidly depleted coastal salt marshes of terrapins, especially in the mid-Atlantic region. As these hapless turtles became more scarce, prices for the surviving ones naturally increased in response to the law of supply and demand. By the turn of the century, the price for a dozen large terrapins had skyrocketed to as much as \$90 to \$100. Taking inflation into consideration, this is the equivalent of roughly \$1,700 per dozen today.

Fortunately for the relatively few terrapins that survived the early 1900s, the demand for them as a food eventually subsided. The onset of Prohibition (a key ingredient in the soups and stews was sherry), and later, the Great Depression, combined to eliminate virtually all commercial interest in these beleaguered turtles, and their populations finally had a chance to recover, at least to some extent.

In the meantime, however, a new and different kind of threat to terrapins had developed, in the form of large-scale loss and degradation of salt marsh habitat through the early and mid-1900s. Although environmental legislation, starting

Diamondback terrapins have the most variation in colors and markings of perhaps any turtle species in the world.



PHOTOS BY ROGER WOOD

A terrapin digs her nest at night in Avalon.

with the Wetlands Act of 1971 and subsequent clean water regulations, has largely ended the filling in of marshes and pollution of their waters, it was already too late to protect habitat vital to terrapins. In particular, vast stretches of prime nesting habitat — sand dunes on what are now coastal barrier beach island resort communities — have forever disappeared.

No longer able to nest in their traditional areas, terrapins have had to seek alternative nesting sites above the high tide line. And this had led to fatal choices. Increasingly since the early 1970s, these turtles have turned to the embankments of roads crossing or immediately adjacent to salt marshes as new nesting sites. Following the example of the proverbial chickens that cross roads for no particular compelling reason, terrapins that emerge from the marshes to seek a suitable nesting site often wander across roads to explore the embankments. Turtles and tires don't co-exist happily, with the inevitable consequence that large numbers of female terrapins are killed annually by vehicular traffic during the nesting season.

Life After Death

In the hope of ameliorating the dual threats to terrapins posed by tires and traps, the Wetlands Institute of Stone Harbor initiated studies of terrapin road kills and the impact of crab traps on the terrapin population along the southern coast of New Jersey.

Beginning in 1989, the institute began round-the-clock patrols to document road-kill mortality during the nesting season. During this period, females will lay eggs around the clock. Although there was more traffic during the day, the greatest number of terrapins were run over at night when they are virtually impossible to spot on the pavement.

While the number of road-kill terrapins has been decreasing over the last six years — from slightly more than 1,000 to just under 500 in 1994 — the statistics are not as favorable as they may appear. What the declining numbers actually indicate is a diminishing of the population in the study area. It is estimated that 1,000 to 1,500 female terrapins are killed throughout the



Two live terrapins caught in a commercial crab trap.

state on the road each year.

In an effort to combat this decline, the institute has begun to rescue undamaged and potentially viable eggs from fresh road kill. This head-starting project, called "Life After Death," incubates eggs at a specially modified facility at Stockton State College in Pomona. This "terrapin farm" has been successful in hatching 30 to 50 percent of the eggs that are retrieved.

The terrapins normally hatch in late summer and early fall after an incubation period of about two months. The tiny babies, whose shells are about the size of a quarter, are then kept in warm water over the winter and fed as much as they can eat.

By the following June, these hatchlings, which have grown to three to four inches in length, are released back to the salt marshes, too large for most of their predators. As a result, many may reach reproductive age and contribute to the perpetuation of their species.

While head-starting appears to be successful in a limited way, it is extraordinarily labor intensive and expensive to operate. It

can only partially compensate for the years of slaughter of nesting terrapins. If all of these hatchlings survived to adulthood, they would replace only half of the mature female terrapins killed annually by motor vehicles. This merely helps to slow down the rate at which the terrapin population is declining.

Trapped in Traps

But terrapins are facing an even greater loss from commercial crab traps. The Wetlands Institute estimates that tens of thousands of terrapins of all sizes and both sexes drown each year in the 50,000 crab traps deployed in New Jersey coastal waters.

Terrapins, being broad-spectrum carnivores, are attracted by the baits used in these traps. Although they can push their way into crab traps, terrapins ordinarily can't get back out of them. Because terrapins have lungs and are air breathers, they drown unless the traps happen to be pulled from the water for inspection within a relatively short time after the turtles have entered them.

Without question, commercial crab traps are currently the single largest source of mortality for terrapin populations, not only in New Jersey, but in much of the rest of the geographic range of the terrapins as well.

As a result of this devastating loss, the Wetlands Institute developed a simple, inexpensive device, which was evaluated with the help of federal funding and other assistance from the Department of Environmental Protection's Division of Fish, Game and Wildlife, to prevent terrapins from entering the traps. Called a Bycatch Reduction Apparatus (BRA), this rectangular frame made from stiff wire has an inner dimension of five by ten centimeters. It is installed in the inner end of each of the four entrance funnels of typical commercial crab traps. Some crabbers in the state have begun installing the device on a voluntary basis.

This device has been successful in preventing 90 percent of all terrapins from entering the crab traps. At the same time, even the largest crabs can still creep through the wire frame and into the traps. Unexpectedly, an initial study of these devices found that those equipped with the device actually caught more crabs.

If the use of this device becomes widespread not only in New Jersey, but other Atlantic and Gulf Coast states, there is a potential for saving enormous numbers of terrapins. And with terrapin numbers declining year after year, the device may have arrived just in time.

Some Protection Offered

All of these problems have been inflicted upon terrapins despite the fact they are afforded varying degrees of protection by every state in which they are found. New Jersey's terrapin regulations are potentially among the most stringent of all. Although they are classified as a game species, terrapins only



Children from Avalon and Stone Harbor, on their way to release baby turtles back to the wild, help to warn motorists of terrapin crossings at the Wetlands Institute.

can be taken from Nov. 1 to March 31, which coincides with their hibernating season when they are hard to find. In addition, terrapins must be a minimum of five inches long, and no traps, pots, fykes, seines, weirs or nets may be used to capture them. There is also a prohibition against collecting or destroying eggs.

During the remainder of the year, when terrapins are active, they are absolutely protected. It is illegal to hunt or catch them in any manner, and there is even a fine of \$25 for each unhatched terrapin egg found in anyone's possession.

Regrettably, the prohibition against the taking of terrapins during the closed season is, in practice, very difficult to enforce because of the large number of crabbers and relatively small marine enforcement units, as well as tourists who take hatchlings or turtles as pets. Motorists who kill female terrapins during nesting or commercial crabbers who drown terrapins in their pots are not, in most cases, trying to harm these turtles. In fact, the presence of terrapins on the roads is a traffic hazard, and their proclivity toward entering traps is a

nuisance most crabbers would prefer to avoid. However the ecology and behavior of terrapins, coupled with increasingly intensive human use of the coastal regions, inevitably puts these inoffensive turtles in harm's way.

The public can take some simple steps to help protect this vulnerable population. When commercial-type crab traps are used for recreational purposes, install a Bycatch Reduction Apparatus. During the nesting season, use caution when driving on roads that traverse saltwater marsh areas.

Without preventive efforts such as these, stress on the terrapin population will continue to be severe, and there is a very real danger that this unfortunate species may once again suffer a population crash similar to the one it experienced several years ago. But arming people with information about the sources of its mortality may help to put them back on the road to recovery.

Roger Wood is the director of research at the Wetlands Institute in Stone Harbor and a professor of zoology at Stockton State College.



The Bonny Highlands

by John T. Cunningham

Southwestward roll the hills in a continuous line, from Vermont's venerated Green Mountains to Virginia's mystic Blue Ridge, from the festive Berkshires of Massachusetts to West Virginia's Appalachia, where economic distress contrasts with the richness of the land. Center stage among those often exalted treasures is New Jersey's Highlands region, kin to them all — and not surpassed by any.

The lilting name Highlands strongly suggests ties to Scotland's bonny braes and cold blue lochs, but those who bestowed the New Jersey name in the mid-19th century were sober-sided geologists, not poets or publicists. Highlands to them was a workaday physiographic designation describing a series of high, rolling hills.

Surely, too, they appreciated the Highlands' natural treasures, most of which still exist — the more than 225 species of birds, including soaring hawks and an occasional bald eagle or saw-whet owl; nearly 300 plants ranging from wild orchids to the beautiful, if common, wild roadside asters; the 14 kinds of snakes, especially the poisonous copperheads and timber rattlesnakes; and more than 40 mammals, including wildcats, opossums and otters. Today, nearly all of these remain, plus scores of bears and, more recently, the eastern coyote.

It is pleasant to conjecture that in christening this region the scientists meant to pay tribute to the region's verdant hardwood forests, the rhododendrons and mountain laurels of spring, the red and gold of autumn's foliage and deep winter snows that defined the region.

Suppose those geologists climbed through the Ramapo Mountains in about 1860 and looked westward across hundreds of square miles of primeval woodlands, marked only by an occasional wisp of smoke from a settler's cabin? From that perspective, "Highlands" fit the region perfectly.

Some of the sensations of those anonymous geologists can be recaptured in a modern ride northward on the stretch of Interstate 287 that opened in 1994 between Montville and Suffern, New York. It cuts through the gap on the southern end of the Ramapo Mountains. The Highlands roll outward in every direction, no longer pristine, but still magnificent.

Rich in History

Lenape Indians once roamed the Highlands, leaving behind their own poetry in such place names as Pequannock, Musconetcong, and Hopatcong; Pochuck, Ramapo and Pohatcong. Colonial prospectors found iron ore in the plains of Succasunna. Washington twice brought his beleaguered army to recuperate in the Highlands. In time, the region became the essence of wealthy suburbia near Morristown and in the Somerset Hills.

Such a land should be cherished by New Jerseyans as a singular gift of nature. Yet most residents, including those who live in the region, would be hard put to define this area that is arguably the state's most beautiful, most historic and most endangered.

Shaped like a giant, raggedly-cut piece of pie, the New Jersey section of the Highlands runs southwest from the New York boundary to the Delaware River. The slice is about 28 miles wide on the New York border, but only about eight miles broad at the Delaware River.

This piece contains roughly 1,000 square miles, enough to encompass about half of each of five counties — Passaic, Sussex, Morris, Hunterdon and Warren — plus the estate portion of Somerset County and a small bit of Bergen County mountain land.

Anyone who has dwelled in the shadow of the 14,000-foot Rockies might find the 15 to 20 "mountains" of the Highlands whimsical: the highest point, between Vernon and Canistota, is 1,496 feet above sea level.

The designation of the mountains stems from colonial days. One of the "peaks," about 1,200 feet above sea level, was noted in a 1797 journal as "Scotch Mountain" (now Scotts Mountain). The little-known hamlet Montana (Spanish for "mountainous") in Warren County was so named just after the Civil War — more than 20 years before the State of Montana was admitted to the Union in 1889.

Ancient Lands

The Highlands is New Jersey's most ancient land, created through hundreds of millions of years of violent shifting and tilting of ancient rock formations. That was followed by hundreds of thousands of years of scraping and gouging by a series of implacable glaciers. Then, between 20,000 and 40,000 years ago, the last of the glaciers disappeared. Serenity came to the Highlands.

Most important to the region, in the beginning and today, is the huge quantity of water that originates in or flows through the Highlands. Rapidly-moving streams have sliced through hard rocks over countless eons of time. Hundreds of lakes, ponds and reservoirs nestle in pockets carved out by glaciers.

Water is omnipresent. The Pequannock River speeds through a path it wore down for itself



WALTER CHOROZEWSKI

A Civil War cannon is part of a soldiers' monument in the Town Green (above) in Morristown.

Round Valley Recreation Area (opposite page) in Lebanon, Hunterdon County.



through thousands of centuries. The Rockaway plunges in fury through the flume at Boonton. The South Branch of the Raritan ripples and roils over the boulders in the Ken Lockwood Gorge near High Bridge.

Every major reservoir in New Jersey is in the Highlands: Wanaque, Monksville, Charlotteburg, Canistear, Clinton, Echo Lake, Oak Ridge, Kakeout, Spruce Run, Round Valley, Boonton and Split Rock. These slake the thirsts of an estimated four million people (most of whom live beyond the Highlands) and supply the ever-mounting wants of thousands of industrial plants and commercial buildings.

New Jersey's most important watersheds, the Raritan and the Passaic, originate in myriads of Highlands springs. The most dramatic, and yet simplest, such point of origin is found at the Hilltop Church on the highest hill in Mendham Borough.

Rain falling on the north side of the church roof courses through down spouts toward a small brook that leads to the Passaic River. Drops on the south side of the roof hasten to a small rivulet headed for the North Branch of the Raritan.

Molded by Giant Hands

Looking at a topographical map, particularly one molded to give a third dimension to Highlands ridges and valleys, provides two quick impressions. First is the fancy that a mythical giant's hand gouged the land with powerful fingers, leaving the long valleys between high ridges. Second is the temptation to include the Watchung Mountains in the Highlands.

But it was the relentless force of rampaging streams, not legendary fingers, that created the valleys, gorges, flumes and waterfalls. And the inclusion of the Watchung is misguided.

The Watchung ridges oozed into being from lava flows that erupted from a volcano near modern Boonton about 125 million years ago. The Watchungs rise north of Paterson and continue through Short Hills to Moggy Hollow near Far Hills. They are an aberration on the Piedmont Plateau, not a portion of the Highlands.

So much for placement, impressions and aberrations. The test for stewardship of primeval land is not how magnificent it is when humans find it, but rather how people treat their inheritance.

From Lenapes to Developers

The Lenapes met the test well because they were essentially farmers in tune with their environment. They followed the streams, naming them for the land formations through which the rivers flowed. Pequannock followed the "open land." Musconetcong was "the place of a rapidly running stream." Pohatcong meant "stream outlet in the split hills." And the state's largest lake, Hopatcong, translates into "honey pond of many coves."

The Lenapes altered the forests only to cut out small farms beside the rivers or for trails, most of which were widened into the first roads for European colonists.

In about 1710, Lenape guides led residents of Newark westward to "Succysunny" (black stone), their name for iron ore. The ore was loaded in leather bags thrown over the backs of horses for the shipment to the forge where the metal was heated for shaping at Hanover on the Whippanong River (now the Whippany River).

The Highlands was rich in the four elements needed for production — ore; fuel (wood) to smelt the ore; limestone for flux; and water to run the bellows and other machinery in a furnace or forge.

Soon after the opening of the Hanover forge, ironworks opened in "the Hollow" in Morristown, at Dover (1722) and Rockaway (1730). Three Philadelphians picked up the pace in 1742. That year, William Turner and Joseph Allen built the famed Union Forge at what is now



WALTER CHOROSZEWSKI

Hilltop Church (above) in Mendham is a source of water for the Passaic River and the North Branch of the Raritan River.

Hanks Pond (opposite page) in West Milford, Passaic County.



The Great Falls (above) in Paterson, Passaic County.

Greenwood Lake in West Milford, Passaic County, was a resort community at the turn of the century. Boating (opposite page) is still popular on this lake, which straddles New York and New Jersey.

High Bridge. Simultaneously, Jonathan Robeson fired a 38-foot-high furnace at Oxford.

No iron man surpassed the almost-legendary Peter Hasenclever, who acquired the old Ringwood furnace in 1764, bought “upwards of 50,000 acres” in the Highlands and imported 500 German “miners, founders, forgers, colliers, carpenters, masons and laborers,” plus their families. It was one of the major colonizing efforts of the period.

Hasenclever’s men opened 53 iron mines, built forges, furnaces, roads, dams, houses, stables, bridges, ponds, mills and various other structures. His accomplishments would be incredible even today. He lived well — friends and enemies alike called him “Baron.” But he fell suddenly. When his expenditures exceeded 50,000 pounds (\$80,510 based on today’s exchange rate), his backers recalled him to London in 1769. Ringwood State Park is a reminder of the Baron’s vast estate and the industry he commanded.

Iron brought George Washington to the Highlands twice, in January 1777 and again from Dec. 1, 1779 to mid-June 1780. Backed by ironworks that could forge the instruments of war, Washington also found safety between a soundly-

conceived network of alarms (fire beacons by night, cannons by day) along the ridges.

Despite a smallpox epidemic in 1777 and the dreadful cold and snowstorms of 1779-80, Washington’s army found healing and hope in Morristown. In 1780, after the successful Battle of Springfield, Washington remained in the Highlands by moving to the Dey Mansion in Preakness (west of Paterson) for 80 days.

Inroads to the Highlands

The rugged Highlands at first thwarted growth when the industrial age arrived early in the 19th century. The forges and furnaces had devastated huge portions of the original forest; a single forge “fire” could use 1,000 acres of woodlands annually. Iron fires went out, and villages, such as Dover and Boonton, fell on dire times.

New Jersey’s first turnpikes cut through the Highlands before 1810, not for iron but for the “salubrious air” of Morristown and the healing springs atop isolated Schooley’s Mountain in Long Valley. Carriages streaming westward from New York, Newark and Elizabeth brought the wealthy sick outward to receive the benefits of air and mineral springs. (One of the natural ingredients in the water was bicarbonate of soda, sure to please those who suffered from indigestion.)

A Morristown schoolmaster, George P. Macculloch, brought the Highlands into the 19th century as a dividend from a fishing trip to Lake Hopatcong in the summer of 1822. His restless mind envisioned a canal, utilizing the waters of Hopatcong and flowing eastward to tidewater down the Rockaway and Passaic river valleys. Westward, down the Musconetcong River valley, lay Phillipsburg, gateway to Pennsylvania anthracite coal.

Others finished the waterway — the Morris Canal — between Phillipsburg and Newark by 1831, using an ingenious system of locks and inclined planes to enable boats to “climb mountains.” Because of incoming coal from Pennsylvania, iron mining boomed, forges and furnaces flamed, and collapsed Highland villages again knew the sights and sounds of prosperity.

Railroads followed. The Morris & Essex reached Morristown in 1838, Dover ten years later and Phillipsburg in 1852. The Jersey Central, struggling westward out of Elizabeth since 1831, tackled the Highlands near Clinton in 1850, built a mighty span across the North Branch (“High Bridge”) and entered Phillipsburg in 1852, ready to earn riches from carrying coal.

Steam locomotives awakened the Highlands. By the end of the 19th century, weekend excursion trains left Jersey City to haul thousands of travelers on one-day Highlands vacations at Lake



Hopatcong, Greenwood Lake, Cranberry Lake and other resorts.

