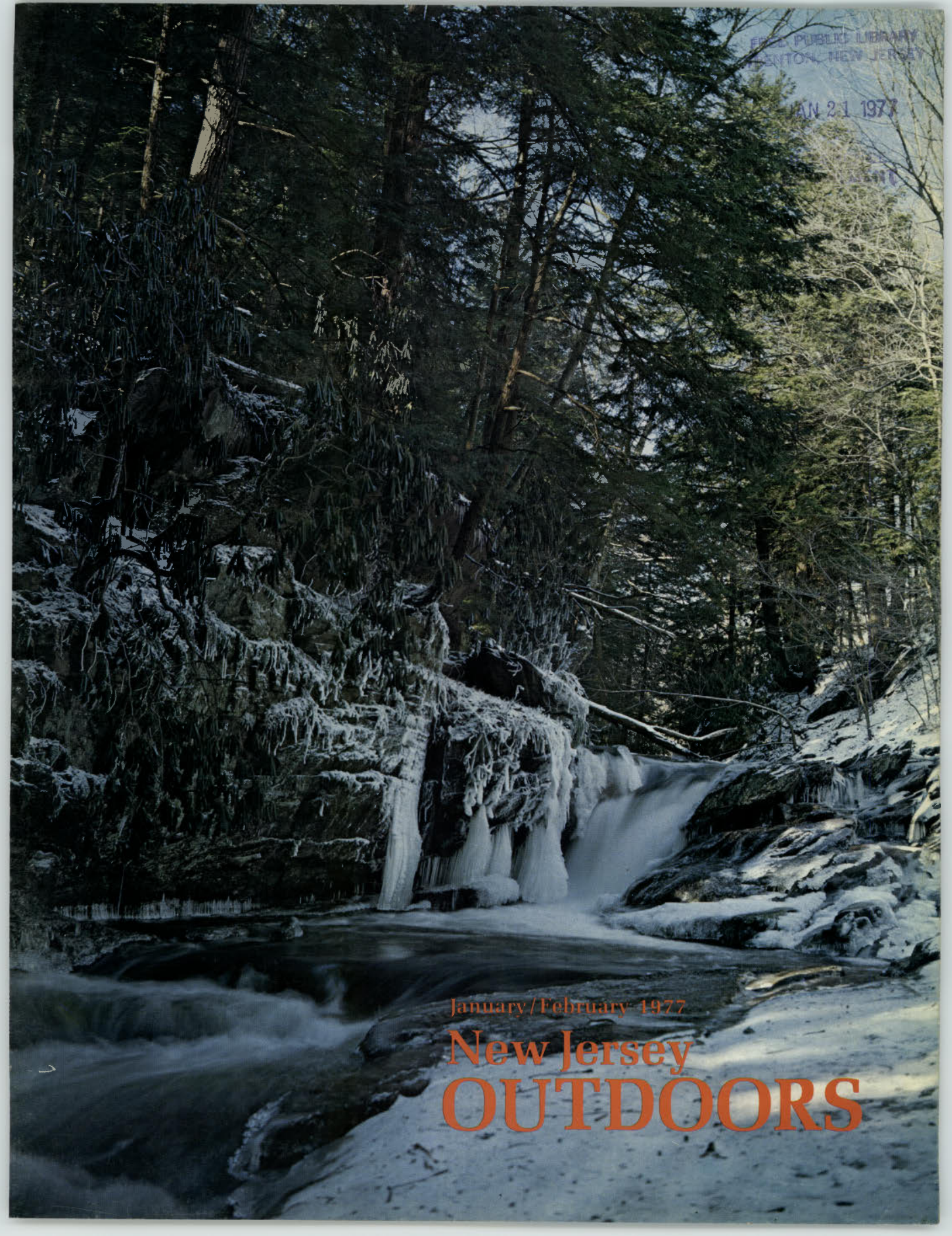

January/February 1977

New Jersey OUTDOORS

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Wildlife Weekend for Teachers

Last spring the Division of Fish, Game, and Shellfisheries of the Department of Environmental Protection sponsored a Wildlife Weekend for Teachers at the New Jersey State School of Conservation in Branchville, NJ. Approximately 100 teacher-students attended this workshop—and the response from this group and from other teachers is responsible for the scheduling of *two* Wildlife Workshops in 1977. (See page 12 for details.)

One of the strong points of these workshops is the fact that the teachers are resource managers communicating directly with teacher-students, providing them with sources of information for classroom use and stimulating their interest in wildlife and other renewable resources. Participants should be prepared for a busy weekend. The Wildlife Workshops are "get wet—get dirty" outdoors events, so dress accordingly, and enjoy the invigorating experience.

You asked for it—at the NJEA conference in Atlantic City this past November, approximately 350 teachers inquired about future Wildlife Workshops. Now it's your move.

IN THIS ISSUE . . .

Another new year and another batch of articles that we hope will inform, educate, and entertain our readers. For starters, we have "Prescribed Burning For Wildlife" by Charles H. Menzer, Wildlife Management Area Foreman from Colliers Mills. The author demonstrates how controlled fire can be a safe, effective, and inexpensive wildlife management tool.

Bowhunter Bob McDowell gives some tips on how to become a successful winter bow hunter and how to keep your toes from freezing while waiting for that buck.

Our forests are one of "New Jersey's Renewable Resources" and Forester George Pierson writes about forestry uses from the turn of the century to the present. This article features some hand-colored lantern slides from the early 1900's.

Historian Donald H. Rolfs writes about the oyster schooners of Delaware Bay and some of the surviving seafaring men who sailed on these doughty ships.

New Jerseyans looking for good skiing don't have to travel five or six hours to New England. Skier Janet Bamford tells us about the many fine slopes in our own state. Several hand-colored lantern slides from the 1920's depict early skiing scenes at High Point State Park.

Biologist Fred Ferrigno and Lee Widjeskog estimate "Clapper Rail Mortality Resulting from Hurricane Belle" this past summer.

Read the "Clean Water Action Project" by John Baranowski of the Rutgers University CWAP group. This dedicated group of volunteers has made New Jersey a safer and cleaner place to live by carrying out CWAP programs in Middlesex and Monmouth counties.

Author Pete McLain writes about "The Plight of Endangered Species and Nongame Programs" in the state of New Jersey and the other 36 states involved in Nongame Management Programs.

An extinct avian subspecies that once inhabited some areas of New Jersey is discussed by author Kirk H. Beattie, in "The Heath Hen." This game bird, the eastern race of the greater prairie chicken, was last seen in 1932. □

PRESCRIBED BURNING FOR WILDLIFE

PHOTOS BY AUTHOR

A "hot" prescribed fire in mature scrub oak and pitch pine stands will allow growth of new wildlife food plants.

CHARLES H. MENZER

Fire! Ravager of forests, destroyer of wildlife — the conservationist's enemy. At least, that's how we've looked at it (solemnly encouraged by Smokey the Bear) for nearly a century. Today, however, ecological research has shown that natural fires are important elements in many ecosystems, and that controlled fire can be a safe, effective, and inexpensive wildlife management tool.

Old roads in area to be prescribed burned are cleared down to mineral soil for safety control and access.

The Division of Fish, Game, and Shellfisheries began to study the effectiveness of "prescribed burning" for New Jersey wildlife in 1974. After a test burn of 40 acres of pitch pine and scrub oak on the Manchester Wildlife Management Area, biologists found that the amount of available browse on the site was greatly increased.

Encouraged by this success, the division worked with the Bureau of Forestry and the Forest Fire Service to set up a prescribed burning program. Under New Jersey law, "prescribed burning" means the open burning of plant life under such conditions that the fire is confined to a predetermined area and accomplishes the environmentally beneficial objectives of prevention and control of wildfires. With these primary objectives, and with the enhancement of wildlife habitat as an added bonus, the division in 1975 burned more than 800 acres on Wildlife Management Areas in Ocean County.

These burns showed that a quick, "hot" fire is most effective, as it kills mature scrub oak growth without damaging the roots, thus allowing the oaks to sprout new, succulent browse which is heavily utilized by deer, rabbits, and grouse. Site location also proved to be a key element in burning success; certain soil types are not as conducive to quality browse production, so it is of little value to burn on such land.

Weather is the key safety factor in prescribed burning. Winds must be light, temperature low, and humidity high for maximum control of the blaze. Since west winds prevail in our area during the winter burning season, fire lines are plowed in a North-South direction. The fire is started on the downwind side of the selected area, and is allowed to burn *into* the wind. In typical pitch pine/scrub oak cover, such a fire will advance at about 60 feet per minute. Next the sides of the area are lit and allowed to burn inward. Finally the windward side is set ablaze, causing the fire to draw toward the center and creating the temperature profiles desired for maximum wildfire hazard reduction and browse production.

Not only is such controlled burning effective in creating conditions favorable for the growth of food and cover desirable for wildlife — at $15.60 an acre it is also much less expensive than standard clearing and planting operations costing $375 per acre. Such economy is one of the many reasons why the division hopes to expand its use of prescribed burning for the benefit of New Jersey wildlife and the people who enjoy this resource. □

Control of noxious vegetation and reduction of wildlife hazards is also accomplished with prescribed burning of established wildlife plantings.

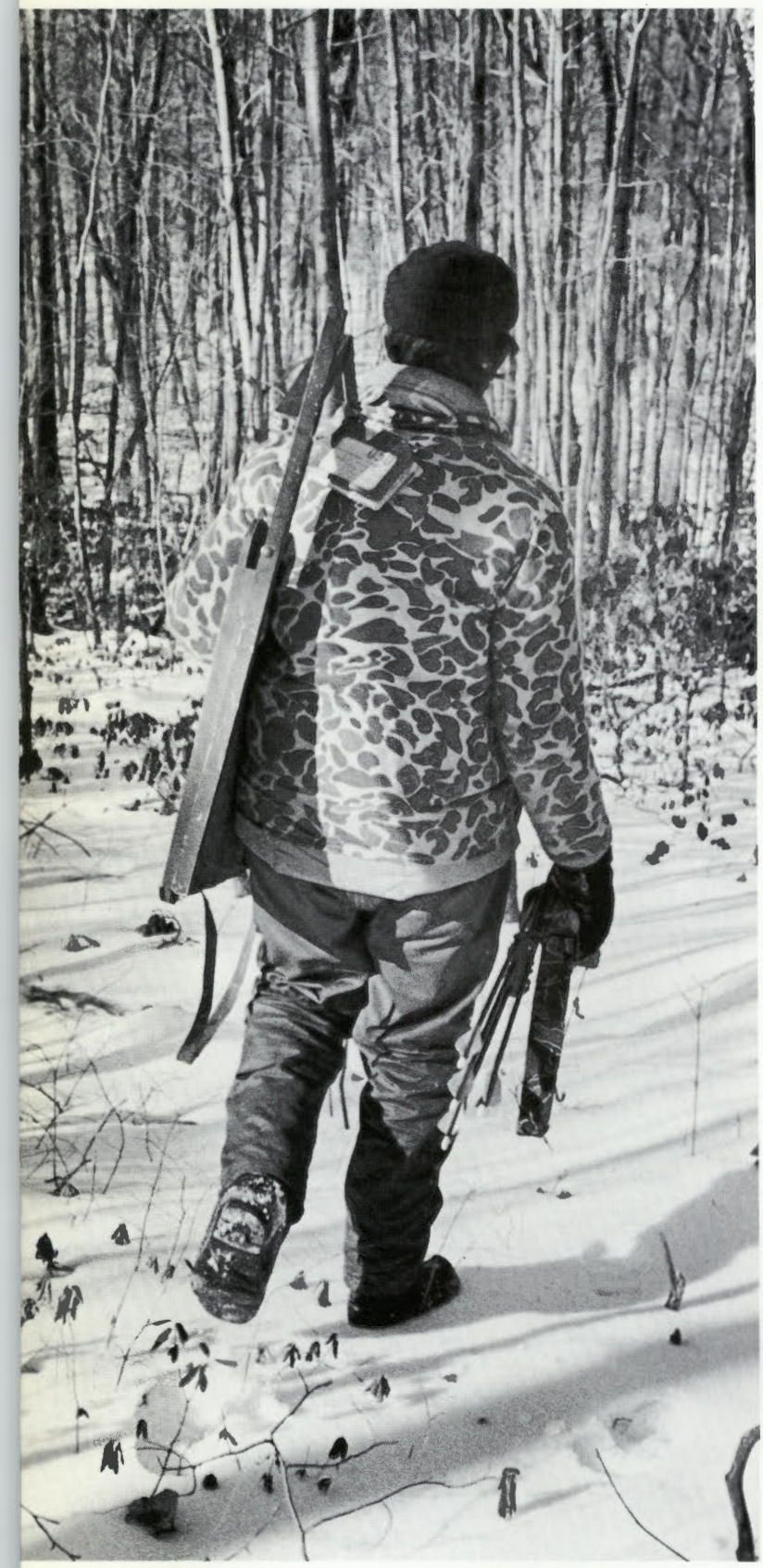
New high-quality browse produced after prescribed fires is measured by Wildlife Biologist Rodgers Todd.

snows

BY BOB McDOWELL

The thermometer was shivering near 15 degrees below, tne snow underfoot was crispy crunch, and the sun was still an hour away from showing its face above the horizon. As I viewed the snow-covered brush from my tree stand I questioned the sanity of bow hunters, myself in particular. New Jersey's first one-week winter bow season for deer in January 1976 was the reason I found myself 12 feet up in a white oak overlooking several well-used deer trails on this bitter cold winter morning.

Continued on page 28



A Bow hunter must scout the deer hunting area thoroughly to determine where deer are during cold weather.

The Author with a deer taken under the trying conditions of a winter season. A knowledge of winter deer habits and patience pay off.

bows & frozen toes

PHOTOS BY HARRY GROSCH

Fresh tracks and droppings are good indicators of deer activity. Snow cover adds a new dimension to bow hunting.

Deer food habits change in winter. Bow hunters need to learn what deer eat during the winter.

NEW JERSEY'S RENEWABLE RESOURCES

forestry uses from the turn of the century to the present

BY GEORGE PIERSON

Photos are reproduced from hand-colored lantern slides photographed in the early 1900's. From the files of the N.J. Bureau of Forestry.

At the time of its original settlement, it is estimated that four-fifths of New Jersey was covered with forest. The open portions consisted of natural meadowland and of areas cleared by the Indian inhabitants, mainly for village sites and agriculture. Permanent Indian villages were in some cases of considerable size — one site is reported to have occupied at least 150 acres. Surrounding the village sites were areas cleared for agriculture which in turn were surrounded by partially cleared areas from which previously killed trees had been removed for firewood. When the traveling distance to wood became greater and when the soil

TOP PHOTO

Ten cords of wood loaded and ready for delivery to pulpmill. Wood was cut by "choppers," men using axes, near Van Hiseville, Ocean County, in 1926.

