November/December 1984
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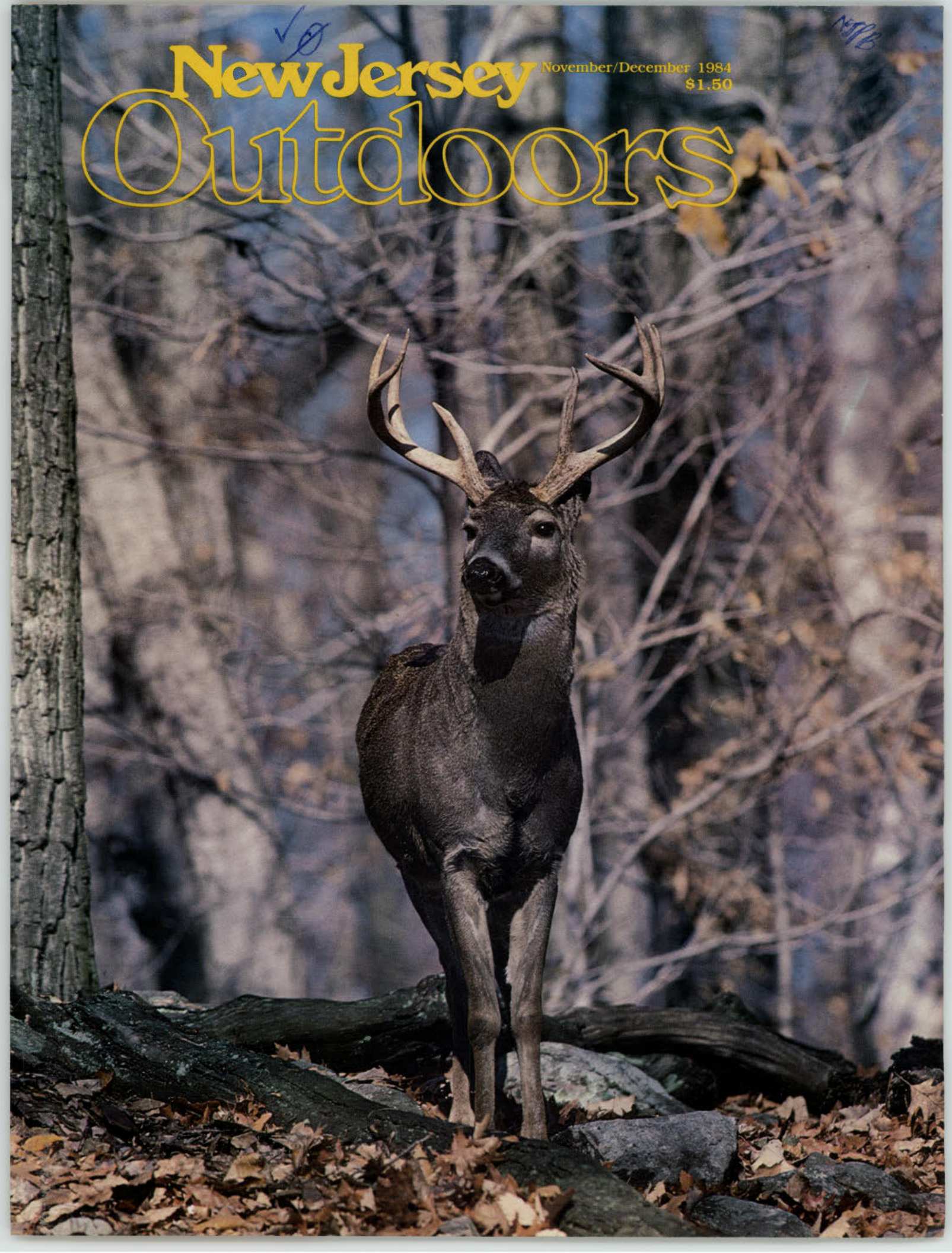
# New Jersey Outdoors



Vol. 11 No. 6 • November/December 1984

# New Jersey Outdoors



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*NEW JERSEY OUTDOORS CREDO*
*This publication is dedicated to the wise management and conservation of our natural resources and to the fostering of greater appreciation of the outdoors. The purpose of this publication is to promote proper use and appreciation of our natural, cultural, and recreational resources, and to provide information that will help protect and improve the environment of New Jersey.*

*(Note: Costs of publishing the magazine not covered by subscriptions are met from general revenues available to the Department of Environmental Protection.)*

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

# FROM THE EDITOR

## *Happy Holidays!!*

This issue, because we print bi-monthly, serves as our holiday issue. As such, we've included two Christmas articles. One, titled *Yuletide at Steuben House*, discusses the celebrations to be held at this state historic site. The second, titled *The Christmas Tree Custom*, traces the decorating of trees back to the Middle Ages. So it seems this custom has been around awhile.

Which reminds me that I've also been around awhile. This issue, the 66th published during my editorship, marks the completion of 11 years on this job.

Again I wish you all a happy holiday season. And again I remind you to give a gift of *New Jersey Outdoors* magazine, because it's a gift that will last a year, or two, or three years. And throughout the life of the gift subscription, you will be remembered with the arrival of each issue.

# IN THIS ISSUE

The author of *Yuletide at Steuben House* is Kevin Wright, the curator at Steuben House.

The author of the *Christmas Tree Custom* is Susan J. Barry, a free lance writer, specializing in outdoors and environmental topics.

The lead story in this issue, *The Civilian Conservation Corps: A Legacy of Contribution* was written by Cathie Cush, a frequent contributor to our publication. This mid-1930's program not only provided meaningful employment for the youth of that era, but also introduced and taught them the meaning of conservation of our natural resources. Many of the facilities and structures built by the CCC are still standing and in use in our state parks.

Old time hunter Henry Schaeffer tells us how it was in the article titled, *Pheasant Hunting—then, and now.*

In the article titled, *A Walk Along the Hudson Riverwalk*, author Barbara Kauffman discusses the plans for the Hudson River Walkway. Ms. Kauffman is employed in DEP's Coastal Resources Division.

In the article titled, *I Didn't Know We Had those Here*, photographer/writer Paul Ayick discusses the wildlife and the habitats in the flood basin of the Passaic River.

The article titled, *Island Beach State Park Management Plan* by Carolyn Bevis has to do with the "preservation strategies for the 3.3 mile stretch that forms the 700-acre Island Beach Northern Natural Area. Ms. Bevis is a free lance writer/editor from Long Beach Island.

Explore and enjoy *The Trails of Great Swamp* in any season. According to the author, R.J. Johnson, there are six trails which provide more than eight miles of comfortable walking. Mr. Johnson has been published in *Mechanix Illustrated, Bird Watcher's Digest, American Forests*, and *Audubon* magazines.

Are the Pine Barrens becoming more acid? Read the article, *Acid Rain in New Jersey*, by David Iams. Mr. Iams is a reporter/writer for *The Philadelphia Inquirer.*

*Why Muzzleloaders Don't Go Off* is a misfire problem that happens to many black powder hunters. This article discusses some procedures and preventive maintenance which may help you avoid these misfires. The article was written by Pete McLain, Deputy Director of DEP's Division of Fish, Game and Wildlife.

"Lead is on insidious poison," writes author Dr. Douglas E. Roscoe, in the article titled, *A Missed Shot Can Still Kill.* Dr. Roscoe, a wildlife pathologist with the Division of Fish, Game and Wildlife, discusses some major studies and other research data which made it necessary for the Division to recommend a statewide ban on the use of lead shot for waterfowl hunting by 1986.

Frequent contributor Thomas Dale Pagliaroli writes about hunting *Junkyard Bunnies.* Hunting in a junkyard sounds like an unlikely place to find rabbits, but I can't argue with success.

A new author, Thomas Farner, gives us something to do during the cold winter months ahead. Make your own *Pinelands Maple Syrup.*

*Saltwater Fishing Along the Jersey Shore* by Brion Babbitt discusses some specialized fall fishing such as jetty fishing, surf fishing, and inlet fishing.

Non-game biologist Jo Ann Frier-Murza writes about *Bald Eagle Restoration in New Jersey.* Funds received from income tax check off have provided much-needed funds for this program. Please continue to check off for Wildlife on Line 37B of your N.J. Income Tax Form.

The Wildlife in New Jersey species is the *American Eel.* The article was written by wildlife biologist Dave Chanda and illustrated by Carol Decker. Ms. Decker also provided the cover illustration and some two dozen field sketches of birds for a book titled, *Wood Notes*, written by Richard Wood and published by Prentice-Hall, Inc.

On page 32 of the September/October 1984 issue, author Chip Deffaa in the article titled, *The Nation's Largest Environmentally Center is in New Jersey*, wrote that Alton Partridge had passed away. The author said there was some misunderstanding during the interview process, and D. Alton Partridge is alive and living in Utah.

Steve Perrone

1.

# The Civilian Conservation Corps: A LEGACY OF CONTRIBUTION

*"Our program is twofold: conservation of our natural resources., and conservation of our human resources. Both are sound investments for the future of our country."*

*—Franklin Delano Roosevelt, 1933*

BY CATHIE CUSH
PHOTOS PROVIDED BY
DIVISION OF PARKS AND FORESTRY

Nature has blessed New Jersey with an abundance of natural resources. From the northern mountains to the southern Pinelands, residents and visitors alike enjoy thousands upon thousands of acres of open lands.

But Nature can't take all the credit for these popular recreational facilities. She can work wonders in the wilderness, but when it comes to making those wild areas accessible to the public, Nature needs a hand.

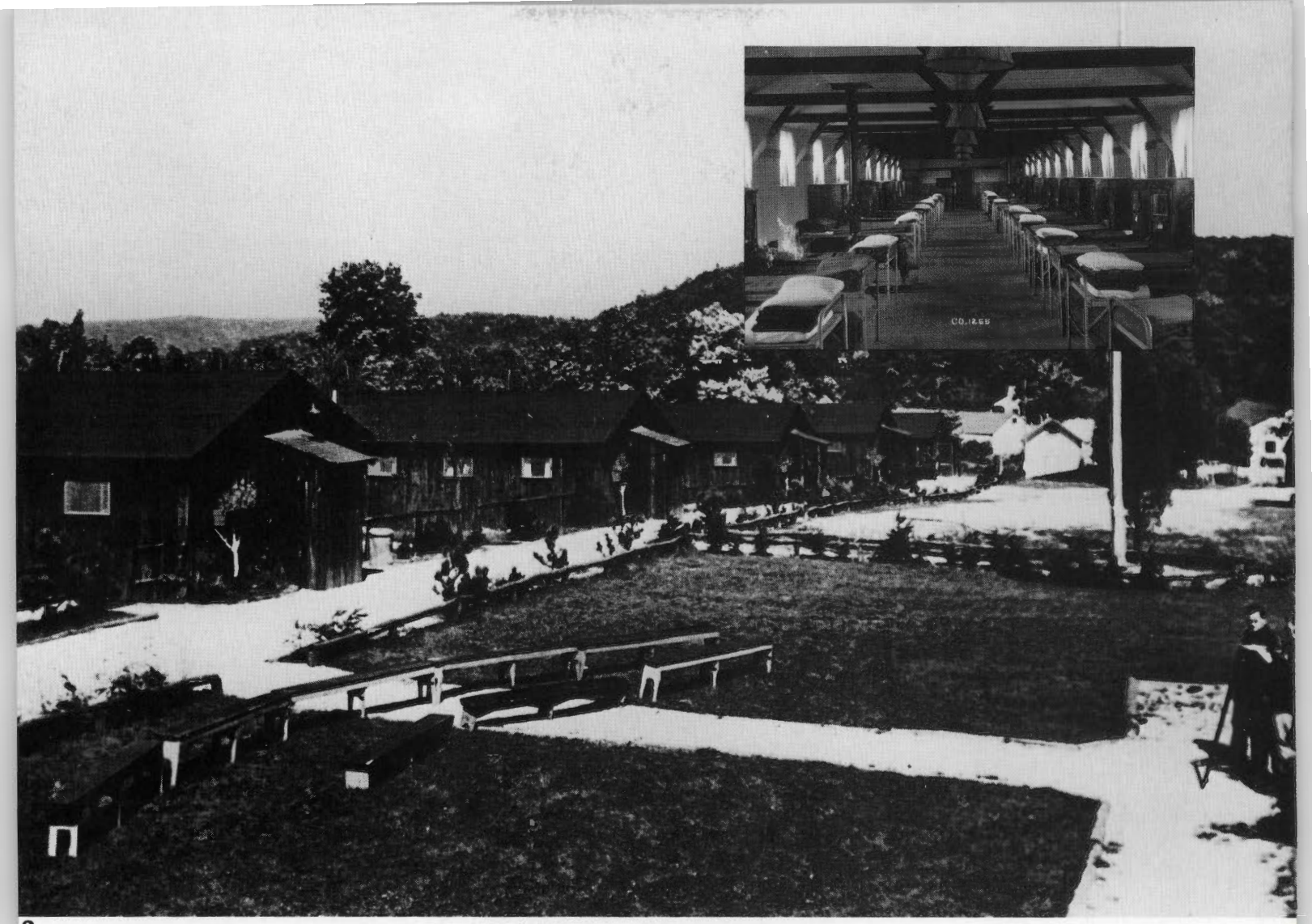
A federal program that came into being during the Depression Era not only helped bring the country's natural resources closer to the people (and vice versa), but created jobs for hundreds of thousands of youths. The Civilian Conservation Corps left a legacy that won't soon be forgotten.

From the mid-1930's until the early '40s, when World War II took young men from the forests and put them on the battlefields of Europe, the Civilian Conservation Corps developed and maintained recreational facilities at state and national parks throughout the United States. In New Jersey and elsewhere, many of the cabins they built and the paths they cleared are still in use today.

The early '30s were a time of hopelessness and despair. Some 15 million jobless, among them millions of teenagers, searched for work that simply did not exist in the wake of the financial disaster that paralyzed the country. The land itself seemed to suffer, as droughts destroyed crops and winds took away precious topsoil. Only 100 million acres of the nation's original billion acres of forest remained.

Officially born on March 31, 1933, during the famous Hundred Days of Franklin Delano Roosevelt's "New Deal" administration, the Civilian Conservation Corps was one of several agencies created to help put the country back on its feet. Within 90 days of the CCC's establishment, a total of 274,375 enrollees were in Corps camps. By the end of the year, there were more than 1,500 camps in full operation, and by 1935 there were 2,600 camps and 500,000 enrollees—more than half of which were involved in forestry work.

The CCC was an unusual cooperative effort between several federal departments: Labor, Army, Agriculture, Interior and others. Although the Army ran the camps with reserve and regular officers, a civilian director, Robert Fechner, reported to the Department of Labor, and coordinated CCC efforts with those departments that required Corps services.



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The CCC was open to unmarried males in good physical condition between the ages of 17 and 24 from needy families. Would-be members applied through state welfare offices, and were selected on a quota basis according to need. There was no racial discrimination. In fact, the all black camp S-52 at the abandoned glassworks in Lebanon State Forest boasted the first black supervisor of a CCC camp—Andrew W. Byron.

Members were paid $30 a month (group leaders and assistants earned $36 to $45), and $22 to $25 was deducted and sent directly to the member's home. Housing, food, clothing and medical care were provided. Housing, in most cases, consisted of tents. Pre-fab barracks were used extensively after 1936.

Corpsmen worked on thousands of projects involving more that 300 types of labor. They treated 30 million acres of forest for Dutch Elm disease, and had planted 1,500 million trees by 1937. In two years they built 3,500,000 check dams to control erosion. The CCC built a dam on the Winooski River in Vermont, and established a protective habitat for trumpeter swans in Yellowstone National Park. They did archaeological work in Jamestown, Va. They stocked streams. They taught farmers contour planting and other erosion control techniques. They built irrigation and drainage ditches, reservoirs, greenhouses and more.

"I learned how to handle dynamite," recalls Robert E. O'Connell, a CCC alumnus now living in West Orange. He spent a year with Company 286, first at New Centerville, Idaho, then at Muscle Shoals, Ala. "The first time I saw dynamite I took a run. We used to blow stumps out of the right of way for fire trails. We built 36 miles of roads in four months through virgin timber—that's bridges and all."

National and state parks reaped huge benefits from the Corp's labor. The list of CCC projects throughout the Garden State is impressive, to say the least, and even more so if examined in the light of what the same work would cost today.

Two camps were stationed at Lebanon State Forest. In addition to the 60 miles of roads they developed and maintained, the Corps developed Pakim Ponds and the facilities there, including two shelters and three cabins, which are still in use, and two bathhouses, which are no longer standing. Butler Place Picnic Area, completed in 1936, is still in use as a group camping area.

At Lebanon, the CCC planted more than 3 million seedlings on over 12,000 acres.

"The trees which they planted are harvested for use by the forest today," notes Park Superintendent Christian Bethmann, "providing lumber for signs and repair of structures."

Camp S-80, Company 242, was located at Bellplain State Forest from June 24, 1937, until Aug. 31, 1941, under the leadeship of Superintendent A.S. Truman.

"Forest stand improvement activity, such as clearing, restocking, thinning, release projects and experimental plots, was the main thrust of the CCC

*1. A CCC Camp photograph of a dump truck stuck in a log-covered bog at Belleplain State Forest*

*2. CCC Camp 5-57 at Stokes State Forest*

*3. CCC Company 1266 barracks at Stokes State Forest*

operation, "relates Belleplain Superintendent Thomas Keck, Jr. "Over 15,991 trees of various species were planted. Our records indicate that 51,844 man-days were spent on these projects alone!

"Among the accomplishments of the camp, perhaps none were as important to the initial development of the recreation area as the creation of Meisle Lake, later renamed Lake Nummy," Keck notes. Originally a declining cranberry bog owned by Robert Meisle, the 28-acre area was cleared and dug by hand. A steam engine-driven shovel wasn't brought in until the final days of the project.

Today's visitors to Belleplain can see CCC handiwork in roads, vehicle bridges at Sunset Road and Beaver Crossway, in foot bridges, in the shelter at the main picnic area and in the park office, which may originally have been a dwelling.

Enrollees at Camp 1280, commonly known as Camp Kuser, developed Steenykill and Monument trails, constructed Ridge Roads, Sawmill Lake shelter and Steenykill Dam, and reconstructed Sawmill Road and Sawmill Dam. These facilities, with the exception of the Sawmill Lake shelter, are still in use today at High Point State Park. Concrete slabs are all that remain of the camp's temporary shelters.