More importantly, railroads created a breed of men convinced of the wisdom of working in the city and living in the country. Strings of commuting towns grew up beside the rails; the Highlands became home to clerks and high financiers alike, all riding to work in "the cars."

As the 19th century waned millionaires particularly enjoyed the "banker's specials" that left Morristown, Bernardsville and Far Hills because it coincided with their workday, had nonstop service after Summit and had amenities such as breakfast and parlor cars. By 1900, more than 100 powerful millionaires lived between Madison and Far Hills, running the world on weekdays, playing in the country on weekends.

Perhaps the best-known millionaires were Florence and Hamilton Twombly, who built a 100-room mansion in Florham Park, now the site of Fairleigh Dickinson University. The Twomblys had amassed a fortune of \$70 million from inheritances (Florence was a Vanderbilt) and the chemical industry. The town of Florham Park still bears their names.

On the eve of World War II, prosperous small farms dotted the Highlands, even on the edges of the towering virgin forests in northern Passaic County and in parts of nearly every other Highlands

State Acts to Protect the Highlands

In a continuing commitment to preserving open space in the Highlands, the Department of Environmental Protection recently purchased Copperas Ridge in Rockaway Township, a 2,500-acre tract filled with mountainous terrain, forested land, wetlands, streams and diverse habitat.

The tract will be used for recreational opportunities and to protect drinking water supplies. The area is also home to several endangered plant and animal species, including the Indiana bat, as well as bears, bobcats, beavers, coopers, hawks, turkeys and migratory birds.

The site, which cost \$5.2 million, was purchased with \$4.2 million in Green Acres funds approved by voters as well as a \$1 million grant from the Richard King Mellon Foundation of Pittsburgh, Pa. with the assistance of The Conservation Fund of Arlington, Va.

In addition to the Copperas purchase, Gov. Christine Todd Whitman approved \$24 million last June to acquire additional land in the Highlands.

"The Highlands is one of New Jersey's most significant natural resources, and we're taking steps to ensure that New Jersey residents will be able to continue to enjoy the natural beauty of the region — its lakes, forests and mountain views," Whitman says.

WALTER CHOROSZEWSKI



Waterfalls, like this one in Boonton in Morris County, can be found throughout the Highlands region.

complex in "the country" was as foreign as the notion that people might buy look-alike development homes hastily erected on quarter-acre plots.

Families began fleeing toward the Highlands in the 1950s, first to the edges, then deeper as developers followed Interstates 78 and 80 into the hills. Interstate 78 went from Newark into Easton, Pa., while Route 80 went from nearly the George Washington Bridge to Stroudsburg, Pa. Industries followed suit, abandoning cities for open land near interstate exchanges.

City problems — traffic, noise, escalating taxes, policing, school budgets and sewers — followed the exodus. These were not problems of the Highlands alone. Fortunately, a move to preserve a reasonable portion of the land had begun before the problems were beyond solution.

For one thing, county park systems, particularly in Morris and Somerset counties, have vigorously pursued land acquisition. Fortunately, too, about 55,000 acres of state-owned land dot the Highlands. Another 50,000 acres are protected in watersheds from which the mountain reservoirs draw their supplies.

Water supplies are the main worry. As populations have risen dramatically and industrial use has skyrocketed, water reserves have remained the same. Water is finite. Everyone — residents, businessmen, politicians and journalists — can agree on that.

The Highlands deserve serious examination. In 1992, the New Jersey Conservation Foundation published the most comprehensive study of the Highlands ever undertaken — *The New Jersey Highlands: Treasures at Risk*, by Alison E. Mitchell. It presents the Highlands as a marvelous piece of New Jersey that is up for grabs.

Huge sections of the Highlands are "at risk," Mitchell believes. Of the 471,000 acres of open space left in the Highlands, 84 percent is unprotected. *Treasures at Risk* might be debated. It cannot be ignored.

Meanwhile, ride 287 northward to see the magnificent woodlands and watersheds. Venture off the interstates. Visit Scotts Mountain. See Montana. Seek out Hope, Harmony and Tranquillity (all towns in or close to the Highlands.) Ride around the lakes and reservoirs. Venture over Ramapo Mountain from Oakland to see one of the finest vistas in the East. Read Mitchell's balanced prose.

Then you'll discover New Jersey's Highlands. If Vermont can brag about its Green Mountains, Massachusetts can boast of its Berkshires and Virginians can get misty-eyed over the Blue Ridge, does the Highlands deserve anything less?

John T. Cunningham, a freelance writer from Florham Park, is the author of 34 books.



DR. NICHOLI VORSA

Wild Blueberries Tamed in the Garden State

There is an old Native American legend about a “star berry” that was sent from the Great Spirit to relieve the hunger of children during a famine. That berry, formed from a five-pointed white flower, is the blueberry.

The wild blueberry was a staple in the Native American diet for centuries, but it was not until the early 20th century that the fruit was brought from the woods to the fields to be cultivated as a crop. And that farmed fruit has its roots right here in the Garden State.

Whitesbog Village is the birthplace of the modern cultivated blueberry. The land, once owned by the J.J. White family, was used for years as cranberry bogs. But J.J.’s eldest daughter, Elizabeth Coleman White, with her love of agriculture, inquiring mind and knowledge of the Pine Barrens, served as the catalyst for the fledging blueberry industry.

In 1911, Dr. Frederick Coville, a scientist from the U.S. Department of Agriculture, joined Elizabeth White at Whitesbog. He possessed the scientific knowledge; she had access to her family’s farm with its highly acidic, sandy soil and abundant water supply. They proved to be the ideal research team.

She hired local residents like Ruben Leek to scour the forests looking for bushes bearing the largest and sweetest wild blueberries. She sent each prospector out with a card bearing a large hole; any berries fitting that dimension would be tagged in the woods, and cuttings would be taken later. These carefully selected bushes became the forebears of all of the domesticated highbush varieties and often carried the names of the prospectors who found them.

Although the blueberry harvesting at Whitesbog halted several years ago, remnants of the operation remain. Visitors can still see the blueberry fields first cultivated by White and Coville, the foundations of greenhouses, and the agricultural village where blueberry and cranberry harvesters lived and worked.

A blueberry harvesting machine in Chatsworth.



CORNELIUS HOGENBIRK

New Jersey has
135 blueberry
farms, which
last year
produced
35 million
pounds of fruit.



WILLIAM C. ERICKSON, NEW WAVE PHOTOGRAPHY

An abandoned blueberry packing house in Chatsworth.

Today, New Jersey has 135 blueberry farms, which last year produced 35 million pounds of fruit. The Garden State has the second largest blueberry industry in the country behind only Michigan. Most of the state's blueberries — 25 million pounds — went to the fresh fruit market in 1994. Ten million pounds were processed into food products. All totaled, New Jersey blueberries were shipped to 50 states and four continents.

A Festive Fruit

Blueberries, which range in flavor from sweet to tart, can be used in many kinds of food, including pies, cakes, cheesecake, breads, muffins, donuts, yogurts, ice creams, jams, preserves, trail mixes, beverages, syrups and pancake batter. Tomasello Winery in Hammonton makes a blueberry dessert wine, and Renault Winery in Egg Harbor City makes the only blueberry champagne in the world, which won an honorary gold medal at the Culinary Olympics in Graz, Austria, in 1982.

Every year, Hammonton, which was dubbed the Blueberry Capital of the World by Readers Digest, hosts an annual Red, White and Blueberry Festival. The event, to be held this year on June 25, features all kinds of blueberry products — from pastries to ice cream to soda — along with the traditional blueberry pie eating contest. In addition, the festival has stage presentations, two local bands, arts and crafts, vendors, ethnic foods, children's games and an antique car show.

Whitesbog Village also celebrates its heritage with the Whitesbog Blueberry Festival, to be held this year on June 24. The event features a cross country run, bluegrass music, crafts — including homemade blueberry jellies and jams and blueberry soap — and blueberry contests, such as pie-eating, blueberry-on-a-spoon and the search for the largest blueberry.

But despite New Jersey's claim to fame, the real root of the blueberry can be found in the forests of North America. It is one

of only three fruits native to this continent; the others are cranberries and Concord grapes.

Blueberries were dried and eaten by Native Americans. During his expedition to Lake Huron, explorer Samuel Champlain recalled seeing Indians beating dried blueberries into a powder and adding water and honey to make a pudding. Dried blueberries were also shared by Indians with the first American settlers to get them through the winter.

A strong aromatic tea made from the root of the blueberry was used as a relaxant during childbirth by Native Americans, a remedy that was repeated in a medical book for the colonists in 1813. Union soldiers feasted on wild blueberries during the Civil War when Maine became the first state to can them for the military.

A Year-Round Affair

Wild blueberries are known as a "lowbush" variety. They generally grow only 6 to 18 inches high, but can produce up to two tons of fruit a year per acre. The cultivated blueberry is known as the "highbush" variety and is generally larger in size. These bushes can grow up to eight feet high and yield about 500 crates an acre. There are many varieties grown in the Garden State, including the plump and sweet Bluecrops and the smaller and tangier Weymouths, Elliotts, Dukes and Bluettas.

The blueberry season in New Jersey stretches from June 10 to the end of August or beginning of September. But cultivating this fruit takes the whole year.

"Blueberry growing is a year-round occupation," says John Bertino, the president of Variety Farm Inc. in Hammonton.

Grass and weed control signal the start of spring. Today, herbicides have replaced the chopping of grass. Once this is complete, the soil is enriched with fertilizer. Honey bees may be imported for pollination when the blooms begin and, when their work is done, the bee boxes are removed. Fungicides then are

Blueberry picking can be enjoyed by the young (right) and the old.

sprayed onto developing and maturing berries.

Efforts are underway to reduce the amount and types of pesticides used through integrated pest management, which attempts to reduce chemical exposure by using alternative treatments.

By mid-June, the early varieties, including Weymouth and Bluejay, are ready for harvest. Hand pickers are brought in to harvest the majority of the fruit; machines will get the rest by shaking the bushes to liberate the ripened fruit.

Fall is cleanup time. Weeds are chopped down, diseased plants are dug out, and older, less productive, less flavorful or disease-susceptible varieties are removed. Pruning begins and continues through winter until March. Cuttings are chopped up and put back into the soil. If new fields are to be developed, turf from the wet, peaty areas of the farm and cranberry leaves are mulched into the sandy soil.

LES RUDNICK



Many farms, such as Ed Well's Farm in Vincentown (below), offer pick-your-own opportunities.



LES RUDNICK

Modern communications link growers throughout the United States and Canada, and the North American Blueberry Council, based in California, keeps them up to date on weather patterns, crop production and crop promotion efforts. The New Jersey Blueberry Advisory Council, which was formed several years ago, also helps to promote Garden State crops.

Blueberry Research

Like most modern crops, blueberries are constantly under attack, from insects, weeds, diseases and birds that prey upon the fruit.

The Rutgers Experiment Station's Blueberry/Cranberry Research Center, located near Lake Oswego, is home to the National Blueberry Research Center, a facility funded by blueberry growers in 1990. Located in the heart of the Pine Barrens, the facility has the acidic soil and abundant water supply which is ideal for cranberry and blueberry research.

There are many different types of research going on at the facility. A French firm is investigating flavors and fruits that may be used in food products, such as beverages and yogurts. Specimens from across North America and Newfoundland are being examined for those high in natural sugar and vitamin C. New Jersey's highbush species have been found to have lots of citric acid, thus enhancing the berry flavor.

A plant geneticist is investigating North America's 24 blueberry species in hopes of finding the genes to build better plants and varieties, particularly those that are insect and disease resistant. In the meantime, other researchers at the facility are investigating strategies to increase crop production, reduce costs and protect the natural environment. And one is even looking into the medicinal value of a Florida blueberry variety.

Tru-Blues

In New Jersey, the pioneering spirit of the blueberry industry is being kept alive by the Tru-Blu Cooperative Association, the nation's first blueberry cooperative of farmers founded by Elizabeth White on March 22, 1927, under the name of New Jersey Blueberry Cooperative Association.

Blueberry production in the Garden State "took off" after World War II, when the fresh fruit market allowed growers to capitalize on the delicious flavors of New Jersey berries. That crop has become as well known as the Jersey tomato, explains Dennis "Denny" Doyle, general manager of the cooperative.

Today, most of the state's blueberries are sold throughout the United States and Canada under the "Diamond Blueberry," "Atlantic Blueberry" or "Tru-Blu" labels.

The largest cultivated blueberry farm in the world is the Atlantic Blueberry Company, which encompasses 1,300 acres in Mays Landing. Last summer's crop was a record breaker at nearly 10 million pounds of fruit. Although there are 23 full time employees, the ranks swell by 1,200 seasonal workers for two to three weeks in July for the harvest. During this period, workdays often stretch from 6:30 a.m. to 10 p.m.

The Atlantic Blueberry Company is an international concern shipping fresh and frozen fruit to four continents — North and South America, Europe and Asia. Varieties grown on the farm include Weymouth, Bluetta, Bluecrop, Blueray, Nelson, Jersey, Elliott and Duke. The latter, introduced for commercial planting in 1986, is named in honor of Duke Galletta, the man who brought blueberries to this farm in 1949. The Duke is now the industry's most widely planted blueberry variety.

But not all blueberry farms in New Jersey are as large as the Atlantic Blueberry Company. At smaller operations, like Moore's Meadows, crews will pick berries three, four or even five times at 10-day intervals before the harvest is complete.

Here, some bushes were planted by Sam Moore's grandfather 60 years ago, a testament to the fact that cultivated blueberry bushes can last a lifetime as long as they receive good care.

Moore's Meadows has added bonuses. In addition to the wild bumblebees that help pollinate the crop, the farm is home to red foxes, swallows, northern harriers, hawks, wood ducks, mallards and a resident population of Canada geese. Even a bald eagle, first sited in 1994, has returned to the property.

Neva Moore of Moore's Meadows shares the outlook of many growers when she says that she would like to leave farming as a legacy for her children, "with the hope that they enjoy the land as much as their Dad and I have."

Blueberries are part of the legacy of New Jersey. And those plump, juicy and delicious fruits are a testament that the Garden State is alive and well.

A migrant field worker shows off the fruit of her labor.

CORNELIUS HOGENBIRK



Fields of Blue

An informal experiment by farmers is combining blueberries and bluebirds in South Jersey.

The bluebird population had been on the decline around the Sheep Penn Hill area when Dennis "Denny" Doyle, general manager of the Tru-Blu Cooperative, de-

ENDANGERED & NONGAME SPECIES PROGRAM



cid to put bluebird nesting boxes around his fields. The results have exceeded his expectations.

Doyle now has two pair of bluebirds on this property, which fledge about four to five young a year. Down the road, other farmers, including Bob Reeves, Eddie Bush and Fred Detrick, also have installed bluebird boxes around the periphery of several fields. Detrick has six bluebirds on his property.

Bluebirds, like blueberries, are indigenous to the Pine Barrens and serve as a bellwether, registering the environmental health of a region. Like the robin, they are a member of the thrush family; but unlike robins, they feed on the wing in addition to gleaning insects from foliage

and beetles from the ground.

Bluebirds help to keep down the pests in blueberry fields and have found a comfortable home there.

"They are efficient hunters that enjoy moths, grasshoppers, katydids and crickets, as well as an occasional blueberry," says Len Little, Doyle's brother-in-law and an avid birder who began the bluebird project.

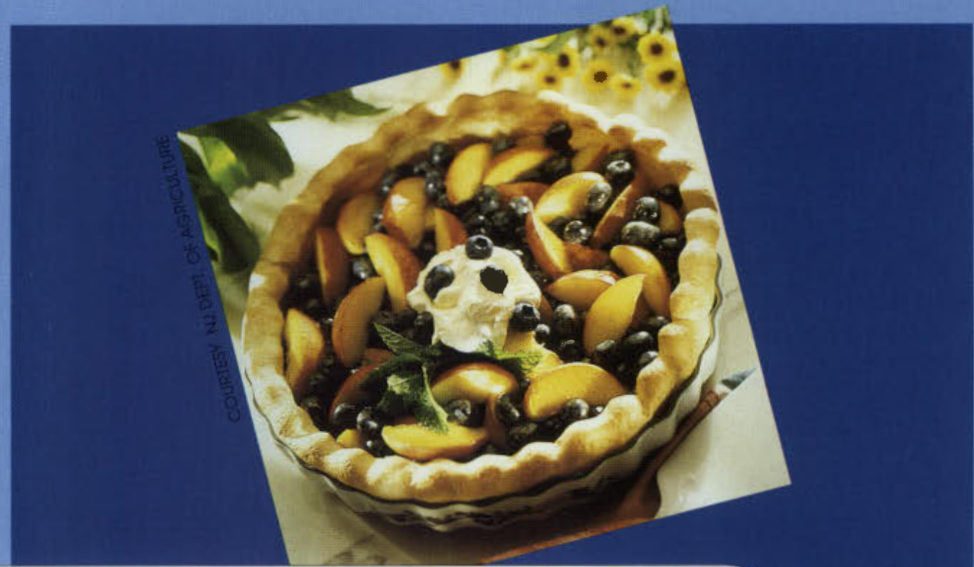
The bluebird's natural nesting habitat is cavities in

decaying trees or old fence posts. More than 30 years ago, the bluebird population began to decline in the state because of habitat loss, the results of forest re-growth, intensive farming, development and the competition from non-indigenous species. To counter this, Little decided to enhance the "natural" setting. He constructed nesting boxes, a substitute for the traditional hollow tree nest, on metal poles six

feet off the ground at the edge of blueberry fields. The pole's smooth surface naturally wards off predators such as mice, snakes, raccoons and squirrels.

Today, bluebirds and blueberries are thriving side by side. For Little, the cooperation of the farmers have created a success story.

"Farmers have been the stewards of the land ever since the colonization of America," he says.



Jersey Peach and Blueberry Brunch Puff

3 Jersey Fresh eggs	1 pint Jersey Fresh blueberries
1 cup flour	1/2 cup of peach preserves
1 cup milk	3 tablespoons orange juice
1/4 teaspoon salt	2 teaspoons cornstarch
2 tablespoons butter	Sweetened whipped cream
3 to 4 large Jersey Fresh peaches	

Heat oven to 400 degrees Fahrenheit. Place butter in a 10-inch quiche dish or pie plate. Place in oven until butter melts. In a medium bowl, beat eggs with electric mixer. Add flour, milk and salt; beat just until smooth (do not overbeat). Pour batter into dish. Bake for 20-25 minutes until puffy and golden brown. While puff is baking, prepare fruit filling.