Loading white cedar logs for transport to sawmill in Atlantic County. Butt logs were hewn into shingles while the lower quality upper logs were manufactured into plastering lath.

eventually became depleted, the entire complex was moved to a new location.

The original colonists found land cleared for use, deserted by the Indians who formerly had fields there. The availability of numerous openings along the rivers made it possible for the original settlers to become established quickly; for those who came later, it was a different story. The forests, while providing shelter, food, clothing, and fuel, were at the same time an obstacle to agriculture.

After 1664, when the Dutch capitulated to the English, emigration to New Jersey began in earnest. By

Continued on page 30

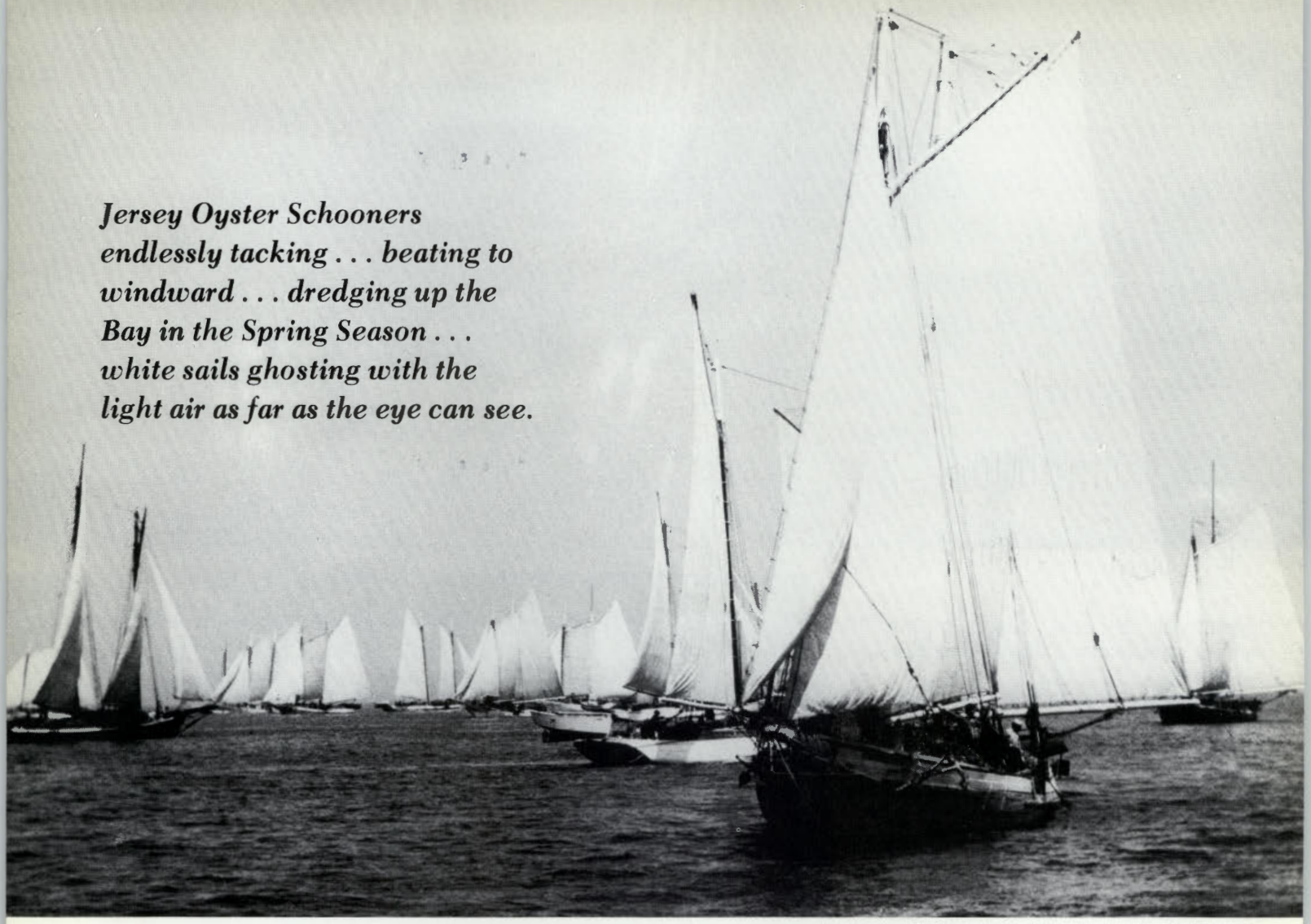
N.J. BUREAU OF PROMOTION AND TOURISM

Forest products today—New Jersey's forests continue to provide products ranging from fencing and baskets to rollers used in manufacturing tires and cannon ramrods for line-throwing guns on freighters.

TOP PHOTO

S. L. Bristol's sawmill operating on the property of H. B. Kunhardt, Bernardsville, before 1910. During this period 156 sawmills were active in New Jersey and were water or steam powered.

Horse drawn high wheel "bummer" delivers 35-inch diameter white oak sawlog to D. C. Kalbach & Co. sawmill near Marlton, 1913.



Jersey Oyster Schooners endlessly tacking . . . beating to windward . . . dredging up the Bay in the Spring Season . . . white sails ghosting with the light air as far as the eye can see.

PHOTOS PROVIDED BY THE DOWN JERSEY MARINE HISTORICAL SOCIETY

WORKHORSES UNDER SAIL

The Oyster Schooners of Delaware Bay

BY DONALD H. ROLFS

Seafaring men who have lived on the shores of the Delaware Bay, and have heard the thunder of canvas sheeted home, the squeal of blocks, and the clank of a windlass, can never forget the fleet of oyster schooners that sailed the waters of the Bay. In the recent past more than 500 ships under sail set out from the Maurice River and the surrounding creeks and rivers to harvest the succulent bivalve. This collection of centerboard schooners was undoubtedly one of the finest fleets of sailing vessels on the Atlantic seaboard.

The first watermen to use the Delaware Bay were the Indians, as artifacts found in and around the Maurice River Cove attest. Recently the New Jersey State Museum dated several ancient artifacts at or around 2000 B.C. There is much later evidence that the Lenape Indians migrated each summer to the bayshore to harvest clams and oysters. Stone wedges and axeheads which were used to open the shellfish have been found near the village of Port Norris. The Lenapes apparently dried and smoked the mollusks to endure the long winter. When the Dutch and Swedish explorers entered the Bay in the 17th century, they found the Indians using dugouts and birchbark canoes.

The oyster beds in the Delaware Bay were recognized as a great and valuable resource by the colonial legislature as early as 1719, when regulatory laws were enacted to prevent their despoliation. In 1775 they were additionally protected against the lime-burners. During

the colonial period many towns and villages grew and prospered along the New Jersey bayshore. Shipbuilding flourished along the Maurice River in the "Watering Communities" of Mauricetown and Leesburg. Port Elizabeth competed with Philadelphia until the War of 1812 as a chief port in the West Indies trade. Full-rigged ships and schooners engaged in the coastal trade were a common sight in the Bay and the estuaries. Even today in the small hamlets and villages on the bayshore, tales of privateering and Blackbeard's booty still persist. Many a youngster has sat around grandfather's pot-bellied stove on a howling winter night, listening to yarns of pirate treasure buried with the ancient spars of an unidentified wreck out in the Bay.

Until 1875, oystering was done on a small scale by tongers with dredging by small sloops. The most prevalent craft used until the turn of the century was the centerboard sloop. Captain Walter Campbell, 91, remembers the old sloops well, with their high mastheads and topsails. "Thats about all there was in the Bay when I started in the oyster business," he remarked. "My first boat was the sloop, *Mail*. She was 80 years old when I got her and rotten as a pear. I think she was about 40 feet long, carried a gaff-headed mainsail and a jib. She lasted about two years and then we run her up on the river bank to die. I believe we sold her to a farmer for $50. He wanted her for his dike along the river."

The oyster sloops used in the Delaware Bay were probably a derivative of the New York sloop. They were built around New York Bay, possibly on the Jersey shore. By the end of the Civil War the model had spread southward along the coast to the Delaware Bay and on to the Chesapeake.

Before 1875 the oyster fishery was only a part of the maritime industry in the Bay. In these years the harvested oysters were brought in from the Bay and placed in wooden bins on the river mud flats. After the tide had washed through them several times they would be loaded on the sloops or small schooners

Continued on page 24

Oyster crew dressed in oil-skins . . . fore and aft the deck piled high with oysters.

The Schooner Katherine Lee dredging for seed oysters by Ship John Light

The Schooner "Katherine M. Lee" was built in Dorchester New Jersey in 1923 and was used as an Oyster Dredgeboat under sail until 1945.

Skiers from the first "snow train" in New Jersey at High Point State Park

The skiers cluster around as the instructor gives pointers

An instructor demonstrates a kick turn, still one of the best ways to turn 180 degrees.

SKIING IN NEW JERSEY

From the 1920's to 1977

JANET BAMFORD

Hand-colored Lantern Slides from N.J. Bureau of Forestry Files

Contrary to popular belief, New Jerseyans looking for good skiing don't have to travel five or six hours to New England. New Jersey offers fine slopes, and has for many years.

STORY ON PAGE 12

Chairlift at Great Gorge—Mt. Vernon ski areas

N.J. BUREAU OF PROMOTION AND TOURISM

Skiers at Great Gorge

These reproductions of hand-colored lantern slides were taken at High Point State Park in Sussex County more than 40 years ago. In those early days of New Jersey skiing, an enthusiast would lace up his leather boots, strap himself into a pair of cable or bear-trap bindings, and take off on seven-foot hickory-wood skis. All occasional rope-tow was the only lift available (a rope-tow revolves continuously around two pulleys placed at the top and bottom of the hill; riders grab the rope and are towed up) so when a skier reached the bottom of a slope, he would take off his skis, strap them to his back, and hike back up the hill.

Although plans were made to construct a modern ski area at High Point, they never materialized, and instead a large facility now named Great Gorge Ski Area was built nearby in McAfee. That complex, which has since joined with Vernon Valley Ski Area, offers a dramatic contrast to the kind of skiing done years earlier at High Point. The two areas boast 13 double chairlifts, 5 beginner areas, 50 trails for novice to expert skiers, night skiing, and large ski schools. For those who enjoy skiing as a spectator sport, the two lodges are complete with restaurants, ski shops, and cafeterias.

Although the Vernon Valley-Great Gorge complex is undoubtedly the largest ski area in the state it is by no means the only one. Eleven other areas are located throughout New Jersey, from Salem to Sussex counties. Of the eleven, four have chairlift facilities (Hidden Valley in Sussex County, Belle Mountain in Mercer County, Campgaw Mt. Reservation in Bergen County and Holly Mountain in Salem County), three have T-bar lifts (Craigmeur in Morris County, Mount Bethel in Warren County and Ski Mountain in Camden County) and nearly all have at least one rope-tow lift.

If you're in the business of running a ski area in New Jersey, snowmaking facilities are a necessity; although the state is blessed with both cold weather and precipitation, often the two don't coincide. The Vernon Valley-Great Gorge area has the largest snowmaking system in the world. In this system, compressed air and water meet in a snow gun and form the crystals that are blown onto the slope. For this process, temperatures below freezing are needed. A single snow gun pumping water and compressed air at pressures of 100 pounds per square inch and 110 pounds per square inch, respectively, can cover 10,000 square feet of slope with an inch of snow within an hour. Making snow is expensive, costing about $2,500 per hour; however, once the snow is on the slope, in many respects it is more durable than natural snow. Because it has already been well packed in the snow gun, artificial snow is less likely to be affected by rain or moved around by skis. With the exception of Peapack Ski Area in Somerset County, all the ski areas in New Jersey have snowmaking facilities, thus improving both the quality and the length of their ski seasons.

This year, at the end of a long day, some lucky skiers who are busy unbuckling stiff plastic boots, and packing away flashy fiberglass skis with quick-release bindings, will have an extra reason to smile. Instead of anticipating a long drive home, they can relax—they're in their own home state! □

Wildlife Weekend for Teachers

Spring and Fall Sessions

A return engagement at the New Jersey State School of Conservation because you asked for it! The Division of Fish, Game, and Shellfisheries is cosponsoring a repeat performance of the Wildlife Workshop held in 1976. Teacher-students will be treated to a variety of resource management courses taught by wildlife and fisheries biologists and personnel from the School of Conservation. The date for the Spring Wildlife Workshop is May 20, 21, and 22. Anyone interested can make arrangements for attendance and get details from the New Jersey State School of Conservation, Branchville, NJ (201) 948-4646. The cost is $35 for room, board, and instruction for the weekend.

The second Wildlife Workshop in 1977 will be held at the Conservation and Environmental Studies Center at Whitesbog, NJ. Tentative dates are the last weekend in September or the first weekend in October. *New Jersey Outdoors* will announce the final details in a later issue.

Clapper Rail Mortality Resulting From Hurricane Belle

BY FRED FERRIGNO AND LEE WIDJESKOG

PHOTO SUPPLIED BY AUTHORS

Fred Ferrigno examines dead Clapper Rails

Hurricane Belle struck New Jersey on August 9, 1976, moving rapidly north about 30 miles off the coast. Northeast winds began to intensify late in the afternoon, and the storm reached its height between 8:00 and 9:00. Winds were greater than 60 mph, with gusts reported at 80 mph. With tides running four to five feet above normal New Jersey's coastal salt marshes were completely covered with water roughened by the strong winds. Conditions such as these obviously pose a potential threat to marsh-dwelling wildlife species. To gauge the storm's damaging effects and especially to determine whether any changes in the upcoming clapper rail season would be necessary, the Division of Fish, Game, and Shellfisheries conducted field surveys covering most of the important marshes from Route 72 in Ocean County to Cape May City, Cape May County.

As Hurricane Belle passed New Jersey, its winds shifted to the west and northwest, so most debris and wildlife carcasses were carried to the eastern edges of the marshes. Dead bird counts were made along these edges adjacent to roads, resorts, and upland edge. Samples of .1 mile were taken at random and projected onto estimates of the total debris line for each county to arrive at an estimate of total mortality.