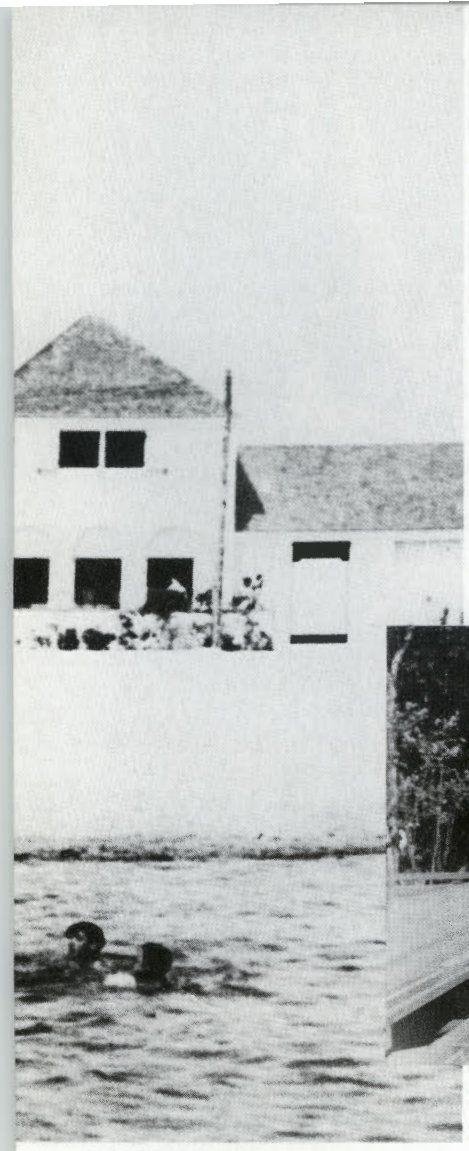
Most of Parvin State Park owes its existence to the CCC. Although the barracks and compound along 540 have been removed, facilities built by Company 1225 still in use today include Thundergust Lake and picnic area, Second Landing and Island Point picnic areas, the office complex, boat house and nature center, all roads inside the park as well as 10 miles of hiking trails, campsites at Jaggers Point, and a series of cabins.

These cabins were built at several of New Jersey's (and other state's) parks to be used as public rental facilities, and they are still popular. Most of the cabins have hot and cold running water and electricity, which is included in the rental fee, as well as a fireplace in the living room and a screened-in porch. Most accommodate six to eight people, although a few are larger and some are smaller. Rates run from $20 to $55 per night.

For summer stays, the state Division of Parks accepts reservations in January and February from New Jersey residents only. Non-resident applications are reviewed in March. The Division's Loretta Malloy reports that reservations should be in early, because many of the best cabins are already spoken for by the end of January.

From June 15 through Labor Day, cabins must be rented for one- or two-week periods. In spring and fall they may be rented for a two-day minimum.

Also available at some state parks are CCC-built shelters. Although they lack the comforts of home that the cabins offer, like electricity and water, they do offer woodburning stoves, and outdoor fireplace, bunks with mattresses, brooms, dust pans and sanitary and refuse disposal facilities. Occupants must bring bedding, cooking utensils, lanterns and



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*1. Parvin Grove Bathhouse—an early 1940's scene. It was built by the CCC and it looks much the same today.*

*2. A September 1935 photo of CCC'ers building dam for Thundergust Lake at Parvin.*

*3. Spring Cabin at High Point State Park constructed by CCC and still in use.*

dining ware. Most sleep six and rent for about $15 a night.

The handiwork of the CCC is as popular now as it was when the Corps was active. Although funding for the CCC and its projects was cut in 1942, after the United States got involved in World War II, there are many who would like to see the program, or something similar, in action today.

A handful of bills at different stages in the legislative process, on both the state and the federal level, would put young, unemployed, underpriviledged people to work on conservation-related projects. H.R. 999, the American Conservation Corps Act of 1983, passed the House and awaits Senate action. In New Jersey, bills introduced early in 1984 in both the Senate and Assembly would establish a New Jersey Conservation Corps within the Department of Environmental Protection. One bill purposes $1 million in appropriations to establish and administer the program, with further funding to come from, among other sources, the aforementioned American Conservation Corps Act.

A similar program on the West Coast, the California Conservation Corps, seems to be successful. Twenty-six camps have been established there since 1976.

"It's something that should be done again. No doubt about it," observes O'Connell, who is vice-president of Chapter 8 of the National Association of Civilian Conservation Corps Alumni. "As far as I'm concerned, there's no better education."

Chapter President John Moscinski, Little Falls, agrees. "If you ask almost any alumnus," he says, "you'll get the same phrase: 'The best years of my life.' It built the body, it built the mind and it gave a sense of responsibility."

NACCCA's main purpose is to do whatever possible to re-institute the CCC program. In the meantime, the New Jersey group has, among other activities, begun teaching young people solar energy for domestic use at a former CCC camp in West Milford.

Another alumni group, the Brotherhood of XCCCers, headquartered in Elmwood Park, has worked to establish a CCC museum at Fort Dix, and was instrumental in having a CCC commemmorative stamp issued during the Corp's golden anniversary in 1983. The XCCCers are also active in helping preserve existing CCC-built structures. According to the Department of the Interior, 44 such buildings on National Park lands have been named to the National Register.

In 1934 President Roosevelt told the National Emergency Council, "The CCC camp activity has probably been the most successful of anything we have done. There is not a word of complaint—rap on wood."

And it seems the program was a success. It was not only beneficial for the 2.5 million young men who joined "Roosevelt's Tree Army," but for all those since who have enjoyed the state's—indeed, the nation's—natural resources.

*18th Century Musical Performance*

# yuletide at the steuben house

By Kevin Wright
Photos Provided By
The Bureau of Parks

Yule-tide at the Steuben House begins on December 6, the Feast of Saint Nicholas, with the traditional carrying in of the greens. The halls are decked with a variety of floral ornaments reflecting ancient customs surrounding the winter solstice. Around the fourth century A.D., many traditions associated with the Rebirth of the Unconquered Sun were reinterpreted through Christian allegory and festivities came to honor the nativity of Christ as the Light of the World.

According to old English tradition, a kissing bough is hung in the keeping room. A globe fashioned from holly, ivy and evergreens is hung with apples and lit by candles. In its center is a sprig of mistletoe. Mistletoe was considered an all-healing plant by the ancient Druids. It healed not only physical ailments but also resolved emnity between people, and thus the practice of kissing beneath it was established. The kissing bough represents the universe, the apples being the heavenly bodies and the candles being the celestial lights. This ornament celebrates the reinvigoration of the warmth and light of the sun.

As feed for Saint Nicholas' horse, a sheaf of wheat is hung on the door and wooden clogs are filled with carrots and straw. St. Nick bears an uncanny resemblence to the Germanic deity, Wodin, whose omniscience depended on his humble practice of riding across the earth on a white steed or of wandering on foot with staff in hand. A wreath is decorated with three oranges in commemoration of the three bags of gold which the Christian saint provided secretly as dowries for the three daughters of an impoverished nobleman. One of these bags, tossed through a window, was said to have landed in a stocking hung by the fireplace today. Saint Nicholas, whose name was shortened over the ages to Sant Claas, was the patron saint of Holland and of New Amsterdam.

The winter solstice was an astronomical turning point which promised the return of spring and the renewel of life. The yule log is a survival of the ancient habit of lighting bonfires to encourage the awakening sun. Evergreens and especially holly and ivy, whose only visible fruits are born in winter, are used extensively in the decorations as they symbolize the fertility of Nature in a world beset by winter. For this same reason, a small tree is hung with fruits and nuts. A rosemary bush is ornamented with scented herbal balls and ribbons. Rosemary, the herb of remembrace, was said to aid the memory. Its inclusion signifies that the solstice was the start of a New Year.

Steuben House will also feature displays of artifacts which trace the evolution of Christmas and New Year's Day as American holidays. Featured this year will be: two New Year's greetings, the oldest (1783) handwritten in Jersey Dutch, and the second in English dating back to 1826; an original copy of "The Night Before Christmas" illustrated by Thomas Nast in 1881; newspapers and magazines illustrating the keeping of Christmas from the Civil War to the end of the nineteenth century; antique ornaments and Christmas' postcards; a letter from

## PARKS '84 HAPPENINGS FOR THE HOLIDAYS

### NOVEMBER

| | |
|---|---|
| 1-30 | Christmas at the General Store (except Mondays)<br>Allaire State Park, Farmingdale<br>201-938-2371 |
| 4-25 | Fourth Annual Quilt Show<br>Rockingham, Rocky Hill<br>609-921-8835 |

### DECEMBER

| | |
|---|---|
| 1-16 | Christmas at the General Store (except Mondays)<br>Allaire State Park, Farmingdale<br>201-938-2371 |
| | Candle Light Tour (Call for date)<br>Rockingham, Rocky Hill<br>609-921-8835 |
| 1, 2, 5, 8, 9 | Victorian Christmas (admission charge)<br>Ringwood Manor, Ringwood State Park<br>201-962-7031 |
| 2 | Port Mercer Canal House Open House |
| 8 | Blackwell's Mill Canal House Open House<br>Delaware and Raritan Canal State Park<br>201-873-3050 |
| 9, 15, 16 | Christmas by Candlelight<br>Wallace House, Somerville<br>201-725-1015 |
| 25 | Re-enactment of Washington Crossing the Delaware<br>Washington Crossing State Park, Titusville<br>609-737-0623 |

Santa Claus to a child in Bergenfield dated 1923: a rare turn-of-the-century printed Christmas' stocking; and G.I. V-Mail Christmas' greeting sent from the Pacific during the Second World War. A tree decorated with cut paper ornaments based upon instructions in an 1878 *Harper's Bazaar* magazine will also be shown.

The Steuben House, decorated for the holidays, will be open to the public during normal visiting hours from December 5 to the end of the month. Candlelight tours will be held on the evenings of Saturday, December 15, and Sunday, December 16, between 7:00 and 9:30 PM. The candlelite tours feature 18th century musical performances by a quartet featuring Linda Russell. Holiday jigs and carols are played on the harp, violin, guitar, mountain and hammered dulcimers. Attendance is by reservation only (201-487-1739).

### A Gift Fit For a Baron

Most Americans remember the Baron Von Steuben from their grammer school lessons as the Prussian Drillmaster who trained the ragged Continentals in the snows at Valley Forge. For almost a century, many Jerseymen have pondered his association with a beautiful old sandstone mansion on the banks of the Hackensack. Many are suprised to learn that this twelve-room house with its seven fireplaces was one of the most remarkable Christmas gifts in American history.

Steuben House was once the prized possession of


Jan Zabriskie, a leading merchant of Bergen County, who operated a tide mill and river landing here at the Hackensack New Bridge. During the Revolution, his domain was confiscated by the State of New Jersey under the provisions of an act which penalized "fugitives and offenders" guilty of giving assistance to or of taking refuge with the enemy in Manhatten.

On December 23, 1783, the State Legislature offered the Inspector-General the use of the Zabriskie estate in compensation for his services to the Revolutionary cause. It has been said that General Steuben declined to live here because he did not have the heart to dispossess the Zabriskies. More likely, the long war had rendered the house uninhabitable. On numerous occasions, it served as a fort to defend the strategic New Bridge and as a military headquarters.

Apparently, Jan Zabriskie rented the property from Steuben for on July 4, 1785, he entertained the Prussian General and his entourage at the house. Many leading citizens of Hackensack attended. The guest of honor, unawares, paid for his own entertainment as Zabriskie's servants charged provisions for the party obtained from the New Bridge Inn to the General's account.

In 1788, the Legislature invested Steuben with full right and title to the estate. The renovated mansion and grounds were then sold back to Jan Zabriskie, son of the Loyalist, for the handsome sum of 1200 pounds.

*Henry Schaefer (left) and Don Lordi of Wall Township and their two Brittany spaniels with four cock pheasants bagged on open land in Monmouth County.*

# Pheasant hunting then, and now

By Henry Schaefer
Photos Provided by Author

Garden State Parkway mile marker 150 above Bloomfield seems an unlikely spot to be on the opening day of small game season. But back in 1930 the right of way was the Morris Canal, and on both sides were the swampy woodlands and farms of what was then largely rural Essex County.

Hunting in the swamp alongside the canal on that Nov. 10th. was a 20-year-old former Newark boy whose life's ambition was to get just one cock pheasant. He had seen many during the three years he lived on the outskirts of Nutley, but had never fired at one.

This day it would be different. From a thicket a big, brilliantly colored bird thundered into the air, screeching the alarm that cocks always sound at takeoff. When the shotgun fired, the bird collapsed, falling back into the swamp.

The ringneck pheasant was always plentiful in Hunterdon, Somerset, Mercer and western Monmouth counties in numbers people today find hard to believe. During the early 1930's it was usual to flush 25 to 50 pheasants a day during the open season.

Pheasants, native to Asia, were brought to first Italy and eventually to the British Isles by the early Romans. They didn't reach the United States until the last century. The first open season on record was in Oregon in 1892. In New Jersey, the first pheasants were brought, reared and stocked on the former Peter Stuyvesant Estate at Allamuchy, Warren County, about that time.

It is believed that birds escaped from there, spreading throughout all the northern and central New Jersey counties. The wild birds were at their peak of abundance before World War II.

The Stuyvesant Estate, now Allamuchy State Park, was a private preserve where only the family and invited guests could hunt. But during the 1930's the first two commercial shooting preserves appeared—one in Chester and another outside Green Village, now the Great Swamp National Wildlife Refuge.

At about the same time, the New Jersey Board of Fish and Game Commissioners acquired several tracts to be used as "public shooting grounds." These lands were the first three of the state's current 61 Wildlife Management Areas.

Walpack Tract and Hainesville, both in Sussex County, were and are relatively small. A third, Clinton, was a huge preserve, including most of what is now Spruce Run Reservoir, in addition to the present 1,082 acres of fields and woodland.

On opening day it seemed as if at least 10% of the state's estimated 70,000 hunters were there. Total state license sales in 1934 were 150,237, but the license covered fishing as well as hunting, so nobody was certain how many hunted, fished, or did both.

The resident hunting and fishing license cost $1.65 and both males and females above the age of 14 had to have one to hunt. However, resident females did not require a license to fish.

In addition to a big annual crop of cottontails and wild pheasants at Clinton, the tract was always heavily stocked before opening day with state farm-reared pheasants. And with 700 or more men afield and game very plentiful, the morning of opening day

always sounded like a small-arms war.

Shooting started at first light. Hen pheasants could not be distinguished from young cocks in the semi-darkness, but if the bird screeched an alarm the hunter knew it was a legal target. With the aid of a good springer spaniel, it was easy to flush out two cock pheasants within 15 minutes.

Nobody ever shot rockets by the dawn's early light in the early days at Clinton, but the muzzle flashes from hundreds of shotguns provided a reasonable facsimile. Miraculously, accidents were few, but there always seemed to be a waiting ambulance parked off the main and only road, just a dirt lane in those days.

The commercial preserve at Chester was on land bordering the Black River, on a huge estate. The owner, an Austrian nobleman, brought William Cowie from Scotland to propagate pheasants and manage the shooting.

Cowie raised pheasants as they had been raised since the days of the Roman legions, utilizing broody chicken hens to incubate the eggs. As far as I know, captive pheasant hens never incubated their eggs, but dropped them all over the pens. The job of collecting the eggs and placing them under chickens was left to the game breeder.

Each spring, during laying season, Cowie would scour the countryside in search of bröody hens to produce his pheasants. The Forked River State Game Farm also used domestic hens, but by 1937 had established a large brooder house, and all production there was being done with incubators and brooders run by electricity.

Artificial incubation and brooding greatly increased production and lowered costs, but the birds lost their ability to reproduce in the wild.

The foster mother hens had taught the chicks how to scratch for food and catch insects, to freeze at the appearance of a hawk, in short, how to survive. The artificially reared birds simply couldn't make it.

Today, incubating and brooding with domestic chickens isn't feasible. Few chickens become broody any longer. The instinct seems to have been bred out of them under current production methods.

If the last of the state's waning wild pheasants should disappear, a viable population could never be re-established without the release of wild stock from elsewhere.

However, as plentiful as wild pheasants used to be, hunting today is actually better for many people. In the so-called good old days, the bulk of the annual harvest of legal cocks was achieved on the first day of the season. Saturday and Thanksgiving Day hunters might get as many as 10 birds a season, if they were lucky and had good dogs.

Wild cocks, the legal birds, had an uncanny ability to vanish after opening day, not reappearing in the fields until after the season was over. In New Jersey the season ran only from November 10 through December 15.

Through the winter you could see lots of pheasants walking about on the snowy fields, including a generous percentage of cocks that knew people would no longer be shooting at them.

Sportsmen learned a long time ago that for continued good hunting they would have to rely on game farm birds stocked through the season. There is good pheasant hunting on many of the state's 61 Wildlife Management Areas, huge tracts of excellent habitat that are now in the public domain for all people to enjoy throughout the year.

*Fully protected for many years, hen pheasants are now legal game on wildlife management tracts and some counties.*

*A state worker releasing cock pheasants on private land open to hunting in Monmouth County where males only are legal.*

# How did it all begin?

# THE CHRISTMAS TREE CUSTOM

R. SHEAY

Each year a particular subject graces hundreds of Christmas cards and reigns as a favorite study for nostalgia painters like Grandma Moses and Norman Rockwell. The scene depicts a solitary, snow-covered figure joyfully returning home from the forest, dragging a beautiful, bushy evergreen. Were the scenario to be further developed, subsequent scenes would show our hunter erecting the tree in his house and participating with his family in the festive ritual of decorating its boughs with baubles and trinkets and multi-colored lights.

Hunting the tree has always been a treasured custom in this country, but one that can hardly be called typical or even possible anymore in a state as populous as New Jersey. For one thing, there just aren't enough native evergreens for thirty million or so households each year. And for another, most of the remaining natural Christmas trees are growing on private land.

The holiday season always brings a few horror stories of stolen blue spruces from front lawns or cedar windbreaks denuded overnight. But George Pierson, Chief of the State's forest management program, warns that tough laws make it a criminal offense to cut down a tree without the owner's permission. To prevent Christmas tree poachers from removing trees on state property, the New Jersey Division of Parks and Forestry has been forced to spray evergreens with deer repellent chemicals which give off a noxious odor if the tree is brought indoors. Some private property owners have borrowed the practice as well.

Not everyone wants a natural tree and some even prefer permanent trees of plastic or aluminum,

CHRIS GRALD

SUSAN J. BARRY

although there is still a large segment of the holiday-loving public which cannot imagine Christmas without the smell of real piney boughs. New Jersey farmers, responding to the large seasonal demand, have gone into Christmas tree farming in a big way. There are over 400 Christmas tree growers in the state, and officials estimate that 100,000 to 200,000 trees are sold in a typical year. Native evergreens like the white pine and Norway spruce are popular choices, but other exotics grow well here: white spruce, blue spruce, Austrian pine, Scotch pine and Douglas-fir. Some farmers even allow customers to choose and cut their own trees.

Growing Christmas trees is certainly much more than a seasonal occupation. A pine or spruce must grow for two to four years before it is even large enough as a seedling to be planted in a field. Then an additional eight to ten years (and in the case of some spruces and firs, 12 years) are required for growing a six-foot tree. Spraying for insects and shearing operations to encourage a bushy appearance and symmetry are annual practices undertaken once a seedling reaches a height of 18 inches.

The fact that Christmas trees have become such a profitable crop in New Jersey indicates unquestionably that the tree as a symbol of Christmas is still the central focus of traditional holiday decorating. Just how did the evergreen become so popular? Here fact and legend are intertwined.

As far back as the Middle Ages one finds no special mention of Christmas trees, although the custom of decorating trees was practiced on many holy days throughout the year. The specific connection between Christmas and evergreen trees may have occurred in Bavaria around that time. Among practicing Christians, it was a widely held belief that Adam and Eve had their birthday on December 24th. To mark that occasion, pageants called mystery plays were presented throughout the towns and villages, depicting specific religious "events": the Creation, Adam's temptation by Eve (and Eve's temptation by the serpent), their expulsion from the Garden of Eden (Paradise), and the foretelling of the coming of a savior or christ.