Wash and slice peaches. Rinse blueberries and pat dry. Place fruit in a medium bowl; set aside. In a small saucepan, combine preserves, orange juice and cornstarch, mixing well. Bring mixture to a boil; boil one minute. Remove from the heat and strain. Pour strained mixture over fruit and gently toss to coat fruit. Place puff on serving plate and spoon fruit into center. Top with whipped cream, if desired. Serve immediately. Serves four for brunch; serves eight as a dessert.

Get Ready to Go . . .

Balloons ascend (left) during a festival formerly held in Bloomsbury.

COURTESY OF MARYBETH AND MICHAEL BRENNER



Authors Marybeth and Michael Brenner prepare for takeoff (above).

Hot Air Ballooning

It is amazing how quiet New Jersey is — floating a mile above the landscape, that is.

You can still see the cars, trains and factories peeking through the wispy clouds, but they are all oddly silent. There aren't even birds up here to disturb the peacefulness.

And then there's the view. You know you have seen it before; the patchwork pattern of the land and lakes. Swimming pools look like puddles, and those tiny boxes are houses.

The last time you may have seen this, you were straining to look out the tiny porthole window of an airplane as the pilot announced your final descent. But this time, it's as if you're out there on the wing. There is nothing to block your view, except maybe a passing cloud.

And, perhaps, the most calming sen-

WILLIAM NEUMANN



A balloon, which averages 70 feet high and 60 feet across, is inflated.

sation of all is the knowledge that you are moving, but you cannot feel a thing.

If all this sounds inviting, then you are ready to go hot air ballooning.

First things first — you need to find someone who can take you up. You shouldn't have a problem, since there are more than 30 commercial balloon pilots in the state, most of whom operate out of northwestern New Jersey. With the help of the yellow pages or local area travel guides, you should be able to schedule a ride.

Hot air ballooning is a relatively safe activity. According to the latest statistics from the Federal Aviation Administration (FAA), there are 6,794 balloons registered in the United States and 19,405 pilots with ballooning certificates. Since 1990, there have been only 85 accidents or incidents reported nationwide — ranging from minor incidents such as hard landings to a single fatality during a hot air balloon bungee jump — a small percentage of the thousands of trips taken each year. There

were only two incidents reported in New Jersey; one where a balloon got caught in trees in high winds, and the other where a passenger broke a foot during a hard landing.

Hot air balloon rides range from \$150 to \$240 per person. Rides generally last about three hours, from setup to the return to your launch point. But times may vary based on weather, fuel and daylight hours.

There are only two times of day when the wind conditions are calm enough to safely take off and land — dawn and late afternoon. In addition, most pilots in New Jersey only schedule flights between the months of April and November; however, there are some that operate year-round.

Although the scenery is not as colorful in wintertime, balloon flights provide an opportunity to view wildlife you may not see through the tree canopy in the spring or summer, says Jack Grinton of Festival Flights Inc. of Bedminster, a year-round operator. He recalls seeing snowy egrets, owls, blue herons and hundreds of deer from above during his winter flights.

Celebrations of Life

For most, the balloon ride is part of a celebration — for everything from birthdays to anniversaries and weddings. In fact, most ballooning packages include champagne for adults at the conclusion of the ride.

Regardless of the occasion or when you book your flight, be sure to wear comfortable clothes and shoes, since you will be standing the entire ride. There is no need to dress warmer than is appropriate for the outside temperature on the ground; the heat from the burners will help take off any extra chill due to the higher altitude. And don't forget your camera!

Once the date is set, pray for good weather. Too much wind or any rain, and you are grounded. For a winter flight, however, a dusting of snow the night before can make for ever more beautiful scenery. But if bad weather does hit, don't despair — pilots are very accommodating when it comes to rescheduling your flight.

When you meet the pilot at the designated location, you may have the option of assisting the crew with preparing the balloon. You should strongly consider helping, as it is part of the fun and educational.

It doesn't look like much, at first, as the balloon, packed away neatly in a nylon bag, is unpacked and unfolded in an open field. But as fans fill it up with air, and it begins to take shape, you realize how big it is. In fact, most balloons are about 70 feet high and 60 feet across and hold more than 100,000 cubic feet of air.

A Lot of Hot Air

What actually lifts the balloon off the ground, of course, is hot air. To heat the air, the basket (or gondola) is equipped with one or two burners, which generate as much as 15 million BTUs each. The burners are turned on to begin heating the air inside the balloon as you join the pilot and your fellow passengers inside the basket. Most baskets will hold be-

Get Ready to Go . . .



A balloon casts its shadow over New Jersey farmlands.

tween five and seven passengers.

After a few more bursts of heat from the burners, the earth begins to fall away, and your ascent begins. The sensation is somewhat like the smoothest elevator ride you have ever taken.

You may ask your pilot where you will be going and, invariably, the answer will be, "I can't tell you." After all, you cannot steer a balloon, you can really only go up and down. For the rest, you are at the mercy of the wind. By changing altitudes, you can pick up different wind cur-

Some days, the ride will take you just above the treetops; other times, you will soar as high as 5,000 feet.

rents that will take you in another direction, but you never know where that will be and where you will land. That's all part of the excitement of the ride.

But coasting with the wind is not all it takes to be a hot air balloon pilot. Balloon pilots, like all aircraft pilots, must be certified by the FAA, and their balloons must be inspected on an annual basis. You should confirm that the pilot with whom you plan to fly possesses a license. You should also ask some questions about their experience, such as how long they have been flying and how many passengers they have taken up. This can help you decide on a pilot or company with which to fly.

Once the balloon clears the tree tops, the sky seems to open up before you, and you can literally see for miles. Often in the distance you will see other balloons and, if you get high enough, you may actually float through clouds. Each balloon ride is unique, says Kevin Olsen of Alexandria Balloon Flights of Milford, who has taken 6,000 passengers



Baskets come in many shapes and sizes, including this triangular one.

up in his balloon over the past 25 years. Some days, the ride will take you just above the treetops; other times, you will soar as high as 5,000 feet. On average, however, you can expect to be between 1,000 and 2,000 feet above the ground.

The landscape of northwest New Jersey provides a wide variety of vistas. From the rural countryside, dotted with farmhouses and horses, to the rolling hills, the reservoirs and the Delaware River, there is something to see in every direction. In fall, the entire area is awash in color, and you often can pick the colored leaves from the tree tops as you ascend into the clouds.

The Chase Is On

For the pilot, each ride is a new experience. While passengers can bask in the beauty of the scenery and attempt to identify some far off structure or natural formation, the pilot is looking at things with a different eye. He or she looks for identifiable streets and landmarks to radio to the chase crew. This crew actually chases the balloon from the ground,

WILLIAM NEUMANN
COURTESY OF MARYBETH AND MICHAEL BRENNER

so they can secure a landing spot and transport the balloon and its passengers back to the starting point.

The crew maintains visual contact with the balloon when possible and remains in radio contact with the pilot throughout the flight. They may have to pull over and wait for directions from the pilot as changing winds could easily send them driving in a circle.

Perhaps the most difficult task for the chase crew is assisting the pilot in landing the balloon. As the flight time comes to an end, the pilot will radio the crew with information on the general vicinity of the land. The crew then will literally knock on doors to get permission to land on someone's property if there is no open public space in sight. Most people are cooperative, and the landing will often create quite a stir in the neighborhood as adults and children alike converge on the landing spot to see the balloon. A bottle of champagne is often given to the owners of the make-shift landing area to thank them for their cooperation.

Meanwhile, up above, the pilot begins his or her job of bringing the balloon back to earth. To do this, he or she allows the air inside to cool by turning off the burners, causing the balloon to descend. It's a delicate balance of heating and cooling the air until the actual landing site is in view. Once the balloon is a few feet from the ground, the chase crew pulls it down using the ropes attached to the basket.

Once all the air is pressed out of the balloon with the help of passengers and crew, it is dismantled and packed away. You then can return to your meeting place and often enjoy a champagne toast to end your experience. It definitely will be one trip you will never forget.

by Marybeth Brenner of the Department of Environmental Protection's Office of Communications, and Michael Brenner of Choice Courier Systems Inc., a husband and wife team who recently took their first hot air balloon ride



WILLIAM NEUMANN

Shaped balloons are featured at the Alexandria Balloon Festival in Pittstown.

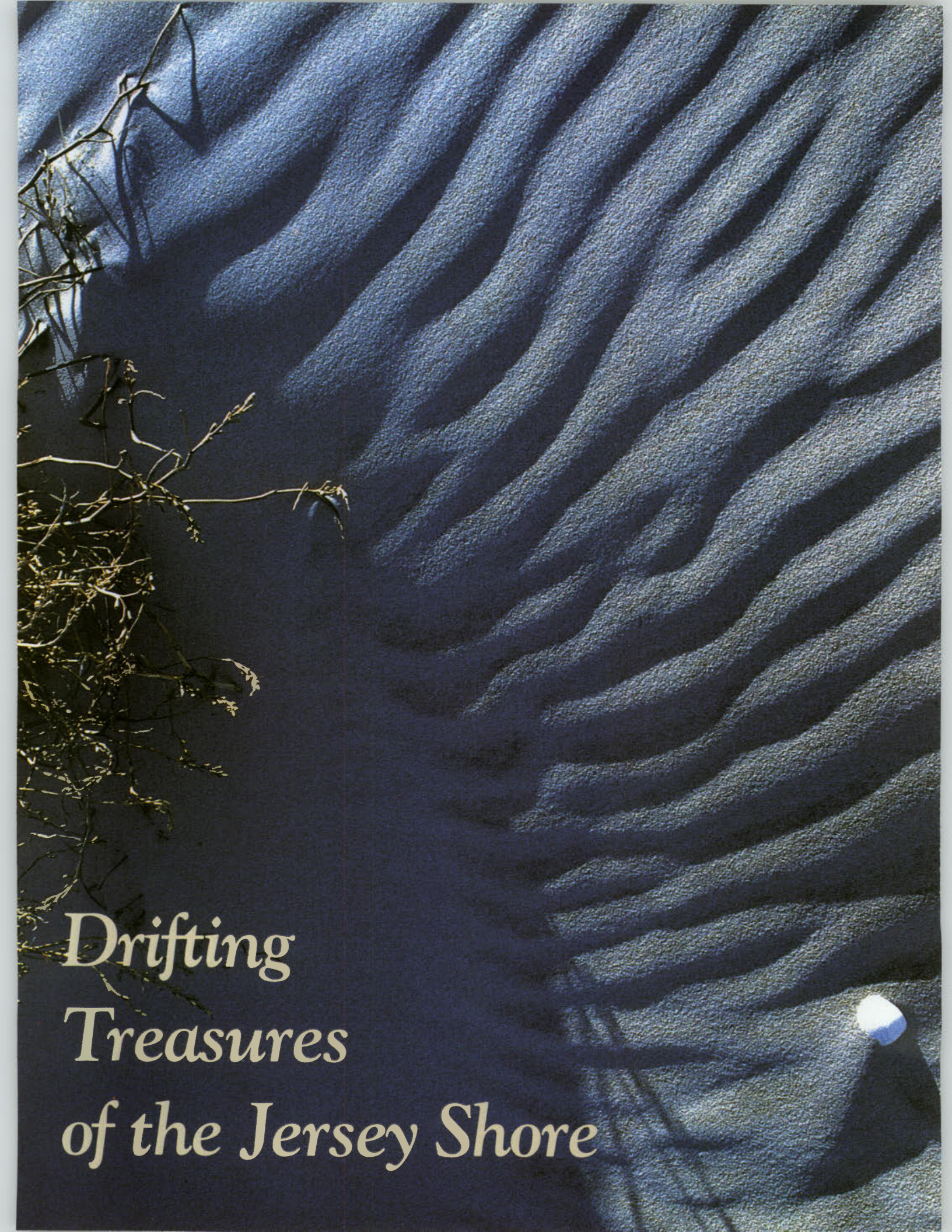
A Show from the Ground

You do not need to actually fly in a balloon to enjoy the beauty and excitement of hot air ballooning. There are a number of festivals in New Jersey throughout the spring and summer. These events provide a unique opportunity to see many balloons ascend at one time, and you may even be able to arrange a ride during these events.

The two largest festivals — the Quick Chek New Jersey Festival of Ballooning and the Magic of Alexandria Balloon Festival — will be held July 28-30 and Aug. 4-6, respectively.

The Quick Chek New Jersey Festival of Ballooning, held at Solberg Airport in Readington, will display 118 balloons, including 15 shaped balloons such as Malcolm Forbes' macaw and genie, Manchester's dragon, Ever Ready's Bunny, Rayovac's battery and Planter's peanut. This festival also features air shows, concerts, children's events and stage shows. For more information and advance ticket sales, call 1-800-HOT-AIR9.

The Magic of Alexandria Balloon Festival, held at Alexandria Field in Pittstown, will feature more than 80 balloons, including several shaped balloons, such as Disney's castle-in-the-sky and Earforce I (Mickey Mouse), Kellogg's Tony the Tiger, United Vanlines' moving van and Bell Atlantic's mobile phone. The balloons will be tethered during the day and will take to the sky in evening, weather permitting. This event also offers concerts, children's activities, party tents, crafts, an antiques show and military aircraft performances. For more information and advance ticket sales, call (908) 735-0870.

A photograph of a beach with sand ripples and driftwood. The sand is light-colored and has been sculpted into a series of parallel, wavy ridges and troughs, creating a rhythmic pattern across the frame. In the upper left corner, there are several pieces of weathered, light-colored driftwood. In the lower right corner, a small, white, cylindrical object, possibly a piece of driftwood or a marker, is visible. The overall scene is captured in bright, natural light, highlighting the textures of the sand and wood.

*Drifting
Treasures
of the Jersey Shore*

Photos By Rick Vizzi



Cycles

When
I held
the moon shell
in my hand
it spoke
of a
day
when
I would
trace
its surface,
when I would
be *willing*
to make small
concentric circles
with my eyes
focused
on the spiraling
path the path
that leads
in
through
chambers
of this shell
and there
I would
review all
the lessons
of all my lives
being stored
like grains
of sand
blown
into
an endless
sheet
of see-through
glass

by *Therese Halscheid,*
a poet from Haddonfield

Dunes ripple with the wind
and tide at the Jersey Shore
(opposite page).

Water rushes over a moon
snail in the surf (top).

An abandoned boat and a
dead cedar stump at Bay
Beach in Island Beach State
Park (left).

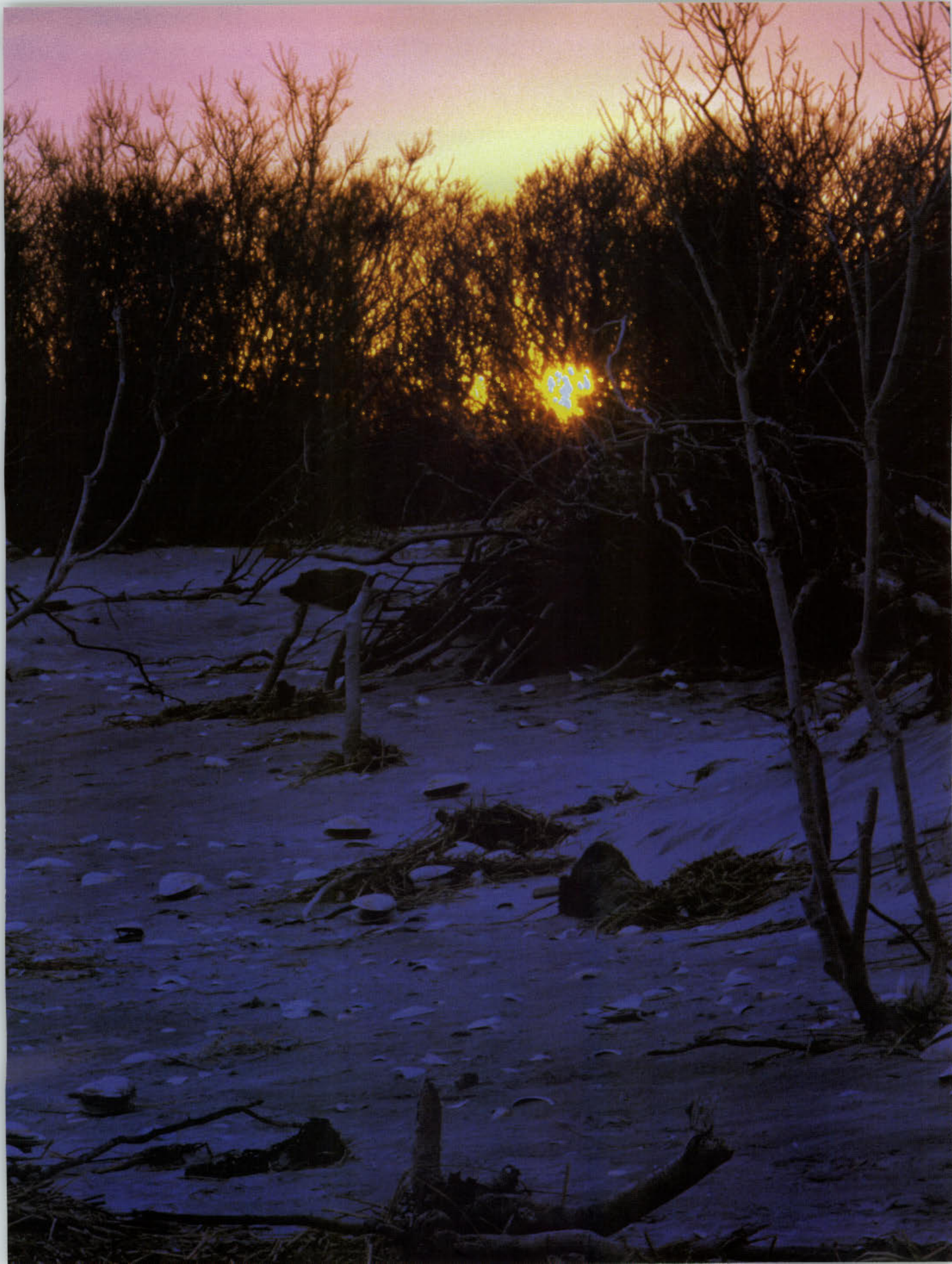


A seagull (top) glides in for a landing on the shoreline.