In Cape May County, 6.2 miles of .1 mile samples were made; 265 dead clapper rails were recovered from the sample. Projected onto the computed 130 miles of edge in the county, this figure yields an estimated clapper rail mortality for Cape May County of 3500. In Ocean and Atlantic counties the samples indicated total clapper rail mortalities of 5600 and 11,200, respectively. Estimated total mortality for the surveyed areas was thus 20,000, more than the annual total taken by hunters. Had the storm struck the coastal marshes directly, the results could have been truly devastating.

ESTIMATED TOTAL MORTALITY FOR THE THREE SURVEYED COUNTIES

County	Estimated Clapper Rail Mortality
Ocean County (South of Route 72) (East of Garden State Parkway)	5,600
Atlantic County (East of Garden State Parkway)	11,200
Cape May County (East of Garden State Parkway)	3,500
Total (Surveyed Area)	20,300*

*approximately 20,000-bird mortality

Using the figures of 77,000 acres of salt marsh, one successful nest hatch for 2 acres, .7 adults per acre and a survival rate of 4 young per period, an estimate of the total clapper rail population at storm time amounted to approximately 208,000 birds. This means that the 20,000-bird mortality due to Hurricane Belle represents about a 10 percent loss to the entire population. Since this year's production and population were well above long-term averages, the anticipated hunting harvest would not adversely affect the population even with the 20,000 storm loss. Therefore, no changes were recommended in the hunting season. □

Mile Run Brook—Thomas Vollmuth, Gary Shaar, Gary Schwartz

Thomas Vollmuth, Gary Schwartz, Gary Shaar

Thomas Vollmuth, Gary Schwartz

Thomas Vollmuth, Gary Shaar, John Malleck, Gary Schwartz, Steve Jurewicz

clean water action project

BY JOHN BARANOWSKI

PHOTOS PROVIDED BY AUTHOR

On almost any Saturday or Sunday through the fall and early winter of 1975, if you had been near one of many rivers, streams, or other unnamed bodies of moving water which run through Middlesex County, you might have stumbled upon some human activity appearing quite out of the ordinary. You would have seen a group of two or three young men or women in hipboots or sometimes leaning out of a rowboat moving

Often dirtied with mud or the waste materials in the water, they searched the banks with keen eyes, stopping occasionally, intent upon finding *something*.

Treasure hunters? Escaped criminals? No, hardly as thrilling as that, but in all ways a lot more important to the people of New Jersey. These young people would undoubtedly have been Rutgers University students, working as part of a Rutgers environmental group, the Clean Water Action Project (CWAP). And what were they doing? In the ongoing battle against illegal and ugly waste dumping, they were searching out drains, effluent discharge pipes, tributary streams, and so forth —all possible sources of the pollutants which have turned many of Middlesex County's waterways unsafe and unsightly.

"Streamwalking," as the job is called, is all done by volunteer students involved in CWAP, or by others seeking active environmental work as part of their university course requirements. It is neither a clean nor a glamorous job, as the students themselves will tell you. As the weather grew colder, they felt the effects of prolonged exposure.

When a rowboat wasn't available, as was often the case, the students resorted to hipboots and to wading through much of the effluent that they were in the long run, trying to curb.

Streamwalking, on paper, does not seem very complicated. The selection of a specific waterway including consideration of safety factors demands advance research and advice-seeking; then, equipment resources must be measured.

Using maps of the intended route, the volunteers "walk" a certain waterway, noting where effluents are being discharged, theorizing on the possible makeup of the effluent, and identifying (without trespassing) the source of the outflow. They must obey property rights, which often makes water sampling and source identification difficult.

They are also on the lookout for other types of environmental insults, including manmade erosion, illegal drainage pipes, and solid-waste dumping into the waterway.

Documentation is made by taking photographs of the insult; the type of insult, its approximate location on the regional map, and the names of nearby industries are noted. Then the walkers move on, in this way often working an entire day. Such activity provides the students with an impressive dramatization of the effects of liquid-waste dumping by placing them squarely in the middle of it.

What use is made of the data they obtain? Students who are applying the experience for university credit draw up detailed reports to be presented to their sponsoring professors for review; these reports include, in addition to the data, difficulties encountered during the streamwalk, analyses of the waterway's situation, and problems and recommendations for action.

But academic synthesis is not the stopping point for the streamwalking data. Fortunately, the information has a much more immediate, action-oriented purpose. John Malleck, a senior at Rutgers' Cook College and the coordinator of CWAP, forwards data from streamwalks to the Region II office (covering New York, New Jersey, the Virgin Islands, and Puerto Rico) of the Environmental Protection Agency (EPA), whose job it is to investigate such insults. The EPA, faced with such a mammoth job, eagerly accepts the kind of help that CWAP and other private environmental groups can give it.

The EPA uses the information to conduct its own investigations into the insults reported; if its findings warrant, the offending industry, municipality, or individual may then be prosecuted.

Although CWAP's workers are often experienced in this type of field work, they have no legal power to bring offenders directly to any sort of court action.

The Clean Water Action Project was initiated in 1973 by a Rutgers College student. At the outset, its efforts consisted of paperwork; a handful of students worked from a single desk to supply technical comments and suggestions, as public advocates, on liquid-waste dumping permit applications which were subject to public scrutiny. (Under the 1972 Federal Water Pollution Control Amendments, all industries that pour effluents into public waterways must obtain a permit to do so from the EPA. Standards are determined by the EPA and industry jointly, as each situation demands, in keeping with EPA's goal to eliminate all effluent dumping by 1985.

National Pollutant Discharge Elimination System (NPDES) permits specify an individual industry's qualitative and quantitative parameters for dumping. At its beginning, CWAP merely provided the EPA with suggestions for altering, adding to, or deleting from these permits. When Malleck took over the reins of the project beginning in the fall of 1974, it was his desire to see CWAP expand rapidly by broadening its perspectives. The organization's office-based format shifted to one of active, outdoor involvement; concurrently, the number of students involved also grew—although even today CWAP's efforts are limited by fluctuations in available manpower.

Streamwalking is part of CWAP's new emphasis. The projects recently extended its services to various municipalities throughout the state by offering to perform water quality surveys on local water supplies. CWAP has gone outdoors to make innumerable water analyses, too, testing samples from polluted lakes and streams to identify possible toxic substances and their sources.

So far, most of the streamwalking has been done in Middlesex County, the area most easily accessible from CWAP's home base, Rutgers. The organization has made successful walks in the Lawrence Brook Watershed, the Bound Brook, parts of the Raritan River, the South River, the Deep Run Brook, and Tennets Brook. Plans are being made for more walks in the future.

In all its work, CWAP has remained a group of students interested primarily in *New Jersey,* limiting its efforts to this state only. Some of the project's other activities include:

- representing the public at EPA adjudicatory and public hearings, where permits are challenged by government and private groups and individuals;
- functioning as an information source and referral center for professional consulting services and citi-

zens' groups who are trying to deal with pollution problems;

- inviting as wide a student involvement as possible, in order to provide valuable field experience and technical tools and the opportunity to learn the systems of pollution management in the state;
- tracking down those industries which have not even applied for Federal liquid-waste dumping permits, by comparing lists of filers against industrial directories;
- speaking before many student organizations, citizens' groups, etc., on pollution issues of local and state impact.

Malleck, who heads the project from an office in the Rutgers College Student Center in New Brunswick, emphasizes that groups such as CWAP cannot accomplish the entire job of cleaning up the state's waterways without "more interest and involvement from the public." CWAP's work is sponsored largely by the New Jersey Public Interest Research Group (NJPIRG). PIRG is a statewide nonprofit, nonpartisan advocacy corporation funded and controlled entirely by students at nine New Jersey campuses. Its principal areas of concern are consumer protection, environmental preservation, government accountability, and citizen participation. CWAP has also received financial support from Environmental Political Action, another Rutgers environmental group, as well as from individual contributions.

Toward the end of 1975, CWAP received an enormous boost in the form of a monetary grant by the Water Resources Research Institute at Rutgers, under the direction of General William Whipple. The money will finance more numerous and thorough water quality studies on Middlesex County, and should enable CWAP to expand and intensify its work in the county.

For all the wet feet, dirty clothes, and even water rats—not to mention writer's cramp and tired eyes—that the people of CWAP have endured, they have been justly recognized by private groups and government alike.

To cite two examples, John Malleck, representing CWAP, last year received the EPA's Certificate of Appreciation, given to dedicated environmentalists, and the EPA's Region II Office Special Award of Merit for Significant Work in Environmental Education and Citizen Activism. In addition, Malleck and the project have also been honored by awards and letters of appreciation from numerous private groups. CWAP's founder, former Rutgers student Richard Willinger (now studying law), has also received the Certificate of Appreciation. Edward Lloyd, an attorney for the NJPIRG, who has supervised the preparation and presentation of adjudicatory arguments before the EPA, was recently awarded the Special Award of Merit.

CWAP's dedicated members, along with other, similar groups in the state, have aided immensely in making New Jersey a safer place for people to live, have helped to give "dead" waterways a chance to revitalize their plant, fish, and animal populations, and have given future New Jerseyans guidance in the direction to take toward cleaner recreation and work areas.

What is CWAP's future? Expansion, hopefully. As funds and manpower go, so will the project. As current leaders graduate, a smooth turnover in CWAP's administration is anticipated, although John Malleck cautions that "experience is what counts in dealing with both natural problems and the dilemmas of bureaucratic paperwork."

Streamwalking. It almost seems a nuisance job when you consider the often meager results obtained in proportion to the time and energy expended. But don't tell the people of the Clean Water Action Project that. Looking at the deterioration of their state's waterways, they know that much of the restorative work to be done isn't glamorous in the least, but that *someone* has to take the initiative and *do it.* □

Mile Run Brook—Steve Jurewicz, John Malleck.

Environmental News

PHOTOS SUPPLIED BY DEP

$120 MILLION CLEAN WATERS BOND ISSUE WINS APPROVAL

"More jobs, less pollution, a better environment"

New Jersey voters in the November 2 general elections overwhelmingly approved the 1976 Clean Waters bond issue proposal. The "New Jersey Clean Waters Bond Act of 1976" authorizes the sale of $120 million in bonds to be used for the development, construction, and maintenance of water supply and water pollution control facilities.

DEP Commissioner David J. Bardin said, "Voter approval will reinforce New Jersey's position when we seek early action in the new Congress to provide additional water pollution control funds in fiscal 1977 and succeeding years. We can point to the maturity and decisiveness with which the New Jersey electorate voted to continue the momentum for more jobs, less pollution and a better environment."

U.S. SUPREME COURT HEARS STATE DEFEND LAW BANNING DUMPING OF WASTES FROM OUT-OF-STATE SOURCES

The State of New Jersey went before the U.S. Supreme Court in Washington, D.C., on November 3 to defend its law banning the dumping of solid and liquid wastes from out-of-state sources in New Jersey landfills. The cities of Philadelphia (Pa.) and Glen Cove (N.Y.) are appealing the constitutionality of the 1973 New Jersey law on the basis that it violates the commerce clause which bars most state restrictions on the flow of commerce.

Assistant Attorney General Stephen Skillman, representing the State of New Jersey, Department of Environmental Protection, told the court that the statute is necessary to protect New Jersey's available landfill areas from being depleted by solid waste from other states, and that the law does not discriminate against the free flow of interstate commerce. He argued that the northern part of the state is fast running out of landfill capacity . . . and that the law falls within New Jersey's basic right to protect its environment and the health and safety of its citizens.

The two cities argued that the law should be declared unconstitutional because it places a burden on a legitimate form of free enterprise—the transportation and processing of solid waste. (Four New Jersey firms which stand to lose business by enforcement of the law joined the municipalities in their suit.)

If the court upholds the New Jersey law, it would allow states to reserve their own land solely for the disposal of solid and liquid waste that originates from within that state's borders. If the law is struck down, New

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PLANNING IN PROGRESS TO END OCEAN DUMPING OF SLUDGE

Several large wasewater treatment plants in Northeastern metropolitan New Jersey are developing plans for land-based disposal of their sewage sludge in order to end ocean dumping. The plans must be completed and submitted to DEP for preliminary approval and to the federal Environmental Protection Agency (EPA) for final approval by December 31, 1977. Seventy-five percent of the cost of the studies is eligible for federal financing under the Water Pollution Control Act.

The sewage treatment systems, most of them regional, are presently producing an estimated sludge residue of more than 600 dry tons a day. Because the sludge is barged to sea in wet form containing about 95 percent water, the sludge volume dumped into the ocean is actually about 3 million gallons daily.

The sewer authorities involved were issued interim ocean dumping permits by EPA on August 1, 1976, with the requirement that they prepare proposals and apply for initial facility planning grants from EPA by October 1. They all met that requirement. Now they must complete their facility planning by December 31, 1977; complete construction plans and specifications for the alternative selected by July 30, 1979; and complete construction of the alternative facility by December 31, 1981—the federally mandated deadline for ending all ocean disposal of sludge.

DEP said that each sewerage authority would conduct its own study because of the unique characteristics of its area's sludge. The ratio of industrial to domestic waste varies from one authority to another as does

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Letter to Commissioner Bardin:

CARTER PLEDGED TO SEEK FUNDS FOR STATES THAT HAVE EXHAUSTED FEDERAL FUNDS FOR WASTEWATER TREATMENT PLANTS

A week before he was elected the next President of the United States, Jimmy Carter wrote DEP Commissioner Bardin that he would "seek funds" for states that have used all federal funds allotted them for wastewater treatment plants.

In the October 26, 1976, letter, then Democratic candidate for President Carter wrote: *"The job of cleaning up our nation's water is of extreme importance to the health of all Americans and to the protection of our rivers, oceans, coastal areas, and wetlands . . . . I am aware that several states, including New Jersey, have exhausted federal matching funds available for wastewater treatment plants. Projects which are clearly needed and are ready to be built should be promptly funded. If elected, I will work with the Congress to seek funds for these facilities during the time that the overall structure of the construction grants program is being evaluated and revised."* Carter declared, *"The construction grant program has had a positive impact on water quality, and has also provided jobs in the hard-hit construction industry."*

Bardin had advised both Presidential candidates that New Jersey will need $300 million in 1977 for construction-ready water pollution control projects to clean up New Jersey's rivers, bays, and the ocean. These projects will create 22,000 jobs according to the state Department of Labor and Industry, which estimates the average rate of unemployment in the construction industry at 35 percent. □

1976 FISHKILL IS SUBJECT OF SCIENTIFIC WORKSHOPS

The massive fishkill which plagued the Mid-Atlantic New Jersey coast from July 4 weekend through the end of September, 1976, was the subject of seven scientific workshops held in New Jersey and New York during November and December. The workshops, conducted jointly by several federal and state agencies (including DEP) and private organizations, gave interested scientists the opportunity to meet and share

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300-page manual

DEP COMPILES LIST OF 80 POSSIBLE CANCER-CAUSING SUBSTANCES

One of the major goals in the initial phase of DEP's program on Cancer and the Environment has been the selection of a number of cancer-causing chemicals (carcinogens) of potential concern to the residents of New Jersey. A working list of such substances is needed as a foundation for various facets of the program. In November 1976 a draft list of approximately 80 known or suspected cancer-causing chemicals (*Selected Environmental Carcinogens, Draft #1*) compiled by DEP was released by the Governor's Cabinet Committee on Cancer Control.