The central focus for the plays was a Tree of Paradise, usually a small fir tree hung with apples to represent the storied tree with the forbidden fruit. Revelers paraded the fir tree through the streets to drum up audiences for their plays, subsequently placing it in the center of the stage and surrounding it with candles. When the miracle plays were outlawed by the church in the 15th century, the ritual tree moved inside where families celebrated privately. In many houses, the Tree of Paradise was often just suggested by bundles of evergreens hung from the ceiling. Not only was the evergreen valued as a symbol of fertility, but draping the rafters of one's house with the tops of evergreen trees could insure good luck and protect one against the devil for an entire year.

During the same period in another part of Germany, Moravians built wooden pyramids made of sticks and branches, on which they hung various baubles and decorations. Christmas tree "yards" were common among this sect's believers, and many Moravians later in this country continued the practice of creating miniature outdoor landscapes of different varieties to act as a backdrop for their nativity scenes. New figures and structures were added each year, but the tree was always prominently displayed.

Germany's Martin Luther actually is credited with popularizing the custom of the lighted tree in the 1600s. According to fond legend, he was walking home through the woods on Christmas Eve, when he came upon a beautiful fir tree silhouetted against the black sky, the brilliant winter stars twinkling among its branches. Upon reaching his house, he was unable to adequately describe the wonder of that particular sight to his family. Suddenly, he had a inspiration and rushed from the room out into the night, returning moments later with a tiny three-foot high fir tree which he placed in the center of the table. He then dispatched the children to find all the candles in the house, which he settled among the branches of the miniature fir. When he lit the candles, the children were enchanted, and it was not long after that every house on the Luthers' block had a candlelit Christmas tree.

Prevailing opinion seems generally to attribute the traditional trimming of the tree to the citizens of the town of Strasbourg, Germany in 1603. A description of holiday (holy day) customs written at the time contains mention of small evergreen trees placed on tables and decorated with paper roses, apples and painted communion wafers or "hosts". Eventually, the hosts were replaced with cookies made of two kinds of dough: brown to depict humans and animals, and white for stars, hearts, angels, etc.

Although the Germans had celebrated Christmas with the tannenbaum for hundreds of years in Europe, Christmas trees did not win easy acceptance in the New World. Festivals honoring this major winter holiday were slow to be welcomed on this continent, a factor obviously related to prevailing Puritan-English influences which did not favor such blatant examples of ostentation. There were even laws in young America, as there were in England, forbidding festive displays and celebrations

*continued on page 15*

CHRIS GRALD

*Wallace House*

'Twas the first night of Christmas and all through the Inn,
The Hessians were drunk and enjoying the din.
A flickering glow dominated the scene
From candles ablaze on a dark evergreen.
Then out in the snow there arose a great clatter,
But nobody bothered to check out the matter.
Thus, General Washington marched right on through,
Defeated the Hessians and took Trenton, too.
George was heard to exclaim 'ere he rode out of sight—
"I'll have me a Christmas tree next Christmas night!"

As historians who specialize in native lore and legend would have us believe, that Hessian celebration in 1776 at Washington's Crossing of the Delaware marked the first time a lighted Christmas tree was ever seen in this country. Actually, isolated sightings are mentioned in diaries and chronicles of a few German immigrants. General Washington, however, having been charmed by the Hessians' Christmas tree and its beauty, purportedly did indeed display just such a decoration the next Christmas at his Philadelphia headquarters, to the great delight of family and friends, so it is said.

# A walk along the Hudson Riverwalk

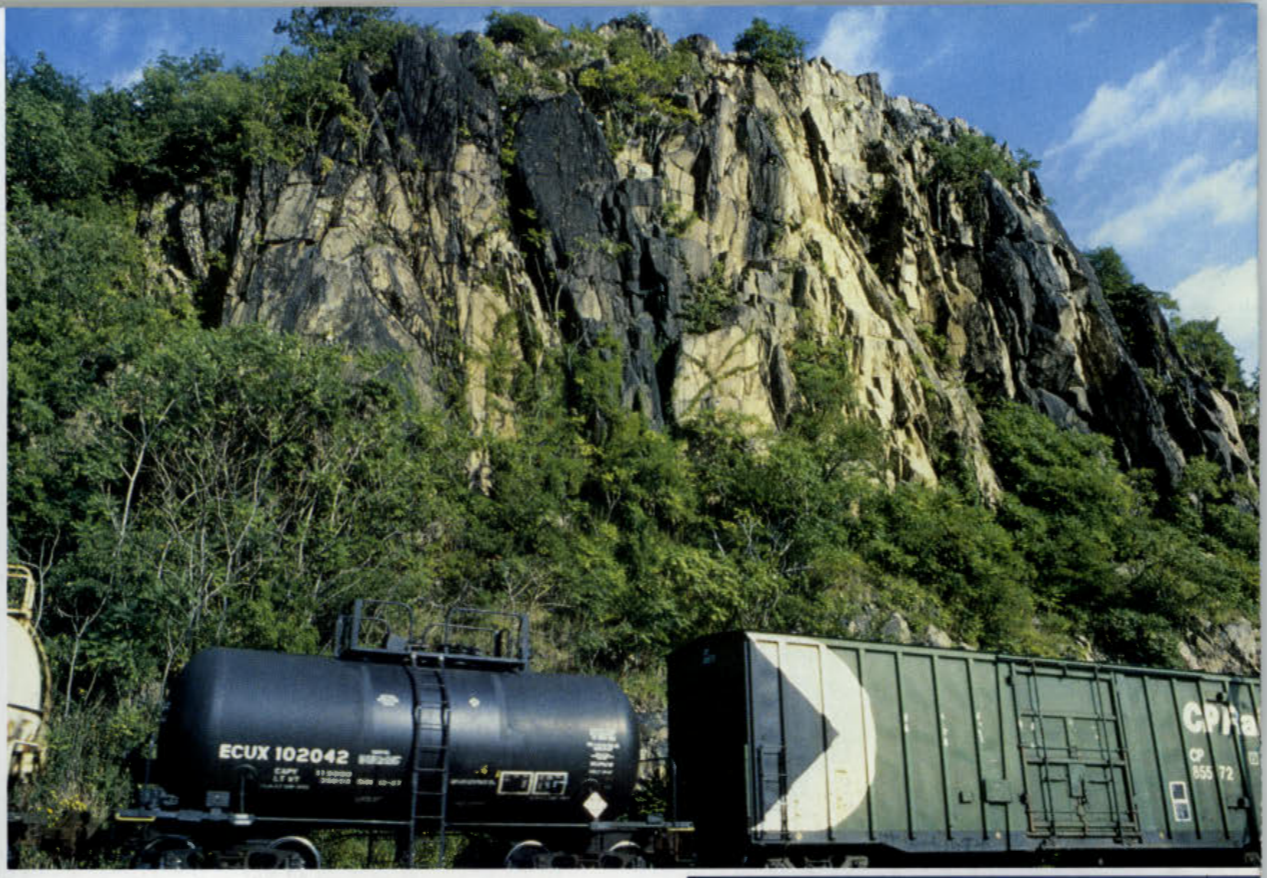
By Barbara Kauffman
Photos by Virginia Rolston

On April 12, 1984, Governor Thomas Kean announced the completion of plans for a walkway along the Hudson River from the George Washington Bridge in Fort Lee to the Bayonne Bridge across Kill Van Kull. When the Walkway is completed, an 18 mile stretch of waterfront will be open for people to walk, bicyle, jog, or just sit and enjoy the view.

The product of a two year study by the Department of Environmental Protection's Division of Coastal Resources, its consultants and many municipal officials and citizens from Hudson River communities, the Hudson River Walkway Plan will link present and future commercial and residential buildings with each other and with parks and marinas along the waterfront. There will be connecting walkways to adjacent neighborhoods and to scenic and historic attractions like the Palisades Interstate Park in Fort Lee, historic Washington and Hudson Streets in Hoboken, Liberty State Park in New Jersey and Kill Van Kull Park in Bayonne.

Completing the walkway will take a great deal of effort by municipal, state and regional agencies, citizens and developers. It is a goal worth working for. As Governor Kean noted when he announced completion of the plan, "The bridges which link us to New York are often described as 'Strings of pearls, with their glowing lights.' Let us look forward to the day when the Hudson River waterfront and this public walkway become jewels along our shore, linked in a shining affirmation of New Jersey's vitality."

The photographs on these pages are selected from Virginia Rolston's exhibit, "Riverwalk" which will be on display at the Liberty State Park Administration Building during November and December. They show the magnificent views of the River and the New York skyline that we can see today and give a hint of the views that we will be able to enjoy once the Hudson River Walkway is completed. For further information on the exhibit, call Liberty State Park at 201-435-0737, or Barbara Kauffman at 609-292-9762.

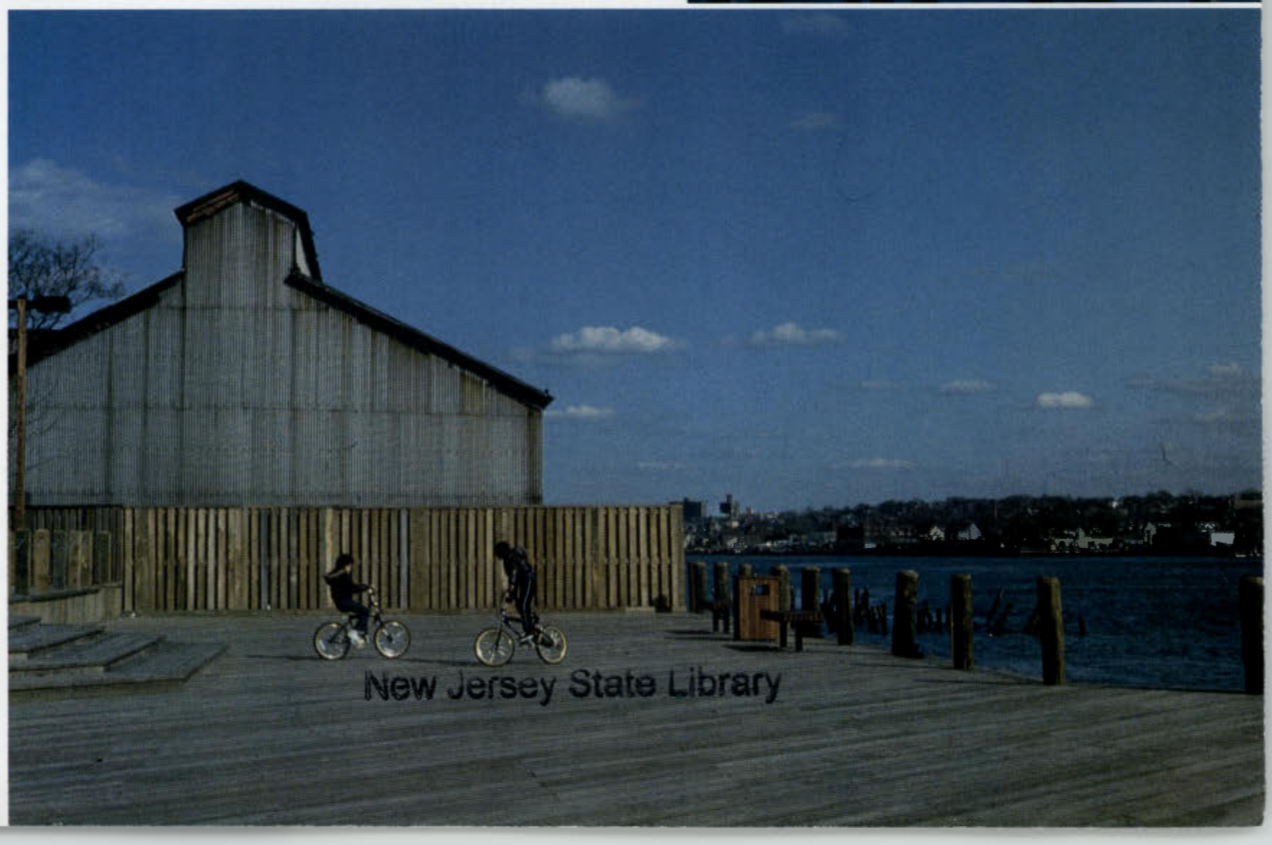



*In Weehawken, the Palisades are a dramatic backdrop*

*The walkway will detour around active industrial sites like this Hoboken shipyard*

*A night-time view of New York City from Weehawken*

*Brady's dock in Bayonne at Kill Van Kull Park is one of the few places the public can see the Hudson River waterfront today*



*Big Piece Meadows*

*Sandpipers at Dusk*

# *I Didn't Know We Had Those Here*

BY PAUL AYICK
PHOTOS BY AUTHOR

It's hardly the kind of area where one would think of looking for wildlife. It lies in a residential area of our state that is, perhaps, best known for its shopping malls. Yet, here it is—just a scant two miles from the busy junction of routes 46 and 23. The area of which I speak is the flood basin of the Passaic River in western Essex County.

As the river winds its way from its source in the highlands around Mendham to Newark Bay, it finds its way through the lowlands of Caldwell and Fairfield. Here, the river is surrounded by the Big Piece Meadows, Hatfield Swamp and Troy Meadows. Most of these flood-prone areas have been spared any large-scale development. As a result, thousands of acres of swamp, meadows, and flood plain deciduous forest are intact. During the spring rains, the area resembles a small-scale Louisiana Bayou.

I lived in Fairfield for nearly 20 years not knowing that these areas existed in my own backyard. My interest in bird photography finally led me to discover what was all around me. In the couple of years since I began exploring and photographing, I have seen deer, rabbit, skunk, red fox, snakes, turtles, owls, hawks, falcons, wood-duck, teal, egret, heron and more than 100 species of song birds.

*Grackle*

Unfortunately, there are those people who disregard the welfare of our wildlife—people who hunt indiscriminately, dump their garbage, and run their four-wheelers over nesting birds. They can be found here, too.

A large portion of Hatfield Swamp is owned by a local sportsmen's club, and it is off-limits to developers. However, a proposed 14-mile drainage tunnel may soon be constructed in portions of the swamp to alleviate local flooding. Steps could be taken to preserve these wetlands and the creatures that make their homes here, but the efforts of concerned citizens are essential to this effort.

In the meantime, I'll continue to explore and photograph, and undoubtedly, some friend or neighbor will view my work and exclaim, "I didn't know we had those here!"

*Passaic River*

## Christmas Tree Customs

*continued from page 11*

during this most serious and holy time of the religious year. Believers were expected to work.

One such Puritan law from the Common Court of Massachusetts, written in 1659, stated that "Anybody found observing by abstinence from labor, feasting, or in any other way any such days as Christmas Day, shall *pay* for every such offense five shillings."

Tradition, however, is not easily squashed, and the non-English residents of Pennsylvania, it seems, refused to be dominated by their stricter Quaker neighbors. They continued their custom of decorating the tree. Many times the "tree" was actually a pyramid of green brushwood tied together and festooned with candles and apples and hand-written Bible verses.

By the mid-1800s lighted trees were appearing in Philadelphia, and in as far-flung sections of this new country as Cleveland, Richmond, and Worcester, Massachusetts. A San Francisco botanist in 1862 described the use of evergreens in western churches and homes, "even without the snow." Soon thereafter, the evergreen became part of England's Christmastime, too.

Innovative Philadelphians were evidently the first to replace the traditional candles with gas jets, and it was only a short time later that electric lights became the rage.

As the nation grew, Christmas began to emerge as a significant holiday, indeed the most colorful and popular of the year. Individual states, as early as 1836, began recognizing Christmas. Alabama was the first to declare it a legal holiday, and New Jersey made a similar designation in 1854.

Recognition of the evergreen as the major symbol for the holiday occurred in 1926 when Congress selected "the Nation's Christmas Tree": the General Grant Sequoia in California. That giant conifer is acknowledged to be one of the oldest living things in the world, dating back many thousands of years. Located in Kings Canyon National Park, the General Grant Sequoia is forty feet in diameter at its base and stands 275 feet high. According to information posted at the foot of its majestic trunk, the lowest branch is larger than the trunk of the biggest tree growing east of the Mississippi River!

In addition to the "Nation's Christmas Tree," there is also a national Christmas tree, which each year is cut and transported to Washington D.C. Having been carefully chosen from among hundreds of 65-70 foot candidates, the national Christmas tree is placed in a prominent location outside on the Capital Mall, where it is decorated with more than 4,000 colored lights. An additional 8,000 lights adorn the smaller trees surrounding the national symbol, representing the United States' 53 individual states and territories.

What began as an outlawed tradition in the Middle Ages has become the most popular of all holiday ornamentation. A verse from the beautiful German carol "O Tannenbaum" expresses the appeal of the ever-lovely evergreen:

O tannenbaum, O tannenbaum,
Your faithful leaves will teach me
That hope and love and constancy
Give peace and joy eternally.


## 1984-1985 NEW JERSEY WATERFOWL STAMP ORDER FORM

**CANVASBACK—TOM HIRATA**

The 1984-84 stamp shows a beautifully detailed pair of canvasbacks resting on the water. The design was created by Tom Hirata who specializes in wildlife art including North American game, birds of prey, ducks, and other birds. Stamps are valid for the period July 1, 1984 to June 30, 1985.

Only individuals who possess a valid New Jersey resident firearm hunting or bow and arrow license may purchase resident ($2.50) waterfowl stamps before June 30, 1985. A copy of your valid resident license must be enclosed with order. Any number of stamps may be ordered while quanities last.

Non-resident ($5) waterfowl stamps may be purchased by anyone. 1984 resident ($2.50) waterfowl stamps can be purchased without a resident hunting license between June 30, 1985 and December 31, 1985. No orders postmarked after December 31, 1985 will be accepted. All unsold 1984 stamps will then be destroyed.

Please include a stamped, self-addressed envelope with single stamp orders. Personal checks will be accepted for orders less than $50. Bank checks or money orders must be used for orders over $50. Make checks payable to the New Jersey Division of Fish, Game and Wildlife. Please allow three weeks for delivery.

Return this order form or a copy to:
New Jersey Division of Fish, Game and Wildlife
Waterfowl Stamp
CN 400
Trenton, NJ 08625

| | | Qty. | Price | Total |
|---|---|---|---|---|
| A | Resident Stamp | _____ | $ 2.50 | _____ |
| B | Non-Resident Stamp | _____ | 5.00 | _____ |
| C | Resident Plate Block | _____ | 10.00 | _____ |
| D | Non-Resident Plate Block | _____ | 20.00 | _____ |
| E | Resident Sheet of 30 | _____ | 75.00 | _____ |
| F | Non-Resident Sheet of 30 | _____ | 150.00 | _____ |
| | | | ORDER TOTAL | _____ |

Name_____

Address_____

City_____ State_____ Zip Code_____

# Island Beach State Park management plan

*Syd Walker, regional superintendent of state parks for region 1: John Verdier, former superintendent for Island Beach State Park; and Thomas Hampton, administrator of the Office of National Lands Management, and author of the management report, looking over plans at southern tip of Island Beach—Barnegat Inlet and Lighthouse in background*

By Carolyn Bevis
Photos by Ray Fisk

Ocean County's Island Beach State Park is one of the last undeveloped stretches of barrier island on New Jersey's Atlantic coast. Visible from the northernmost border of the beachfront park are the resort motels and amusement parks that sprawl along the boardwalk in the town of Seaside Park. Visible across Barnegat Inlet at the southern tip of Island Beach are the seashore homes densely packed together on Long Beach Island. But on the ten-mile-long sand spit called Island Beach State Park, wide beaches meet towering sand dunes that are covered with thick clusters of dunegrass. Beach heather, bayberry, holly, cedars, pines and oaks form dense, green thickets and woodlands. At the bayshore, the thickets give way to open salt marshes.