A broken whelk shell (left) lies partially buried in the sand.

A scallop shell (above).

Sunrise at Brigantine Beach (opposite page).



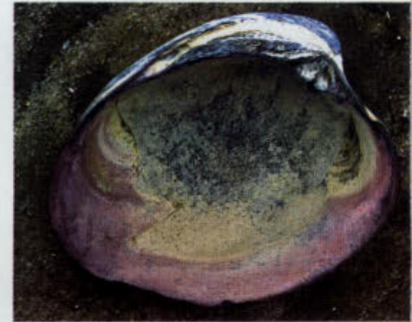
The Claws

Scattering of crab claws,
sharp as stars, shadow the
sand. Castoffs, they lie
hollow, mix with drift-
wood, reeds, rope, cork,
clamshells. Like water-
worn mussels that strewn
the tide line, they shine.
Gulls pick them clean;
salt tides polish them. An
ancient armor, they
gauntlet the beach now
with empty threats.

Against the perpetual
stride of the sea, sandy
shifts ticking ticking in
the reeds ticking in the
shells ticking in the
claws of the crabs —
above it all, a gull,
mocking, mews.

*by Frank Finale,
a poet from Bayville*





The shell of a horseshoe crab (opposite page).

Seaweed and shells dot the beach (top).

The underside of a starfish (left).

A clam shell (above).



HERB SEGARS

The Hook: A Blend of Natural and Historic Wonders

By Arline Zatz



Some visit Sandy Hook to swim, breathe the sea air, sit and watch the boats or read while listening to the roar of the ocean. Others visit this 6 1/2-mile peninsula to fish, stroll, run, hike, bicycle, bird watch, wind surf, sunbathe or participate in a ranger-led tour.

Few, however, are aware of the rich blend of nature and history found on this 1,665-acre barrier beach, fondly referred to by many as the "Hook." Over hundreds of years, the strip of beach has grown wider and longer as it's shaped and reshaped by the constant action of waves, winds, tides and storms. In 1974, the year it was turned over to the National Park Service and officially became the "Sandy Hook Unit of the Gateway National Recreation Area," the Hook also had the distinction of becoming America's first urban national park.

You'll need an entire day, or longer, to explore this area that has played an important role through the centuries because of its proximity to New York Harbor, Sandy Hook Bay and the Atlantic Ocean. Plan on seeing the maritime forest, where the largest stand of hollies on the East Coast grows; gaze up at the Sandy Hook Lighthouse, the oldest working lighthouse in the nation, or visit the new James J. Howard Marine Sciences Laboratory (see related story on page 13), a modern facility to study the marine environment. And don't miss walking or driving through Fort Hancock, where crumbling buildings, gun batteries, officers' quarters, a jail, old artillery and great views bring history alive.

Make your first stop the Spermaceti Cove Visitor's Center. Housed in one of the first U.S. Life-Saving Stations built on the eastern seaboard, it's filled with interesting exhibits describing the area's natural history and is loaded with information on the U.S. Life-Saving Service. Pick up free self-guiding tour brochures to Old Dune Trail for a one-mile stroll and to Fort Hancock for an exploration of this long-time military outpost.

A Natural Paradise

The Old Dune Trail is a sandy, winding path next to dunes covered with bayberries, junipers, prickly pear cactuses and outstanding black cherry and holly trees. On the trail, you'll discover a freshwater pond, once a saltwater lagoon that became isolated as the sand began to build up. From a viewing platform near the freshwater pond, you'll spot a few of the more than 300 species of birds found at the Hook and sometimes a turtle or muskrat.

As you make your way back along the beach, check out the dunes for a first-hand look at how poison ivy and beach grass hold the mound of sand together. You may see insects, spiders or meadow mice scurrying around and, if you walk along the water, there are always interesting shells to examine, as well as tiny crabs and an occasional starfish.

The plants you'll pass as you make your way to Fort Hancock and the Sandy Hook Lighthouse at the tip of the Hook were probably here when the Lenni-Lenapes came to gather their food supply. They most likely supplemented their diet of fresh-caught ocean fish with tasty berries and beach plums, and yarrow may have been used in those days for treating minor bruises and curing earaches. Wildflowers, such as Queen Anne's lace and black-eyed Susans, abound on the Hook from spring through fall, while other plants found in the wet areas include bayberry, sphagnum moss and willow trees.

When the European settlers arrived, they realized what a treasure the Indians had discovered and began their plantations on small plots of land. Wealthy settler Richard Hartshorne purchased the land from the Indians for just a few shillings; in 1678 and stopped all fishing and hunting on his land. Soon after, sailing vessels carrying immigrants and goods began plying the narrow curving channel around the Hook's tip into New York Harbor. However, shifting sand bars, shoals and strong winds made the route extremely hazardous. Ships were forced to maneuver so close to the point that a New York governor remarked, "from on board one might toss a biscuit cake on shore."

So many were stranded or wrecked on the shoals that New York merchants began fretting over losing money, which ultimately led them to petition the New York Colonial Assembly to build a lighthouse. Two lotteries were held to purchase land for this purpose from Hartshorne. In addition, a tonnage tax was placed on ships entering the channel to help with operating costs.

The Sandy Hook Lighthouse (opposite page, top).

Seaside goldenrod blooms on a rock seawall (opposite page, bottom).

Sandy Hook boasts the largest stand of hollies (below) on the East Coast.



ARJUNE DANE

The lighthouse as seen through the Mortar Battery.



ARLINE ZATZ

The Oldest Operating Lighthouse

When the lighthouse was first illuminated by 48 whale-oil burners on June 11, 1764, its beacon could be seen for only a few miles. Fresnel lens replaced the burners in 1822, its powerful single light beam visible for a distance of 15 or more miles. Standing nine stories (103 feet) high, with rubble stone exterior walls, the Sandy Hook Lighthouse today is the oldest original operating lighthouse in the nation.

While the lighthouse helped prevent many shipwrecks, our forbears had another worry when the American Revolution began. Figuring it was possible for the British naval forces to try to gain entry through the channel, Congress ordered the tower's lamps to be dismantled, and all oil removed. Despite these precautions, a party of British seamen rowed to land and restored the lighthouse to guide their ships. Local militia and several small boats, under the command of American Captain John Conover, bombarded the tower with cannon fire in an attempt to destroy it. Damage was light and when the war was over, it was easily repaired.

By 1787, the lighthouse again became an issue when New York passed a law requiring vessels from other states to pay a whopping fee for coming into the harbor. New Jersey retaliated by levying a monthly tax on the lighthouse, still owned and operated by New York. The federal government settled this feud by taking over the operation and later creating what became known as the U.S. Lighthouse Service to care for lighthouses throughout the nation.

In 1962, the lighthouse was automated with a 45,000 candlepower, third-order electric light visible for some 19 miles. Most visitors are surprised to see how far from the water it stands but, according to park historian Thomas (Tom) Hoffman, "the

Hook's contours keep changing due to the ocean's longshore current. Originally it stood only 500 feet from the water's edge; today it's 1 1/2 miles away due to the off-shore current that keeps adding sand to the Hook's tip." The lighthouse, operated by the U.S. Coast Guard, is closed to visitors.

A Fort is Born

Sandy Hook was acquired by the federal government in 1817 to prevent enemies from sneaking through New York Harbor. Efforts began in 1859 to build a permanent fort made of granite block, but it was never completed because, after the Civil War, the fort became obsolete. Not only was it difficult for the fort's older rifle cannons to reach ships far out in the harbor, but the fort also was vulnerable to attack from newly developed, spiral groove guns that could rip holes in the stone.

Rather than add to the military, it was decided to concentrate on developing better fire power, and America's first proving ground was established at Sandy Hook in the 1870s. According to Hoffman, "the ocean side of Sandy Hook was ideal as a range, with some tests conducted offshore at times. When offshore, all foreign and domestic ship companies with offices in New York were notified. Other times, the soldiers would fire at targets set up along the beach, later retrieving the shells so that their impact on the targets could be studied." Weaponry tested here ranged from rifles, pistols, machine guns and heavy artillery to the carriages that held the guns and gun powder. The tests proved that big cannons could penetrate, damage and destroy battleships and other warships.

Since New York Harbor headed the list of waterways the military wanted to defend against invaders because of its geographical and commercial importance, a new defense plan — based on building concrete gun batteries — began at Sandy Hook in the early 1890s. Although the new batteries were huge

Officers' row at Fort Hancock.



MICHAEL S. MILLER

and designed to store ammunition and equipment, soldiers couldn't live in them because they were too dark and damp. To house those soldiers, yellow brick buildings were built, beginning on Oct. 30, 1895. The base was named Fort Hancock in honor of deceased Civil War General Winfield Scott Hancock.

An Officer's Haven

Exploring Fort Hancock today is a return to yesteryear. Head first to History House (building #1; open weekends, 1 to 5 p.m.). Situated along Officer's Row, it was one of 18 officer's residences done in the Victorian style. Each has three stories, a full basement, hardwood floors, mahogany railed staircases and elegantly styled fireplaces. The price of construction in 1898, at a time when a laborer's salary was \$400 a year, ranged from \$8,290 for a lieutenant's residence (the smallest) to \$13,694 for a captain's to \$19,383 for the post commander's home (the largest). Five enlisted men's barracks, with a capacity of 80 men each, also were erected, with larger barracks, mess halls and a firehouse completed by 1909. Even the smallest officer's house is huge.

"In the 1890s, there were approximately 36,000 officers and enlisted men in the entire U.S. Army," Hoffman explains. "Officers, who were given the best treatment and housing, could hire live-in help — easily affordable on their \$1,200 to

\$1,500 annual salaries because heat was included, as well as an allowance for food. Officers often hired enlisted men to come in to keep their coal furnaces burning or to stock the fireplace with coal or wood; they'd nickname these men 'strikers.'"

Standing on the spacious porch of the History House, you'll notice that the fronts of these houses face the bay to enjoy the lovely view and cooling breezes, not the parade grounds as was customary. Inside, you'll find typical furnishings from the period, plus information on the three major regiments that served here.

A Battery of Batteries

Battery Potter, completed in 1893 and named in honor of Civil War General Joseph Potter, was the first and only steam-powered lift gun battery invented to protect an American harbor.

Designed to blend in with the seashore landscape for protection and camouflage, it contained two 12-inch caliber guns. Each 52-ton gun barrel was mounted on a large elevator platform powered by steam pressure driven by hydraulic machinery. Soldiers loaded the guns from within the battery while protected by massive concrete walls. When loaded, each gun platform was lifted through a square opening onto the battery roof.

The guns could fire half-ton projectiles at approaching

The Battery Potter, used at the turn of the century, featured a steam-powered lift gun.



Staring down the barrel of a 20-inch Rodman gun.

enemy battleships and cruisers for as far as seven miles. After firing, the platform moved back down inside the battery for reloading, leading to its nickname as the “disappearing gun.”

Due to the development of faster-firing, counter-weight operated carriages, Battery Potter was actually considered obsolete only a few years after it was finally put into operation and was dismantled in 1906.

At the same time, a submarine mine network was installed, along with a dynamite gun battery that could propel missiles by compressed air rather than gun powder. As new batteries were added, they were named for Army officers and heroes.

America’s first concrete mortar battery stands opposite the lighthouse. It is eerie to walk through a concrete wall and follow railroad tracks into one of four identical pits connected by a tunnel. Each circle on the floor marks the site of a circular platform that once supported a large breechloading cannon. These faded into oblivion during World War I when mortar batteries lost their tactical advantage to warships with long-range guns. Also gone are the mines that were planted off the coast throughout World War I and II to destroy enemy vessels. These mines could be set off at any time electrically from the fort.

Don’t miss Battery Gunnison, a prime example of one of the fort’s rapid-fire gun batteries, and the only two guns left



HERB SEGARS

from all that made up the defenses at Sandy Hook. Originally a six-inch disappearing gun battery built in 1904, it was converted to pedestal-mounted guns of the same caliber during World War II. Aimed toward the ocean, these guns could fire two rounds per minute while the cast steel shields protected the gun crews from machine gun or light cannon fire.

An Army Outpost

By 1899, Fort Hancock consisted of 34 buildings, including building #28, the post guardhouse jail where men with minor infractions were placed under guard. Nearby, usually in solitary, were those with serious offenses waiting to go to trial. During World War II, the military police were in this building, but in 1968, the Army turned it into the Sandy Hook Museum. Historical artifacts and the jail are very

This rapid-fire gun is only one of two left on Sandy Hook at Battery Gunnison.



ARLINE ZATZ

interesting, as are the large artillery shells outside.

By 1945, 18,000 men and women were stationed on the Hook, but soon this type of coastal defense also was declared obsolete and replaced with an air defense for the next decade. Fort Hancock was prominent for a while during the Cold War period as a NIKE anti-aircraft missile base designed to protect New York — this time from an air attack.

From 1954 to 1959, Fort Hancock was the site of conventional and later nuclear warheads. The NIKE Ajax missile was based here but, from 1958 to 1974, the more powerful NIKE Hercules missile took over standing guard since its nuclear warhead was capable of climbing more than 150,000 feet. Guardian Park, within the fort, has full-scale NIKE missiles on display as a monument to the last descendants of America's coastal defenses. A 20-inch Rodman Gun, cast in 1869, also can be seen opposite the Coast Guard Station, a monument to the old class of guns.

On December 31, 1974, Fort Hancock officially closed and, except for the Coast Guard station at the northern tip, was turned over to the National Park Service. In 1982, it was declared a National Historic Landmark. Today it stands as a monument of the natural and military history of the Jersey coast.

Arline Zatz is a freelance writer from Metuchen and an author of several books.

Sandy Hook is open daily, sunrise to sunset. Spermaceti Cove Visitor Center is open daily, 10 a.m. to 5 p.m.; Sandy Hook Museum and the History House are open weekends, 1 to 5 p.m. A fee is charged for parking from Memorial Day weekend to Labor Day; entry is free for the Visitor's Center, Fort Hancock and fishing. For further information, call (908) 872-0115.

The Lyle gun is prepared to fire rope to the mast of a disabled ship during an annual reenactment of 19th century rescue techniques.



ARLINE ZATZ



ARLINE ZATZ

A man is rescued using a breeches buoy (right) during the annual reenactment at Sandy Hook.

Saving Lives at the Shore

Imagine using a gun to save lives?

In 1899, a special gun was used off the coast of Sandy Hook to save people on ships that had run aground in the hazardous currents. And each year, National Park Service employees and other volunteers show just how it was done.

Between 1839 and 1848, an estimated 158 vessels were lost off the Jersey coast. The cry for help was answered in the 1840s when a rescue plan was developed, and life boat stations were put in place.

Surfmen would patrol the beaches in search of vessels in trouble. Once the keeper in charge was informed, a decision was made on whether to use boats or a cannon for the rescue, depending on ocean conditions.

If the sea was calm, passengers on the shipwreck would be transported back to shore with boats. Open wooden surf

boats, which were rowed out to the wreck by a crew of six people, could transport 10 to 12 people. The Francis Metallic Life Car, a metal covered rescue boat, could fit six people — uncomfortably. Several trips were necessary to get everyone out.

In rough seas, a Lyle gun — a bronze smoothbore weighing 168 pounds and firing a 20-pound solid shot with a line attached — was used. This line was shot over the ship near its mast and used to haul in a heavier rope. Once the heavier rope was tied around the mast, it could be used to rescue people from the disabled ship with a "breeches buoy." That device, which resembled a life preserver with pants, would keep a person in a sitting position as he or she was pulled into shore over the waves.

This old-fashioned rescue technique is demonstrated each year in drills put on by the National Park Service. The drills will be held this year in July and August. Call the National Park Service at (908) 872-0115 for the dates and times.

Gardens



Butterflies found in the Higbee garden include: the broad-winged skipper (top, left), the American painted lady (top, center), the gray hairstreak (top, right) and the monarch butterfly (bottom).



PHOTOS BY CLAY MYERS

A Butterfly Bonanza

Imagine walking down a soft wood chip path on an early September morning. Your eyes are greeted by an explosion of vibrant colors — deep reds, bright blues, rich purples and beaming yellows spring forth before your eyes.

As you adjust to the kaleidoscope of colors, you are enveloped by the fragrances that surround you. The pool of pleasant scents dazzle your olfactory senses, putting even the finest perfumes to shame. Suddenly, you notice a small butterfly perched upon the resplendent flower heads.

The painted lady butterfly, itself displaying a magical blend of colors, opens its wings to absorb the sun's warmth. Its beauty is accentuated by the brilliant yellow goldenrod flower upon which it rests. As the day warms, more butterflies congregate around the wildflower garden's rich nectar source in search of food and, possibly, a mating partner. To the right, you spy the magnificent monarch and catch a glimpse of its delicate straw-like proboscis before it disappears into the flower to sip nature's sweet juice.

This splendid scene is a real-life experience at the butterfly wildflower garden at the Higbee Beach Wildlife Management Area. Located on the southernmost tip of the Cape May peninsula, the area has long been lauded as a mecca for bird watchers. But recently, it has emerged as a real hot spot for butterfly watching as well.

A Three Month Miracle

In 1994, the state Department of Environmental Protection's Division of Fish, Game and Wildlife decided to erect the garden to attract butterflies. In just three months' time, from groundbreaking in April to the wildflower bloom in June, a bare and sandy clearing measuring about 35 by 65 feet was magically transformed

into a beautiful butterfly wildflower garden.

The garden began with soil enriched with composted lawn and leaf matter. A wood chip path was laid, and wildflower seeds were planted. The process took only three days, thanks to a handful of energetic volunteers.

The wildflowers were chosen for their diversity of color, which helps attract a myriad of butterflies that rely on the nectar for food. The butterflies, in turn, pollinate the flowers, ensuring the plants' ability to propagate. Despite the rainbow of wildflowers, the colors of the butterflies seem to outshine even the most vibrant of these flowers.

Behold the black swallowtail butterfly feasting upon nectar; its wings shine iridescent blue against a dark backdrop, dotted with yellow spots and orange markings. Or gaze upon the common buckeye as it feeds momentarily on a flower. The intricate pattern is mesmerizing with psychedelic eyespots on the wings, lying amid a blend of grays, oranges, browns and whites.