DEP has already slated this list for use in two other efforts: a carcinogen use survey and a chemical monitoring program. The survey, to be done in conjunction with the state Department of Labor and Industry, will provide information on the chemicals' use, production, and emission into the environment. DEP's chemical monitoring program will supply data about concentrations as well as emissions of these substances in specific locations around the state. The list plus information garnered by the aforementioned projects will also serve the state Department of Health's development of occupational health programs by pointing toward the sites in the state where workers are at the greatest risk.

The list is not intended as a final setting of priorities and DEP expects that it will be expanded as more information becomes available. DEP officials, and members of the Governor's Cabinet Committee on Cancer Control (established by Governor Byrne in May 1976) will meet with technical advisors in other departments, industry representatives, and other interested health, environmental, and labor groups to discuss the contents of the list and ensure that its final draft is comprehensive.

Dr. Glen Paulson, assistant commissioner of Environmental Protection, and Dr. Peter Preuss, special assistant to the Commissioner, who prepared the list, said that it is not the product of any original laboratory research by DEP, but is culled from published national and international reviews of scientific literature in the field. Three major criteria were used for selecting the substances included on the list: the substance had to be a proven carcinogen in either animals or man, and in addition it had to be in widespread use, or a particularly potent carcinogen.

Governor Brendan Byrne termed the list "a major step in the first phase of our efforts to investigate, analyze, and control cancer-causing substances in our environment, and to prevent the occurrence of cancer in our citizens."

Copies of the 90-page document, "Selected Environmental Carcinogens, Draft #1," are available from DEP, Room 805, L & I Bldg., Trenton 08625. □

THE D & R CANAL IN THE 1860's. An historic map of the Delaware and Raritan (D & R) Canal, based on one made in 1866 during the waterway's heyday, has been published by DEP. The D & R canal was one of the most important contributors to New Jersey's economic development in the 1800's—along it moved people, raw materials, and finished products. Dr. Kemble Widmer, state geologist, prepared the 20" x 30" map, which shows the location of the canal and its feeder, the location of the locks, and the elevation of each canal pool. DEP employee Rita Carroll displays the map (photo above) which also includes, in an insert, a detailed map of Trenton showing the several basins and water power canals in that area in 1897. On the right side of the map is a short history of the D & R canal with some of the interesting highlights of its construction, traffic, and operations. The map, which lends itself to classroom use and/or framing, is available at $3 from DEP's Bureau of Geology and Topography, Publication Sales, Box 2809, Trenton 08625. Please make check or money order payable to General Treasury, State of New Jersey (G.T. of N.J.).

Emergency Response Plan For Nuclear Plant Incidents

DEP's Bureau of Radiation Protection has developed a comprehensive response plan for dealing with radiation incidents at major nuclear facilities such as power plants. The 300-page manual details the procedures to be followed in event of a radiation emergency as well as the operational agreements among the various federal, state, county, and local agencies for carrying out the response.

The manual is the result of a several-year effort by DEP, state police, state Civil Defense, the utilities, and local government units. The department expects to add to and amend the manual as new information becomes available and new strategies are developed.

More than a month before the scheduled January public meetings on the response plan, copies of the manual were placed at three locations in the state for public inspection: the Bureau of Radiation Protection in West Trenton (Ewing Township), Mercer County; the Salem Public Library in Salem; and the Ocean County Public Library in Toms River. The latter two sites are located near existing nuclear power plants—the Salem Generating Station at Artificial Island, Salem County, and Oyster Creek Generating Station, Lacey Township, Ocean County, respectively. □

TRENTON BATTLE MONUMENT. The Continental Army, defeated time and again by British forces after the Siege of Boston (1775-76), tasted victory for the first time at the Battle of Trenton on December 26, 1776. The Trenton Battle Monument, a 150-foot granite column topped by an observation platform and a statue of George Washington, is said to mark the site of the main gun emplacement of that battle, which saw Washington and the Continentals defeat the Hessian mercenaries. The monument, built between 1891 and 1893, was designed by John H. Duncan, the architect of Grant's Tomb; the statue was carved by prominent 19th-century sculptor William R. O'Donovan. At the base of the column are three bronze cast plaques depicting Washington crossing the Delaware, the opening of the Battle of Trenton, and the surrender of the Hessians. The original panels made by Thomas Eakins and Karl Niehaus, which were on the monument for well over half a century, were removed in 1969, restored to beauty, and given over to the State Museum's jurisdiction. In October 1976 the monument was placed on the State Register of Historic Places. Located at "Five Points" at the corner of North Broad and North Warren Streets in Trenton (Mercer County), this historic site is administered by DEP.

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STATE DEFENDS BAN

Jersey and other states will have to allow out-of-state municipalities and businesses to use local landfill sites in the interest of free enterprise and interstate commerce.

(In 1974, DEP estimated that Philadelphia was disposing of 10,000 tons of garbage a week in the state, and that for the whole year 1.5 million tons of waste was brought in from the outside. Ironically, a Pennsylvania law which restricts garbage dumping in much the same way as New Jersey statute has forced Philadelphia to seek out landfill areas in the Garden State. The law allows a local community to stop other Pennsylvania cities and towns from using its land for waste disposal, and so far the Philadelphia suburbs have resisted the importation of big-city garbage.)

A decision on the case by the Supreme Court is expected early in 1977. □

EIGHT PARK PROJECTS APPROVED FOR GREEN ACRES MATCHING FUNDS

Eight park site development projects in six counties were recently approved for Green Acres matching grants by DEP. The parks are easily accessible by public transportation, walking, or bicycling; serve all segments of the community's population; and are multi-purpose facilities. The projects will be funded from a pending Green Acres appropriations bill (A-2294).

Under DEP's urban recreation policy, two of the projects—Newark and Elizabeth—were approved for 90 percent funding using a combination of funds from Green Acres and the federal Bureau of Outdoor Recreation.

The projects, which will receive a total of more than $3.6 million in matching funds, are described below in the order of grant amount.

NEWARK (Essex County): A **$1.4 million grant** for the development of Central R-6 Park on Stratford Place. The park will serve four public housing projects, two schools, and a neighborhood of over 30,000 population. The 8-acre park will include horseshoe and shuffleboard courts and game tables for senior citizens; courts for tennis, basketball, roller hockey, and handball; fields for baseball, softball, football, and soccer; a spray/splash pool and tot lot. The park has been designed with "barrier free" consideration for people with handicaps.

ENGLEWOOD (Bergen): **$948,000** for the development of MacKay Park located along Englewood Avenue. The 29-acre park will include a swimming pool complex, an ice-skating rink, tennis and basketball courts, a track, and a tot lot. The project also will provide a senior citizens area and restoration of the existing gatehouse for a park administration building.

PLAINFIELD (Union): **$425,000** for development of the Tract 19 recreation area along East Third Street. The 34-acre park will include tennis and basketball courts, baseball and football fields, and trails for biking and hiking. A storm retention basin to help alleviate flooding along Cedar Brook will be designed so that these grassy areas will provide more than 10 acres of open playfields for most of the year.

ELIZABETH (Union): **$400,000** to the Union County Park Commission for redevelopment of 36-acre Mattano Park on Trenton Avenue. The park is bisected by the Elizabeth River. The project will include baseball and football fields; tennis courts; a multipurpose court for basketball, volleyball, and handball; a senior citizens area; bike racks; and comfort station.

RUNNEMEDE (Camden): **$164,500** for development of Beaver Branch Park. The 45-acre park will include baseball and football fields, tennis and basketball courts, a tot lot, and trails for biking and hiking.

FAIRVIEW (Bergen): **$145,000** for the development of English Neighborhood Park located along Sedore Avenue. The 2.4-acre park will include a baseball/softball field, an open multipurpose field, a basketball court, a tot lot, and a comfort station/maintenance building.

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News Capsules

REGULAR TRAPPING SEASONS WILL CLOSE MARCH 15

DEP's Division of Fish, Game, and Shellfisheries reminds trappers that the New Jersey Summary of 1976-77 Hunting and Trapping Laws, available free from license issuing agents, gives full details about where and when trapping is permitted, which furbearers may be trapped, rules concerning traps, and trap restrictions existing in some counties. The regular trapping seasons close on March 15. The division emphasizes that otter, black bear, bobcat, and coyote may *not* be trapped, or taken, possessed, or killed by any method. □

REPORT SPILLS TO DEP AT ONCE!

DEP has a well-trained emergency response team available on a 24-hour basis to respond to spills of oil and hazardous materials. The team is trained and experienced in spill response, containment, and removal. The members know the proper enforcement procedures, recognizing that the responsible party (company or individual) is liable for clean-up costs as well as penalties.

The response team depends on prompt notification of a spill incident in order to be of assistance. If an illegal discharge of oil or hazardous materials occurs in your area from any cause—pipeline break, highway accident, tanker grounding, etc.—please call 609-292-5560 (Office of Special Services) during working hours or 609-292-7172 (*Environmental Action Line*) day or night.

Karl Birn, chief of the Office of Special Services, (OSS) said spills should *not* be hosed down because if the material is flushed away it is likely to be washed into a waterway which may pollute a water supply downstream. A spill should be cleaned up: A call to OSS for advice and/or assistance may prevent a potentially dangerous public-health situation from developing as well as safeguard the quality of the water. □

WATER-SAVING FIXTURES ARE MONEY-SAVERS TOO

In the spring of 1976 DEP called upon the state's homebuilding industry to use water-conservation plumbing in all new construction to help prevent unnecessary demand on sewer and water systems. At a meeting in October, the Board of Directors of the New Jersey Builders Association voted unanimously to recommend that all new residential structures be equipped with water-saving fixtures whenever possible. By installing plumbing fixtures which reduce water volume to only what is needed, a saving of 36 percent on each toilet flush and 12 percent on each shower would be realized without inconvenience to the homeowner—and the homeowner would save on his water bill. Water-saving fixtures cost no more to install than the standard types. □

LIBERTY PARK—ELLIS ISLAND BOAT SERVICE TRIAL A SUCCESS

A month-long experiment by the state with Circle Lines and the National Park Service to provide boat service from Liberty State Park in Jersey City to Ellis Island in New York harbor has been judged a success. During the trial period, September 9 to October 11, 1976, the Circle Line boats were filled almost to their 125-passenger capacity on the one-round-trip-daily schedule, six days a week (Mondays excepted). The fare of $1.25 per person was the same as that charged from Liberty Island to Ellis Island, with group rates for 25 or more persons at $1 each. DEP advocates resumption of the service in the spring on an expanded schedule of three trips daily from Liberty State Park to the National Historic Site. □

CAFRA PERMIT ACTIONS

Two recent Coastal Area Facility Review Act (CAFRA) permit actions are examples of the program's efforts toward proper development of the coastal zone. Though both projects were proposed for the same township in the same county, one was denied, the other approved.

Denied: The application from the Colony Company to build 40 apartment units on dunes along the ocean front of Ortley Beach, Dover Township, Ocean County. In denying the application, DEP said, "Conservation of dunes is essential for protection of New Jersey's coastal area against wave, wind, and storm surges. Dunes act as buffers, protecting both inland properties and the shore itself from erosion." During the 1976 hurricane Belle, the waves came part way up the high dune, but the dune was not breached.

Approved: The application from Mapletree Enterprises, Inc., to construct an 87-unit single-family development in a built-up area of Dover Township, Ocean County. The proposed facility will be situated on a 30-acre tract bounded on the north and west by existing Mapletree developments. Two conditions attached to the approval are that Mapletree submit to DEP plans for tree preservation and protection of natural features, and that the firm apply for and obtain a Division of Water Resources sewer construction permit. □

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PARK PROJECTS APPROVED

BELMAR (Monmouth): **$122,500** for development of Three-Acre Park located along West Railroad Avenue in this built-up shore community. The project will include basketball and handball courts, a volleyball/badminton court, a football field, a tot lot, a picnic area, and a comfort station. This project is an example of the recreation objectives of DEP's Coastal Zone Management Program.

OCEAN CITY (Cape May): **$42,000** for construction of four tennis courts and a maintenance building on 35th Street, and for the paving and lighting of three clay courts on Fifth Street. □

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FISHKILL WORKSHOPS

their data and observations to develop a clearer picture of what happened and why it happened. A better understanding of what went wrong will provide a sounder basis for future steps to reduce the chances of such ecological catastrophes in the future.

(Investigations by federal and state agencies and academic institutions between July and October indicated that the fishkill was caused by a lack of dissolved oxygen in the waters below the thermocline—the interface between the cooler bottom waters and the warmer overlying waters. DEP's interim report on the fishkill was submitted to a legislative committee on August 2.)

Involved in the workshops were two federal agencies—the U.S. Environmental Protection Agency and the National Oceanic and Atmospheric Administration; two state agencies—DEP and the New York State Department of Environmental Conservation; and two private organizations—the American Littoral Society and the Lamont-Doherty Laboratory of Columbia University. □

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SEWAGE SLUDGE DISPOSAL

the type of wastes handled by each plant. The studies will consider the best options for treatment and/or disposal of sewage sludge and arrive at a plan for meeting this objective at a compatible cost.

The sewerage authorities concerned are Bergen, Middlesex and Northeast Monmouth Counties, Rahway Valley, Middletown Township, and Linden-Roselle, as well as the Passaic Valley Sewerage Commission, the Elizabeth Joint Meeting and the municipalities of Kearny and Woodridge. □

DEP O.K.'S $5.5 MILLION PROJECT TO REDUCE CYANAMID ODOR PROBLEM

A $5.5 million air pollution control project, to be carried out by the American Cyanamid Company in its Bound Brook (Somerset County) plant, became the 26th project to be certified by DEP under the 1973 New Jersey Industrial Pollution Control Financing Law and the Amended Economic Development Act. The value of all such projects through the end of November 1976 totaled $233.9 million.