This dune complex and barrier island habitat is believed to have changed little since pre-settlement times, and the Division of Parks and Forestry's Office of Natural Lands Management would like to keep it that way.

In June, Division of Parks and Forestry Director RUssell Myers approved a natural area management plan outlining preservation strategies for the 3.3-mile stretch that forms the 700-acre Island Beach Northern Natural Area. This is the first such management plan in the state, and is a milestone for the Office of Natural Lands Management, charged with developing specific management plans to preserve each of the state's 41 designated natural areas.

In a meeting at Island Beach State Park prior to approval of the northern area management plan, the significance of Island Beach was discussed by John Verdier, the now-retired superintendent of the park, Syd Walker, the regional superintendent of the state parks, and Thomas Hampton, administrator of the Office of Natural Lands Management.

"There is no other area in New Jersey this long that's an example of a dune complex. And it's easy to appreciate this today if you look back and realize that almost all of New Jersey's coastline was once like this, and now it's bungalows in Seaside Park to the north or $100,000 homes to the south on Long Beach Island. That's when you really appreciate what Island Beach is to us," said Hampton.

"From the broad picture," Walker interjected, "in the northern natural area you're talking about the whole region as an endangered area if you look at the history of the Jersey coast."

Henry Phipps, who owned Island Beach from 1926 until his death in 1930, planned to develop the area as a luxury seashore resort, but the collapse of the stock market in 1929 and the death of Phipps a year later thwarted the plans. The area remained relatively undeveloped, although at one time 82 houses were built on the island.

The state purchased Island Beach from the Phipps estate in 1953 with direct appropriation of two-and-three-quarter million dollars. It was made a state park in 1954. Since then, most of the homes from the Phipps estate were eliminated. The state owns the remaining 12, and they are leased, on non-transferable yearly terms, to private individuals. One of the state-owned beach houses serves as a summer house for New Jersey's governor.

The central portion of the park is a recreation area with a bathhouse and a protected bathing beach. The southern portion is a state designated natural area where limited recreational activities are permitted. The northern portion is a strictly controlled natural area. The management plan pertains only to the northern natural area.

The barrier island's vegetation and dune complex are its striking natural features.

A total of 292 vascular plant species thrive on Island Beach. Some are beach species, some are native to the Pine Barrens and others are characteristic of New Jersey's upland regions. Verdier pointed out that the location of the various species on the island shows the influence of moisture on the environment. The vegetation is affected by the level of the water table and the amounts of moisture in the soil, and by the water lapping over the barrier island and the ocean salt carried on the wind.

Dunegrasses, goldenrod, beach peas and Japanese sedge grow on the eastern dunes. The grasses give way to woody thickets of poison ivy, Virginia creeper, bayberry, black cherry, greenbriar and beach heather. Further west, holly, red cedar, white cedar, pitch pine and oaks form dune woodland communities, and in low, moist areas, rushes, marsh ferns and cattails grow in fresh marsh communities. On the western bayshore, reedgrass covers the low salt marshes.

The towering dunes at Island Beach protect the area from storms, and to a great extent, these undisturbed dunes maintain themselves.

The natural dune dynamic is a continual process of building up, tearing down and rebuilding, Verdier explained. Grains of wind-blown sand accumulate to form a dune. Dunegrass takes root and traps more sand. Nutrients present in new deposits of wind-blown sand nourish the dunegrass, and the dune builds until it reaches its apex. When no more new sand accumulates, the dunegrass stagnates and dies. Without dunegrass to hold the sand in place, the dune crumbles. Eventually, the building process begins again.

When people intrude, however, dunegrass is destroyed and a dune breaks down faster than nature can rebuild it, Verdier said.

"This little sand spit and the dunes were here many years coming and going," he explained. "The dunes were building up, and storms would come along and dunes would be knocked down. Vegetation would be destroyed, vegetation would be re-established. More beach would be added, beach would be taken away. This is just the way nature works. The storms, wave action and winds all had an influence on the park, and nature was doing a pretty good job, I would guess, of maintaining some sort of equilibrium .... The state took over, nature still did what it wanted to, but the difference was we introduced thousands of persons per day who were tearing the dunes down faster then mama nature could build them up."

When the park opened in 1954, activities of the few visitors who came to Island Beach were uncontrolled. However, as greater numbers of people traveled to the park, and as the impact of their presence on the barrier island became evident, steps were taken to control their activities. Active recreation was confined to the central recreation area, and in 1962, the northern 3.3-mile stretch of Island Beach (which was not designated a natural area until 1978) was deemed off limits for most types of public use. Now more than 10,000 people visit the park's recreation area each day during the summer months.

John Verdier, who worked at the park for 30 years until his retirement in June 1984, is credited with many of the preservation efforts conducted at the park over the years. For 22 years, without written guidelines, Verdier managed the northern section as a natural area.

"I think that's a compliment to John and the park service," said Hampton. "Here we are in 1984 coming out with a glorious management plan, but we're coming out with a management plan that protects something that's already been protected all those years that the state park service has owned it."

Verdier said his primary interest lies in preserving Island Beach, and he feels the management plan is good if it can achieve that purpose. Under the plan, the dune complex will be left undisturbed in its self-maintaining natural state, and no active management techniques will be imposed.

"I think if we have a plan and that's our method of operation, it's not going to be easy for someone to come in and just open the area up and develop it for all kinds of uses. So I think something like this, a document, is good to have on the records," Verdier said.

However, Verdier voiced some concerns about implementation of the plan. For 22 years, public activity in the northern area was restricted to self-guided tours of a nature trail and fishing only during the months from September through May. Under the new plan, however, the nature trail will be open year round, on a permit basis, and jogging and walking will be permitted along the ocean at the water's edge. These are the only substantial changes in management of the area specified by the plan.

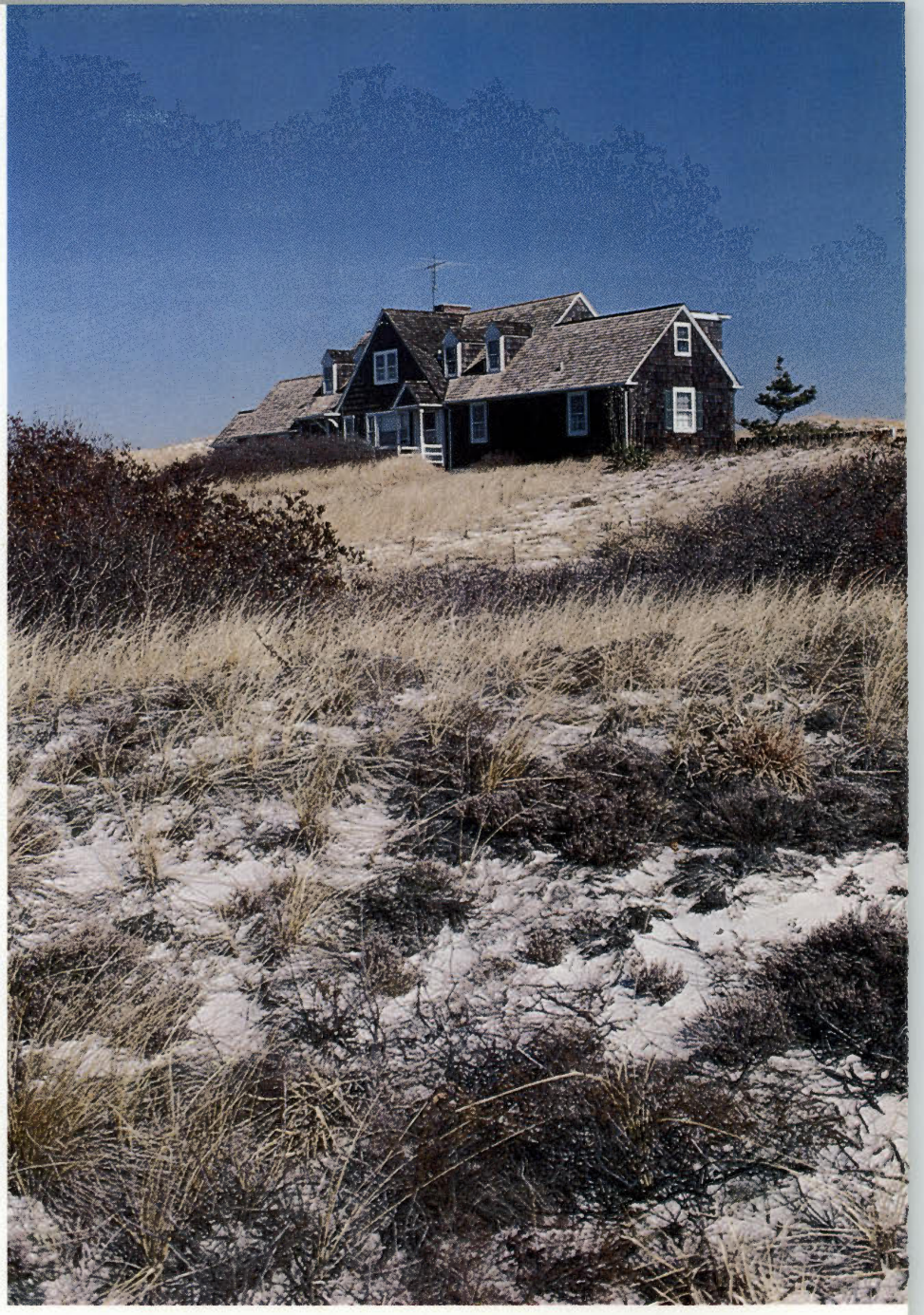
This expanded public access, Verdier said, will enable more visitors who ignore warning signs to wander in the restricted, delicate dune areas. Signs alone do not dissuade people from intruding in restricted areas, he said, thus the areas will need to be patrolled. The need for patrols could pose a problem, since the management plan is not accomplished by funding to implement it.

"There's no money for seasonal staff and no additional money for permanent staff," Verdier said. "With what we have to work with, we're going to have to concentrate our efforts up in there, which means we're going to have to slight somewhere else."

Hampton pointed out, however, that the plan could serve as a justification for additional state funding for the park. The impact of the plan on the natural area will be evaluated, Hampton said, and if it does result in public intrusion in sensitive natural areas, the plan will be changed.

Hampton and his staff are at work now on management plans for three other natural areas, Tillman's Ravine, Cheesequake Marsh and Swimming River. Tillman's Ravine, located in Stokes State Forest in Sussex County, is a dense hemlock forest that has remained uncut for more that 100 years. Cheesequake Marsh, at Cheesequake State Park in Middlesex County, is a salt marsh that includes other habitats—cedar swamps, fresh marshes and upland forests, and is a home for some endangered species of plants. The 108-acre Swimming River area in Monmouth County is a valuable environmental study site because it is a composite of many different habitats—salt marsh and fresh marsh, wet forest and dry forest, steep slopes and expansive stands of wild rice.

The concept of a statewide Natural Area System developed in 1961 when the Division of Parks and Forestry was established by state statute. In 1975, a supplemental bill sponsored by then-Assemblyman Thomas H. Kean detailed criteria for identifying natural areas and procedures for incorporating them into the system. During the following three years, the Department of Environmental Protection identified natural areas throughout the state, and in 1978, the state designated 41 natural areas and adopted rules governing the Natural Areas System. All of the areas have striking natural features and they can include rare plant or animal habitats, or habitats that are representative of New Jersey's natural environment.

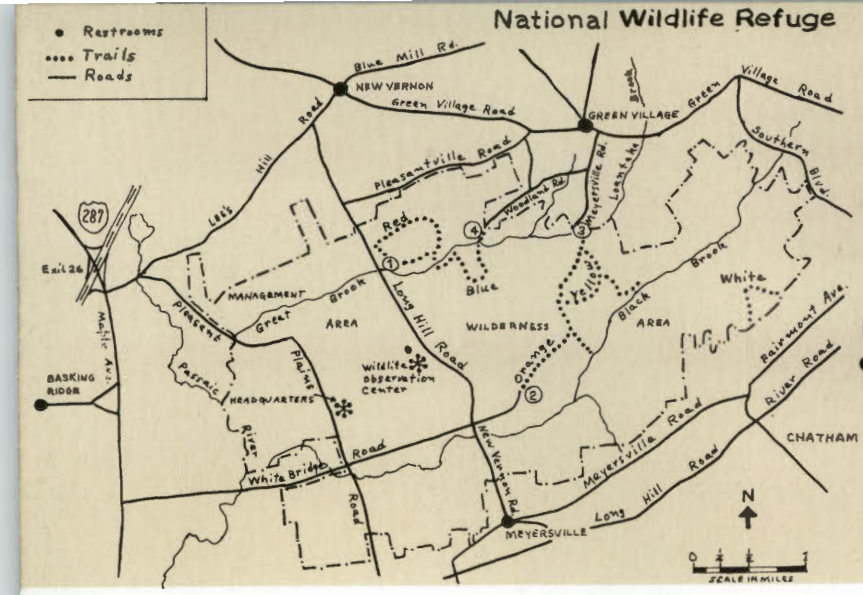


*The Governor's summer house*

Many of the natural areas are located within state parks, and therefore the state already owned them when they were designated to the system. Ten of the natural areas were purchased by the state with Green Acres funds so that they could be designated to the system.

New areas may be added to the system through the state's natural areas register, a roster of private or public lands with natural features worthy of recognition. If the state acquires the lands, they may eventually be designated as natural areas.

"I imagine there are probably many areas throughout the state that are not managed but that have unique representative features that qualify them for recognition as natural areas," Hampton said. "We will be looking for them."




# The trails of Great Swamp

*Open areas along the Orange Tra in full color.*

The doe is reluctant to leave the dike, fearing the marsh on either side may be too difficult for her fawns. I follow slowly as she trots ahead, the fawns close behind, until they find the cutoff. By the time I arrive, the deer are a hundred yards down the path. Seeing me again, they move into the woods with short jumps and a flip of white tail.

The trail is in shade here and a cool breeze, welcome after recent heat, flows from the north. High overhead cirrus clouds sweep the sky. It is unusually blue this June morning. Like others I have enjoyed in Great Swamp over the years, this day is a celebration of life and light.

Still more country than suburban park, the 6800-acre Great Swamp National Wildlife Refuge is becoming increasingly important as a haven both for wild things and for people. It is not heavily used, considering the population in central New Jersey, though annual attendance approaches 200,000, and weekends in September and October can be busy. At other times it is not unusual to be the only person on a given trail.

A glance at our map shows that the Refuge is bisected by Long Hill Road, the principal subdivisions being the Management Area to the west, and the easterly Wilderness Area. A headquarters building and maintenance shops are situated in the Management Area on Pleasant Plains Road. Visitors normally view the fields, marshes, and ponds here from their cars, since this part of the Refuge has no trails open to the public. However, maps and literature about Great Swamp and its wildlife are available at Headquarters.

Another focal point in the Management Area is the Wildlife Observation Center (WOC), off Long Hill Road, where a large parking lot opens onto two short trails, each leading to a well maintained observation blind. Maps and other displays are presented in glass panels under a shelter near the parking lot. The only public restrooms in the Refuge are located here, at the entrance to the boardwalk. Refuge visiting hours are from 8:00 AM to dusk, though chances of seeing wildlife are best in the morning or evening. At present, WOC facilities are not convenient for persons whose mobility is restricted or those using wheelchairs.

The short trail at the WOC is mostly boardwalk over a wet area. (True to its name, the Great Swamp is indeed wet—it occupies the bed of an ancient lake formed by the melting of the Wisconsin Glacier which covered this part of New Jersey some 20,000 years ago.) The trail leads to a pond which is home for green herons and bullfrogs, but it requires patience and a sharp eye to spot these animals among the aquatic plants which thrive here in summer. In 1983 a spunky phoebe nested successfully over the open doorway of the blind at the far end of the boardwalk. Along this walk are informative displays concerning bluebirds, Canada geese, deer, and wood ducks. Pink steeplebush and the exotic orange Turk's-cap lily add color to the surrounding green fields in July.

A slightly longer WOC trail winds nearly half a mile through red maple swamp and mixed hardwood trees. It is popular all year for birdwatching, and in May the beautiful lady's slipper orchid may be seen in certain locations.

This is probably a good place to mention snakes, since many people tend to associate them with swamps. Of the dozen species inhabiting the Refuge, only garter snakes and water snakes are common. None are poisonous.

East of Long Hill Road lies the Wilderness Area of Great Swamp. Persons on foot may enter at any of four main access points, each featuring a large rustic sign, a small parking area, and a trail guide or map for orientation. These parking lots are patrolled, and Refuge operators are strict about enforcing the posted regulations. Additionally, the eastern part of the Wilderness Area may be entered via Laurel Trail off a dirt road which parallels the power line across Southern Boulevard in Chatham Township.

The six trails in the Wilderness Area provide more than eight miles of comfortable walking. After considerable experience with different trail marks, Refuge personnel have settled on a simple color code consisting of highly visible bands of paint on certain trees in a rough line-of-sight sequence. Each trail is assigned a different color, and the layout of the several trails in the system is shown on the trail guides at the main entrances. Distances are also given on the trail guides as an aid to elderly or handicapped persons and groups with small children.

Seasonal considerations affect the use and enjoyment of these trails. Because the Refuge lies in a natural basin, it contains a lot of water, which drains through Great Brook and Black Brook to the Passaic River along the western boundary. All the

TEXT AND PHOTOS
BY R.J. JOHNSON

*ermit optimum viewing of the Wilderness Area*

*On higher ground, the Blue Trail enters a forest of ferns and giant hardwoods.*

*This reach of Great Brook near the Red Trail is home for mallards, muskrats and turtles.*

trails have low places and crossings which require waterproof footgear for comfort, especially in the spring and later fall. Deer flies and mosquitos can be bothersome, so a good insect repellant containing at least 25 percent N, N-diethyl-meta-toluamide is a must from May through August. A hat or cap, long—sleeved shirt, and trousers are recommended. Hikers should carry their own water, and cooking fires and camping are prohibited.

As you explore the Great Swamp, you'll quickly become aware of the many different kinds of habitat present. This is, in fact, the key to its richness as a repository for wildlife. By actual count, the refuge is home for 393 plant species (including at least 215 wildflowers), 39 reptiles and amphibians, 24 species of fish, 30 mammals, and 126 birds. A U.S. Fish and Wildlife plot lists 20 types of "cover," such as cat-tail marsh, open field, or oak-dominated hardwoods.

The longest and most varied of the walks in the Wilderness Area is the Red Trail, which loops from an entrance off Long Hill Road to a point near Great Brook, uphill through magnificent stands of red oak and beech then back along the brook. Red-tailed hawks often soar over the field near the entrance. On high ground the ephemeral wood anemone is found in spring. Carp laze in sunny spaces of Great Brook as yellow iris and cardinal flower bloom in low, hidden spots. Occasionally a muskrat, mouth stuffed with cat-tail shoots, will be seen plowing sedately through the algae and duckweed to its lodge.