These tributes to the beauty and wonder of evolution are becoming increasingly easy to view as butterfly wildflower gardens begin to sprout all over the country. From wildlife reserves to suburban backyards to landscaped corporate parks, people are rolling up their sleeves and planting these gardens. Butterfly wildflower gardens are aesthetically rewarding, relatively inexpensive, educationally powerful and ecologically important. As fields and forests are converted into homes and businesses, the habitat critical for butterflies diminishes. Butterfly wildflower gardens can act to offset that loss.

A How-To Primer

You don't need a lot of space to create your own butterfly garden. You can start with a few small wildflower containers outside your apartment or condominium. Or you can tackle a dizzying array of flowers on large plots around your home.

To begin your garden, it is crucial to

find out about soil conditions in your area. You can have your soil tested for a nominal fee by county agricultural agents. Different plants will tolerate different conditions, from sandy to clay soil, nutrient-rich or nutrient-poor.

When selecting your plants and flowers, there are two basic criteria to consider. First, the flowers must provide a good source of nectar, or the butterflies will not come. Secondly, you want to consider plants that are also a good source of food for caterpillars in order to keep your butterflies around throughout their life cycle.

At Higbee, the flowers planted included milkweed, a favorite food for monarch butterflies; cosmos; purple coneflowers; coropsis; and butterfly bush. Many native trees and shrubs are food for caterpillars. Black cherry, for example, feeds several species of butterflies and moths. Other plants may only feed one species of caterpillar, but the butterfly could not exist without the plant. The black swallowtail is partial to parsley, fennel and dill.

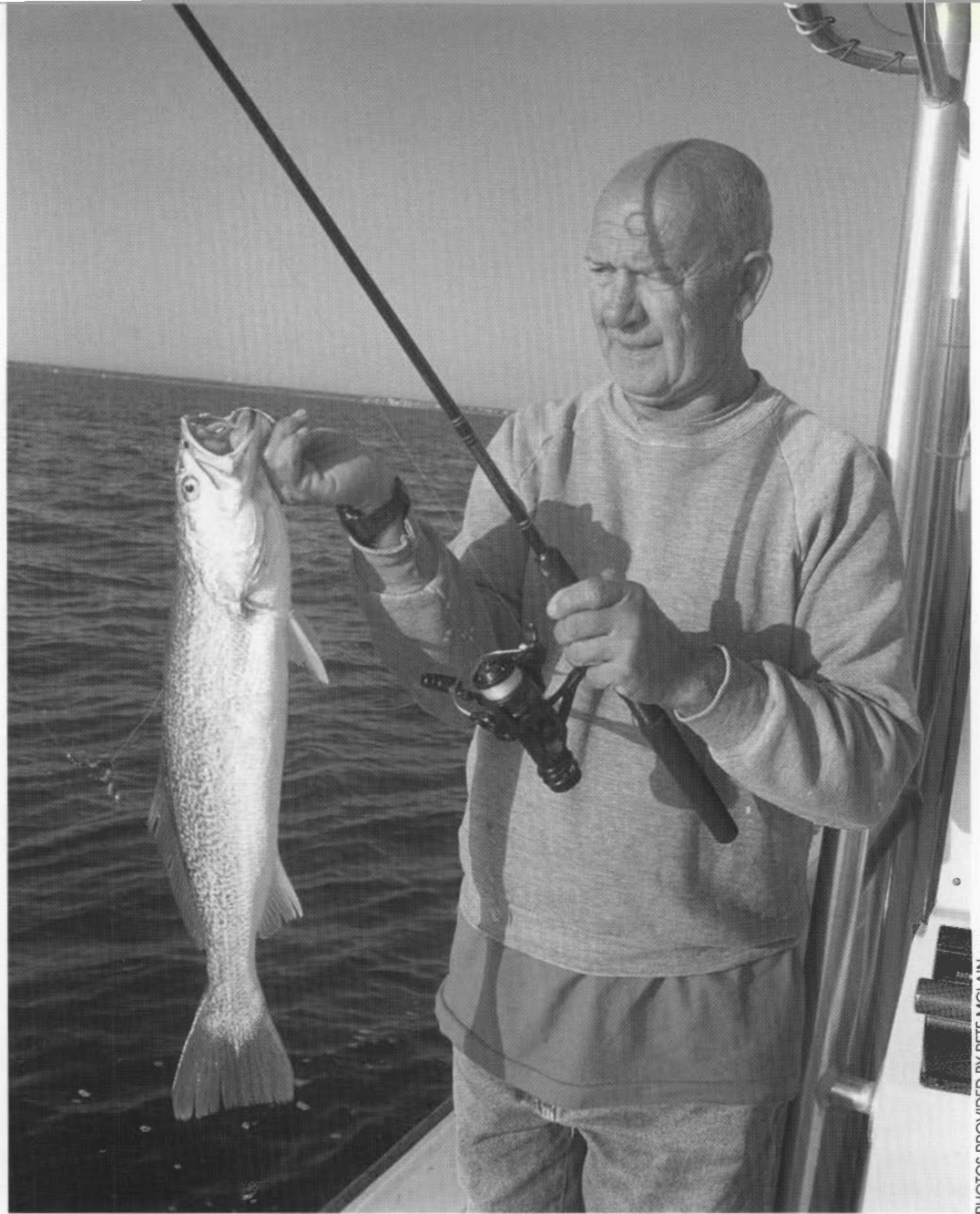
In your search for plants, make sure to purchase seeds from companies and nurseries that are reputable; do not poach plants or seeds from wild areas.

There is a wide range of books on butterfly wildflower gardens on the market to help guide you on your way. Annuals should be planted by mid-May; perennials can be planted from April to May or late August to October. Butterflies generally appear from mid-May through October, but will change with the seasons.

But whether you create your own canvas of colors from butterflies and flowers or simply visit the growing number of gardens dedicated to these special species, you are sure to get eyeful of pleasure from these garden masterpieces.

by Karen Williams of Flora for Fauna in Woodbine, a nursery specializing in plantings for wildlife, and Eric Stiles of the Division of Fish, Game and Wildlife's Endangered and Nongame Species Program

Weakfish are on a comeback in New Jersey.



PHOTOS PROVIDED BY PETE MCLAIN

The Return of the Tiderunners

by Pete McLain

The weakfish is glamorous with its bright silver sides, yellow fins and distinctive purple-black and greenish colored head. But when it strikes a lure, it feels like a little bolt of lightning, beginning an all-out battle before it comes to the net.

Weakfish have burst back on the scene in New Jersey after a 15-year dry spell. But many anglers have forgotten how and where to fish for them.

"New Jersey, for the past several years, has had the best weakfishing to be found on the East Coast," says Bruce Freeman, former research scientist for the Department of Environmental Protection's Division of Fish, Game and Wildlife and chairman of the Weakfish Advisory Board for the Atlantic States Marine Fisheries Commission. "The return of the weakfish to the tidal rivers, bays and ocean in New Jersey is presenting a superb fishing opportunity, which a large number of saltwater anglers are missing."

From the Raritan Bay and the Navesink and Shrewsbury rivers, along the Shark and

Manasquan rivers, down through Barnegat and Great bays, south to Cape May and even into the Delaware Bay and lower part of the Delaware River, weakfish are ready and waiting for anglers from mid-April to early October. The weakfish, also called weakies, sea trout, trout, squetague and tiderunners, are a wonderful and plentiful summer saltwater fish, and rank right at the top of New Jersey's local seafood fare.

In the 1930s and 1940s, the weakfish was known as the "Premier Fish" of New Jersey waters. Then came the decline in population, and bluefish and striped bass became the most popular saltwater sport fish. In the late 1980s, the weakfish population began to rebuild and, at present, the weakies are on a comeback.

The comeback was made possible by improved water quality in the state due to clean water laws and wetlands and shore protection measures. This has allowed eel grass to thrive in the bays and high quality breeding grounds to be established.

New Jersey's weakfish range in size from eight ounces to 10 pounds along the beach and in larger bays and up to four pounds in the smaller bays and rivers. The present New Jersey All Tackle record is 18 pounds, eight ounces, taken in 1986 by Kurt Jones in the Delaware Bay.

Schools of weakfish spend the winter off the coast of Virginia and North Carolina, from a few miles to more than 20 miles offshore, depending on water temperatures. As the ocean water warms in March and April, the schools move north and arrive in local tidal waters to spawn. Fishing usually starts in late April in the Delaware Bay and, by mid to late May and early June, the weakies have settled into the northern waters of the state.

There are three major migrations of weakfish in the state. The first spawning run, which occurs for two to three weeks in late April to May, produces the largest fish, some up to 12 pounds or more. The second spawning run arrives for two to three weeks in June, with fish in the two- to three-pound range. The final migration of weakfish spends the summer in Jersey tidal waters before returning to the ocean when the water temperatures cool in October.

Early and late season anglers probably catch the largest fish; those fishing in the summer are likely to catch the most fish. Under current regulations, weakfish must be a minimum length of 14 inches, and there is a bag limit of 14 fish per day. Freeman says that more stringent requirements may be considered in the near future.

Catching Weakies

Catching weakfish can be as simple or as complicated as you care to make it. Some anglers may use 45-foot sport fishing boats in the ocean; others may choose 12-foot outboard skiffs in the protected bays. Sea and wind conditions frequently dictate the size of the boat for safe fishing. Weakfish also can be caught from fishing piers, docks, sod banks and the surf.

Fishing tackle for weakfish ranges from a number 8 fly rod using sinking or floating line, with shrimp-like flies and an assortment of streamers, to heavy spinning and conventional tackle for charter and party boats. The most popular tackle probably would be the one-handed six- to eight-foot medium-action spinning rod with eight-pound monofilament. Some anglers prefer a bait casting rod and reel spooled with 10-pound test monofilament. For offshore party boat fishing, a medium action six- to eight-foot spinning rod is a good choice for bottom jiggling.

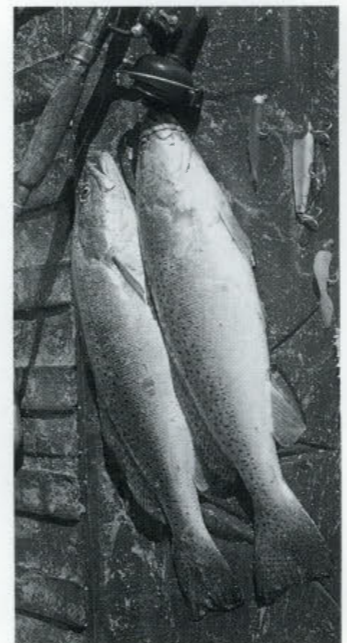
There are a number of methods of fishing for weakfish, depending on where they are located, how deep the water is, how strong the tides run and what the weakfish are feeding on.

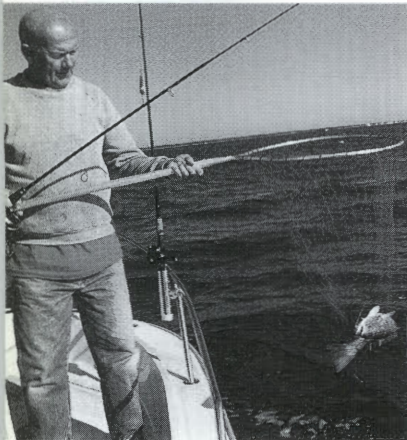
Most of the largest weakfish probably are taken on live or fresh bait, such as grass shrimp, shedder crabs, strips of squid, sand and blood worms and small bait fish. Live bait usually is fished on a hi-low hook rig with 30 inches or more of 20-pound monofilament attached to a two-to five-ounce bank sinker. Two dropper loops off this line hold a 16-inch length of filament line with a 2/0 or 5/0 gold beak hook. It's important to have enough sinker weight to hold bottom and to keep the bait off the bottom and away from the crabs.

Jiggling is a popular method of taking the weakies on artificial lures. Bucktail jigs and diamond jigs dressed with rubber worms or a plastic twister tail provide extra action to the jigs by bounc-

Early and late season anglers probably catch the largest fish; those fishing in the summer are likely to catch the most fish.

Lures can be used to catch weakfish.





Nets are especially helpful in catching weakies because of their notoriously thin mouths.

ing along the bottom from a drifting boat or by casting out and retrieving the lure.

Weakfish also can be taken on small plugs, spinners, metal, bucktail jigs, spoons and other lures by casting toward marsh sod banks, under bridges and into deeper channels. A strip of squid cut five inches long and a half inch wide and into a taper is frequently used to sweeten up artificial lures.

Not to be overlooked is chumming for weakfish using live grass shrimp and crushed bluecrab shells. Anchoring a boat or drifting, you attract weakfish to your area by ladling out a dipper full of shrimp or other chum until you coax the fish into the slick. If a bobber or float is used, your bait, which can include shrimp, squid or shedder crab, can be set to the depth where the fish are feeding.

When weakfishing, it's wise to carry a good size net. Weakfish have notoriously thin mouths, and hooks imbedded in this tissue will frequently pull free if too much pressure is placed on the fish while fighting or netting it. A weakfish hooked in the hard part of the mouth usually will stay hooked. Always beware of the needle-sharp teeth in a weakfish's mouth.

Where and When to Fish

Where are the best places to fish for weakfish from May to the end of September? Two of the best places are the Mullica River between the Garden State Parkway bridge and the mouth of the river and in the Great Bay around Grassy Channel and the sod banks of the tidal marshes. In Barnegat Bay, the fish may be in shoals near the center of the bay not far from the main channel, usually in about six to nine feet of water. They frequently forage for food out on the shallow sand flats.

There is some good weakfishing in the Shark and Manasquan rivers and also in the Shrewsbury and Navesink rivers in northern Monmouth County. Raritan Bay also has some good weakfishing. Don't overlook the Delaware Bay off Cape May, Cumberland and Salem counties. Some really big tiderunners are found near the rock piles of the bay's lighthouses and along the deeper shipping channels.

The best time of day to fish for weakfish is during the early morning hours from daylight to about 9 a.m. and in late afternoon until sunset. Weakfish are sensitive to boat traffic, and any disturbance by a passing boat can turn off a school of feeding weakfish. By getting out early in the morning and fishing just at sunrise, you may miss the heavy boat traffic. Some great catches of really big weakfish are made at night by drifting with small live and dead eels.

New Jersey boasts a great statewide resource, yet many anglers are not aware of these challenging fighters. So why not get out and give weakfishing a try.

Pete McLain is a freelance outdoors writer who lives in Toms River.

Guarding Weakfish Populations

While the weakfish may appear to be on a comeback in New Jersey, the future of the population for sport and commercial fishing depends on aggressive and practical fisheries management.

The major problem affecting the weakfish schools from

Florida to Cape Cod, Mass.; is overfishing or harvesting by both commercial and sport anglers. In addition, the commercial by-catch of weakfish taken in the major ranges in North Carolina, Virginia and New Jersey has a significant effect on the Atlantic weakfish population. The commercial netters catch a large number of non-marketable juvenile fish (by-catch), which are killed and dumped overboard as waste.

The Atlantic States Ma-

rine Fisheries Commission (ASMFC), comprised of fishery biologists and administrators from states along the East Coast from Florida to Massachusetts, has taken action to reduce the impact on weakfish populations.

The Weakfish Advisory Board of the ASMFC, headed by Bruce Freeman, a former research scientist with the NJ Department of Environmental Protection, has instituted a 50 percent

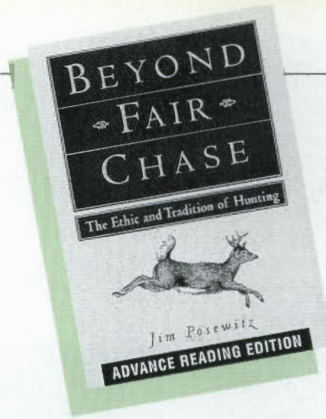
reduction in the 1995 weakfish by-catch allowed for the Atlantic commercial shrimp fishery as well as a 25 percent reduction in the sport and commercial weakfish harvests. The size of the mesh in the commercial nets will be increased to allow 75 percent of the undersized fish to escape. In addition, the board has recommended a stringent minimum length and other regulations for the future.

The Library

Backyard Habitat for Birds and Butterflies, A Guide for Landowners and Communities in New Jersey, by Patricia Sutton, published by the Cape May Bird Observatory and New Jersey Audubon, is a pamphlet describing how to create habitats in yards and throughout communities to attract a wide variety of birds and butterflies. *The cost is \$1. Available from the Cape May Bird Observatory at (609) 884-2736.*

Beyond Fair Chase: The Ethic and Tradition of Hunting, by Jim Posewitz, published by Falcon Press, is a book that addresses the ethical responsibilities and behavior of hunters in an effort to maintain the hunting tradition. This book stresses the ethical way to hunt, from preparation to shooting to care after the shot. It also looks at the importance of physical fitness and safety, hunting on public and private lands and responsibility to a wounded animal. *The cost is \$17.95. Available at local bookstores or from Falcon Press at 1-800-582-2665.*

DEP 1994 Annual Report: Celebrating 25 Years of Environmental Stewardship, published by the Department of Environmental Protection (DEP), is a report reviewing the accomplishments of the DEP in 1994 and during the last 25 years and examining the challenges facing the department in the next quarter century. *The report is free, but quantities are limited. Available from the DEP Public Access Center at (609) 777-3373.*

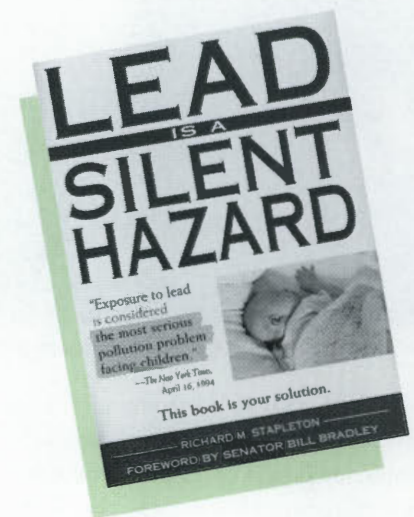


Ecotours and Nature Getaways: A Guide to Environmental Vacations around the World, by Alice M. Geffen and Carole Berglie, published by Crown Publishing Group, is a guide to some of the world's hot spots for one of the travel industry's faster growing sectors. This book includes such outdoor adventures as exploring Alaska's Asognak Island or a rain forest in Costa Rica or participating in an expedition to study the behavior of killer whales. *The book is \$15. Available from local bookstores or from Crown Publishing Group at (212) 751-2600.*

Folk Legacies Revisited, by David Steven Cohen, published by Rutgers University Press, is a book that examines the folklore and folklife of New Jersey, including Native American tribes, Afro-Dutch cultures, the Pineys and the Angel Dancers. By combining history, ethics studies and culture theories, this book demonstrates the need for documented histories of these legends. *The cost is \$15. Available from local bookstores or from Rutgers University Press at 1-800-446-9323.*

A Guide to Bird-Finding in New Jersey by William J. Boyle, published by Rutgers University Press, is a guide to the wide variety of birds that live or pass through the Garden State. This book discusses the wide range of habitats that make New Jersey a hospitable place for water birds, pelagic birds, raptors, migrating birds and northern and southern birds at the edge of their ranges and includes maps, road and trail directions, species lists and the 80 best birdwatching sites in the state. *The cost is \$19.95. Available at local bookstores or from Rutgers University Press at 1-800-446-9323.*

Lead is a Silent Killer, by Richard M. Stapleton, published by Walker and Company, is a reference book on the topic of lead poisoning in children. This book provides at-a-glance answers to virtually every question about childhood lead poisoning and how to prevent it, including avoiding vegetable gardening in soil that tests high for lead, never power-sanding, dry-sanding or dry-scraping lead paint, testing ceramics for leaded glaze and pigment and using bottled water for infants or toddlers unless tap water tests negative for lead. *The cost is \$11.95. Available at local bookstores or from Walker and Company at (212) 727-8300.*



This is New Jersey, by John T. Cunningham, published by Rutgers University Press, is a book that captures the extraordinary diversity of New Jersey on a county by county basis. Discover the many landscapes of the state, from the hardwood forests to the Pinelands to the farmlands to the city belt to the Jersey Shore, and the history of the area, from Native Americans to present times. *The cost is \$15.95. Available at local bookstores or from Rutgers University Press at 1-800-446-9323.*

The Choices Initiative: Solutions, Not Pollution

PHOTOS COURTESY DEP, OFFICE OF ENVIRONMENTAL PLANNING, OUTREACH & EDUCATION



Reduce packaging by bagging same-priced items together.