The Cyanamid project covers a variety of air pollution controls to reduce or eliminate emissions of chemical substances which have contributed to long-standing odor problems in the Bound Brook area. Many of the devices are being installed to comply with an order issued in June 1975 by the Somerset County Superior Court which required Cyanamid to reduce emissions by March 1977. (Over the years DEP has received hundreds of citizen complaints regarding odorous emissions from the plant. The pollution control steps already taken by Cyanamid have reduced the number of complaints, and the new measures are expected to improve the situation further.) □

The Plight of Endangered Species and Nongame Management Programs

BY PETE McLAIN

The bald eagle, our national symbol, is a federal and a state endangered species. There is presently only one nesting eagle pair in New Jersey, but the state winters about 10 eagles. Project personnel are evaluating nesting and wintering eagle habitat and providing special protection to the bald eagles.

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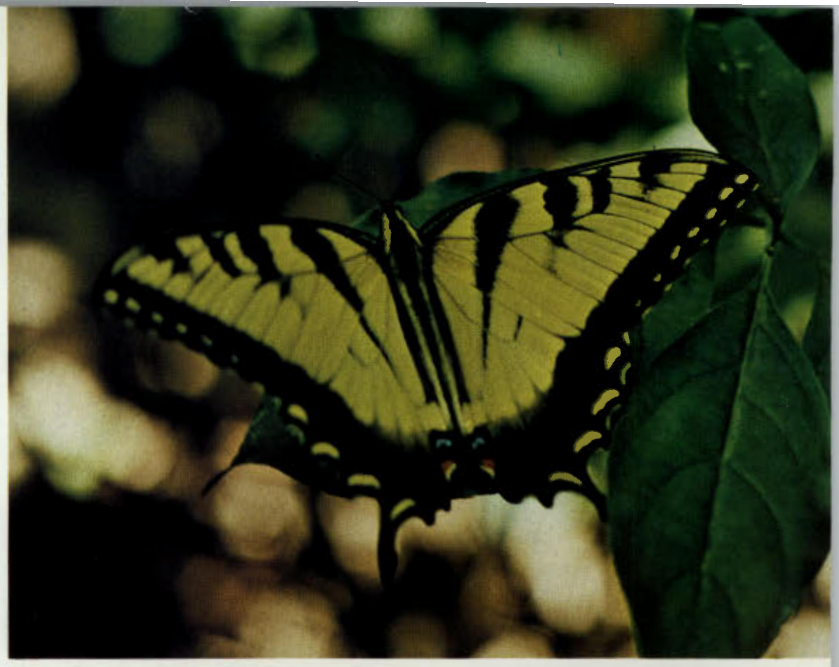
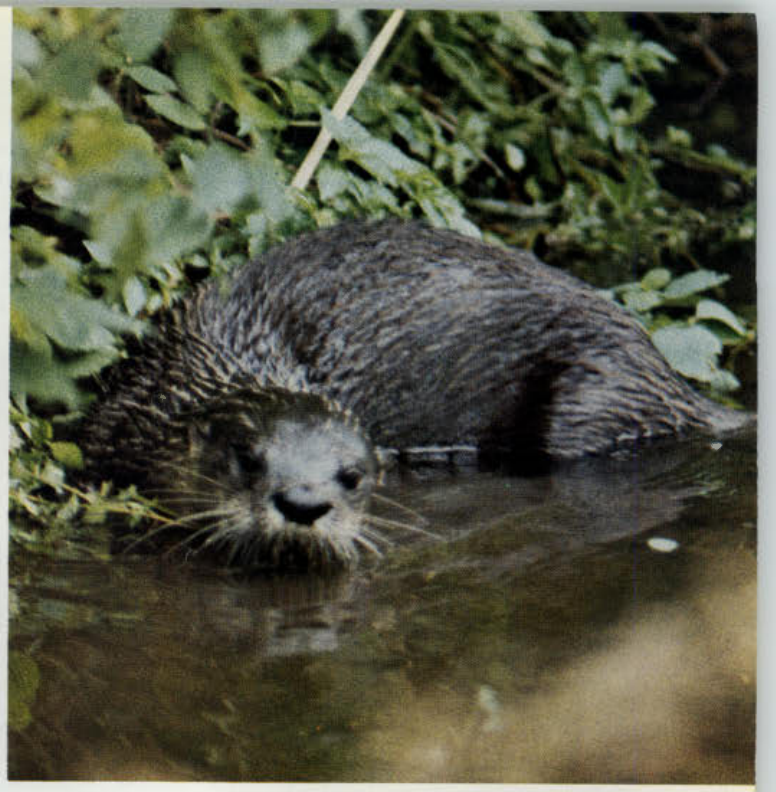
WILDLIFE in New Jersey

In spite of our small size . . . our densely populated cities and surrounding areas . . . our haphazard development of farmlands . . . pollution of our waters . . . and poor air quality over many areas of our state — yet wildlife persists and some species flourish . . .

★

TOP LEFT: *Swallowtail Butterfly by Bob Mellace,* **TOP CENTER:** *Raccoon by Harry Grosch,* **TOP RIGHT:** *River Otter by Ray Underhill,* **LOWER LEFT:** *Spider by Bob McDowell,* **CENTER LEFT:** *Whitetailed Deer by Ray Underhill,* **CENTER, CENTER ROW:** *Night Heron, Ibises and Gulls by Bob Mangold,* **FAR RIGHT, CENTER ROW:** *Cottontail Rabbit by Bob Mellace,* **BOTTOM RIGHT:** *Canada Geese by Ray Layendecker.*





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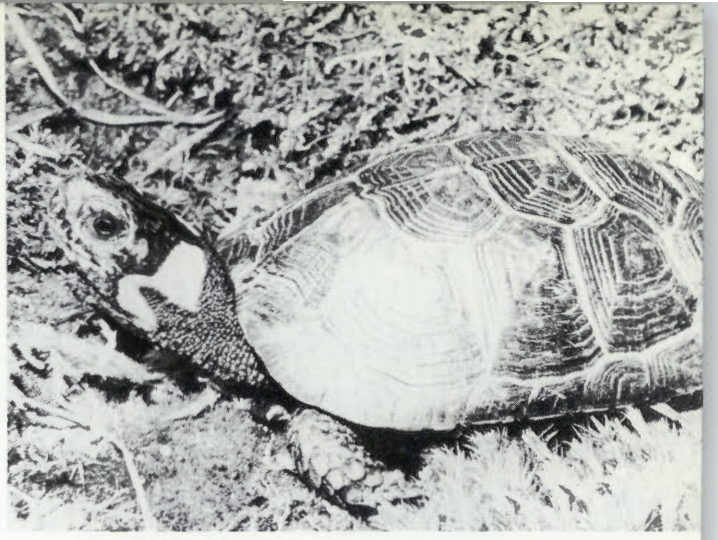
The Plight of Endangered Species and Nongame Management Programs



The bog turtle, a state endangered species, is one of the smallest turtles in the United States and presently exists in only a few scattered locations. Contractual research with Rutgers University has identified bog turtle areas which can be protected.

The peregrine falcon has not nested east of the Mississippi River in more than 20 years. In two years the Endangered Species Project, through contractual research with Cornell University, has fledged a total of 10 endangered peregrine falcons.

PHOTOS BY AUTHOR

One of today's most difficult natural resource management challenges is what to do about the long-neglected nongame and endangered wildlife in the United States. Since the late 1800's the sportsmen have poured their license money into state fish and game management programs. With this funding, augmented by Pittman-Robertson and Dingle-Johnson Federal Aid to Wildlife Restoration money (an excise tax on arms and ammunition and certain fishing equipment), the state fish and game agencies have been effectively managing the consumptive wildlife resource.

This solidly based sportsmen-sponsored funding program, directed principally at the game species, has produced remarkable results not only in game and fish management but also in overall natural resource conservation. We presently have more deer than in Colonial times. The wild turkey has been restored, and many wildlife species are here today only because of the research, management, and protection of their habitat and populations funded only by the sportsman. In addition, millions of acres of prime habitat have been acquired and preserved through the hunting and fishing license buyers.

What about the nongame wildlife resources which are not hunted, and the ever-increasing number of endangered wildlife species? This resource has clearly been the stepchild of the fish and game agencies. In most states the responsibility for ALL the wildlife resources rests with the fish and game agencies. However, since funding is derived primarily from the hunting and fishing license buyers the major emphasis has naturally been on the game species. There has never been a major source of funding directed at nongame wildlife management.

Criticisms have been leveled at some fish and game agencies for not doing more for nongame wildlife. Actually, however, nongame wildlife has had important "spinoff" benefits from fish and game management programs, but this fact is not understood or appreciated by much of the nonhunting public. Land acquisition and development programs have frequently affected nongame populations more than the game species. Enforcement efforts by the state fish and game agencies have been directed at nongame as well as the game species. Some states have inaugurated endangered species management programs using the sportsmen's money even though no single species has become endangered through sport hunting or fishing.

Presently 36 states have some form of nongame species management program. Some have only a single biologist without an operating budget while other states have only a small nongame section. California is the leading state with more than one million dollars a year from general treasury appropriations dedicated to the nongame program.

Most states which have established nongame and endangered species programs are frequently frustrated in their efforts to get the nongame show on the road simply because there is no solid funding base to provide the necessary operating money. Everyone seems to agree that there is a dire need for nongame management, but the present attitude is to "let someone else pay for it."

New Jersey's situation is typical of what most states are encountering in their sincere effort to manage nongame and endangered wildlife. In 1973, the New Jersey Division of Fish, Game and Shellfisheries drafted and Mrs. Josephine Margetts sponsored a bill known as the *Endangered*

Part of the endangered and nongame project involves exotic wildlife. Nongame zoologists inspect zoos, pet shops, animal dealers and exhibitors to make certain they are licensed and the animals are being treated properly. Here, a zoologist inspects a 12-foot Burmese python in an animal dealer's store.

One of the major accomplishments of the Endangered Species Project has been the osprey egg transplant program. Three years of transplanting fertile eggs from Maryland and Virginia into the infertile nests on Barnegat and Sandy Hook Bays have produced 31 young ospreys.

and Nongame Species Conservation Act, A-2151. This bill provided $100,000 from the general treasury for nongame and endangered species management. It passed both houses of the legislature with a unanimous vote in November 1973.

The project geared up and hired three nongame zoologists, three clerks, and one part-time conservation officer. A comprehensive nongame and endangered species project was drafted. The New Jersey Endangered Species project was the first to apply for federal aid funding and one of the first three approved by the U.S. Fish and Wildlife Service under the Endangered Species Act of 1973.

On July 1, 1974, the project was appropriated $70,000, which was adequate to finance the various ongoing programs. An official Endangered and Threatened Wildlife Species list was published, contractual research began on several reptiles and amphibians, an osprey egg transplant program was conducted, and a conservation officer was sent to Kennedy International Airport for specialized endangered species enforcement training by the U.S. Fish and Wildlife Service. Nongame demonstration programs and a management area were developed, a mobile exhibit was constructed, and New Jersey was quickly recognized by other states and by the U.S. Fish and Wildlife Service as a forerunner in endangered species management. The New Jersey project was used as a model and guide by several other states.

In July 1975 the annual appropriation for the New Jersey Nongame and Endangered Species Project was cut to $35,000. One senior biologist, a conservation officer, and two clerks had to be laid off, leaving two nongame zoologists and a clerk-stenographer. Contractual research was reduced and emphasis had to be shifted to endangered species management to take advantage of $20,000 in federal aid to endangered species funding which allowed the project to operate on a $55,000 budget. By careful planning, it was possible to continue work on endangered reptiles and amphibians, to expand the osprey transplant program, and to enter into a contract with Cornell University and the Peregrine Fund for the introduction of three peregrine falcons into New Jersey. Law enforcement was increased and several major cases involving illegal possession of endangered ocelots, wolves, bears, and dangerous exotic wildlife were prosecuted. New Jersey's program was still one of the most progressive in endangered species management.

In July 1976, the New Jersey Endangered and Nongame Species Project suffered a mortal blow when the New Jersey legislature failed to provide any appropriation for the operation of the project. Many letters of public support were sent to Governor Byrne, Commissioner Bardin, and various legislators, but nongame species management took a low budget priority to school funding, mental and penal institution operations, beach erosion, and other apparently more demanding programs. Four regional public project information meetings were held statewide by the Endangered and Nongame Species Council and all project personnel. In addition more than 20 talks were given statewide. Yet, public support was not sufficient to result in legislative funding.

Fortunately in July 1976, the State Federation of Sportsmen's Clubs and the State Fish and Game Council agreed to provide $25,000 of the hunters' and anglers' money to carry on endangered and nongame species management in 1976-77. This state funding allowed the project to obtain about $20,000 in federal aid. Again the sportsmen had risen to the occasion and funded a natural resource conservation program which is clearly the responsibility of all the citizens of New Jersey.

It is obvious that New Jersey needs and must have a highly effective and broad-spectrum nongame and endangered species program. As open space shrinks because of urbanization, pollution, and industrialization, there is a dire need for

Two of these 40 ft. high falcon "hacking" towers have been erected through the Endangered and Nongame Species Project. A total of 10 young peregrines have fledged in two years.

definitive criteria for environmental assessments and wise land-use planning. Nongame populations directly reflect land management practices which affect not only wildlife species, but also human needs. Basic nongame wildlife diversity studies on the various habitat types in New Jersey could well be the key to habitat evaluation and serve as an important criterion for proper land use planning to preserve not only wildlife, but also human habitat needs in the most densely populated state in the country.

In addition, adequate funding could prevent endangered species such as the osprey, bald eagle, peregrine falcon, bog turtle, and several amphibians from becoming extinct and wildlife on the Threatened List from becoming endangered. Equally important, research on endangered species may reveal habitat abuses which are also affecting man without his knowing it.

The answer to managing the nongame and endangered wildlife in New Jersey and every other state is simply a matter of a sound funding base. Nongame belongs to all the citizens of the states and endangered species are everyone's responsibility. Therefore, it is only logical that EVERY CITIZEN share in the obligation to manage the nongame and endangered wildlife populations. I feel that the public is generally aware of its responsibility and willing to provide the funding program necessary to do the job on nongame and endangered wildlife. The problem is how to mobilize an adequate funding program.

There are several alternatives. The easiest and most obvious would be a guaranteed annual general state treasury appropriation directed at nongame and endangered wildlife. In New Jersey this would have to be a minimum of $150,000 a year for two years and then a $200,000 appropriation for the third and fourth year. A state appropriation would also guarantee federal funding of up to $100,000 a year.

With this funding base it would then be possible to expand the present project to include nongame wildlife diversity studies on the various habitat types. This information could easily be plugged into present land-use regulations and provide input into land-use management programs. Contractual research through the universities and qualified conservation agencies would allow for new and exciting studies on many phases of nongame and endangered species and practical management programs. Land evaluation and acquisition would be directed toward critical habitats.