Here, too, the pileated woodpecker is seen, and heard—drumming with a characteristic heavy decelerating knock as though a giant hand were shaking a hollow tree with something hard and loose inside. There are also great hickories which rain nuts late in the year as squirrels in a sort of frenzy rush to the harvest. The squirrels are systematic. They work for hours cutting and dropping nuts, seemingly by the peck, for suitable disposition later.

This is where I learned that the wooly-bear caterpillar can swim, or walk on water. In September, slow-moving Great Brook is partially covered with algae, but the middle of the stream may be clear for several feet. The caterpillar simply proceeded over the algae and across the open water as if it were dry land.

A picturesque wooden bridge crosses Great Brook where the Blue Trail joins the Red Trail. Weathered grey and sagging almost to water level, this bridge

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DR. MARK MORGAN

DR. RALPH E. GOOD

# Acid Rain in New Jersey

BY DAVID IAMS

*Water sampling at Double Trouble State Park; Rutgers U. biology professor Dr. Ralph E. Good on left and graduate student, Jack Dougherty on right.*

*Checking rain gauge; Dr. Mark Morgan, holding plastic jug, and Jack Dougherty on right.*

Go on down to McDonald's Branch of the Rancocas River in the Pine Barrens someday and look at the water. Then taste it. Go on, scoop up a mouthful. It's fresh and pleasant. But it's brown.

Part of the reason for its color is that the water in the Pine Barrens is acidic. It's undetectable by taste buds, but the water has an acidity level that is comparable to a weak solution of vinegar.

It's been that way for ages. The plant and animal life that inhabits the area doesn't notice it either.

But what happens to the balance between water and life when the water in McDonald's branch—and the rest of the Pine Barrens—is inundated with millions of gallons more from the skies above that are just as corrosive, acid rain?

Some scientists say it is simply lost in an already acid environment. But others say it is making the Pine Barrens more acid, and possibly stunting the growth of the trees that give the area its name.

Acid rain has caused plenty of worry—and dispute—throughout the United States, Canada and Europe. Its clearest inpact to date has been on mountain lakes and streams, where it has been blamed for the disappearance of trout.

But in New Jersey, acid rain has not until recently been a burning issue. One reason for the lack of concern is that New Jersey's industrialized areas may make the state a culprit as much as a victim. Another excuse may occur to those who know a little chemistry: Acids are neutralized by alkaline materials; one source of alkalinity is human waste; New Jersey is the nation's most densely populated state—plenty of waste, plenty of alkalinity, no problem with acid rain.

Last summer that complacency was jolted. The U.S. Environmental Protection Agency issued a paper listing the Pine Barrens among the top eight regions in the United States that are susceptible to acid rain. Last fall a report on a public hearing sponsored by the New Jersey Clean Air Council and the Governor's Science Advisory Committee not only warned of the possible effects of acid rain on the Pine Barrens but also in the Kittatinny Mountains to the north.

Both reports noted a "dramatic" growth decrease in two kinds of pine that abound in South Jersey. The state report also said acid rain has "endangered" three lakes in the Kittatinnies near Blairstown.

What makes that concern so far-reaching is its remifications for New Jersey's water supplies. The extended Pine Barrens constitute a third of the state's land surface and include one of its largest groundwater supplies, the Cohansey aquifer. Metal deposits showing up in Kittatinny lakes samples could also be in water supplies of the central highland reservoirs.

On the other hand, nobody is saying the Kittatinny lakes are going to turn into another Arthur Kill or that the Barrens' pines will waste away. Neither the federal nor the state reports specifically blamed acid rain for any damage to wildlife and both called for more study.

One reason for this caution is the nature of acid rain itself.

There is little doubt that sulfur dioxide from the exhausts of fossil-fuel-burning plants in the Midwest and nitrogen oxides from automobile emiss-

ions are released into the atmosphere and eventually dissolved in the water vapor that falls as rain.

But even if cars and factories were banished from the face of the earth, rain would still be acid, the way it has been for hundreds of millions of years. Simply by floating in the sky above fields and forests, clouds of rain absorb carbon dioxide from the air to form carbonic acid, the substance that gives soft drinks their fizz.

Acid is any chemical substance with a surplus of unattached hydrogen atoms, and any liquid involving hydrogen is, if only to a token degree, acidic. In freshly distilled water, one out of every 10,000,000 $H_2O$ molecules will break down and free a single hydrogen atom, a proportion that is designated pH7, for the number of zeroes after the 1 in the number above. Vinegar, for instance, typically has a pH of about 2.9, although its pungent flavor comes from other ingredients, not its content of acetic acid.

Thanks to its carbonic acid content, "pure" rainwater actually has an average pH of 5.6, according to "The Effects of Acid Rain" report. When the wind is from the west, however, that pH can fall to below 4, an increase in acidity by a factor of almost 100.

In Pennsylvania, where the problem has been extensively studied, rain that is this acid has been blamed for damaging auto finishes, leaching copper from water pipes and reducing the legend on a sandstone monument at Gettysburg to virtual illegibility. What it could do to a delicate ecosystem over decades or centuries is even more disturbing.

To be sure, a certain level of environmental acidity is natural, as the eons-old presence of rainwater's carbonic acid suggests. Life itself both generates and consumes acid, beginning with the amino acids out of which all protein is built; and many forms of life, such as holly trees, thrive on acidity. Other creatures, such as trout, can only flourish in streams whose acidity has been neutralized by the surrounding soils through which most of their water supply is filtered.

In the Pine Barrens and the Kittatinny mountains these "buffering" agents are missing, although for different reasons. In the Kittatinnies, the absence is geological. The Kittatinnies are part of the Appalachians, an old mountain range made up of precambrian rock. Its quartzite and granite lack the buffering capacity of newer sedimentary rocks in younger ranges such as limestone and calcium carbonates, according to Prof. Alan McIntosh.

McIntosh, a biologist at the Environmental Science Center at Rutgers' New Brunswick campus, has studied five lakes on the Kittatinny ridge near Blairstown and has found that the acidity of their water ranges from 5.1 to 4.4, a level that not only stops trout but also bass from breeding. Some geologists suggest that this acidity could be due to sulfur springs, but McIntosh is reasonably sure it's from acid rain runoff, although he says acidity measurements at the lakes were not begun until 1981.

One of these lakes, Long Pine Pond, "is classically acid," he said in an interview this spring. "There is only one species of fish, yellow perch, and three or four species of bathyal invertebrates (bottom-water life such as mayfly larvae)," he said. "It's in pretty poor shape."

McIntosh's main concern with water acidity is its tendency to release trace elements of poisonous metals, such as cadmium, zinc and lead, into water bodies. He is conducting a year-long study to see if these metals may accumulate in the tissue of plants and animals living in it, which not only would threaten low-level organisms but also higher ones that depend upon them for sustenance, including man. "The ultimate question is whether there's a toxicity problem," he said. "Some organisms that can tolerate the pH could be eliminated by the elements."

In the Pine Barrens the absence of buffering materials is more complicated to explain. But the potential threat posed by acid rain is no less ominous.

Like the Kittatinnies, the sandy dirt of the Pine Barrens lacks alkaline, according to Prof. Arthur Johnson, a soil expert at the University of Pennsylvania, who has studied the Pine Barrens around McDonald's Branch for several years.

But, says Johnson, the geological acidity encourages plants that are botanically acidic. Pines, for instance, are efficient producers of phenols, acids related to resin and tar, that in turn increase the soil's acidity even more.

When acid rain falls into this acid environment, says Johnson, the obvious happens: According to his studies the acidity increases.

Johnson's findings have been challenged on several fronts but he stands by them, contending that acid rain actually doubles the acidity of the creek. "I feel confident that the acidity is due in some measure to sulfuric acid deposited from the atmosphere," he said. "It's a clear message about acid rain," he added.

He hopes that a study by the U.S. Geological Survey of the area that is now under way will resolve differences between his findings and those of other scientists.

Johnson bases his conclusion on his study of the area of Lebanon State Forest that drains into McDonald's branch, where the only inflow is rain and the only outlet the branch, which drains into the Rancocas River. When acid rain fell, the water draining into the stream had "considerably" higher degrees of acidity "than we would otherwise have expected," he said.

Johnson thinks this increase in acidity may account for a troubling trend he and other scientists have detected among evergreens along the entire eastern seaboard: They are growing less than they used to.

The lag has occurred over the last 20 years and is worst on mountain tops, which frequently jut into rain clouds, says Johnson, who has measured the rings of thousands of trees in 14 states east of the Mississippi. In his office is a collection of tree cross sections that show the same growth pattern: a cluster of thick growth rings surrounded by 15 or 25 that are perceptibly thinner.

The lag parallels a much more dramatic decline in tree life in Germany, where 35 percent of the once heavily forested country's trees are dead or in decline and where inhabitants gloomily refer to "Waldsterben:" the dying forest. U.S. forests may be in the early stages of a similar crisis, warns Robert I. Bruck, a plant pathologist at North Carolina State University. He was quoted in the New York Times as saying it would be "the ecological catasrophe of the of the century."

In a public television program on acid rain, Johnson cited the work of Bruck's graduate students who found that acid moisture killed a certain

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# *Why muzzleloaders don't go off*

BY PETE MCLAIN

I am ashamed to admit that in four years of hunting with a muzzleloader, I have fouled up four shots at white-tailed deer standing still at less that 40 yards. In every case my .50 caliber Hawkin rifle failed to fire, and after the snap of the hammer or the crack of the cap all I saw was the departing white flag of the deer's tail. Fortunately, during the seasons I had other chances, and I managed to take a few deer, but I know now that it was more than skill in knowing how to use the front end stuffer.

Following this disastrous series of blunders, I began to do some research on why I was having problems getting my muzzleloader to fire when a whitetail was in the sights. I would occasionally suffer a misfire on the firing range, but it seemed of no great consequence at the time. It should have told me, however, that I was doing something wrong.

I am not alone in the big fraternity of muzzleloader misfire members. I know of dozens of hunters who recently, like me, came upon the sport, and it's the same story. They practice with the gun and can sock five out of six holes in a six-inch circle at 80 yards, they get a deer in their sights at less than 50 yards, they squeeze the triggers, and there is a "snap" but no "boom".

During the past year I have interviewed a dozen or more veteran black powder hunters, target shooters and gunsmiths. Recently I also spent a few hours with Willis Boitnott of New Castle, Ohio. He is the official armorer for the U. S. International Muzzle Loading Team, and also the official armorer at the famous annual Friendship Matches in Indiana. Mr. Boitnott knows his muzzleloaders and what makes them work, and also why they occasionally don't work.

First, the consensus of veteran muzzleloader shooters is that there is absolutely no reason why the gun should not fire every time the hammer strikes the flint or percussion cap. If there is a misfire, 99 times out of 100 it's the shooter's fault and not that of the gun. It's that simple. There might be a faulty cap or other mechanical failure the other one percent of the time.

The cardinal rule in keeping a muzzleloader firing is to meticulously clean and dry the inside of the barrel and the breech. The worst enemy of black powder is dampness and this is the main reason for misfires. Second would be clogged nipples and bolsters. The principle is to get the spark from the percussion cap through the nipple port, past the bolster, and into the dry powder charge which will explode and send the ball on its way.

Talking with Willis Boitnott, I discovered he recommends a shooter begin a personal relationship with any new or used muzzleloader, starting with a good cleaning before going to the range. This initial cleaning will be the same one he will use every time he cleans the gun in the future.

There are many varied techniques for cleaning a muzzleloader, and veteran shooters have strong feelings about them. However, this is what Mr. Boitnott recommends. First, flush out the barrel with cold water to remove any loose powder, salt or other debris. Then pump scalding hot soapy water up through the nipple port, using the ramrod and patch as a plunger. Remove the barrel from the gun and hold it in a small bucket of water. If the barrel can't be removed, insert a plastic hose over the nipple and pump water from a container into the barrell through the nipple port. There are special hose attachments which screw into the nipple port and pull water from a pan or bucket. The tube arrangement is necessary when you cannot remove the barrel from the gun, and you don't want to get water on the stock or into the action. Don't pull the ramrod too far up the barrel or water may leak out

*PHOTO BY WARREN GARRETSON*

the barrel. Most shooters use a towel at the muzzle end just in case.

This repeated pumping action of the hot water and the changing of patches removes any fouling and caked powder and cleans the barrel, bolster and primer port in one operation. It's best not remove the primer nipple any more than necessary, and certainly not every time you clean the gun. Removing the nipple too frequently can result in wear on the threads, and eventually result in a blown nipple.

The scalding or boiling water is used because it dries faster after you clean the barrel. After the water treatment, run several dry patches down the barrel to make certain the inside and the breech are completely dry. If you are not going to shoot the gun for a few days, a light swabbing with WD-40 on a patch will prevent rusting. If the gun is to be laid up for several days or weeks, applying Rig or other quality gun grease with a patch is a good idea. Stay away from the water-based cleaners and oil lubricants.

When the gun has been cleaned and the inside of the barrel, breech and bolster are thoroughly dry, you are ready for the range. Some shooters will remove the nipple and run a pipe cleaner through the bolster to be certain that there is no trace of water remaining, and they will use a piece of piano wire to ensure that the nipple port is clear. This little extra precaution has become standard practice for me when I load on the opening day of muzzleloading deer season. It can mean the difference between bringing home a nice buck or experiencing a misfire.

There are many thoughts and opinions on the proper powder charge for the various guns and calibers, and on what type of projectiles are best. First, I would follow the manufacturer's recommendations on any new or replica gun. You should know what pressure the gun is tested for. Most veteran muzzleloaders feel the average hunter overcharges his gun. Generally, most feel that 90 grains of FFg powder is tops for the quality brands of .50 and .54 calibers, and that much less is adquate. They also feel that the FFFg might be a little better in the .45 caliber guns, and that big game should not be hunted with a muzzleloader less than .45 caliber. Recommending powder charges is not wise or practical, because of the varying quality of the guns, the age and condition of some originals. It's wise to follow the manufacturer's recommendations.

To test fire and sight in your gun on the range, use a standard powder charge every time, say 50 grains of FFg in a .50 caliber. Position the target at 50 yards so your first shots will at least be on the paper. Then fine tune the sights to get the gun shooting where it should. Once you have the shot group hitting where you want it, move the target back to 80 yards. This is a good hunting range; most muzzleloader hunters feel that 100 yards is about tops for consistent shooting in the field. True, you may occasionally drop a deer at 150 yards, but even 80 yards is a long shot.

If you can get your muzzleloader to shoot two inches high at 50 yards, it will probably shoot dead center at 80 yards and two inches low at 100 yards. This is a general statement, and it will vary with the gun, powder charge, projectile and other factors. The idea is to get your gun sighted in so there is only a four or five inch spread between 50 and 100 yards. This should put your ball into a vital area of a whitetailed deer.

After the premeasured powder charge is dropped into the barrel and settled by lightly thumping the stock on soft ground, a ball starter might be required to get the lubricated patched ball started down the barrel. A steady and even pressure is all that should be applied on the ramrod, and the projectile should slide down the barrel and seat firmly on the powder charge. Do not drive the projectile down on the powder with a final hard tap or push. Always keep the muzzle pointed away from yourself and others when loading.

If a lubricated or patched ball is too tight in the barrel, and you have to force it down, it's the wrong size or there is too much patching. In this case, experiment with different patch materials and sizes and also different styles and brands of projectiles. Some guns will take different styles and brands of projectiles better than others.

For sighting in, it's best to use a shooting table or bench, or you can rest your gun on a sandbag to get it as steady as possible. Remember to move the windage in the direction you want the projectile to move, raising the rear sight raises the initial path of the projectile.

The shooting range is the time and place to really get to know your gun. Practice shooting a few targets every week, and be meticulous in the cleaning and care of the gun. If there are misfires or other problems, this is the time to figure out what's wrong, not in the fall when the hunting season opens. During the practice shootings you will probably want to try prone, sitting, standing and even leaning against a tree for support.

Every muzzleloader is different when it comes to cleaning the bore during the practice shooting. Some guns can be shot a dozen or more times without running a patch through the barrel. Others tend to foul up after a couple of shots. I clean the barrel of my Hawkin when the greased patched ball or the lubricated projectiles begin to go down hard. Some fellows like to clean with a powder solvent followed by several patches. Other will wire brush out the barrel, then run through several patches.

By the time the hunting season opens, you should have the muzzleloader sighted in and complete confidence in your ability to drop a deer at 80 yards. Clean the gun in the usual way the night before your hunt, then in the morning run a couple of patches down the barrel just for good measure. Since this is the real hunt rather than a range shoot, you may want to remove the nipple and run a pipe cleaner through the bolster to make absolutely certain it's dry. Also run a thin wire through the nipple before you replace it to be certain it's clear. I have found that one of those little cans of compressed air used by photographers to clean camera lenses is excellent for blowing out nipples and bolsters.

Finally before you drop in the powder charge, point the muzzle of the gun near some tall grass and fire a few caps. If you see the grass move, you know the patch is clear for a good spark to the powder. All this may sound like alot of extra trouble, but it's well worth the effort.

Condensation is a major problem in muzzleloader hunting, whether your gun is percussion or flintlock. Moisture affects the powder charge. Even a perfectly cleaned and dried gun can misfire if condensation forms inside the breech. The damp, cold days are when you can expect problems.

Always guard against condensation. It's best, for example, to leave the gun in your car trunk or in an unheated building in cold weather. Taking a warm gun into the cold outdoors to load it courts condensation. Once you have loaded the gun, don't

*Hunter waits patiently for deer to approach to within 100 yards.*

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# A missed shot can still kill

By Dr. Douglas E. Roscoe
DIVISION OF FISH, GAME & WILDLIFE

Lead is an insidious poison. Its effects are subtle and gradual. Recent studies of lead poisoning in children have shown very small amounts of lead can cause brain damage and learning disabilities. Although lead is a naturally occurring metal, some unnatural sources exist. In 1972, the National Academy of Science estimated 184,000 tons of lead was emitted in automotive exhaust each year in the United States. Past and recent action taken by the EPA continues to reduce the use of leaded gasoline in the United States.

Although lead poisoning of waterfowl from ingesting spent lead shot was first recognized at the turn of the century, the magnitude of the problem was not adequately documented until the studies of Bellrose in 1959. Based on his work, the U.S. Fish & Wildlife Service estimates that 1.6 to 2.3 million waterfowl die annually from ingesting some of the calculated 3,000 tons of spent lead shot deposited in the sediments of waterfowl marshes during the hunting season.

Ducks feeding in the sediments mistake the shot for food such as seeds and snails or swallow it along with pebbles as grit. The grit lodges in the muscular gizzard and aids in grinding up food. The lead shot also lodges in the gizzard but is ground down over a one to three week period, continuously dosing the bird with toxic lead salts. These salts are absorbed into the blood and circulate throughout the body. The lead inhibits enzymes vital to blood production and nerve function.

PHOTOS BY AUTHOR

A single lead shot pellet may be lethal to a duck. This depends on the bird's diet, general physical condition and environmental stresses. Usually lead poisoning is chronic, gradually diminishing the vitality of the bird through anemia, muscle paralysis and starvation. Under these circumstances, birds in migration may not die near the source of the lead. Because of the nature of the disease and the rapid scavenging of sick birds, it is not realistic or practical to evaluate the problem solely on the basis of body counts.