Phrases such as “earth friendly” and “environmentally conscious” used to conjure up images of sandals, long hair and communes a few decades ago. Today, environmental awareness is a way of life for many and is becoming more mainstream with each passing year.

Anne Seebold, an environmental education specialist, is an environmentalist in every sense of the word. In her profession, in her day-to-day activities and in her home, she makes the environment a priority.

Seebold, of Mullica Hill, says she thinks of the earth when she visits the grocery store. She buys in bulk when she can, staying away from single serve items that use excessive packaging. In the produce aisle, she asks for organic items, which use no pesticides, and those grown locally to save the energy needed for long distance transportation.

She also combines all produce at the same price in a single bag to reduce the amount of plastic she uses.

When buying products packaged in plastic containers, she searches for the numbers “one” or “two” etched on the bottom, the only two varieties that are presently recyclable. And it is not unusual for her to approach the store manager on her shopping trips to suggest alternatives for products that produce excessive waste.

“It’s simple, and it really doesn’t take that long,” Seebold says. “It has become second nature. I feel strongly about the earth. There is only one earth and when it’s all trashed up, we will die sooner. I want to give my children and grandchildren the earth and give them a nice place.”

Seebold is no less vigilant in her home than she is at the grocery store. She has replaced household cleaners

with natural ones, such as baking soda, lemon juice and white vinegar. Her outdoor environment is equally nature-friendly. She mulches her grass, has a compost pile and uses her pigs to fertilize her garden plot during the winter months. She takes special care not to use chemicals in her septic tank, concerned that it will affect the nearby well that supplies her home with water.

The small changes Seebold has made in her everyday life may seem insignificant in the big picture, but she has taken a big step environmentally. By lessening the pollution and amount of waste she produces, she is contributing less to the waste stream. And Seebold is not alone in her dedication to environmental awareness.

The New Jersey Department of Environmental Protection (DEP) has realized the value of this philosophy and has developed a program to encourage other citizens to do the same. Called “The Choices Initiative,” the program includes a slide show and information session addressing some of the simple choices people can make every day to benefit the environment.

The choices program has two basic premises: pollution prevention and individual empowerment. By choosing to prevent pollution at the source rather than cleaning it up after it has been created, there is less air and water pollution as well as less trash. Therefore, by making small changes in their daily lives, individuals may be the key to the solution, not the source of the pollution.

The program follows the basic themes of reduce, reuse and recycle. Reducing the amount of packaging means less material in landfills and prevents pollution at its source. Reusing items whenever possible eliminates the need to dispose of them. And recycling items give them a second chance to be used, not only decreasing the demand for raw materials, but also reducing waste.

These basic premises can be applied to many aspects of an individual’s life without causing drastic or impractical

Remember to consider the environment when driving, shopping or gardening.

changes in daily routines. For example, recycling used motor oil can save one million gallons of water from contamination for every quart recycled.

You can reduce the amount of packaging that goes into the environment by purchasing products sold in bulk rather than in smaller, individually wrapped packages. Also, look for loose items that use no packaging. And remember to bring your grocery bags or plastic produce bags back during your next trip to the store to avoid using new ones. Many items, such as margarine tubs, jelly jars and other containers, can be reused to store leftover food or to hold other items such as pennies or buttons.

"Small things you do in your life can make a big difference in your environment," says Kyrá Hoffmann, coordinator of the DEP Office of Environmental Planning, Outreach and Education. "Realizing that we're all contributing to the problem every day is the first step; taking small steps after that to recognize what can be done will lead to a greater understanding of the problem."

Tree planting is one such water and ground quality improvement a person can easily make in the backyard. While it is widely known that trees help clean the air, many people are not aware that they also help clean and conserve water.

Trees conserve water in a number of ways. By reducing lawn space, trees reduce the need for fertilizers, pesticides and large volumes of water. The tree's root system also provides a natural filtration system and anchors soil to prevent sedimentation and erosion. Additionally,

trees shade lakes, streams and ponds, lowering the water temperature and allowing fish and other aquatic life to grow.

There are many other inexpensive and easy alternatives to polluting. Riding a bicycle or walking are two alternatives to driving a car. By not taking the car, smog is prevented, and water is spared the harmful effects of antifreeze and motor oil leaks. Car exhaust and small leaks add up to a lot of pollution when multiplied by several million drivers.

Litter, fertilizers, pesticides and car emissions are all examples of the biggest environmental threat facing the earth today: nonpoint source pollution. Unlike industrial pollution, which is easier to pinpoint and control, nonpoint source pollution is so varied that it makes regulation difficult. As a result, combating this pollution takes education.

You can help reduce nonpoint source pollution by starting in your own home. Reduce the amount of pesticides and fertilizers used on your lawn and garden. Find safe alternatives for toxic household cleaners and dispose of old, unnecessary cleaners properly.

New Jersey is the most densely populated state in the country, and air and water pollution are serious environmen-



Recycle batteries or use a recharger.

Reuse paper bags at the store.

tal concerns. If each person did his or her part by car pooling, combining several trips into one or taking public transportation, there would be a significant reduction in nonpoint source pollution of air and water.

The Choices presentation is aimed at educating people about the power they have to make a difference in their environment and examining the power they have in curbing their contributions to nonpoint source pollution.

"In the end," Hoffmann says, "people can choose to protect the environment. It is not necessary to join any clubs or attend meetings. Just remember to consider the environment when driving, shopping or gardening."

The Choices Initiative slide show and speaker program currently is available for groups from the 21 county-based Clean Communities Coordinators. For more information about the slide show or nonpoint source pollution, call Hoffmann at (609) 633-1179.

by Amanda MacDonnell, former assistant coordinator of the DEP's Office of Environmental Planning, Outreach and Education



Events

June

15 Geology of New Jersey (Through July 30) See the spectacular effects of water, wind and ice on the geology of New Jersey in this exhibit by James E. Pain and Dr. Betty Faber. **Hours:** 9:30 a.m. to 5:30 p.m. **Fee:** Adults, \$9; seniors/students, \$8; children 2-12, \$6; children under 2, free **Phone:** (201) 200-1000 **Location:** Liberty Science Center, Liberty State Park, Exit 14B, NJ Turnpike, Jersey City

15 Museum of American Glass Annual Exhibition (Through Oct. 22) See more than 100 unique glass containers, both historic and contemporary, in this exhibit entitled "It Figures: American Sculptural Bottles." **Hours:** 10 a.m. to 5 p.m. **Fee:** Adults, \$6; seniors, \$5.50; students, \$3.50; children under 5, free **Phone:** (609) 825-6800. **Location:** Wheaton Village's Museum of American Glass, Glasstown Road, Millville

15 Nature Classes for Children (Also every Wednesday through Sunday year-round) Children can participate in various nature classes and "hands-on" activities at the farm while meeting wildlife and farm animals. **Hours:** 10 a.m. to 4 p.m. (Wednesdays through Sundays) **Fee:** \$3 per class **Phone:** (609) 778-8795 **Location:** Paws Farm, Hainesport-Mt. Laurel Road, Mt. Laurel

15 Summer Exhibits at Liberty State Park (Through Sept. 4) Enjoy exhibits depicting the history of the area, especially transportation and immigration. **Hours:** 10 a.m. to 5 p.m. **Fee:** Free **Phone:** (201) 915-3411 **Location:** Liberty State Park, Exit 14B, NJ Turnpike, Jersey City

16 Sunset Birding at the Meadows (Also every Friday through July 28) See birds at the end of the day as they get more active and vocal. **Hours:** 6:30 p.m. to sunset **Fee:** Call for information **Phone:** (609) 884-2626 **Location:** Cape May Bird Observatory, E. Lake Drive, Cape May Point

16-18 Mako Mania This mako shark fishing tournament features prizes, food and exhibits. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 892-2278 **Location:** Clark's Landing Marina, Arnold Avenue, Point Pleasant Beach

17 Canoe Trip Canoe through the Kearny Marsh on a guided tour of this fascinating wetland and learn its history and how it functions. **Hours:** 8:30 a.m. **Fee:** \$7.50 **Phone:** (201) 460-8300 **Location:** Hackensack Meadowlands Environment Center, DeKorte Park Plaza, Lyndhurst

17 Dragonfly Workshop & Walk Join this informative outdoor workshop and slide show about dragonflies followed by a leisurely walk around a series of ponds. **Hours:** 9 a.m. to 3:30 p.m. **Fee:** Members, \$10; non-members, \$15 **Phone:** (609) 884-2626 **Location:** Cape May Bird Observatory, E. Lake Drive, Cape May Point

17 South Jersey Traditional Small Boat Festival & Sneakbox Rendezvous Bring your own traditional small craft and swap with someone else. **Hours:** 10 a.m. to 5 p.m. **Fee:** Free **Phone:** (609) 971-3085 **Location:** Berkeley Island County Park, Bayville

17 Star Gazing (Also every Saturday through September) Learn about stars and outer space through slide programs and telescope viewing. **Hours:** 8 to 10 p.m. **Fee:** Free **Phone:** (908) 459-4366 **Location:** Jenny Jump State Forest Observatory Site, State Park Road, Hope

17-18 Dairy Days See how our ancestors processed and used dairy products 100 years ago. **Hours:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6 to 16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

17-18 Garden State Wine Growers Spring Wine Festival More than 75 New Jersey wines will be featured at this event, which includes wine cellar tours, entertainment, food, wine seminars and barefoot grape stomping. **Hours:** Call for information **Fee:** Call for information

Phone: (908) 479-6611 **Location:** Kings Road Vineyard, Route 579, Asbury

17-18 Great Locomotive Chase Civil War Reenactment and Civil War Living History Weekend Experience life during the Civil War at Allaire Village, including a reenactment of Andrew's Raid on Big Shanty, Georgia. **Hours:** 10 a.m. to 4 p.m. **Fee:** Exhibits, free; train fare, \$2.50 **Phone:** (609) 938-5524 **Location:** Allaire State Park, Route 524, Farmingdale

17-18 Nature Enrichment Programs (Also every Saturday and Sunday year-round) Join these weekend workshops on various topics of nature and history, including salt marsh birds (July 29-30); turtle identification (Aug. 12-13); and shrubs (Aug. 19-20) **Hours:** Noon to 1 p.m. **Fee:** Free **Phone:** (908) 270-6960 **Location:** Cooper Environment Center, Cattis Island Boulevard, Toms River

17-18 Planetarium Sky Shows (Also every Saturday and Sunday throughout the year) Witness the sights of the season's night sky and other astronomical subjects during these planetarium shows. **Hours:** 1, 2 and 3 p.m. **Fee:** \$1 **Phone:** (609) 292-6308 **Location:** New Jersey State Museum, W. State Street, Trenton

18 Baseball Day Celebration See an old-timers' game, baseball celebrities, baseball memorabilia and a parade. **Hours:** Call for information **Fee:** Free **Phone:** (201) 420-2000 **Location:** Stevens Park, Hudson Street, Hoboken

18 East Coast Triathlon Championship Adults participate in a half-mile swim, 20-mile bike race and 5-mile run. Awards presented in 11 age groups and for top male and female. **Hours:** 8:30 a.m. **Fee:** Call for information **Phone:** (908) 830-7260 **Location:** Hiering Avenue and the Boardwalk, Seaside Heights

18 Father's Day Celebrate this special day by exploring fathers and their roles in the marine environment. **Hours:** All day **Fee:** Adults, \$5.50; children, \$3.50 **Phone:** (908) 899-1212 **Location:** Jenkinson's

Aquarium, Boardwalk and Parkway, Point Pleasant Beach

18 Tours of the Hermitage (Also June 21 and 28) Participate in tours of this national historic landmark, including a clothing exhibit. **Hours:** Call for information **Fee:** \$3 **Phone:** (201) 445-8311 **Location:** The Hermitage, North Franklin Turnpike, Ho-Ho-Kus

19-23 Docent Training Days Participate in this intensive nature study in preparation for guiding walks and assisting with summer nature programs at the Wetlands Institute. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 368-1211 **Location:** Wetlands Institute, Stone Harbor Boulevard, Stone Harbor

21 Discover Barnegat Bay Kayaking (Also every Wednesday through Sept. 6) Discover the ecosystems in and around Barnegat Bay with this introductory course to kayaking. **Hours:** Call for information **Fee:** Adults, \$20; students, \$10 **Phone:** (609) 492-6235 **Location:** Public Beach and Boat Ramp, 9th Avenue at the shore, Ship Bottom

22-25 Grand Frontier Encampment See this encampment of frontiersmen, fur trappers and pointers from the 18th and 19th centuries. **Hours:** Call for information **Fee:** Call for information **Phone:** (201) 347-0900 **Location:** The Village of Waterloo, Waterloo Road, Stanhope

23 Public Nights 1995 (Also alternate Fridays through Nov. 17) See the world of stars, moons and planets through telescopes on clear evenings. **Hours:** Call for information **Fee:** Free **Phone:** (201) 523-0024 **Location:** Astronomical Observatory, Rifle Camp Park, West Paterson

24 Butterfly Counts (Also June 30 and July 1) Help with a census of butterflies as you enjoy a day outdoors. **Hours:** 2 to 3 p.m. **Fee:** Members, \$5; non-members, \$8 **Phone:** (609) 884-2626 **Location:** Cape May Bird Observatory, E. Lake Drive, Cape May Point (June 24), Belleplain State Forest, Belleplain (June 30); Cumberland County (July 1)

24 Fossil Hunting Workshop Find authentic New Jersey fossils at a local site. **Hours:** 8 a.m. to noon **Fee:** Adults, \$7; children, \$5 **Phone:** (908) 899-1212 **Location:** Jenkinson's Aquarium, Boardwalk and Parkway, Point Pleasant Beach

24-25 Annual Battle of Monmouth See a reenactment of the largest battle of the American Revolution. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 577-8816 **Location:** Monmouth Battlefield State Park, Route 33, Freehold

24-25 Birdwatching for Beginners This two-day course covers all aspects of bird identification, birdwatching hot spots, equipment and attracting birds to your own backyard. **Hours:** 7 to 10 p.m. (June 24); 8 to 10 a.m. (June 25) **Fee:** Members, \$10; non-members, \$15 **Phone:** (609) 884-2626 **Location:** Cape May Bird Observatory, E. Lake Drive, Cape May Point

24-25 Summer Nature Program (Also every Saturday and Sunday through Sept. 3) Learn more about Island Beach State Park through a series of programs, including bird walks, beach walks, seining and canoeing. **Hours:** Call for information **Fee:** Free **Phone:** (908) 793-0506 **Location:** Island Beach State Park, Seaside.