This expanded nongame program could easily be integrated into the Division's game and fish management programs, providing the comprehensive and coordinated approach to ALL wildlife management which is the obligation of the Division.

There are other funding possibilities which should be explored. The Wildlife Management Institute in 1975 estimated that at least 40 million dollars would be required to adequately manage the nongame wildlife resource in the United States. One of their recommendations was an excise tax, similar to the sportsmen's Pittman-Robertson and Dingle-Johnson Act, on certain outdoor recreation equipment such as camping gear, ski equipment, recreational vehicles, binoculars, and wild bird foods. The Wildlife Management Institute estimated that about 2½ million dollars might be raised for nongame management in the states by this excise tax. The results of the excise tax on arms, ammunition, and fishing tackle has shown that the users of the resource are willing to pay for its management. The proposed excise tax on recreational equipment would pass the cost of funding of nongame to the outdoor recreation users.

There are other alternatives such as personalized automobile license plates, taxes on soft drinks, nongame decals, and possibly taxes on timber sales, mining programs, and grazing leases, capital gains taxes on subdivisions, or a small percentage of states' income tax. Generally, this type of funding has not been popular or effective. Decal programs depend on donations; only a few states have been successful with nongame decals and stamps other than to provide an ADDED funding for nongame.

Nongame and endangered species management is presently at the crossroads of its short existence. If a broad funding base is established either by general treasury appropriation, by an excise tax, or by other funding, nongame management can be developed into a major natural resource conservation program with direct wildlife and human benefits. If the funding is not provided, state fish and game agency efforts to manage the nongame resource will be small or nonexistent. The nongame and endangered species funding responsibility clearly belongs to ALL the citizens of the country and they must be willing to literally put their money where their mouths have been. The sportsmen have long paid the bill for fish and game management programs. The time is now for the nonhunting public to provide their support and financial input into the nongame and endangered wildlife resources. The state fish and game agencies have the authority, experience, expertise, and desire to manage the nongame wildlife resources. All they need is public support and adequate funding. □

CO'S CORNER

by Conservation Officer William D. Nevins

a range of our own!

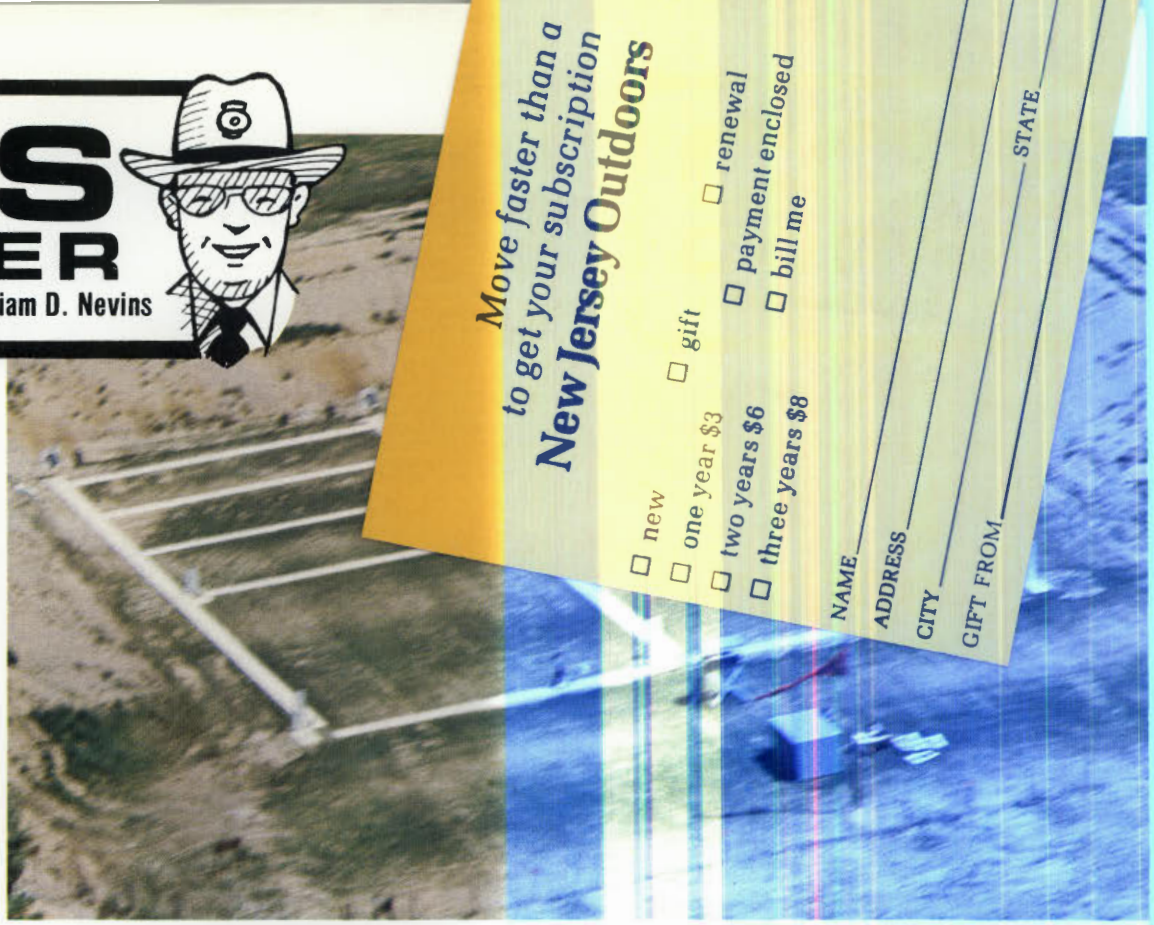


PHOTO BY JOAN GALLI

Over the years, Division of Fish, Game, and Shellfisheries Law Enforcement personnel have received initial and annual firearms training at diverse locations throughout the state. Other law enforcement agencies in New Jersey provided range facilities for this very important aspect of enforcement training.

After considerable study and planning, recommendations were made by the author to consider construction of a pilot training facility at a central location in the state to facilitate training of law enforcement personnel. Because of its location, the Colliers Mills Wildlife Management Area in Ocean County was selected as the range site. Also, this area has a natural knoll which serves as an impact area and has excellent entrance and exit areas.

With the cooperation of division engineer Ken Workman, and wildlife foreman Charles Menzer, range construction plans provided by the Cape May Police Training Committee and the Federal Bureau of Investigation were reviewed and amended as required. Between the time the plans were finalized and ground breaking began, Ken Workman left the division's employ and the author and Charles Menzer carried on the project.

During the original planning, consideration was given to future expansion of the facility to accommodate other agencies having need for a range. In addition, it will someday provide other shooting enthusiasts with an area capable of supporting all types of recreational shooting sports such as: skeet, trap, rifle, and national match pistol competition. Hunter education training was also considered and the range has already been used for muzzleloading rifle training in our Hunter Education program.

The range has an excellent classroom immediately adjacent to the range with berm walls which protect against the possibility of stray rounds entering this area. An excellent target and storage shed, and an observation and control platform for the range commander's use are immediately behind the 50-yard firing line. Poles on which the danger flags are flown are situated so that when shooting is in progress, the warning flags can be seen from all angles. In addition, roads are blocked by locked barriers when shooting is being conducted.

On April 28, the range was officially opened for use with conservation officers attending their annual qualification firing of the tactical revolver course. Many favorable comments were made by the conservation officers over the past few months. The typical remark was, "I don't believe it's really our range." But it is, and our dream of a range of our own has come true.

The Division of Fish, Game, and Shellfisheries is ever-mindful of the cooperation it has received from all who participated in the construction of the range, particularly Charles Menzer. Special thanks goes to the police departments of Middletown, Passaic, and Dover townships and to the Cape May Police Training Committee, who have so graciously permitted our personnel the use of their ranges in the past.

On June 4 the range was dedicated with many state and local officials present. The history of conservation officers firearms training was reviewed and firing demonstration was conducted. The spectators were quite impressed with the manner in which the conservation officers demonstrated their ability to safely and effectively fire their service side arms. □

The Schooner Josiah S. Newcomb was built in Leesburg New Jersey in 1928 and was one of the last of the vessels to be built as a sailing workboat in south jersey.

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WORKHORSES UNDER SAIL

and "run" to Philadelphia.

In 1876 the railroad came to the Maurice River and with it came the possibility of a boomtown prosperity for the village of Port Norris. The first year the railroad finished operation, an average of ten "reefer cars" of oysters in the shell were shipped per week. A decade later they were shipping 90 carloads a week from the harbor at Bivalve. The railroad did more to bring prosperity to the oyster fishery than any other factor.

By the late 1880's there were more than 300 boats engaged in the oyster fishery and their number was steadily increasing. There were not enough dredge boats in Delaware Bay to fill the need in harvesting the oysters, so imports began to arrive from Maryland and the Virginia Tidewater. There were Pungies and Skipjacks from the Chesapeake Bay. The old Delaware Bay sloops were dismantled and refitted as schooners with fore-and-aft rigs. It seemed that the best all-around workboat for the increased needs of the oystermen was the indefatigable workhorse under sail, the schooner.

The obvious advantage of the schooner over any other rig moving the same tonnage with just as much sail was the smallness of the crew needed to work her. It was handier to manage since the fore and main sails could be taken in one at a time, by fewer hands, and with a lighter rigging than would be needed for the same amount of canvas in a sloop's single mainsail. There was more versatility in reefing down to dredge for oysters with the fore-and-aft rig of the schooner.

The oyster captains who still survive swear there's no more beautiful sight than an "oysterin' schooner" scudding home to a "scupper breeze." These "Old Gentlemen" (Captains) make a distinction between "old boats" and "new boats." The "old boats" were clearly marked by the high topmast, which extended above the mainmast and allowed a working topsail to be used in light air. These schooners were built before 1900 and were designed to be used without the pushboat or yawlboat.

According to the old skippers, the last schooner built with a work-

ing topsail was the *Mary Carolyn*, constructed in Greenwich, New Jersey, during the First World War. The "old boats" depended entirely upon the breeze and often carried an extended jib-boom on the bowsprit with a jibsail and flying jib. They also sported a fancy cutwater resembling the clipper bow. The topsail, furled aloft and bound to the mast head, would often "shake-out" with the breeze, causing the boat to rock while at anchor.

The "new boats" were the schooners that were built to use the larger dredge. Until the 1920's, the dredge used had a drawbar of 42 inches; the large dredge was 52 inches across the bar. These later schooners were basically patterned after the fishing smacks of New England, with a spoon bow or a "down east look." They were "Polish rigged," without the topmast on the main. This was also called a "shallop rig," with both masts fore and aft being nearly of the same height. The yawlboat permitted the use of power when there was no breeze, but the art of dredging oysters under sail was still the state law.

The prosperous oystermen built their "new boats" during the peak of their affluence before the depression. Captain Ed Riggin remembers the shock of coming home to Port Norris after the First World War, finding the town more prosperous than any gold-rush town of the old West. "Why them fellars looked like real dandies," he drawled, "with their white knickers and Cadillacs. One 'old gentleman' lit his 'ceegar' with hundred-dollar bills and traded in his Cadillac every time the ashtray got dirty. Why I remember when it took two locomotives to pull them cars full of oysters out of Bivalve, over 200 of them. In those days we were doing eight and nine million dollars' worth of business a year."

The largest schooner ever launched during the golden age of the oyster boom was the *Ethelinda Blackman*. Measuring 102 feet long with a beam of 24 feet, 10 inches, she drew 6 feet of water and would carry 96 tons. This schooner was built in Dorchester, New Jersey, in 1929. Many of these later schooners were built of double-sawed frames. Curiously, the shipwrights of South Jersey believed that steam bending the frames took the life out of the wood, while double-sawed frames extended the life of the boat. Many schooners were built exclusively of local white oak and were carvel planked. Rock salt was added between the planking and the ceiling to help preserve the hull.

Each boat was built from its own model and then marked out in the moldloft of the shipyard. Here on the floor the lines were drawn and faired up. Each set of frames on the boat had its own particular mold which was used only for that boat. The high masts of the schooners were imported from the tall-timber-producing regions of the Far West, a factor which led to the introduction of steel masts. The *Ethel V. Stowman*, an outstanding character boat, was the first oysterboat to use hollow steel masts. She was also the only ship that had a Marconi-rigged mainmast. The *Ethel V.* was built in Dorchester in 1926.

The most legendary schooner that ever sailed the Bay was the *J. and E. Riggin*. This dredgeboat was 76 feet 4 inches long with a 22-foot 3-inch beam, and drew 6 feet of water. The colorful schooner was "Polish rigged" and carried 4000 square feet of canvas. Captain Ed Riggin involuntarily glows from stem to stern as he relates the exploits of his grand old boat. "My gosh," he says, "it was almost as if she was a live creature risin up out o' the sea, running before the wind, a goin' wing and wing. I would have to climb up on top o' the wheel box to see where I was goin'." "You know," he continues, "she was never beat in a race. Many of the 'old gents' thought they could take her, but nobody ever did. Sunday afternoon they used to wait for us at the mouth of the river to give her a try, but there weren't nobody could ever take her."

Delaware Bay racing was arranged by gentlemen's agreement, usually on Sunday afternoons. When the spring oyster planting season came, the race for the seed oyster beds was an annual event. It was a spectacular sight, 500 schooners straining every beam and spar to be the first on the scene of the dredging for the young oysters. According to the time-honored tradition, they would line up and wait for the starting gun, as crowds of spectators lined the bayshore.

Today the spectators are gone and so are the white-winged Pegases of the deep. Gloom and depression cover the bayshore like a captain's greatcoat. Since the end of World War II, the oystermen have been permitted to use full power for dredging. "When they cut down the spars they cut their own throats," said one old skipper. It had been generally held that the limitations enforced by dependence upon wind and weather constituted a healthy and impartial restriction upon the commercial planter and acted to conserve the natural resource. The prophets of doom have indeed had their field day predicting the demise of the oyster fishery since the use of full power became the norm. One "old gent" walked off the quarterdeck never to return when the schooners were shorn of their sails.

At the present time the Bay is mildly polluted and the oysters are suffering from various ailments including the virus known as "MSX." There are 45 dismasted schooners on the Maurice River and only half of them even work the oyster beds today.