The methods employed in diagnosing lead poisoning in humans and domestic animals were employed by the N.J. Division of Fish, Game & Wildlife in evaluating the problem in wild waterfowl. This involved the live capture of mallard and black ducks. Blood samples collected from these birds were tested for lead and protoporphyrin. Both compounds accumulate in the blood of lead poisoned birds. Thresholds set through animal experiments allowed for interpretation of the results. The collection of blood samples was conducted one month after migration ceased, allowing sufficient time for lead shot which might have been ingested further north to be passed from the bird's gizzard and intestine. It also allowed sufficient time for the blood to be cleared of lead. Samples from these resident birds then truly reflected local exposure to lead.

Lead poisoning in waterfowl is most severe during the winter after the hunting season. The probable explanation is the birds are no longer being hazed away from the areas of heavy lead deposition by virtue of the hunting activity itself. Also, the lead shot is readily accessible on the surface of the sediments and the birds are most vulnerable due to food deprivation and harsh winter weather.

Blood lead measurements of 626 ducks from the coastal marshes of Atlantic, Cape May and Cumberland Counties indicated a 20% lead poisoning rate. While not all of these birds died from lead poisoning, some did.

Most of the ducks tested were black ducks. Black duck populations on a flyway-wide basis have been on the decline in recent years, resulting in reduced bag limits. Although the specific causes of the decline have not been clearly identified, it is obvious that a 20% lead poisoning rate could be a significant factor in the decline. Since 20% of the ducks became lead poisoned during one month of sampling, it is not difficult to envision the entire population having some degree of lead poisoning at some point in the course of a year. Comparisons of lead shot ingestion rates (16%) with lead poisoning rates (13%) of ducks from the same area indicate very little difference. This means the lead in the blood of the tested ducks could result from lead shot ingestion alone rather than some other environmental source.

Waterfowl deaths from lead shot poisoning have occurred in New Jersey. Sick and dead swans, geese and ducks found by the public have been submitted to the Division of Fish Game & Wildlife's diagnostic laboratory. In some unusual instances, lead fishing sinkers have also caused swan deaths.

One problem with lead shot is that it's not randomly distributed. It is deposited precisely in the areas where ducks feed, maximizing chances for picking it up. The solution to the problem is to use something other than lead for hunting waterfowl. Extensive research on various substitute metals by munitions manufacturers has focused on steel. Dos-

ing experiments have shown this material to be non-toxic to ducks.

In 1976, the U.S. Fish & Wildlife Service began instituting regulations to require the use of steel shot for hunting waterfowl in potential lead poisoning hotspots. These hotspots were identified in New Jersey by examining gizzards from hunter killed ducks for lead shot ingestion and through blood testing of waterfowl in areas where gizzards were not readily available. Over 2,000 gizzard examinations and 1,200 blood tests have been performed. Steel shot zones were based on the finding of 5% or more of the sampled waterfowl with lead shot ingestion or lead poisoning.

Unfortunately, the "hotspot" idea to reduce lead shot ingestion in wild waterfowl in effect in New Jersey for seven years, no longer appears to be working. Lead shot ingestion by ducks has not decreased and steel shot ingestion has not increased.

This may be due in part to the sportsman's disenchantment with steel shot. When steel shot first came out on the market, it was relatively untested and performed poorly. Concerns over its killing efficiency and the potential for increased crippling of waterfowl were combined with the unattractive higher cost of steel shot and potential for gun barrel damage.

Steel shot has come a long way. Changes in the wads and collars which protect the barrel from the shot have resulted in effective loads. Cost is now comparable to premium lead shot loads and will be even less with the recent availability of reloading components. Barrel damage will not occur in modern manufacture shotguns.

The only important question remaining with respect to the waterfowl resource is the effectiveness of hunters using the steel shot load. If more birds are crippled by hunters using steel shot than die from crippling injuries and lead poisoning using lead shot, steel shot would be an unacceptable substitute.

At least four major studies have been conducted to compare the performance of hunters under normal hunting conditions using steel shot and lead shot. None of the hunters in these studies knew what load they were shooting and their performance was recorded by an observer. In three of the four studies no statistically significant difference in crippling could be detected between steel and lead loads. The one study in which a significant difference was detected showed an increased crippling rate with steel shot. The researchers conducting the experiment at the Lacassine National Wildlife Refuge in Louisiana pointed out that while there was a larger number of birds crippled using steel this was offset by the fact that 13% fewer birds were actually hit using steel. Every major study to date shows that the use of steel shot would not cause more losses to the waterfowl resource than lead.

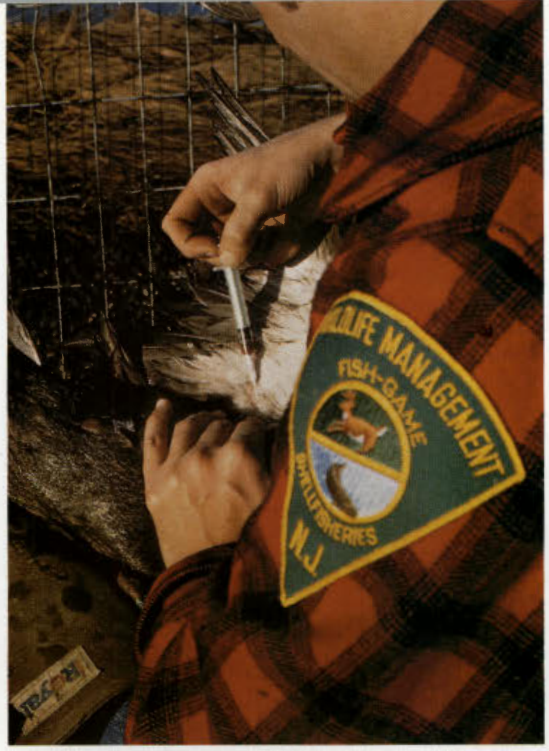
The Lacassine study does point up the need for hunters to become familiar with shooting steel in order to improve their accuracy. Some hunters may forget that they had to learn how to shoot lead shot, and the same is true for steel. Steel shot tends to travel faster and have a tighter pattern and more compact shot string than lead. This means hunters using steel will not have to lead the bird as much and they should use open rather than full chokes.

Because of the demonstrated problems of lead shot poisoning in wild waterfowl, the availibility of a suitable alternative in the form of steel shot and the inability to curtail lead shot ingestion by the "hotspot" method, the New Jersey Division of Fish, Game and Wildlife has recommended a statewide ban on the use of lead shot for waterfowl hunting by 1986. The New Jersey Waterfowlers, a sportmen's organization representing a large segment of the New Jersey waterfowl hunting public, endorses this position and has passed a resolution to that effect.

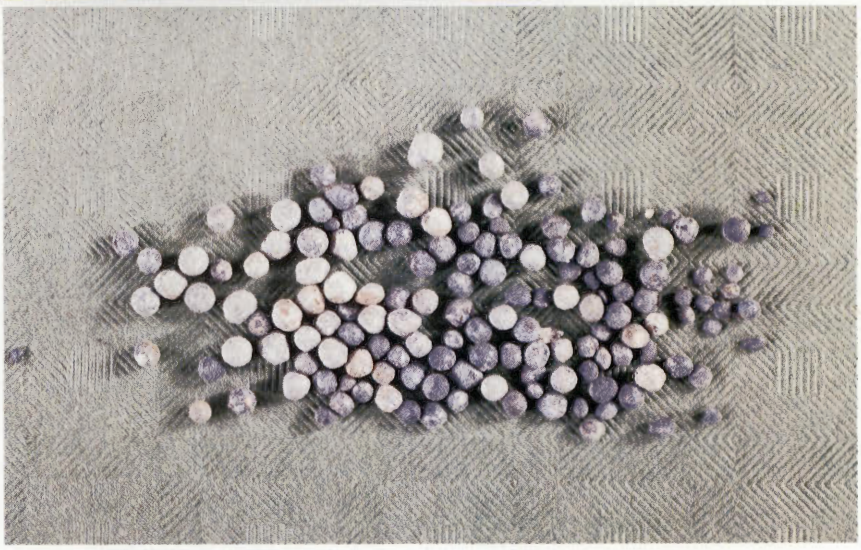
On a international scale, the scientific and political committees responsible for the conservation and management of waterfowl in the Atlantic, Mississippi and Central flyways have resolved to "get the lead out." Numerous other sportsmen-conservation groups have made similar resolutions. Lead is recognized as an environmental pollutant and is being removed from paints, gasoline and now the waterfowl habitat.

The beneficiaries of this action will be not only the waterfowl, but other species of wildlife such as the bald eagle, which have suffered the effects of lead poisoning after swallowing lead shot embedded in the tissue of crippled ducks.

Conservationist-hunters use steel shot because they recognize that with lead a missed shot can still kill.




*Blood samples from live trapped waterfowl showed 20% of the wintering black and mallard ducks suffer from lead poisoning.*



*Lead shot, mistaken for food or grit, poisons feeding ducks. These pellets were eaten by a single scaup.*

# Junkyard bunnies

*The author and his beagle, Ladybug, with a typical junkyard bunny.*

By Thomas Dale Pagliaroli
Photo By Greg Venturo

It wasn't long before the chiming of a very excited duo of beagles wafted through the silence of that warm Christmas Eve afternoon as they worked frantically to get the cottontail out into the open. The bunny was cooperating nicely until it caught a flicker of motion made by one of my companions as he started to bring the smoothbore to his shoulder. It abandoned its circuitous route and broke wide open across a weedfield. The hounds were letting it all hang out as they raced across the plot of windblown vegetation with the scent hot in their quivering nostrils. The cottontail knew exactly where it was heading: a haphazard pile of concrete slabs that loomed up out of the thinning weeds. This shelter featured a variety of hiding places in the form of nooks and crannies. The rabbit disappeared with a flash of its powder—puff tail and the beagles fell silent, save for anxious whines of frustration as they tried to dig into the rocky mounds. We leashed up the dogs and moved off several hundred yards and let them go again.

I was hunting with Mario Rossi of Kenilworth and charter boat skipper/outdoor writer Greg Venturo of Roselle Park. My beagle, Ladybug, was a veteran of

many a rabbit season and took the momentary loss of the bunny with as much professionalism as a chubby beagle can muster, but Mario's young hound, Biscuits, simply couldn't stand to lose! Although we were well aware of the possibility of encountering a pheasant or two, cottontails were the quarry, and the pre-holiday junket promised to be very productive. The unseasonably warm weather the past week or so had the bunnies up above ground, and the three of us were eager not only for some fast gunning but for some Rum 'n Rabbit casserole too. We knew that the dogs would greatly increase our chances of getting some fair shots at these very educated lagomorphs which had somehow managed to survive foxes, diseases, owls, cats, weather and other hunters. Such "super bunnies" were unpredictable and presented what had to be one of the toughest challenges of the season to the upland hunter.

We weren't hunting the most picturesque cottontail cover either. The tract was situated behind several factories on the outskirts of town and served as a dumping ground for a growing contingent of unscrupulous locals. Rusted shopping carts, mattress springs, car doors, and a host of other eyesores littered the property. Patches of black locust, pin oak, and maple were interspersed throughout the area, and the skeletal configurations of knee-high brush and weeds dominated the landscape.

Biscuits struck a chord from along the burned-out shell of an old Pontiac, and a rabbit darted out from under the front bumper and made tracks for a tangle of raspberry bushes bordering a rain-swollen ditch. The ditch ran along the edge of the field for several hundred yards before joining a creek that separated the area we were hunting from a cattail marsh. A soaking rain had fallen two nights before, but drainage was notoriously slow in this lowland acreage. As such, the ditch had been transformed into a muddy torrent.

The bunny did not keep to the raspberry cover for long. Biscuits closed in quickly and it motored out in a blur which vanished into a jumble of railroad ties. While Biscuits worked at rousting the cottontail out, Ladybug hit on a track which led to a rotting pile of sheetrock and plywood. Mario and Greg stuck with Biscuits while I backed up Ladybug. Greg was given the go ahead on the bunny if it exited, which it did with startling speed. Greg, besides being one of the most highly respected skippers on the charter boat circuit, is also one of Union county's finest international style skeet shooters. He let the streaking ball of fluff work up a full head of steam and tumbled it at 40 yards with a load of low brass #6 shot. To show that such shooting was no way involved with luck, he did the same thing two more times.

Ladybug's bunny held tight under the plywood, and I never could get it out of there despite jumping up on the mess. The old gal redeemed herself a little while later by running a rabbit for close to half an hour, finally bringing it well within range of my Ithaca.

We ended up the afternoon's hunt with six nice cottontails, and judging from the shots I missed (four!) and the rabbits which refused to budge from their manmade protection, there would be more than enough to carry on the species the following spring and summer.

Junkyard hunting, while not exactly reminding one of the rolling uplands, does provide some fantastic gunning for cottontails because of the two most important factors whereas bunnies are concerned: cover and food.

Good cover is imperative in attracting and holding rabbits in an area. Typical cover includes stumps, chuck holes, hedgerows, and thickets, but the discarded remnants found at dumps offer much more in the way of concealment. Old tires, abandoned cars, junked washing machines and dryers, shopping carts, boxes—well, you get the idea. These castoffs of civilization provide rabbits with fantastic cover and protection from both the elements and enemies. What better way to sit out a snow or ice storm than from the inside the shell of a washing machine? The bunny is safe from the snow and wind and will make itself quite comfortable inside the ready-made condo.

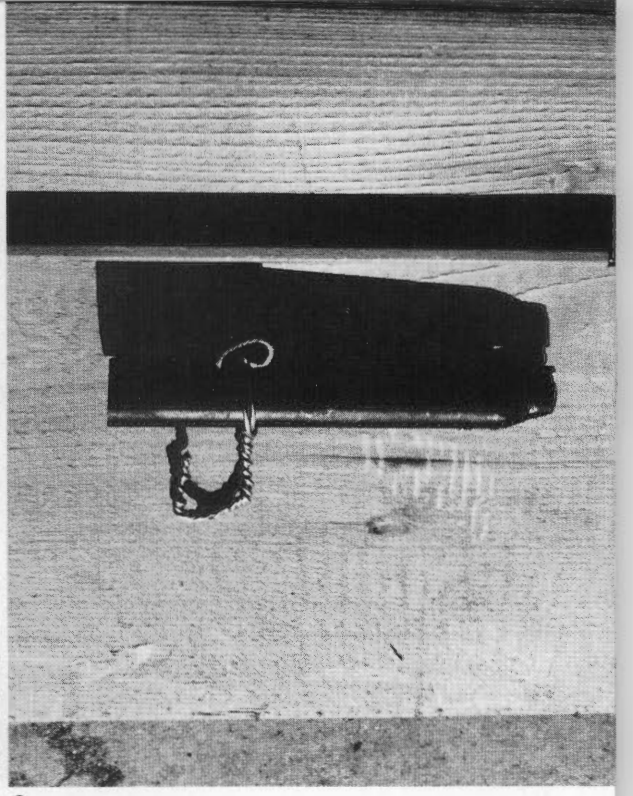
This type of cover also comes in handy to the hunter. As you are well aware, an elevated position is advantageous when gunning with beagles. Height allows the hunter a much better view of the surrounding real estate, thus enabling him to key in on the bunny quicker than if on ground level. Jumping up on a heap of boards or a junked auto puts the hunter in a position to scan the area for the approaching rabbit. This is one case where litter can be convenient.

Another reason why cottontails will be drawn to such an area is the presence of sumac, that nuisance weed that abounds eternal in such an environment. While there may be other vegetation present which will sustain the rabbits through the spring, summer, and autumn, it is the sumac which is the pivotal food source during the winter months. The stalks will be gnawed as high as the bunnies can reach, and the local population can be roughly estimated by observing the extent of scarred sumac throughout the area.

While I prefer to hunt with the assistance of a four-footed partner or two, junkyard bunnies lend themselves well to the sportman who ventures out alone. Cottontails at this time of year are wary, to say the least, and will break way ahead of the hunter, often so far in front that he is not even aware that he has moved a rabbit. This is the norm in standard cottontail cover. When hunting in the "Piles," however, bunnies will sit so tightly that they almost have to be stepped on in order to get them to move. They are secure in the cavities of appliances or under a scrap heap of metal and wood. The hunter must hammer away at these sanctuaries to get the bunnies out, but with enough disturbance they will be on their way. The shooting is quick, and since it is a rather close range, a 20,28 or even a 410 will do the job neatly.

The one advantage of having a beagle when hunting the junk is that the dog can get down under and root around in obstructions which the hunter would otherwise have to abandon without even sighting a rabbit. If the cottontail clears the cover and moves out, a beagle will make tracking it down a lot easier. Just be sure to check your hound's paws from time to time for possible thorns, splinters, cuts, and so forth.

While junkyards are an eyesore, they definitely do produce bunnies when the fields and hedgerows lie barren. They provide food and cover, the two keys to rabbit hunting success. Junkyards are the place!



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# Pinelands Maple Syrup

By Thomas Farner
Photos by Carol J Farner

As a teacher of American History I have spent a great deal of time researching colonial South Jersey and its industries, from ship-building to salt making. But there was always one industry which was not mentioned in the records and old timers said never existed. With this as a challenge my wife and I set out to make pure, New Jersey Pineland maple syrup.

So next winter, instead of doing nothing during that dread time of year between the Super Bowl and the first outdoor activities of spring, why not try America's oldest home industry? Maple syrup, which was first made by the Indians and later by the brave New England colonists, can be tapped as far south as New Jersey. Certainly the people of South Jersey will never drive Vermonters from the market, but with a little ingenuity anyone can make New Jersey maple syrup that is far superior to store-bought.

Before you start planning your hot cakes with homemade syrup, several things must be done. Between now and next January, you should prepare your equipment. First, you will need taps, which you can either buy from a hardware store in rural Vermont or New Hampshire for about 50 cents each, or make yourself.

We started with several store-bought taps, then improvised. To make your own, cut a length of half-inch pipe into roughly four-inch segments. Next stand the segment vertically in a vise and with a hacksaw cut down about half an inch into the pipe at the 6 and 12 o'clock positions. This will give you two tabs at the end of the pipe. Repeat the cutting, this time perpendibular to the first cuts (at 9 and 3 o'clock positions), so there are four tabs at the end of the pipe.

Using a pair of pliers, fold each tab over the next one or crimp them all together to form a point. This end will be driven into the tree.

At the other end of the pipe, make two parallel cuts about a half-inch apart and about one inch long. With a pair of needle-nose pliers bend the tab you just made, backward. This will keep the bucket from sliding off the tap. If you want to be fancy, take a five-inch piece of medium wire, loop it around the pipe, and twist it together. The wire can now be bent to form a hook under the tap from which to hang your bucket.

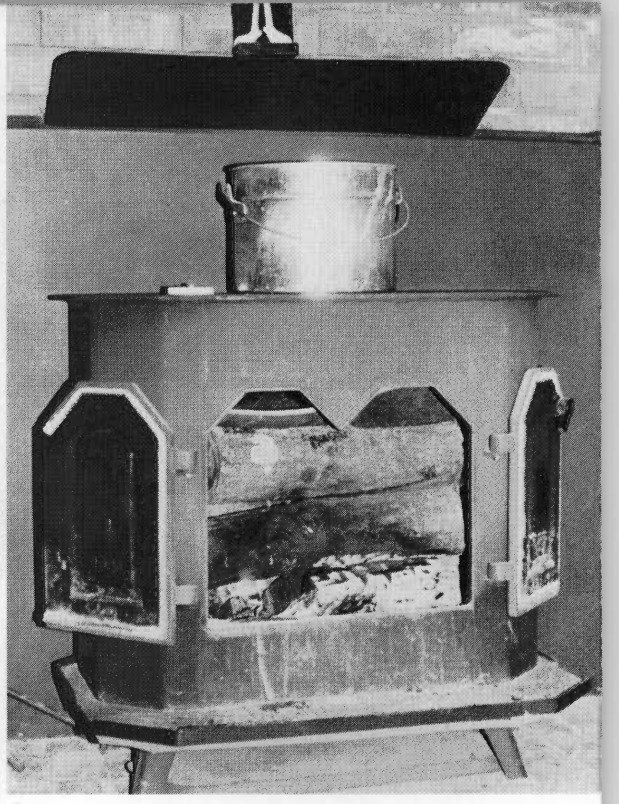
Now with an electric drill and a 1/16-inch bit, drill two holes completely through the pipe about 1½ inches from the tip that is to be driven into the tree.