24-25 Wheaton Village's 25th Anniversary Celebration Enjoy this celebration of Wheaton Village's 25 years as a highly recognized cultural center dedicated to American glass. **Hours:** 10 a.m. to 5 p.m. **Fee:** Adults, \$6; seniors, \$5.50, students, \$3.50; children under 5, free **Phone:** (609) 825-6800 **Location:** Wheaton Village, Glasstown Road, Millville

25 Canoeing the Crosswicks See the Trenton/Hamilton Marsh by canoe in this event sponsored by Delaware and Raritan Greenways. **Hours:** 1 to 5 p.m. **Fee:** Members, \$20; non-members, \$25 (Preregistration required) **Phone:** (609) 452-0525 **Location:** Call for information

25 Cooking Demonstration at the Willow Mansion (Also July 9, 23, Aug. 13 and 27) See how cooking was done on a wood-burning stove at the turn of the century. **Hours:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6 to 16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

25 Laundry Day in the 1830s See a demonstration of how laundry was done in the early 19th century. **Hours:** 1 to 4 p.m. **Fee:** Free **Phone:** (908) 938-2371 **Location:** Allaire Village, Allaire State Park, Route 524, Farmingdale

25 Morning Bird Walk (Also every Sunday through Aug. 27) Join naturalists on this guided walk. **Hours:** 8 a.m. **Fee:** Free **Phone:** (609) 368-1211 **Location:** Wetlands Institute, Stone Harbor Boulevard, Stone Harbor

25 Raritan Valley Roundup Select from five rides, from 20 to 100 miles, in this event sponsored by the Central Jersey Bicycle Club. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 287-0712 **Location:** North Branch Park, Milltown Road, North Branch

25 The Two River Times Annual Rivera Swim Join this one-mile fun race in the Navesink. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 219-5788 **Location:** Marine Park, Wharf Avenue, Red Bank

26 Guided Salt Marsh Walks (Through Aug. 31) Enjoy a film and guided walk through the marshes. **Hours:** 10 a.m., noon and 2 p.m. **Fee:** Adults, \$4; children, \$2 **Phone:** (609) 368-1211 **Location:** Wetlands Institute, Stone Harbor Boulevard, Stone Harbor

26 Sundown Census (Also every Monday through Aug. 28) Help count herons and egrets for a Wetlands Institute research project. **Hours:** 6:30 p.m. **Fee:** Call for information **Phone:** (609) 368-1211 **Location:** Wetlands Institute, Stone Harbor Boulevard, Stone Harbor

Events

27 Featured Creatures (Also every Tuesday and Thursday through Aug. 29) Join this series of family programs designed to educate through crafts, games, lectures and hands-on activities. **Hours:** 10 a.m. to noon **Fee:** Adults, \$4; children, \$2 **Phone:** (609) 368-1211 **Location:** Wetlands Institute, Stone Harbor Boulevard, Stone Harbor

27 Nature Study and Marine Biology Classes (Through Aug. 26) Children ages 6 to 8 can explore the bay, beach and salt marshes, and students ages 9 to 12 can collect and classify specimens from the bay, beach and salt marshes of Long Beach Island. Includes side trips to Barnegat Light jetty and rafting off Harvey Cedars. **Hours:** 9:30 a.m. to noon **Fee:** Members, \$80; non-members, \$95 **Phone:** (201) 460-8300 **Location:** Long Beach Island Foundation for the Arts and Sciences, Long Beach Boulevard, Loveladies

27 Wetlands Wildlife Cruises (Also every Tuesday through Aug. 29) Take a ride aboard the Princess on a guided tour of the area. **Hours:** 6:30 to 8 p.m. **Fee:** Call for information **Phone:** (609) 368-1211 **Location:** Wetlands Institute, Stone Harbor Boulevard, Stone Harbor

28 Guided Beach and Dune Walks (Also every Wednesday through Aug. 30) Walk the beaches and dunes in Avalon and discover the life that lives there. **Hours:** 9 a.m. **Fee:** \$1 **Phone:** (609) 368-1211 **Location:** Wetlands Institute, Stone Harbor Boulevard, Stone Harbor

29 George A. Clark Memorial Lecture Series (Also every Thursday through Aug. 31) Discover topics of nature and natural history through this series of illustrated lectures. **Hours:** 8:15 p.m. **Fee:** Donations requested **Phone:** (609) 368-1211 **Location:** Wetlands Institute, Stone Harbor Boulevard, Stone Harbor

30 Summer Classic Baymen's Museum Women's Fishing Tournament Join this competition for women in catching the largest and heaviest fluke, sea bass and other saltwater species. **Hours:** 8 a.m. to 2 p.m. **Fee:**

\$25 **Phone:** (609) 296-8868 **Location:** Black Whale II, Beach Haven Fishing Centre, Centre Avenue and the Bay, Beach Haven

July

2 Fourth of July Picnic and Games Bring some old-fashioned games to this quiet celebration of the nation's birth. **Hours:** Noon to 3 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6 to 16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

2 Independence Day, 1835 See how Independence Day was celebrated at the Howell Works in 1835 and join in the 210th birthday celebration of the Howell Works founder, James P. Allaire. **Hours:** Noon to 4 p.m. **Fee:** Free **Phone:** (908) 938-2371 **Location:** Allaire Village, Allaire State Park, Route 524, Farmingdale

2 Innertubing: Wading River, Burlington County Cruise down the Wading River through the lush Pine Barrens to a marvelous old-time swimming-hole. **Hours:** 10:15 a.m. **Fee:** Free **Phone:** (609) 267-7052 **Location:** Evans Bridge, Rt. 563 and Green Bank Road, Burlington

2 Summer Lectures '95 (Also every Sunday through Aug. 27) Learn about the history of the area, especially transportation and immigration. **Hours:** 3:30 p.m. **Fee:** Free **Phone:** (201) 915-3411 **Location:** Liberty State Park, Exit 14B, NJ Turnpike, Jersey City

6 The End of the World Planetarium Sky Show (Also every Tuesday through Friday through Sept. 1) Witness the fate of the Earth and Sun as you gaze five billion years into the future. **Hours:** 2 p.m. (Tuesday through Friday); 8 p.m. (Thursday and Friday) **Fee:** Adults, \$4.50; children, \$3 **Phone:** (908) 255-0342 **Location:** The Robert J. Novins Planetarium, Ocean County College, Toms River

6 Gardens by the Sea Tour the area's gardens and have high tea at local restaurants. **Hours:** Call for information **Fee:** Call

for information **Phone:** (908) 892-5564 **Location:** Bay Head and Mantoloking

6 Wetlands and Bayshore Ecology Walk (Also July 28, Aug. 11 and 25) Join this walk around the wetlands at Long Beach Island Foundation of the Arts and Sciences lead by park naturalist German Georgieff. **Hours:** 9:30 a.m. to noon **Fee:** Free **Phone:** (609) 494-3169 **Location:** Long Beach Island Foundation of the Arts and Sciences, Long Beach Boulevard, Loveladies

8 Dolphin Watch Cruises (Also July 30, Aug. 19 and Sept. 10) Cruise the shores of Cape May County in search of dolphins for a population and health assessment of the species by the Marine Mammal Stranding Center. **Hours:** 1 to 4 p.m. **Fee:** Adults, \$15; children, \$7.50 **Phone:** (609) 266-0538 **Location:** The Princess, City Marina, 42nd Street and the Bay, Sea Isle City

8 The Grain Harvest See a horse powered reaper and binder harvest the oat crop. **Hours:** 10 a.m. to noon **Fee:** Adults, \$4; seniors, \$3; children 6 to 16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

8 Moonlight Walk (Also Aug. 12) Enjoy a 5-mile, nighttime walk around the bogs, cedar swamps and pine woods surrounding Whitesbog Village. **Hours:** 7 p.m. **Fee:** \$4 **Phone:** (609) 893-4646 **Location:** Whitesbog Village, Lebanon State Forest, Browns Mills

8-9 Weaving Demonstration See a display and demonstrations on various types of small table looms. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 879-5463 **Location:** Cooper Gristmill, Route 24, Chester

9 Insects and Their Relatives Learn more about those creepy-crawlies that make us squirm while you enjoy games and crafts. **Hours:** 1 to 4 p.m. **Fee:** Free **Phone:** (201) 635-6629 **Location:** Kay Environmental Education Center, Pottersville Road, Chester

10 Shadowbirds Exhibit (Through Aug. 25) See this collection of photographs of the elusive marshland rails. **Hours:** Call for information **Fee:** Free **Phone:** (908) 766-2489 **Location:** Somerset County Park Commission Environmental Education Center, Lord Stirling Road, Basking Ridge

11 Marine Biology Workshops for Children (Also July 13, 20, 28, Aug. 8 and 10) Join these marine biology workshop for children featuring marine ecosystems, the operation of an aquarium, seining, shell collecting and fossil making. **Hours:** 10 a.m. to noon **Fee:** \$5.50 **Phone:** (908) 899-1212 **Location:** Jenkinson's Aquarium, Boardwalk and Parkway, Point Pleasant Beach

11 Clam Shucking Seminar (Also every Tuesday through Aug. 29) Learn how to open clams during this hands-on seminar. **Hours:** Call for information **Fee:** Free **Phone:** (609) 494-9494 **Location:** Boulevard Clams, Long Beach Boulevard, Surf City

11 Night Moves (Also July 26, Aug. 8 and 30) Observe the behavior of wild animals at night. **Hours:** Call for information **Fee:** Call for information **Phone:** (201) 731-5801 **Location:** Turtle Back Zoo, Northfield Avenue, West Orange

14 The Return to Beaver Creek Powwow Native American artists, dancers and crafters gather to share their culture. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 475-3872 **Location:** Matarazzo Farms, Route 519, Belvidere

15 Annual Beach Haven Exchange Club Fishing Tournament Join the contest to catch the heaviest bluefish, weakfish and fluke. **Hours:** Call for information **Fee:** \$125 per boat of five **Phone:** (609) 492-5161 **Location:** Call for information

15 Benefit Powwow Join this Native American festival featuring song and dance, arts and crafts and food sales. **Hours:** 10 a.m. to 6 p.m. **Fee:** Adults, \$6; seniors and children ages 5 to 12, \$3 **Phone:** (908) 525-

0066 **Location:** Sally's Field, Ringwood State Park, Ringwood

15 Catamaran Regatta See a spectacular sailboat race. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 967-3066 **Location:** 40th Street Beach, Avalon

15 King of the Pier Swim Join this one-mile swimming competition, which includes a post race party, giveaways and a T-shirt. **Hours:** 6:30 p.m. **Fee:** Call for information **Phone:** (908) 830-7260 **Location:** Beach at Grant Avenue and Boardwalk, Seaside Heights

15-16 15th Annual National Sweepstakes Regatta This competition features speed boat champions from around the country. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 747-1076 **Location:** Marine Park, Wharf Avenue, Red Bank

16 Laundry Demonstration (Also Aug. 20) See how clothes were washed 100 years ago. **Hours:** 1:30 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6 to 16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

16 Wooden Boat Festival See antique, classic and restored wooden boats and participate in sailing and rowing races. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 845-0717 **Location:** Toms River Yacht Club, Washington Street, Toms River

18 Shark Awareness Day Learn more about sharks through informative talks and enjoy face painting, crafts for children and a diving and feeding exhibition. **Hours:** All day **Fee:** Adults, \$5.50; children, \$3.50 **Phone:** (908) 899-1212 **Location:** Jenkinson's Aquarium, Boardwalk and Parkway, Point Pleasant Beach

19 Wax Seals Learn about wax seals during this lecture and display. **Hours:** 7 p.m. **Fee:** Free (Reservations required)

Phone: (609) 890-3630 **Location:** Kuser Farm Mansion, Newkirk Avenue, Hamilton

20 Conservation Day (Also Aug. 24) Learn how to solve pollution problems and to conserve the marine environment. **Hours:** All day **Fee:** Adults, \$5.50; children, \$3.50 **Phone:** (908) 899-1212 **Location:** Jenkinson's Aquarium, Boardwalk and Parkway, Point Pleasant Beach

22 Night in Venice Boat Parade and Celebration This parade features more than 100 decorated boats and 300 decorated bayfront homes. **Hours:** Call for information **Fee:** Free **Phone:** (609) 525-9300 **Location:** Great Egg Harbor Bay, Ocean City

22 Pioneer Days Enjoy games, crafts and food in this event to learn how the pioneers lived. **Hours:** 1 to 4 p.m. **Fee:** Free **Phone:** (201) 635-6629 **Location:** Kay Environmental Education Center, Pottersville Road, Chester

22 Space Day A daylong celebration of America's achievements in space, including workshops, planetarium shows, exhibits and more. **Hours:** 9 a.m. to 4:45 p.m. **Fee:** Planetarium shows, \$1; exhibits, free **Phone:** (609) 292-6308 **Location:** New Jersey State Museum, W. State Street, Trenton

22 Threshing Demonstration (Also Aug. 5) See and hear a 90-year-old thresher as he describes how to remove the grain from the straw and chaff. **Hours:** 1 to 3 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6 to 16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

23 Caught on Film: Wildlife Photography by Leonard Balish (Through Aug. 30) See this creative photography that uses superimposed images to artistically portray bird wildlife. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 652-8848 **Location:** The Noyes Museum, Lily Lake Drive, Oceanville

Events

23 19th Century Craft Guilds Open House See demonstrations of crafts from the 1830s, including blacksmithing, carpentry, cooking and gardening. **Hours:** Noon to 4 p.m. **Fee:** Free **Phone:** (908) 938-2371 **Location:** Allaire Village, Allaire State Park, Route 524, Farmingdale

23 Sand Sculpturing Contest See displays, demonstrations and judging of this unique art form. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 914-0100 **Location:** Second Avenue Beach, Seaside Park

25-30 Monmouth County Fair Enjoy garden displays, animal exhibits, a living history farm tent and lots of entertainment. **Hours:** 5 to 11 p.m. (July 25-27); 11 a.m. to 11 p.m. (July 28-29); 11 a.m. to 6 p.m. (July 30) **Fee:** Adults, \$4; children under 12, free; seniors, free on July 28) **Phone:** (908) 842-4000 **Location:** East Freehold Park Showgrounds, Kozloski Road, Freehold

27 Historic Beach Haven Walking Tours (Also every Tuesday and Friday through Sept. 8) Join this one and a half hour tour through 26 Victorian cottages and bed & breakfast guest houses within three blocks of the Long Beach Island Museum. **Hours:** 10:30 a.m. **Fee:** Adults, \$3; children, 50¢ **Phone:** (609) 492-0700 **Location:** Long Beach Island Museum, Engleside and Beach avenues, Beach Haven

29 Sea Island Beach Patrol One-Mile Ocean Swim See more than 400 swimmers compete in this ocean race. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 263-3655 **Location:** Beach Patrol Headquarters, 44th Street and Boardwalk, Sea Isle City

30 Historic Herbs and Herbal Jellies Learn about the historic use of garden herbs and learn to make jelly. **Hours:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6 to 16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

30-31 Mayor's Cup The beach patrols of Long Beach Township demonstrate ocean rescue skills in 14 different competitions. **Hours:** Call for information **Fee:** Free **Phone:** (609) 361-1200 **Location:** Ocean Beach, 82nd Street, Beach Haven Crest

August

2 Miss Crustacean Hermit Crab Beauty Contest Witness the world's only beauty pageant for hermit crabs. Crab races to follow. **Hours:** Call for information **Fee:** Free **Phone:** (609) 525-9300 **Location:** Sixth Street Beach, Ocean City

3-13 New Jersey State Fair See agricultural displays, games, food, entertainment and shows. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 646-3340 **Location:** Garden State Park, Haddonfield Road, Cherry Hill

4 Preparing the Feed See a variety of period agricultural machinery used to process feeds and grains. **Hours:** 1 to 3 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6 to 16, \$2; children under 6, free **Phone:** (201) 326- **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

5 Open House at East Point Lighthouse Tour the lighthouse and see historical objects and nature exhibits. **Hours:** Call for information **Fee:** Free **Phone:** (609) 327-3714 **Location:** East Point Lighthouse, East Point Road, Heislerville

5-6 Camp Olden Civil War Re-enactment/Living History This event commemorates the original Camp Olden Civil War training camp in Hamilton. **Hours:** 10 a.m. to 5:30 p.m. **Fee:** Free **Phone:** (609) 581-4129 **Location:** Veterans Park, Whitehorse-Hamilton Square Road, Hamilton

6 1830s Temperance & Charitable Society Fair Join this reenactment of the social issues of the 1830s, including alcohol tolerance. **Hours:** Call for information **Fee:** Free **Phone:** (908) 938-2371 **Location:** Allaire Village, Allaire

State Park, Route 524, Farmingdale

6 Historical Slide Show See this presentation of local history and music. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 494-3522 **Location:** Barnegat Light House State Park, Broadway, Barnegat Light

6 Jersey Fresh Festival This outdoor festival celebrates the agriculture products of the Vineland area with culinary demonstrations, a produce auction, specialty foods, crafts exhibits and booths, pageants, music and a salad contest. **Hours:** Noon to 7 p.m. **Fee:** \$3 **Phone:** (609) 794-4011 **Location:** Giampietro Park, Landis and Lincoln Avenues, Vineland

7-8 Hummingbird & Gardening Seminars (Also every Monday and Tuesday in August) Learn all about hummingbirds and gardening without work. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 465-5871 **Location:** Leamings Run Gardens, Route 9 North, Cape May Court House

8-9 Victorian Christmas Decoration Making Demonstration Learn how to make old-fashioned decorations for the Christmas tree. **Hours:** 7 p.m. **Fee:** Free (Reservations required) **Phone:** (609) 890-3630 **Location:** Kuser Farm Mansion, Newkirk Avenue, Hamilton

11-12 34th Annual Long Beach Island Lifeguard Tournament Six beach patrols demonstrate ocean skills in 14 different competitive events. **Hours:** Call for information **Fee:** Free **Phone:** (609) 361-1200 **Location:** Beach at 20th Street, Barnegat Light

12 Big Sea Day This annual competition includes sand castle building, surfing, tennis and horseshoes. **Hours:** Call for information **Fee:** Free **Phone:** (908) 223-0544 **Location:** Beachfront area, Manasquan

12 Bridgeton Zoo Ride Participate in this 25-, 50- or 100-mile bicycle ride over lightly rolling terrain through southern

New Jersey farmlands, then walk through the Bridgeton Zoo. **Hours:** 8 a.m. **Fee:** Pre-registration, \$10, at door, \$12 **Phone:** (609) 848-6123 **Location:** Schalich High School, Centerton

12 Owls of New Jersey Learn about New Jersey owls in this slide show and presentation including live owls. **Hours:** 2 p.m. **Fee:** Free **Phone:** (201) 635-6629 **Location:** Kay Environmental Center, Pottersville Road, Chester

12-13 Jersey Fresh Food and Wine Festival New Jersey's finest wines are served with the state's best produce. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 475-3872 **Location:** Matarazzo Farms, Route 519, Belvidere

13 Festival of Horses See equine shows, demonstrations, exhibits, pony and wagon rides. **Hours:** Call for information **Fee:** Free **Phone:** (609) 984-4389 **Location:** Horse Park of New Jersey, Allentown Clarksburg Road, Allentown

13 Penguin Awareness Day Learn about penguins through informative talks, storytelling and live feeding demonstrations. **Hours:** All day **Fee:** Adults, \$5.50; children, \$3.50 **Phone:** (908) 899-1212 **Location:** Jenkinson's Aquarium, Boardwalk and Parkway, Point Pleasant Beach

13 Pressed Flower Demonstration Witness the Victorian pastime of pressing flowers. **Hours:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6 to 16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown

19-20 Bluegrass and Peach Festival Enjoy live bluegrass music, crafters and a watermelon seed spitting contest. **Hours:** Noon to 7 p.m. **Fee:** Adults, \$6; children under 12, \$4 **Phone:** (908) 475-3872 **Location:** Matarazzo Farms, Route 519, Belvidere

19-20 Farmfest '95 This event features the dedication of the 19th-century Corson-Grandy barn as well as food,

games and square dancing. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 898-2300 **Location:** Historic Cold Springs Village, Route 9, Cape May

19-20 Gotcha-Heritage Surfing Contest Witness a pro-am surfing contest. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 262-3033 **Location:** Beach at 41st Street, Sea Isle City

19-20 20th Annual Clear-water Festival This environmental festival features music, entertainment, arts and crafts, environmental displays and food. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 872-9644 **Location:** Fort Hancock, Sandy Hook National Park, Route 36, Sandy Hook

20 Fly Casting Demonstration Learn the techniques needed to cast a fly and catch fish. **Hours:** 2 p.m. **Fee:** Free **Phone:** (201) 635-6629 **Location:** Kay Environmental Center, Pottersville Road, Chester

20 Paddleboard and Surf Ski Competitions Long Beach Township beach patrols demonstrate ocean rescue skills in eight competitive events. **Hours:** Call for information **Fee:** Call for information **Phone:** (609) 361-1200 **Location:** Ocean Beach at 68th Street, Brant Beach

25-27 Sussex '95 See world class performers at this annual air show. **Hours:** Call for information **Fee:** Call for information **Phone:** (201) 875-0783 **Location:** Sussex Airport, Route 639, Sussex

26 New Jersey Championship Tomato Weigh-In See the heaviest tomato grown in the Garden State. **Hours:** Call for information **Fee:** Free **Phone:** (609) 922-8100 **Location:** Seaview Square Mall, Routes 35 and 66, Ocean Township

26 Wildlife Show Browse through this 14th annual juried show featuring wildlife artists and carvers. **Hours:** 10 a.m. to 8:30 p.m. **Fee:** Call for information **Phone:** (609) 399-7628 **Location:** Music Pier, Moorlyn Terrace and Boardwalk, Ocean City

26-27 Native Indian Powwow & Western Festival See Native American and western crafters and artists, dance competitions, storytelling, music, living history shows, food, pony rides and hay rides. **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 370-5299 **Location:** Vasa Park, Wolfe Road, Budd Lake

27 Original Barnegat Bay Crab Race & Seafood Festival See crab races, entertainment, a flea market, crafts, "Little Miss Crabcake" and "Sir Prince Crab." **Hours:** Call for information **Fee:** Call for information **Phone:** (908) 349-0220 **Location:** Bay Boulevard, Seaside Heights

27 Trapunto Sewing Demonstration Witness this Victorian art of sewing. **Hours:** 1 to 4 p.m. **Fee:** Adults, \$4; seniors, \$3; children 6 to 16, \$2; children under 6, free **Phone:** (201) 326-7645 **Location:** Fosterfields Living Historical Farm, Kahdena Road, Morristown



Explorer

Hey, Explorer!