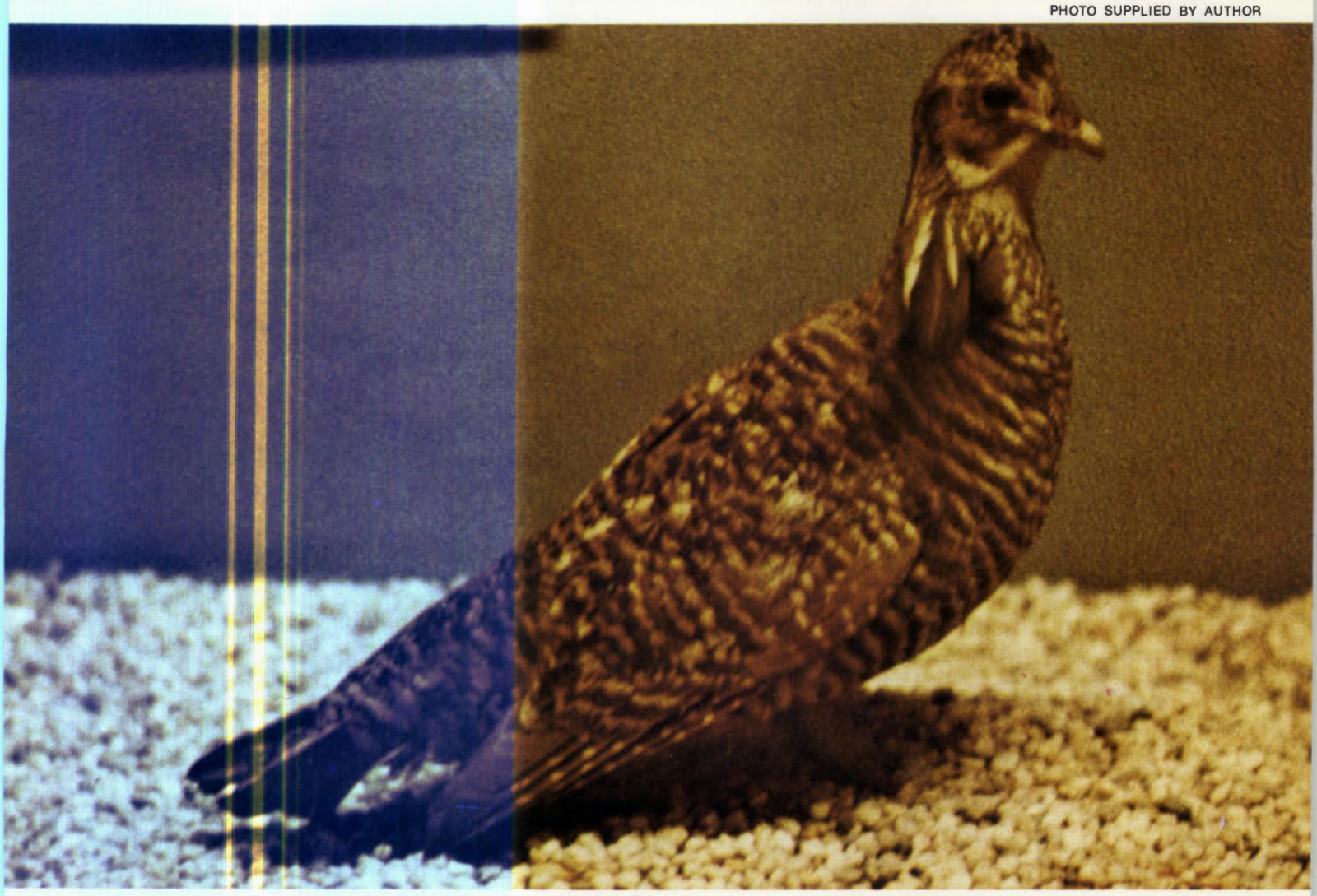
Occasionally, standing on the old wharves at Bivalve in the spring of the year, one may observe an "old gentleman" walking by with a quarterdeck stroll. He may stop and gaze wistfully out at the Bay while humming a chanty along with the wind in the reeds:

Hist up the mainsail
we're gettin' under way
By the looks of me weather-eye
it will be an oysterin' day.
All together on the foresail sheet
we're gettin' out to the Bay;
By the breeze that's a blowin'
on the larboard side
It will be an oysterin' day.
The rails awash with a scupper
breeze
and we're beatin' up the Bay'
Ready the drudge for the grounds
me boys,
it sure is an oysterin' day. □

THE HEATH HEN

BY KIRK H. BEATTIE
Graduate Research Assistant
Virginia Polytechnic Institute and State University

PHOTO SUPPLIED BY AUTHOR



It is good to do some soul-searching now and then. We lament the loss of the passenger pigeon, the heath hen, the great auk, the Carolina parakeet, and, most probably, the ivory-billed woodpecker. But soul-searching is worthless unless it leads to positive action.

The heath hen was the eastern race of the greater prairie chicken. It was a square-tailed game bird with long tufts of feathers on either side of its neck and an orange-colored air sac on its throat. In early Colonial days the heath hen ranged over the Eastern states from Massachusetts to the Potomac River in northeastern Virginia. It avoided forests, preferring pine-scrub oak cover similar to that of the New Jersey Pine Barrens.

Male heath hens (cocks) gathered on communal booming grounds during the springtime and performed courtship rites before gatherings of hens. The cocks "boomed" by inflating their air sacs and then expelling the air forcefully to produce a hollow, resonant sound.

The writings of early authorities suggest that the heath hen was behaviorally similar to the blue grouse of Western states. Easily approached, it could be shot with little difficulty. Heath hens flew laboriously in a straight line and when a flock was flushed the birds would rise one or two at a time, giving a hunter shots at individual birds until he ran out of shells. Although scorned by sportsmen for offering too easy a target, the heath hen was the delight of market hunters. Jay Williams, author of *Fall of the Sparrow*, told of hunters strewing ashes on the spot where a flock usually gathered, waiting for the birds to beat their wings and raise enough dust to blind themselves, and then rushing them with sticks.

The heath hen was frequently used as a basic food staple in early Colonial days. In fact, servants often had to persuade their employers not to feed them heath hen more than several times a week. The species began to decline drastically in the early 1800's despite legislation enacted as early as 1791 to protect the birds from hunters during the spring and summer months. Market hunting, unrestricted shooting, and habitat destruction had eliminated the heath hen from the New England mainland by 1840. By the early 1870's it had been completely exterminated from New Jersey and Pennsylvania, and by 1880 it was confined to the island of Martha's Vineyard.

An 1890 census uncovered only 200 heath hens. A forest fire on the island in 1894 destroyed most of the bird's breeding habitat, and by 1896 there were fewer than 600 heath hens remaining on Martha's Vineyard. Another severe forest fire reduced the number to 77 in 1907 and led to the stocking of 21 birds on a 1600-acre protective sanctuary.

A warden was hired to guard against poaching and to kill predatory cats, hawks, rats, owls, and crows; firebreaks were cut in the woods; and food crops were planted to encourage growth of the small population. By 1916 it appeared as though the heath hen might be saved. There were close to 2,000 birds on the island. However, another disaster struck again in 1916 in the form of a raging May forest fire, which destroyed both habitat and females sitting on nests. The fire, a grueling winter, and an irruption of goshawks had reduced the population to 105 birds in 1917, most of them males.

With only 25 heath hens remaining in 1925, an extra warden was hired to control the natural enemies of the birds. Heroic attempts were made to stave off the approaching extinction of the race. The new warden went outside the boundaries of the sanctuary and wiped out cats, crows, hawks, and owls. Rabbits were introduced on Martha's Vineyard in an attempt to lure predators away from the heath hen. A fear that domestic poultry might be infecting the birds resulted in the removal of poultry from the island. A few heath hens were relocated on the mainland but the transplant was unsuccessful. The birds never recovered from the decimating disasters of 1916.

The following account, written by James Trefethen in *An American Crusade for Wildlife*, tells of the last days of the heath hen:

Each spring, Dr. Gross spent a lonely vigil in a blind commanding a view of the heath hen's principal dancing grounds where most of the island's population congregated to carry on their strange mating ritual. In the first few years, the flocks of survivors fluctuated between three and a dozen. But in 1930, only one lone male appeared. In 1931, the bird reappeared to go through its pathetic mating dance, and Gross was aware that he was eyewitness to the death of a zoological race. In 1932, the bird reappeared. In 1933, there were none.

The tragic loss of the heath hen underscores the need for laws and regulations governing the harvest and protecting the critical habitat of wildlife. But it is not enough simply to enact laws. They must be enforced by a citizenry that recognizes and understands the needs of all living creatures, man included. Protective regulations to control the taking of the heath hen were adopted as early as 1791, but the laws were not enforced or were not enforceable, and thus the heath hen became extinct.

Sportsmen of the time should not be blamed for the demise of the heath hen. Sport hunters and their organizations managed to get potentially beneficial laws passed, but that was not enough. As with the passenger pigeon, unscrupulous hunters, market gunners, a belief that natural resources were boundless, agricultural versus conservation interests, and especially habitat destruction all played their part in the unnecessary loss of a zoological race, the heath hen.

It is good to do some soul-searching now and then. We lament the loss of the passenger pigeon, the heath hen, the great auk, the Carolina parakeet, and, most probably, the ivory-billed woodpecker. But soul-searching is worthless unless it leads to positive action. Hopefully we have learned some valuable lessons from the mistakes and environmental arrogance of previous generations. Reflection is good, but a futuristic attitude is imperative. Perhaps, if our educational system can develop effective programs to instill a true environmental ethic in all citizens, today's endangered species need not share the sad fate of the heath hen. □

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snows bows & frozen toes

Tree stands are the most effective method of bow hunting in the winter.

I, along with 14,000 of New Jersey's 35,000 bow-and-arrow deer hunters, was a part of a successful first effort to provide more hours of bow hunting recreation with a late season bow hunt. The low success rate of 190 deer taken indicates that deer are not easily hunted in the winter and that New Jersey bow hunters have a lot to learn about hunting deer in the late season.

A bow hunter must study the habits of deer in the winter to be successful. During cold weather deer habits change drastically; deer that habitually travel to the corn field or alfalfa field in the fall may spend the entire day in a small area. In Sussex County, where I live, the deer are usually found on the south-facing slope of hills in hemlock, laurel, or rhododendron thickets. In the central part of the state the deer winter on red-cedar-covered south-facing hillsides. In the southern sections, deer spend cold weather periods in the white-cedar lowlands.

This departure from early-season behavior makes it difficult to hunt the wary white-tails. Because the deer don't move much at this time, the hunter must get close to where they are wintering; and if he gets too close, the deer will spook.

One thing in the hunter's favor is the possibility of snow cover, which helps him to detect fresh tracks and droppings more easily and to trace deer movements from bedding to feed areas. Another positive point about winter deer behavior is that they are more likely to be found browsing and wandering around at all hours of the day. This gives the hunter who is patient and able to withstand the weather conditions a slightly better chance to see deer.

But the major problem facing the winter-season bow hunter is the weather; temperatures are likely to be below freezing and possibly below zero. The 1976 season was held during the coldest part of the last winter and the 1977 season (January 8-15) may have more of the same. Proper clothing is a must. I found that several layers of wool clothing topped off with my fall bow hunting garb did the trick. To keep my head warm I wore a wool knit hat. Somewhere I read that the trick to keeping warm is keeping your head warm and I found this to be true. Your feet are probably the weakest link in the battle against freezing temperatures. Try thin wool socks over your feet, followed by down-filled socks and felt-lined rubber bottomed boots.

Now that you are all ready and dressed to withstand the rigors of winter bow hunting, I caution you to practice shooting with all your clothes on. Big puffy warm clothes may get caught in your bow string and cause you to miss, so get accustomed to shooting while wearing bulky outerwear.

Despite the difficulties, hunting deer with bow and arrow during the cold weather is a fantastic experience. The forest abounds with wildlife; in many cases, the species are different from those observable in the fall. The sights and sounds are different and the tranquility of the winter woods uplifts and renews the spirit. Really that's what bow hunting is all about—being out in the forest observing and being part of the real world of the ecosystem. It's this return to nature that makes the winter bow season an experience to remember. □

Photos by Harry Grosch

the coming of the wild turkey

Joseph M. Penkala
Project Leader, Upland Game

The Eastern wild turkey was a member of New Jersey's native fauna when the first white settlers arrived in the new world. The wild turkey was very important to the American Indian. It provided a source of food as well as feathers for adornment and ritual purposes. The turkey's large size and good table qualities made it a favorite with the new settlers who depended on the wilderness to provide them with food until their farms could take over the job. The turkey was so highly prized that Ben Franklin proposed that the wild turkey should be our national bird, rather than the bald eagle.

The turkey's popularity combined with the increasingly sophisticated and intensive agricultural practices almost spelled the end for the wild turkey in the northeast. The mature expanses of forest that had once been the realm of the wild turkey and the black bear were rapidly converted into farms that proved to be ideal habitat for white-tailed deer and cottontail rabbits.

Year-round unrestricted hunting also contributed to the decline of this noble game bird. By the early 1900's the wild turkey had been exterminated from nearly half of the 39 states in which it had originally occurred, and appeared to be fighting an uphill battle in the areas where it still remained. The last open season on wild turkey in New Jersey occurred in 1913. The season ran from November 10 to December 15. After this date the season was closed and the birds were given full protection. From 1913 through 1930 the Fish and Game Commission administered a program of releasing game farm turkeys. The program was discontinued until 1960 when a final release of 26 birds was made.

All attempts to re-establish the birds had failed. Two reasons probably caused the failure. First, adequate habitat may not have existed and second (and probably most important), the birds used were game farm birds which are far inferior to wild caught birds. The game farm turkeys do not possess the behavioral skills to survive in the wild.