You will also need an old-fashioned brace and bit to drill your hole in the tree. The best place to find this piece of equipment is at the local flea market, where chances are you can pick one up for anywhere from 50¢ to $5.

The final step is to get your friends to save coffee cans—the larger the better. The best are #10 size tin cans. Punch a hole in each side and make a loop across the top of the can with a short piece of wire.

Now you are ready to look for trees. There are very few sugar maples in South Jersey, so you must settle for the much more common red or swamp maple, which is easy to find but whose sap has a lower sugar content than that of the sugar maple. As its name suggests, this tree can be found in most of the area's hardwood swamps and is easily recognized by its red buds, which become conspicious in the spring.

Our experiment took us to Tom Haines' U-Pick



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Blueberry Farm, in Pemberton, Burlington County. According to Haines, blueberry and cranberry farmers regard these maples at weeds. He wished us luck with our experiment saying, "I hope you get enough sap to kill the trees." (The process does not harm the trees.)

The biggest "trick" to gathering maple sap is knowing which few weeks a year it runs. In the mountains of New England it runs from the end of February to early March. Here in New Jersey early February seems to be about the right time to start, especially if the winter has been mild.

Choose your tree. Look up for one with a healthy trunk about 18 inches in diameter or larger. Stand under a large branch, and about three to four feet from the ground bore a hole about two inches deep using the brace and bit. Slant the hole slightly upward so the tap will point downward. Then drive the tap in so the holes you drilled in the pipe are inside the tree. Next, hang your bucket and proceed to the next tree.

Don't be surprised when your sap starts dripping. Maple sap has no color or odor, and is just about tasteless. You will think what you are collecting is water. It isn't.

As you begin collecting the sap you will quickly learn how touchy it is. The sap only runs under certain favorable conditions. It likes nights around 20 degrees, and bright, sunny days in the 40s. Some people claim the tree should have snow at its base. If conditions are not good, the sap simply will not run. Dark clouds, rain, and warm nights all tend to turn the sap off. Soon you'll be able to look out your window at the sky and say, "Yep, sap's running." But once you have started collecting, you can expect to get two to three good weeks of sap.

When you bring the sap home (you should check the buckets at least every other day) transfer it from your collecting container to a holding container by pouring it through several layers of cheesecloth (both holding and collecting containers should be about five-gallon capacity and have a lid or cap). Once you have collected about three gallons of sap, you are ready to start boiling it down to syrup.

If you have a wood stove or kerosene heater that you keep a pan of water on to add humidity to the air, it's perfect for boiling the sap. You want a low boil—from 212 to 219 degrees. If the temperature is too high the syrup will boil off with the water. Any pan with a large surface area will be good.

Start with a half-gallon of sap and let it slowly boil away. When the first half-gallon has reduced by about 75 percent, add another half-gallon; repeat this procedure several times. As the sap boils down, a whitish-brown scum will form on the surface. This is natural.

A sugar maple tree yields about one ounce of syrup per quart of sap, or about a 32:1 ratio. The red maple's yield is approximately 45:1. This means to get eight ounces of syrup you will need about three gallons of sap.

As it boils down, the mixture will become darker and sweeter. You are now in the home stretch. Once you have reduced about three gallons to less than a quart, you will want to move to the kitchen stove if you have been using a wood stove. Line a wire kitchen strainer (not a collander) with a cloth napkin or a few coffee filters. Pour the mixture through this into a clean pan.

Boil this pan down very slowly over medium heat. By now you will be able to smell the distinctive, sweet, maple odor. As you gently rotate the pan, look for a light film or coating to stick to the sides. When this occurs you are finished. Pour syrup into a clean bottle, cap and refrigerate immediately.

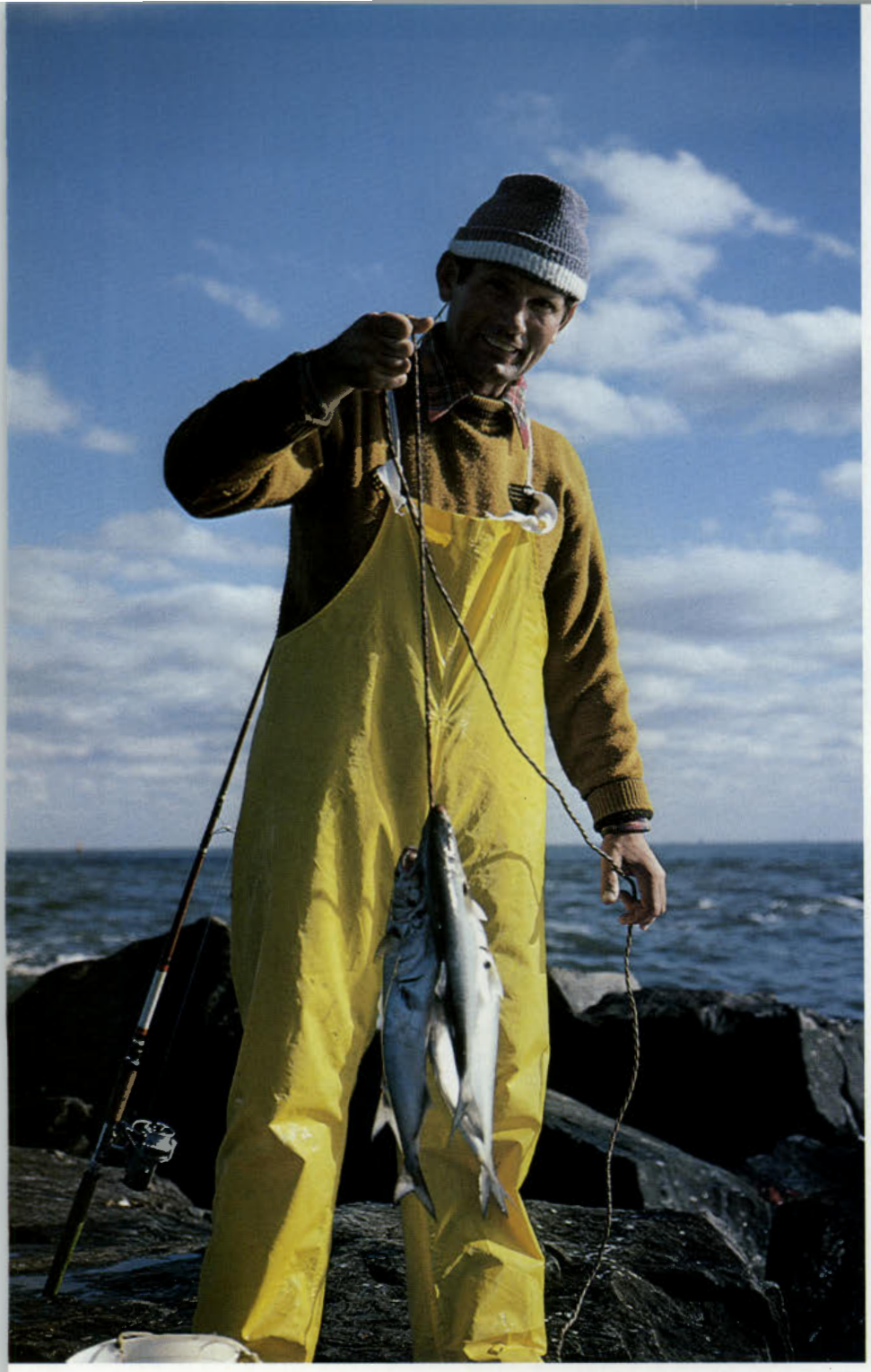
What you now have will amaze you with its rich, sweet flavor, especially if you are used to the store-bought kind, which is only about three percent real maple sugar. Its uses are almost unlimited: on oatmeal, in a cup of tea, over cornbread, over ice cream, etc. Never again will you be able to call the commercial concoctions maple syrup and never again will you begrudge the high price of the real thing.

*1. The tap hole should be drilled at a slight upward angle to improve the flow of sap.*

*2. A home-made tap showing twisted wire hook and tapered end to be driven into maple tree.*

*3. The ping of sap dripping into the metal can breaks the silence of a cold February day, but this sound tells you you did everything right.*

*4. Boiling slowly on a wood stove, the sap will not have any odor until it's almost ready.*



# Saltwater fishing along the Jersey Shore

PHOTOS AND TEXT
BY BRION BABBITT

In the world of sportfishing hard fast rules are difficult to find, and marine angling is no different. But fortunately for Garden State enthusiasts who regularly visit the beaches, jetties and inlets from Sandy Hook to Cape May, superlative fishing during the fall season is the unequivocal rule.

In autumn, pursuing marine gamefish at the interface of land and sea is a totally delightful experience—summer crowds and traffic have dispersed and air temperatures are more tolerable. More importantly, saltwater species such as big bluefish, weakfish, "doormat" fluke and even the downcycling striped bass swim close to the shoreline more frequently. At this time of year ocean gamesters swim and feed totally under the strongly compelling urge to migrate from our coastal waters. This biological timeclock prompts fish to school en masse and to seek food for their long travels ahead.

Forage or baitfish are not exempt from the migratory impulse. When deciduous leaves begin to portray a multitude of hues, menhaden (bunker) and mullet schools actively ply the shore waters with a southerly disposition. At this time of year it is a simple, fundamental relationship: baitfish point their noses south and track our shores while hungry, marauding gamesters fin closely behind. When the two factors meet the results are usually explosive.

New Jersey anglers intent on catching saltwater fish can exploit autumn's influence on seagoing creatures by practicing their sport either along the high surf proper, along rockpiles (jetties) that help our beaches stem the effects of erosion or at inlets—turbulent, watery thoroughfares that connect quiet backwaters and estuaries to the Atlantic. All three put practitioners in close proximity to feeding fish.

Fishing the high surf from an open beach puts more demands on the participant than a jetty or inlet in that there is certainly more detective work involved. A casual glance seaward from any sandy perch may very well give the novice a superficial impression of surf bottom, however this approach would be a tad naive.

From the Gateway National Seashore at Sandy Hook through Island Beach State Park to Long Beach Island and on to the beaches at the foot of the Cape May Point Lighthouse, surf bottom topography varies considerably. Observing the height and placement of the waves rushing shoreward is key to mapping features below. A wave approaching shore will begin to break when the depth of water below is equal to the height of the comber. Thus water depth can be ascertained by a roving eye. Breaking white water that extends far from the beach unmistakably indicates a gradually sloping sea bottom. A sharply declining ocean floor will allow waves to travel close to shore before crashing. In this instance deep water is only a short throw away. Waves that tumble offshore then settle only to build again before expending their last energy on the beachhead generally mean that a slough or bottom gully exists between the beach and an offshore bar. Sloughs are much sought after by the knowledgeable surfman as these often hold gamefish nuzzling the shoreline.

Sloughs and the deeper sections of water in front of a beach typically yield more frequent catches for the surf fisherman. Close observation of wave dynamics will train the eye and lead to even more success in the surf.

Jetty fishing is actually a variant on basic surf

fishing. Instead of casting directly from the beach, a "jetty jockey" attempts to entice a critter from aboard a rockpile. Not only does a jetty extend a fisherman's range seaward but baitfish and other small sea dwellers that are fair game for predators seek refuge in the submerged rocks. It's another basic relationship: Prey lured by the apparent safety of the rocks in turn attracts larger fish searching for food. Many of us who have logged countless hours astride a rock can relate personal accounts of fish that were literally caught while nosing in among the boulders. Striped bass and weakfish are notorious for being taken while cruising only a rod's length away.

Productive jetty fishing entails, in a word, thoroughness. I've caught fish at every imaginable part of a jetty in the "corner" where rocks meet beach sand, at mid-length, from the end in presumably the deepest water and at all points between. Methodically working a jetty requires obvious patience and a driving desire to feel confident that no trophies were errantly left behind in one's haste to move on. Firing casts in a semi-circle from each rocktop perch will assure you that all productive waters have been covered. Carefully manipulating a jetty can be time consuming, but you only need latch on to one giant to convince you of its effectiveness.

Jetty fishing is a very specialized form of marine angling and as such some unique equipment is required. Treading on slippery, moss-covered boulders makes sure traction mandatory. Cleated shoes or other spiked or studded footwear are a prerequisite for good safety. Many tackle stores sell footwear especially for this purpose and its purchase is strongly recommended.

Inlet fishing is a close cousin of surf and jetty angling but is different enough to deserve separate attention. Regulars who deploy their inlet fishing tactics would certainly take umbrage at any suggestion that there is little difference between surf or jetty technique and fishing an inlet effectively.

Scores of gamefish are taken from inlets every fall using methods geared for the purpose. Tidal currents are often brutal. They are a result of a lot of water trying to pass through a relatively narrow cut in the land all at once. Flows can be fierce and tackle must be chosen to suit at these times. Often heavy sinkers are needed to anchor baits in place. Lighter tackle can be used but not during periods of heavy tidal movement, especially near the mouths of inlets. Bucktails and metal lures worked in inlets are potent attractors and are more manageable in stiffer currents than lighter plastic or wooden swimming lures.

The pronounced current flows in inlets can be felt by gamefish well out from the inlet mouth proper. Predators are attracted by the water movement and the bounty contained therein. Smaller forage fish and other creatures comprising a big fish's diet are hapless targets within the inlet's powerful flow. In their domain large fish are astute, sensing the available food supply within an inlet's grasp. Accordingly, outgoing tide can be a bonanza for the inlet fisherman. Receding waters sweep forage from rich backwaters into the mouths of waiting gamefish. Unknowing baitfish—whether stepping to a migratory or tidal march beat—pass from relatively quiescent backwaters into a stronger army of predators swimming in a turbulent battlefield.

Fishing the high surf, jetty fishing and inlet angling share a common thread in that they are all forms of coastal marine angling. Yet each is distinct and deserving of individual approach. Purists may argue the superiority of their brand but the savvy, shore-based generalist who realizes the advantages of all three stands to benefit the most in autumn when migratory patterns are in operation and coastal fish—large and small—are on the move along our New Jersey shore.

*Pictured opposite: Jetty fishing is extremely productive during the fall season, as shown by this angler displaying a nice stringer of fresh-caught bluefish. These blues were caught by presenting a bait from a rockpile well out beyond the surfline.*

*Pictured below: Hereford Inlet, situated between Wildwood and Stone Harbor in South Jersey, provides outstanding fishing when gamefish migrations are underway. Inlets all along the New Jersey coast are great spots to practice marine angling. Here a Hereford Inlet angler plys his trade just at sundown.*

*Hack Tower*

# Bald Eagle Restoration in New Jersey

BY JO ANN FRIER-MURZA
PHOTOS BY AUTHOR

The magnificent bald eagle survives in New Jersey even though its numbers have declined as a result of environmental contaminants and loss of habitat. Because of the improved handling of toxic substances during the past decade, birds of prey are beginning to respond by producing healthy offspring. Although much eagle habitat has been lost to development, New Jersey's wealth of natural resources still includes many square miles of wilderness habitat suitable for bald eagles. The great expanse of the Fortesque Glades and Bear Swamp, Wharton State Forest, the lower Wading River, Brigantine National Wildlife Refuge and Dennis Creek all exemplify bald eagle habitat along the Delaware Bay and Atlantic Coasts.

In 1964, F.W. McLaughlin reported 10 eagle nests in the Delaware Bay Counties in 1959. In 1975, the State's Endangered and Nongame Species Program first-year census of eagles showed only one nesting pair remaining. In the following years, the only successful nesting occured in 1976 when one eaglet fledged. The Division of Fish, Game and Wildlife's Endangered and Nongame Species group, the agency devoted to ensuring the survival of endangered and nongame species, began investigating management techniques to assist the pair.

The bald eagle pair had been laying eggs which did not hatch. In 1979, program biologists attempted to introduce a captive bred eaglet from the US Fish and Wildlife Patuxent Wildlife Research Center in Maryland into the nest. The attempt failed when the adults were harassed by predators and abandoned their nest. The chick was returned to the source. (See *A Little "Faith" is Followed by "Stars" and "Stripes"* by James W. Carpenter & John A. Stegeman in the Jan./Feb. 1984 issue.)

In 1982, precautions were taken to avert the predator problem. Program biologists substituted artificial eggs for the real eggs "convincing" the adults to remain on the nest. Meanwhile, the eagles' eggs were transported to Patuxent Research Center where they were incubated but failed to hatch. Pesticide contamination had caused excessive shell-thinning which allowed the embryos to dehydrate. The Patuxent Research Center again supplied a chick. This time it was accepted and raised by the pair until it fledged in June.

The entire management procedure was repeated in 1983 and 1984. In spite of thin shells, both years the pair's own eggs hatched under ideal incubator conditions and three checks were successfully introduced back to the nest. Four young wild eagles have been regularly observed in Southern New Jersey in recent years, and it is expected that they will return to the area when the mature in three to five years.

Still searching for eagle restoration techniques, the Program biologists had been watching the activities of New York's Endangered Species Program for several years and more recently Massachusetts and Pennsylvania. The wildlife agencies of these states have been releasing young eaglets imported from Alaska and other states by a gradual process known as "hacking." This technique had been successfully employed with peregrine falcons in New Jersey, and we thought it might be the best way to restore the bald eagles, too. New York's project has already resulted in two breeding pairs.

The Program entered the Bald Eagle Restoration Project with a promise of eaglets from Nova Scotia and Manitoba and a cooperative lease agreement for a "hack tower" with the Natural Lands Trust, in Fortesque Glades. The United States Fish and Wildlife Service delivered a total of sixteen eaglets

during the summers of 1983 and 1984. Wearing colored markers, leg bands, and radio transmitters, the eaglets fledged after two months of constant care in the hack tower by Program sponsored student assistants. The fledged eagles' movements were radio-tracked for several weeks until they dispersed, and data on their habitat preferences during that period are now being analyzed.

The Bald Eagle Restoration Project is planned to continue for five years. The results of the hacking project and nest manipulations will then be assessed to determine future strategies. The Project is directed toward the goal of establishing eight to ten nesting pairs.

The Endangered and Nongame Species Program has been fortunate to receive contributions through the Income Tax Check-Off. These funds have been the funding source for the Bald Eagle Restoration Project. Its continuation depends on your assistance. Remember "Go Wild for Wildlife" Check Off for Wildlife on Line 37B of your New Jersey Income Tax Form.

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## MUZZLELOADERS

*continued from page 23*

take it inside or into an area where there is artificial heat. If it's a damp or rainy day, some shooters seal the percussion cap on the nipple with clean fingernail polish, and take the nipple off only at the end of the hunt, or for safety reasons.