Your Wild Neighbors

Whether you live in a development, a town, a city or the country, you share your space with wild animals. You can learn more about wildlife by finding the different species that live around your home.

New Jersey is a unique place. Even though there are many people in our state, we also have many kinds of wildlife. At least 500 kinds of vertebrates (animals with backbones) live in New Jersey, and there are thousands of animal species in all if you consider insects and other small creatures. These animals are important to us for many reasons. They are important to the whole system of life — animals eat plants, animals die and decompose and become food for more plants. Some wild animals are good for people to eat, and some people use them to enhance their diets. Animals also enrich our quality of life. By learning about wildlife and having them in our company, we can become richer human beings.

Some animals live near you that you may never see. Flying squirrels and great horned owls, for example, are common in New Jersey, but are active only at night. Moles and salamanders usually live below the surface of the ground. Foxes are secretive. Some animals, such as deer, need a lot of space, but may visit your yard in their travels. Other animals, such as chipmunks, can spend their entire lives undetected in your neighborhood.

You already may be familiar with many kinds of wildlife. Robins, blue jays, cardinals and mockingbirds can be found throughout New Jersey and are readily visible during the day. Squirrels, too, are everywhere. Many animals, such as woodchucks, opossums and toads, are able to use a variety of habitats and can survive in some difficult situations, such as near developments or in cities.

All wild animals share a common need for food, water, shelter and living space. These elements of habitat must be in a suitable arrangement for each animal, and different species have different habitat needs. Ducks and geese need water, which they use as a source for food and shelter to avoid many predators. Robins can meet their needs in most any neighborhood — insects, worms and berries provide food, while shrubs and trees provide cover. Rabbits and squirrels often can be found in suburban areas where shrubby trees provide cover for rabbits and tall trees are a refuge for squirrels. All wild animals thrive best in neighborhoods where domestic cats or dogs are not allowed to prowl freely because these pets can become predators.

Unlike our pets, wild animals don't depend on people directly for food and water. Don't try to make a pet from a wild animal. But while wild animals don't need people to take care of them, they do need people to protect their habitat.

You are probably helping wildlife right now where you live without even

knowing it. Do you have trees or shrubs that produce berries? Do you have any woodpiles, rock walls or brushy areas? Are you feeding birds? You may have put up bird houses and other nesting structures. These are a few things you do that provide food and shelter.

You also can help wildlife by becoming aware of the species in your neighborhood and sharing your interest with others. Mourning doves, robins and house finches are common nesting birds. By protecting their nest sites from pets and people, you can help these common birds.

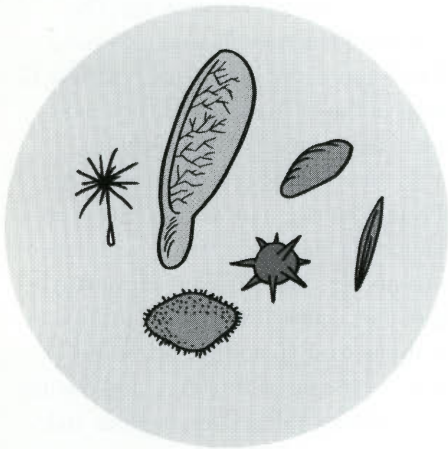
You don't need an elaborate plan to attract wildlife around your home. Just remember the basics of food, water, shelter and living space in a suitable arrangement. Learn about the native species you want to attract and be careful not to tempt undesirable critters, such as rats. Use native plants whenever you can. And don't forget that your surroundings will have a big effect on the types of animals you'll be able to see. If we all do a little bit where we live, it will add up to a lot for our wild neighbors.

To find out more about the species that make their home on the Jersey Shore, see the article entitled "Drifting Treasures of the Jersey Shore" on page 36.

by Mimi Dunne, a wildlife biologist with the Department of Environmental Protection's Division of Fish, Game and Wildlife

Discover Wildlife in Your Yard

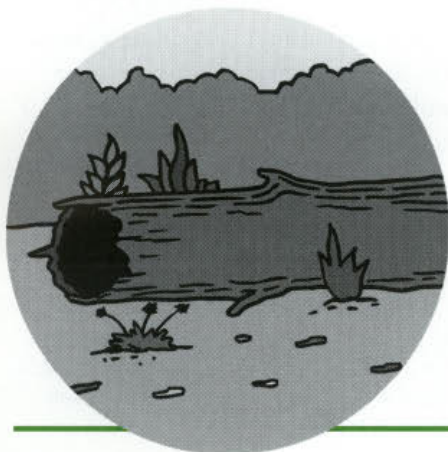
Here are a number of activities that you can try to discover the wildlife outside your home.



Seeds and Wildlife

It's fun to go to an outdoor area during any season to look for seeds. Many seeds are adapted to travel with animals and are dispersed to new locations by birds or four-legged creatures. Some seeds contained in fruits on plants around your home may be a source of food for robins and mockingbirds.

Find seeds that come in hard cases, are very fuzzy, can blow in the wind, have hooks or burrs in them, or can float. Also look for fruits that may contain seeds. How are these seeds adapted to help new plants begin?



The Music of Birds

Go outside in the early morning or evening and listen to the music of the birds. Bring a notebook and pencil. Once you hear a bird call, locate it with your eyes and watch as it calls. Write down the pattern of its song, where the bird was located and a description of the bird. Try to find a few different species, making the trip on different days and at different times.

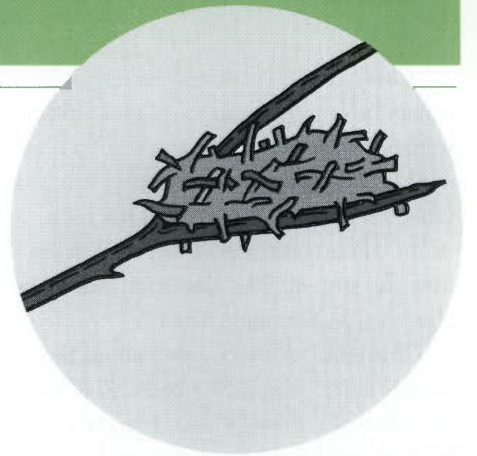
Birds use calls for a variety of reasons, including as a warning and to attract a mate. Can you guess the purpose of the bird's song by examining what is happening around you?



A New Log-In

Find a decaying log or root system and carefully explore it. Tap the log and listen — is it hollow or solid? Feel it — is the wood damp, dry, cold or rough? Is there anything living in the log? Under it?

Often salamanders live under decaying logs and feed on insects and pill bugs. Because this log could be a home for several species, make sure to put everything back when you are through exploring.



Build a Nest

Find a forked twig to serve as your nest site. Weave some string or yarn around the fork where it branches to form the base of the nest. Stick in some grass, straw, pieces of paper or other materials that a bird might find in the environment.



Tracking Wildlife

The next time you walk on bare soil or through grass, stop and see if you can find the tracks you've just made. Even through it may be difficult to see them, your footprints are usually there.

Many creatures leave behind signs or imprints in their travels — tracks, chewed nuts or twigs, bent grass and gnawed bark. Dirt roads are especially good places to find wildlife signs. Look for deer tracks, raccoon tracks or bird tracks.

Wildlife in New Jersey

The River Otter

"Otters are now so seldom seen, that it may be counted a piece of good luck to meet with one in the course of a day's ramble. I feel repaid for the exertion of a ten-mile tramp if one crosses my path, or if I catch a glimpse of one as it dives into the stream. The last otter that I saw alive was in February, 1874."

Charles C. Abbott wrote about the elusive otter in his 1885 book, *A Naturalist Rambles about Home*, about the time he spent afield in New Jersey and eastern Pennsylvania. More than 100 years later, the otter remains a wary animal, but it is once again abundant in New Jersey's rivers, streams and marshes.

The otter's comeback is due largely to the enactment and enforcement of New Jersey's Freshwater Wetlands Protection Act and Clean Water Act. As a result of these two laws, water quality in the state has improved greatly, making it possible for the river otter to reestablish itself in extensive sections of the state.

Otters are now recognized and managed as a valuable furbearing animal in New Jersey. A special permit and a license from the New Jersey Division of Fish, Game and Wildlife are needed to trap otters in this state and, in 1995, there was a limit of one otter during the season, which lasted from Jan. 15 to Feb. 11.

The river otter is a member of the *mustelid* family, the other well-known members which include weasels, skunks, minks, fishers and martens. The otter is the most water-loving of these species and can remain underwater for up to two minutes and swim up to seven miles per hour. Its sleek fur has an oily, short, under-fur mixed with long guard hairs, which trap air and insulate the otter from the cold water.

Streamlined for aquatic life, the otter's body is long and thick with short powerful legs. The feet are webbed and, most often, the otter swims by paddling with its hind feet. It has small ears, but

can hear extremely well. Its ears and nose close when submerged. The otter's long stiff whiskers, located under and behind its nose, helps it locate prey.

Because of its speed, an otter is capable of catching fast-moving prey, such as trout. However, it usually feeds on slow-moving fish, such as shiners, carp, suckers, bullheads, catfish, sunfish, perch and darters. An otter also will prey on spawning fish or those that are injured.

Although fish are the major part of the otter's diet, it fails to thrive on fish alone; crayfish and crustaceans also are important. In fact, its diet may include clams, snails, mussels, snakes, frogs, insects, muskrats, small birds, turtles, earthworms and some plants. The food, especially fish, is usually eaten on land.

Otters have few natural enemies and may live 10 to 15 years. If cornered, they are strong and ferocious fighters.

Otters become sexually mature at two years of age and breed in the spring following the birth of young. River otters display a phenomenon called delayed implantation. This means that once the eggs are fertilized and just begin to divide with 200-300 cells, the process stops, and the eggs remain free and dormant in the uterus until December or January. This extraordinary adaptation is shared with the other members of the *mustelid* family (except the least weasel) and bears.

Just before birth, the female retreats to a sheltered stream or pond to excavate a den under a rock pile or tree root. Or she may use an abandoned beaver, woodchuck or muskrat burrow.

Usually, the female gives birth to two to four pups. The newborns are blind, toothless and quite helpless. The pups stay in the den for the first two months of life. The mother otter teaches her pups how to swim by first carrying and pushing them into the water and then rescuing those that tire by allowing

them to climb on her back.

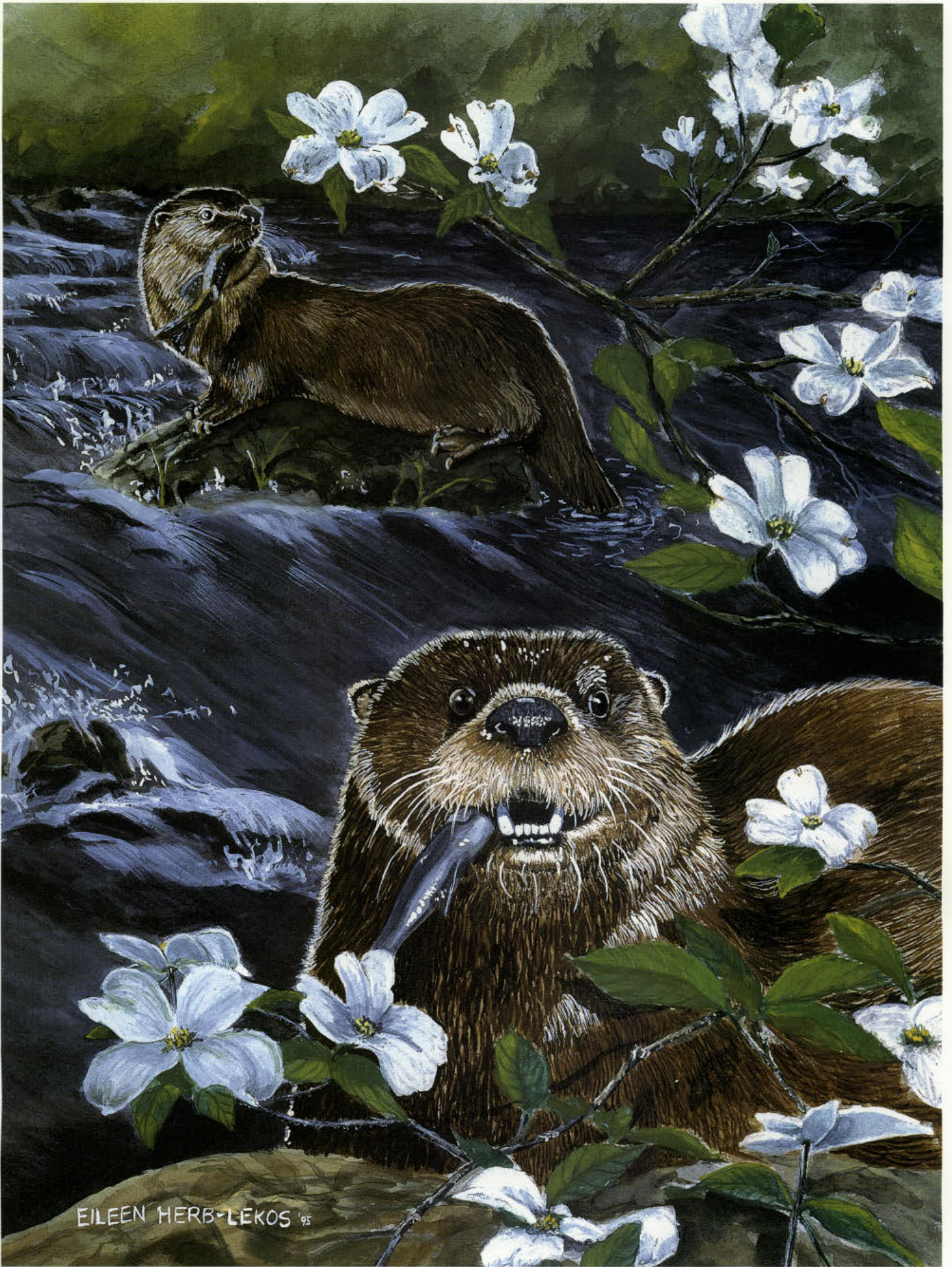
By three months of age, the young are able to travel well enough to leave the den. The young may remain with the mother until she gives birth to a new litter of pups the following spring. The year-old otters may disperse a considerable distance, but most remain within 20 miles of the birth area. Male otters do not assist in raising their offspring.

In New Jersey, coastal marshes throughout the state provide the best habitat for the river otter. In upland environments, they prefer streams with a fairly fast water flow that do not freeze to the bottom in winter. There also must be good cover for dens and resting sites. Shrubs, tall grasses, logjams and tree root cavities are all important components of otter habitat.

The river otter is at the top of the food chain in its watery world. This means that any pollutants, such as pesticides, heavy metals and chlorinated hydrocarbons, accumulate in their bodies. Therefore, they are very sensitive to negative changes in their environment and avoid areas that are polluted, heavily developed or highly disturbed.

Charles C. Abbott would be pleased to know that the disappearing otter of the 1870s has made a strong comeback in New Jersey. Otters serve as an indicator of the overall health of our water resources and represent the well-being of New Jersey's wildlife. As long as there is public support for maintaining a clean, healthy environment, the river otter will remain an important component of aquatic communities.

by Patty McConnell, a principal wildlife biologist with the Division of Fish, Game and Wildlife, with Paul Tarlowe, a wildlife education specialist with the division



WATERCOLOR AND GOUACHE BY EILEEN HERB-LEKOS

EILEEN HERB-LEKOS '95



A lion at the Cape May County Zoo is one of many species from around the world that is getting a boost in New Jersey. See how zoos throughout the state are helping to preserve species not only at home, but around the globe, in the fall issue of *New Jersey Outdoors*.

Coming Soon

Ride the Rails through History
Discover New Jersey's Zoos
The Garden State: An Ecotourism Destination
Bowhunting for the Whitetail
The Origins of New Jersey's Nicknames