In the meantime other states in the northeast, most notably Pennsylvania, were having a great deal of success in re-establishing wild turkeys. Presently Pennsylvania, New York, Vermont, Maryland and West Virginia all have resident turkey populations. In 1973 the Bureau of Wildlife Management of the New Jersey Division of Fish, Game, and Shellfisheries began a study to determine if wild

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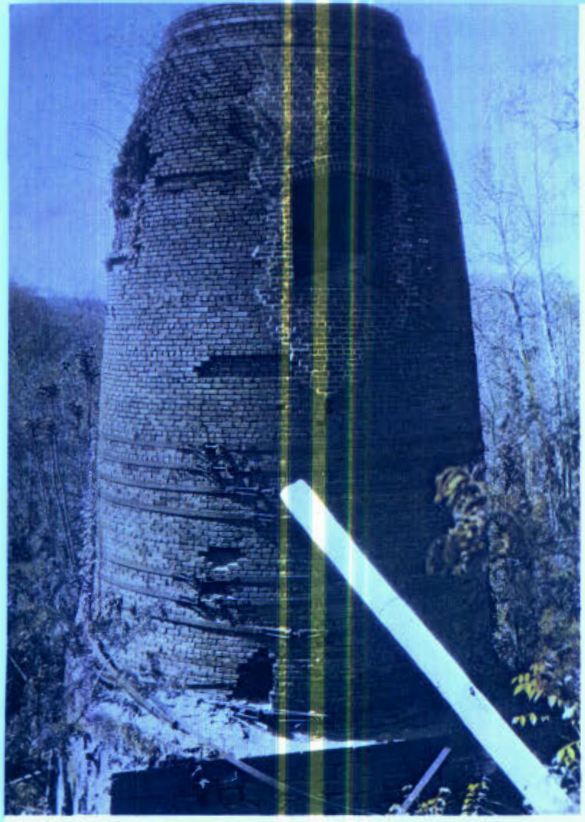

Remains of blast furnace at Allaire State Park as it appeared in 1932. Iron works such as this required huge quantities of charcoal during the mid 1800's.

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NEW JERSEY'S RENEWABLE RESOURCES

1686, roads, probably improved Indian trails, connected the settlements on the Hudson and Delaware rivers. In 1726, the population of New Jersey was about 30,000; in 1737, 47,000; and in 1745, 61,000.

Settlement started along the waterways and proceeded inland, with the better farmland being cleared first. Most of the central region of the state was in agriculture by the time of the Revolution; no significant changes in woodland acreage occurred here from 1800 until the 20th century.

From the time of the European discovery to the end of the 19th century, the forests were of greater direct importance to the people than they have been in the 20th century. The mountainous woodlands of north Jersey and the southern pinelands supplied wood both to our state and to New York and Philadelphia.

The earliest record of a sawmill in New Jersey dates from about 1682, when Johnathan Bishop operated one in Woodbridge on the "Rahawack" River. Wood products were originally manufactured using hand tools such as axes, adzes, and pit saws. To use the pit saw, a hole was dug or a frame built to a convenient height. A log was moved into place and two sawyers, one on the log and the other beneath it, used a saw similar to a crosscut to remove boards. It was not long before these vertical saws were operated by water power. The circular saw was introduced around 1815 and the number of mills continued to increase. The U.S. Census of 1830 records 655 sawmills in the state, ranging from 19 in Salem

Atlantic white cedar harvested from Shinn's Branch, Lebanon State Forest during the winter of 1926-27. Cedar logs were brought from swamp on steel track.

Hewing railroad ties on the Stokes State Forest during the 1920's. Early railroads were heavy users of wood for ties and fuel.

County to 93 in Bergen.

Until about 1850, when anthracite began to replace it, wood or charcoal was New Jersey's only fuel, domestic as well as industrial. The charcoal-ironworks of this era used considerable quantities of wood. One of these furnaces, the Union, consumed in 12 to 15 years the wood from nearly 20,000 acres. Cumberland furnace, established in 1810, was abandoned in 1840 when charcoal could no longer be obtained from the 15,000 acres of woodland associated with the ironworks. Quite often these cutover ironworks lands were sold and further cleared for farming; however, since their soils were generally poor for agriculture they were usually abandoned to revert to woodlands. The "old field," typical of the succession back to forest, has been a part of the New Jersey landscape since before the European settlement.

Other early industries, including glassworks, steamboats, and the early railroads, also relied on wood for fuel. Because of their demands, the original forest of New Jersey had been almost completely cut over by the decade of 1850-1860. Many stands had been cut over three times; often fire followed the cutting. The period of the Civil War marks the time when New Jersey had its greatest amount of cleared land.

Heavy cutting for fuelwood continued until the 1920's, necessitating that smaller diameter and younger timber be cut. In 1908, lumber production was 35 million board feet; in 1920 it was down to 23 million board feet, a decline which continued to 3 million board feet in 1928. During the 1930's the harvest slowly increased. Thirty million board feet was reached in 1943, reflecting the demand for ship timbers during the Second World War.

From the mid-19th century until World War II, the forest acreage of the state remained fairly constant, since the acreage of abandoned farmland reverting to forest stayed slightly greater than that of forest land being cleared. The period from World War II to the present has been marked by rapidly increasing population with a concurrent increasing demand for land. During these two decades, more than a million housing units have been constructed, almost equalling the total available prior to 1950.

Despite these demands, New Jersey's acreage of forest land has changed little since the late 1800's; most of the new development has occurred on previously cleared agricultural land. Farmland decreased from 1,665,241 acres in 1954 to 1,035,678 in 1969, a loss of approximately 40 percent. During the 16-year period from 1955 to 1971 commercial forest acreage decreased less than nine percent.

Today the forests are continuing to recover from the heavy cutting of the early 1900's. The 1955 Forest Survey indicated a timber harvest four times greater than that of 1932. More recently, the 1971 Forest Survey revealed that even with the reduction in forest land acreage, the volume of growing stock has increased.

New Jersey has the highest population density of any state in the nation. Yet 54 percent of its land area—2,613,400 acres—as tree cover.

The most recent forest survey by the Northeastern Forest Experiment Station, U.S. Forest Service, classifies 1,856,800 acres as commercial forest land—land that is producing or capable of producing wood for industrial use. Eighty-three percent of such commercial forest land is in private ownership. The remaining wooded areas are in parks, natural areas, and other uses where timber harvest may be restricted.

New Jersey has a viable forest industry using homegrown timber for raw material. Presently the state's 67 operating sawmills use electric, gas, or diesel power to produce 15 million board feet of lumber annually. Uses of this lumber include the manufacture of pallets and crates, truck bodies, fencing, boats, planning mill products, and specialty items such as custom furniture, fireplace mantels, and large dimension timbers. Pulpwood production is cyclic. Three pulpmills used 47,000 cords of wood in 1974, an increase from the 30,000 cords used in 1971, but approximately the same as the 45,000 cords required in 1968. Felt paper is manufactured from pulpwood, and is in turn remanufactured into asphalt shingles.

Baskets for farm produce are supplied by two veneer plants. These industries use much of their waste material to generate the steam necessary to soften the logs before they are "peeled." The steamed logs are placed on a lathe and revolved against a knife to produce the thin-wood veneers from which the baskets are made.

Low-quality logs are used as furnace poles by three metal refineries in New Jersey and by three others in adjoining states. Placed in the furnace with the ore, they act as a reductant and aid in removing impurities from the metal. Other markets for homegrown wood products include posts, pilings, firewood, and Christmas trees. These industries boast 4,800 employees, a payroll of more than $30,000,000, and industry shipments valued at more than $100,000,000 annually.

For more than 300 years New Jersey's forests have provided wood for homes, tools, industry, and fuel. The importance of fuelwood and the heavy, continuous cutting for this commodity left New Jersey's forests in poor condition at the start of the 1900's fanately, however, trees are a renewable resource. The decline in demand for fuelwood and the increasing effectiveness of forest-fire protection and forest management have brought about increased production of timber products. Through careful management New Jersey's woodlands can yield countless products for man's use and enhance environmental quality at the same time.

Many of the needs and amenities of New Jersey's citizens would not be possible without the state's forest resource. Wildlife, outdoor recreation, and water quality would be reduced and in some cases practically eliminated without the existence of forest lands.

People are becoming increasingly aware of the value of their woodlands. Legislative actions, including tax reform, subsidies, and regulation, are being suggested as a means of maintaining New Jersey's forests. In the long run, however; the future of the state's woodlands rests in the hands of the private woodland owner and will depend upon his attitude toward managing and maintaining the forest resource. □

Continued from page 29

the coming of the wild turkey

turkeys could be successfully reintroduced into New Jersey.

Working in conjunction with biologists from other states in the northeast, an extensive inventory of potential turkey habitats was conducted. The results of the initial inventory were very encouraging. Many farms that had been abandoned had reverted to hardwood forests and had again become turkey habitat. Large tracts of land owned by federal, state, and municipal agencies, such as the Delaware Water Gap National Recreational Area, Stokes State Forest, and the Newark Watershed also offered excellent habitat for turkeys. When the survey was completed it was determined that somewhere around 2,000 square miles of potential turkey habitat existed. Five hundred square miles of it existed in the counties of Sussex, Warren, Passaic and Morris. This area will probably become the state's prime habitat. Because of the soil types, vegetation, and land use in this area, the highest densities of turkeys should occur in this region.

A much larger area of potential habitat exists in the Pine Barrens of South Jersey. Approximately 1,500 square miles of range exists in this area. Because of low fertility of the soils in some areas, and an absence of adequate food, not all of this area will support turkeys. However, the sheer vastness of the area insures that it will also become an important turkey producing region.

For the last three years the New Jersey Division of Fish, Game, and Shellfisheries has been attempting to obtain wild caught turkeys from other states in the northeast. Game farm birds were available but because they proved inferior in the past, reintroduction was postponed until wild stock could be obtained. Last summer arrangements were completed to receive wild trapped turkeys from the State of Vermont where the wild turkey is a real success story. Vermont began with about 30 birds in 1969 and the present population estimates are from 4,000 to 6,000 turkeys statewide.

During December of 1976 turkeys will be cannon netted over bait. These birds will be transported from Vermont to New Jersey for release. The initial releases will be made in the northern region of the state in areas considered to be our prime turkey range. In anticipation of this release, division biologists assigned to the turkey project underwent an intensive turkey training session under the guidance of Jerry Warring and Arney Hayden of the Pennsylvania Game Commission, two of the top turkey biologists in the northeast. The biologists spent a week this October in Pennsylvania learning about turkey biology and management. They visited various turkey habitat management projects, tracked turkeys equipped with radio transmitters, and learned the various techniques used in turkey management. In the course of that short week they traveled from one end of Pennsylvania to the other picking up much turkey "know how" along the way.

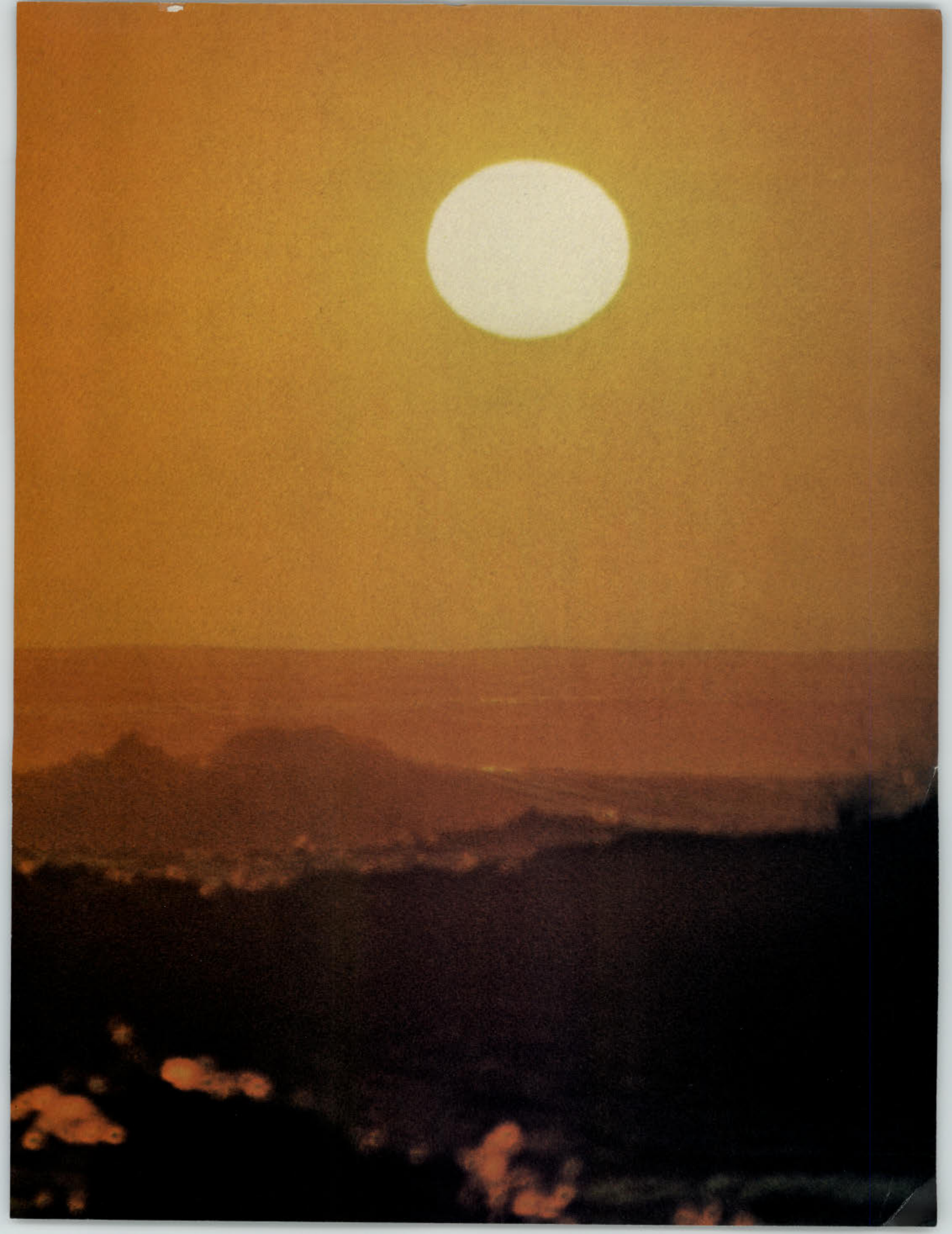
All that remains at present is for the birds to arrive from Vermont. Our program will depend on the success of the biologists of Vermont Fish and Game during their winter trapping. And trapping success depends mostly on weather conditions and cooperative birds. If all goes well the wild turkey will again be a part of New Jersey's native fauna for all to see and enjoy. And the Garden State sportsmen may again know the challenge of pursuing this wary and noble game bird. □

EDITOR'S NOTE: In the next issue we should have an article about the release of wild turkeys in New Jersey (if the Vermont weather and turkeys cooperate).

FRONT COVER — Van Campens Glen in the Kittatinny Mountains in Warren County. Photographed by David A. Bast

INSIDE BACK COVER — Sunset on Long Beach Island Photographed by Michael Gallagher

BACK COVER — "We All Need Clean Water" A female brown bear and her cubs stand in a rushing stream, symbolizing the theme for National Wildlife Week 1977: "We All Need Clean Water." The National Wildlife Federation marks its 40th annual sponsorship of National Wildlife Week from March 20-26, 1977.



WE ALL NEED CLEAN WATER

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