Peep sights on a muzzleloader are fine on the range, but at dawn and dusk in the woods or on overcast days, it can be difficult to see through them. Most hunters prefer open sights. A good trick is to paint the front of the blade and the bead with fluorescent orange nail polish or paint. The front sight then really stands out, and it's easier to pick it up with the rear sight in a dark woods. You might also want to move the rear sight forward or backward on the barrel until you get a sharp sight picture, depending on whether you are slightly near or farsighted. In my own case, moving the rear sight two inches forward made a world of difference.

An important but frequently overlooked safety factor is to be absolutely certain the ball or projectile grips the barrel tightly over the powder charge. Every year you hear about projectiles falling out of the barrel while the hunter is walking or on stand. If a projectile should slide a few inches down the barrel and stop, you have a live bomb in your hand. Should you fire the gun, the gasses will rapidly expand, and when they reach the projectile, a ruptured barrel and possibly injury to you can be the result. So make certain the projectile is seated on the powder charge and stays there.

It's also important to select the size percussion cap recommended for the brand of nipple you are using. Be certain the caps fits snugly all the way down on the nipple. A cap that does not seat properly may not fire, since the hammer will not strike a solid blow. You might have to file down a nipple slightly to get a tight, solid fit with certain caps.

Many muzzleloader shooters prefer the stronger fiberglass or metal ramrods to woods. Wooden ramrods might not have straight grain, or be much more that wooden dowels, and if they should break under even light pressure, you can injure your hand. Some black powder enthusiasts feel fiberglass and metal rods will score the barrel. They do make muzzle bushings which center the rod in the muzzle and prevent abrasion, if you are concerned about it.

Because black powder is a "Type-A" explosive, you should never smoke or have open flames in an area where you are loading or shooting. There is always the possibility of a blow-back, and also of a piece of a primer flying back. Eye protection is important. Shooting glasses are recommended on a range and in the field.

The bullet or patch lubricant is another very personal choice. Use whatever your gun handles best. The commercial lubricants seem to work well, but some shooters prefer to blend their own, using Crisco, beeswax, tallow, and the like. A good lubricant will keep fouling inside the barrel soft and will prevent caking.

Undoubtedly I have missed some key points concerning basic muzzleloading problems. Some veteran muzzleloader shooters will also disagree with some statements and techniques I've recommended. However, this is a highly personalized type of shooting and you have to find your own way. That's part of its charm. Perhaps some of these points are worth considering, and maybe one will result in your getting a shot off at a handsome buck.

## Acid rain

*continued from page 21*

fungus that protected the roots of loblolly pines, a species that is also found in the Pine Barrens. Without the fungus, the tree itself declined and died.

Johnson's conclusions, and even his measurements, have been challenged, however. Mark Morgan, assistant professor of zoology at Rutgers University in Camden, agrees that the pH in McDonald's Branch has decreased during most of the 20 years in which it has been measured, but he doubts that acid rain played a role.

According to Morgan's figures, the McDonald's branch pH has varied from 3.5 to 4.5, meaning that on the average the water already is more acidic than the acid rain that drains into it. He says there are other possible explanations for the increase in acidity, such as the 1963 Pine Barrens fire.

And if there has been a reduction in tree growth in Lebanon State Forest it is not apparent to Chris Bethmann, superintendant of the Division of Parks and Forestry's Lebanon office. Bethmann is aware of Johnson's studies but he says he has not marked any change in the forests, pitch pine, white cedar and oak and acid-loving shrubbery such as laurel. As to fish, Bethmann said, "You won't find trout in South Jersey, but there are pickerel and possibly perch and bluegills."

Neither has any growth lag been detected by commercial Christmas tree growers in the area, who presumably would be among the first to see it and complain. What they have seen, according to a random survey, is a discoloration that cuts the prices they can get for the trees.

They blame pollution, but not acid rain. Ray Battle, a Christmas tree farmer and retired county agricultural agent in Richwood says fumes from auto exhausts turn tree branches yellow. Charles A. Dupras, another tree farmer and retired county agent in Mays Landing has seen the same discoloration. "But that's because of ozone," he said.

Acid rain was also dismissed by Steven Johnson, an extension specialist in vegetable pathology at Rutgers' experimental farm in Bridgeton. He cites a study by the Boyce Thompson Institute of Ithaca, N.Y. described at a plant pathology meeting last summer at Laval University in Canada. It showed that to damage a plant's leaves—or needles—rain would have to have a pH level of 2.5 to 3, almost 10 times the acidity of the most acid rain sampled to date. He says the discoloration is caused by acid pollutants collected directly by the trees that destroys the tree's choloplast, the producer of the green chlorophyll with which a plant converts sunlight to energy.

Granted the Thompson Institute study does not address the damage to tree-protecting fungus attributed to acid rain in the North Carolina State study. But even Arthur Johnson acknowledges that the tree stunting he has observed may also be due to ozone, a three-atom oxygen molecule that, according to Johnson, inhibits an organism's capacity to breathe, or it may be due to the dry spell that began in the late 1950s in the eastern U.S. and has persisted off and on ever since. Like most acid rain experts he says a lot more study is needed.

Nevertheless, he says, "it's hard to believe that trees never recovered after 25 years." One possibility he sees is a combination of influences: Any damage done by acid rain is the cause—or result of other debilitating factors. "It would be like having a cold," he said "and then developing pneumonia."

## Great Swamp

*continued from page 19*

is a favorite place to rest or meditate. Beyond the bridge, the Blue Trail runs uphill through a red-maple grove before dropping back along the brook. Then it swings over a ridge through stately hardwoods including some huge black birches well over a foot in diameter. Ferns by the acre carpet the floor of the forest. It is quiet here. Great horned owls live nearby. Sometimes in late fall Canada geese are heard in the distance. The trail is narrow and if the geese pass low overhead they seem to be moving at great speed—wings flashing, bodies elongated—a picture of aerodynamic perfection etched in the mind.

Near Woodland Road the Blue Trail again crosses Great Brook via a large fallen tree, the bark long gone. Dew and rain can make for precarious footing, though attempts have been made to level the top of the log with axe and saw. Hawk sign is frequently seen here, and nearby the lovely swamp rose blooms in July.

Easy underfoot and diverse in habitat is the Orange Trail following the old road from Meyersville to Green Village. The eye marks out fields and orchards of abandoned farms. Early roadside plantings have grown into mature sugar maples, spruce, and pines. Quaking aspens rustle in the breeze, and there is even a tiny grove of chestnut trees old enough to bear. Should Great Swamp ever feature a wildflower trail, this would be it. Open to the sun over much of its length, and edging along grassy fields here and there, the Orange Trail hosts musk mallow and Canada lily, both rare in these parts. Closed gentian and field thistle also occur here, as do many more plentiful species. Woodbine, burning bush, and sumac illuminate these aisles with blazing reds in fall.

The Yellow Trail makes a big loop off the Orange Trail, and a short spur runs over to Black Brook. Great horned owls occasionally question one's presence in the beech and oak forest.

Long-time residents think of the Yellow Trail as Ground Pine Trail, and for years before the government takeover in 1964 it was the best place for hiking in Great Swamp. The track through highbush blueberry thickets is narrow, and worn several inches deep. Near the south junction of the Yellow and Orange trails, denizens of a small but well hidden pond are stalked by great blue herons. The birds' protestations on spotting two-legged intruders echo harshly over adjoining fields.

A more southerly spur off the Orange Trail also connects with Black Brook. This is the Silver Trail, a pleasant walk where one might be attracted by windblown down leaving cat-tail heads in a plume of golden sparks under a low November sun.

Earlier I alluded to Laurel Trail at the eastern end of the Refuge. It, too, has been cleared recently and is now blazed in white. Though this trail is about half a mile from the parking area, the dirt road and marsh along the power line may provide interesting looks at small animals and wildflowers. Much of the understory along the White Trail is mountain laurel, which puts on a special show of pink and white blossoms in June. This trail also features a large stand of chestnut oak on some high ground near the halfway point.

Further information about the trails of Great Swamp may be obtained at the Refuge office on Pleasant Plains Road or by telephoning 201-647-1222 between 8:00 AM and 4:30 PM on weekdays.

# Dear Editor

It was most pleasant to see an article about our local hero, Marvin Creamer, in your July/August issue. However, it was not so pleasant to see the same old mistake repeated, that almost the entire press has perpetuated—where Marvin lives. His home is in Glassboro, not in Pitman. I live only a half-mile from him and recently called him to check. Nothing against Pitman, but we Glassboro residents want the record straight. Glassboro is the home of the world's most excellent sailor and navigator. By the way, when I praised his sailing, he replied in typical modest fashion, "Well how can you miss a whole continent?" Please continue to tell the world, there are still heroes.

Rinehart S. Potts
Glassboro

Please be advised that the American Chestnut on the corner of Trenton and Rue Aves. in Point Pleasant in "N.J.'s Record Trees" (Sept./Oct.) is no longer standing. I went to see it last weekend and was informed that it had recently been cut down. No one seemed to know why.

Camille Della Penta
Oakhurst

**Many thanks for the information.**

Please advise me where I might obtain literature to aid in identifying trees in my area.

Thomas J. Roe
Florence

I believe I may have a few nominees for the list of N.J.'s record trees. I am interested in exact measurement methods and the procedure to nominate record trees. Thank you.

Harry A. Palmer
Senior Ranger
Turkey Swamp Park
Freehold

I'm a hunter and I believe I can break several records listed in "N.J.'s Record Trees." I'm referring to trees deep in the woods. You don't see them from a car. How do I go about reporting these trees? Do I need forms to fill out? A leaf or whatever? I know of some large cedars in a swamp deep in the woods. They look hundreds of years old. It's so dark and tranquil you feel like you are the only person on earth. When I walked through I thought I was walking on pillows. The cedar needles were like cushions of goose down.

Raymond Hoenge
Southville

**We've received a number of letters from people all over the state who know of large trees that they believe should be included in the list of record trees—a black birch in Sparta, a horsechesnut in Westfield, a tulip poplar in Haledon, a purple beech in Lodi. Over the next several months, when they are in the area, members of the N.J. Bureau of Forest Management will check the trees and, if they qualify, they will be added to the list. For more information about N.J.'s trees—record or otherwise—contact George Pierson, Chief, N.J. Bureau of Forest Management, CN 404, Trenton, N.J. 08625.**

This poem was attached to a request for a free fishing license (available to any resident 70 years or older) by the author, 70-year-old Bill McCormack of North Brunswick. The request was mailed to Russell Cookingham, Director of the Division of Fish, Game and Wildlife, who directed it to us.

GOT IT MADE

Gonna get a fishin' license
And I'm gonna get it free;
Being ancient has its good points-
Or at least it has for me.

I have really done no fishing
Since I was a little boy;
But you never lose the know-how
So I'm bubbling with joy.

With some waters now polluted
I feel lucky as can be;
That the Lawrence Brook isn't too bad-
So I'll fish that stream—FOR FREE.

Yes, I'm gonna like this set up
And I sure enjoy the terms;
Now I've got to find some youngster—
To dig up some friendly worms.

*New Jersey Outdoors*, Vol. 20, No. 12, published June 1970 was announced as probably being the last issue of the magazine, so I saved it. At that time, NJO was a good publication, but today it is an excellent game and parks magazine.

George M. Niedermayer
Maple Shade

On your idea of writing a golf story (Letters, July/August), why not have a baseball, soccer, football and hockey story too? If the gentleman would like to read about the dull game of golf, he should subscribe to *Sports Illustrated.*

J.R. Roe, M.D.

**We'd like to publish articles about all the different kinds of outdoor activities at state, county, federal and local parks and wildlife management areas throughout New Jersey so that our readers can get an idea of the many different kinds of recreation available to them.**

I am enjoying my second year's subscription to your very informative and picturesque magazine. You've given me several ideas for day trips, including my new favorite, Twin Lights Historic Site, which I had not been aware of before "Our Friends in the Parks" (January/February '84).

New Jersey is now aggressively pursuing the tourist dollar, but we are sadly deficient, in my opinion, in our state park system. Not that we don't have beautiful parks. It is just that we are not using them to full advantage.

I am a big fan of West Virginia, whose state park system is extensive and well-utilized. They have several parks with cabins and lodges and a few full resorts, including a ski lodge and an 18 hole golf course. These are owned and operated by the state and the profits help reduce taxes.

How about a 60 room lodge on the Wharton Tract somewhere? This is the sort of thing the state should be considering. Keep up the good work.

Louis Hertz
Ventnor

**While New Jersey's park system has no full-scale resorts, there are cabins at Bass River State Forest, High Point State Park, Lebanon State Forest, Parvin State Park, Stokes State Forest, and Wharton State Forest. There are also family and group campsites at 19 state parks. And Spring Meadow at Allaire State Park in Farmingdale is an excellent 18 hole golf course. For further information, contact State Park Service, NJ Department of Environmental Protection, CN 404, Trenton, NJ 08625.**

**If you would like to receive the Department of Environmental Protection's bi-monthly newsletter, fill in the coupon and send it to Editor, *Environmental News*, Department of Environmental Protection, CN 402, Trenton, NJ 08625.**

NAME_____

STREET_____

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**FRONT COVER**
White-tailed buck in rutting season. Photograph by Leonard Lee Rue III.

**INSIDE BACK COVER**
American Eel. Illustration by Carol Decker.

**BACK COVER**
Fall colors—bogs south of Chatsworth. Photograph by Cornelius Hogenbirk.

# American Eel

By Dave Chanda

Where does the American eel come from? Its origin has been the subject of debate for thousands of years. Even modern science has been unable to solve this biological mystery. Perhaps the ancient Greeks were right in their belief that eels developed from horse hairs failing into a stream!

Most of us would describe an eel as a slimy snake-like creature. Unfortunately, this misconception has prevented Americans from enjoying this fish as the delicacy it is considered to be throughout the rest of the world. While the adult eel does have an elongated snake-like body, any other association with the snake is completely false, because the eel is a true fish having both gills and scales. An eel has a pointed snout, a large mouth lined with many needle-like teeth, a pair of pectoral fins just beind its head an a small gill opening in front of each pectoral fin. The dorsal fin starts about 1/3 of the way back on the eel and is continuous around the body to the anal opening. Females are larger than males, varying in length from 30 to 42 inches and weighing from 2½ to 3½ pounds. Females have been known to attain a size of over 4 feet and weights of over 16 pounds. The male, however, rarely exceeds 18 inches in length.

The American eel, also known to us as the yellow eel, silver eel or freshwater eel, is a catadromous fish. Catadromous fish are fish which migrate from fresh water to the sea for the purpose of spawning. Eels can be found in freshwater streams, lakes and tidal areas along our coast. Only the females, however, move upstream into fresh water. The males remain in the brackish waters of the estuaries near the mouths of the rivers.

An eel's color can vary depending on habitat and stage of development. Young eels, called elvers, are usually greyish green but sometimes they are colorless, and then called "Glass eels." An older eel, living in fresh water, will change to a yellow stage—usually a dark muddy brown or black on top, yellowish along the side, and a light yellow on the belly.

During their stay in fresh water they grow slowly, feeding at night on insets, fish, crustaceans, snails and worms. On occasion, they may even feed on one another. During daylight hours, the eels will hide under rocks, in deep holes or bury themselves in the mud. If the pond or stream dries up, they are capable of surviving in the moist mud and will emerge once water returns.

Each fall some of the adult eels undergo a final change. The eels cease to feed and begin a downstream migration. At this time they again change color, becoming more "bronze." Upon reaching the tidal areas the females are joined by the males and they begin a three month migration to their spawning grounds. At this point, the eels drop completely out of sight, and their destination remains a biological mystery. Upon reaching their spawning grounds, they will mate, reproduce and die, completing a cycle that has been going on for centuries.

Some scientists claim that the eels spawn in the Sargasso Sea, which is south of Bermuda and approximately 1,000 miles east of Florida. Other scientists claim this is impossible, as the young eels could never successfully cross the complex currents of the gulf stream. Wherever their spawning grounds may be, each female is capable of producing 15-20 million eggs. They will spawn from February to July. After hatching the larvae are quickly swept out by ocean currents, and for the next year they are completely under the influence of these currents. They feed on plankton as they drift along. In the spring of the year after they are spawned, the larvae appear along our North American shores and transform into young eels or elvers. At this time they are approximately three inches in length.

It is unlikely that the elvers return to the waters inhabited by their parents since they rely so heavily upon the ocean currents to bring them to freshwater. Upon reaching fresh water the female eels migrate upstream until they are sexually mature. The males stay in the coastal areas.

During the upstream migration the elvers' persistence is unbelievable. As long as the surface is moist, they will not hesitate to cross fields, climb rocks or even go around obstructions such as a dam or waterfall. After reaching their destination, they will remain in fresh water from 5 to 10 years. However, eels as old as 20 years have been taken from fresh water.

As a food, the American eel is largely unappreciated in the United States. However, in many parts of Europe they are an important food source. In Japan, which is by far the leading eel producing country in the world, the demand for young Japanese eels is so great that at times eel prices have been as high as several hundred dollars per pound! Even though the United States accounts for less than three percent of the world harvest, eel fisheries have existed here on a limited basis since the arrival of the Pilgrims. Today, New Jersey is one of the leading states in eel production. Each year, commercial fisherman harvest approximately 250,000 pounds of eels, valued at almost one quarter of a million dollars.

The majority of our eel fisheries are located in the Raritan/Sandy Hook Bay and the Delaware Bay areas. The eeling season begins in mid-April and runs until late October. Although there are many methods used to catch eels, the use of eel pots is the most common. Eel pots come in all shapes and sizes. A typical eel pot is a three-foot cylinder, 10 to 12 inches in diameter, made of vinyl coated mesh wire with two net funnels. The funnels divide the pot into two compartments. The bait is placed in the last section so the eel must pass through both funnels to reach it. Once in the inner compartment it is very difficult for the eels to find the two small openings that would lead to their escape. The bait can be any form of marine life, such as clams, mussels, or herring.

An individual eeler may set and tend as many as 50 to 80 pots. The eels are kept alive and stored in large floating boxes until enough are caught to be picked up by dealers. The eels are then transported live in tank trucks to an airport, where they will be shipped overseas to the European market. There are even some countries that send specially designed ships with live wells to the United States and Canada to collect mature eels and ship them back to Europe alive.

Once you catch your eel, the next thing you must do is prepare your fish for cooking. There are many ways to clean eels. One easy method is to clamp the eel by the head in a vertical position. Make a circular cut about three inches behind the head being careful not to cut too deep into the flesh. Next, using a pair of pliers peel the skin off intact. Once skinned, take a sharp knife and make a shallow cut from the gills to slightly past the vent. Remove the viscera and blood vessel along the backbone and thoroughly wash out the gut cavity. Finally, remove the head and last three inches from the tail. Your eel is now ready to be cooked.

*NOTE: Exercise caution when consuming eels from waterways that receive industrial wastes. The New Jersey Department of Environmental Protection has found elevated levels of toxic chemicals in eels from the Hudson River-Newark Bay complex, and DEP has banned the sale and consumption of eels from these waters. An advisory to limit consumption of eels from other waters is also in place.*

*Areas of the coastal region and Delaware Bay which are currently being utilized for the commercial harvest of eels do not pose a significant problem. Additional information can be obtained by contacting the NJDEP Office of Science and Research, CN402, Trenton, N.J. 08625.*


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