



# New Jersey *Outdoors*

August, 1973

PAUL S. CHURCH  
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*Bring the great outdoors to town on*

# National Hunting and Fishing Day

**September 22, 1973**

The first National Hunting and Fishing Day, September 23, 1972, saw some 4 million people visiting Open Houses hosted by over 3,000 sportsmen's clubs throughout the country.

With your help, NHF Day this year can be far bigger, can introduce millions more of the public to the conservation achievements of America's 55 million hunters and fishermen.

One great way to improve on last year's achievement is to take NHF Day into town. That's what many clubs did last year, especially those without their own club grounds, and the results were outstanding. People who might have overlooked a program at a rod and gun club in the country flocked by the thousands to programs staged at shopping centers, town squares and athletic fields.

So don't be held back if your club has no facilities of its own for holding a gala NHF Day event. Start planning now to hold one in town.

Send for the new revised National Hunting and Fishing Day Action Manual. Bulging with knowledge gained from last year's 3,000 celebrations, this new manual gives you complete "how, where and what" information on organizing promoting and conducting a successful NHF Day celebration. It answers every question.

You can also order a special NHF Day Aids Kit containing everything you'll need to advertise and dress up your event in red, white and blue: streamers, signs, banners, posters, bumper stickers, plus publicity announcements that your local newspaper, radio or TV station will want to use.

Please order today. Making NHF Day happen in your town is up to you. #

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For your convenience there is an order blank  
for the National Hunting and Fishing Day  
Manual and Aids Kit on page 29.

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# New Jersey *Outdoors*

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### Cover—"Copperhead Snake"—*Dr. Arthur Panzer*

The copperhead is one of New Jersey's two poisonous, yet interesting, snakes. The other venomous reptile native to our state is the rattlesnake. For more on these two intriguing creatures see page three.

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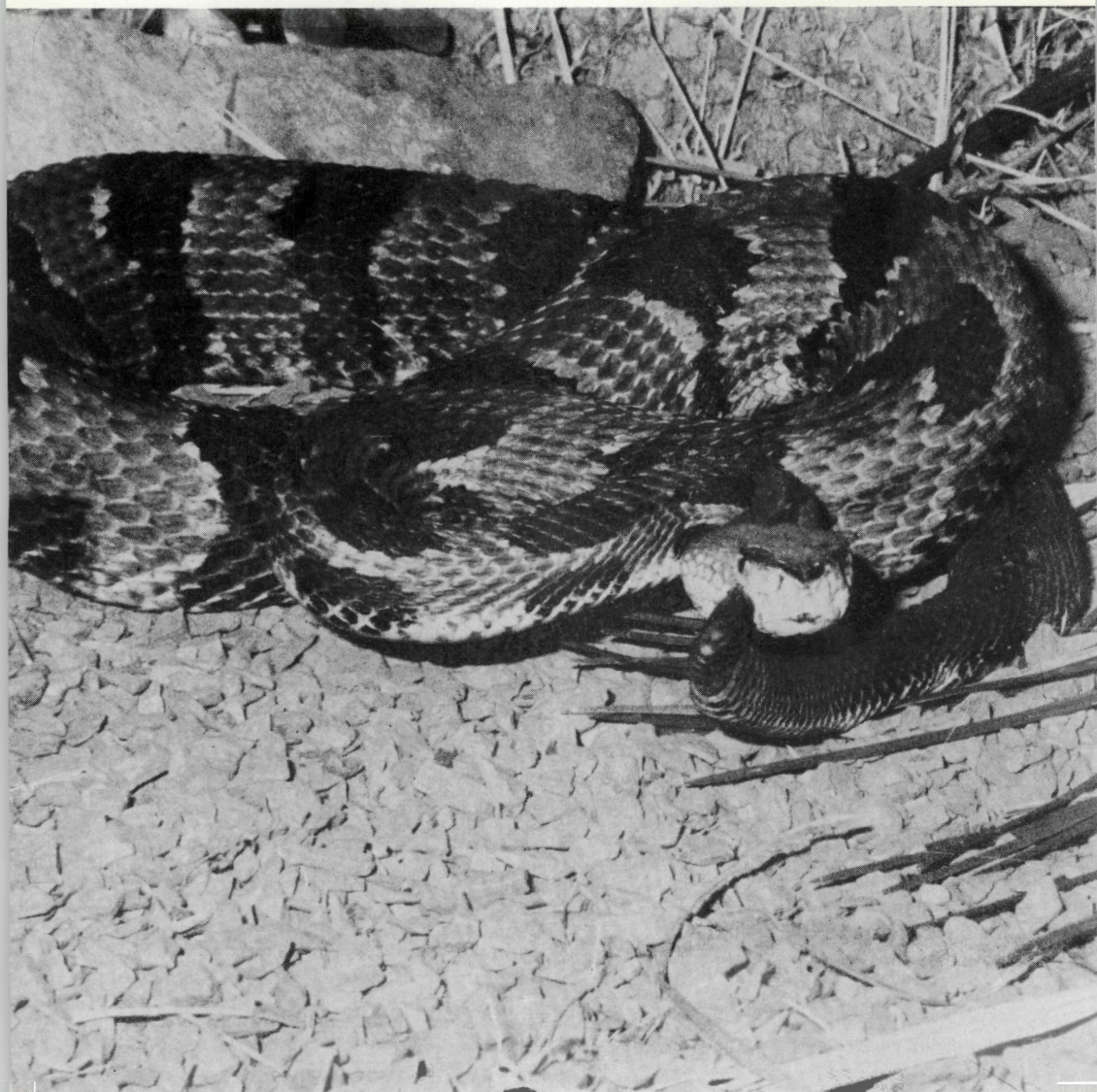
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*The rattlesnake has horny, loosely attached segments at the end of its tail which it vibrates, or rattles, when alarmed*

*Photographs by Dr. Arthur Panzer*

# Poisonous Snakes

## of New Jersey

By Shayna Panzer

The odds against fatal snakebite in this country are two million to one, and improve still further if you live in New Jersey and do not keep a venomous snake as a pet. An informal check of physicians in the northern New Jersey area turned up only tolerant smiles in answer to questions about snakebite. And, John Behler, Assistant Curator of Herpetology at Bronx Zoo, who is occasionally consulted for his expertise with venoms, reports that most bites are "illegitimate"—the result of deliberate handling of a poisonous reptile. Snakebite is not reported separately to the New Jersey Department of Public Health in Trenton but is lumped together with other animal bites. The incidence is believed to be very low.

New Jersey has only two poisonous snakes: the timber rattlesnake and the copperhead. Both are found in the rocky, hilly, northern part of the state, and the former, in swampy areas of southern New Jersey, too.

The timber rattlesnake, sometimes called "velvet-tailed rattler"

because of its dark tail, varies greatly in color. The yellow phase has black or dark brown crossbands or chevrons on a background of yellow to dark green. Occasionally there is an amber stripe down the back. The intermediate phase has the same markings on a fawn-colored background. In the black phase the background is dark brown or black, in some cases obscuring the markings entirely. The yellow phase is most common in New Jersey, according to Fred Space, a former member of the state Fish and Game Council, and snake farm owner.

Young timber rattlers are born colored as in the yellow phase, but less vividly. They have a button at the end of their tails, and each year, two to four horny, loosely attached segments are added. When alarmed, they vibrate these rapidly to produce a loud, buzzing rattle. The rattle is fragile, and pieces break off through wear and tear.

The copperhead has no rattles, but vibrates its tail when alarmed. It is a quiet, shy snake, with chest-

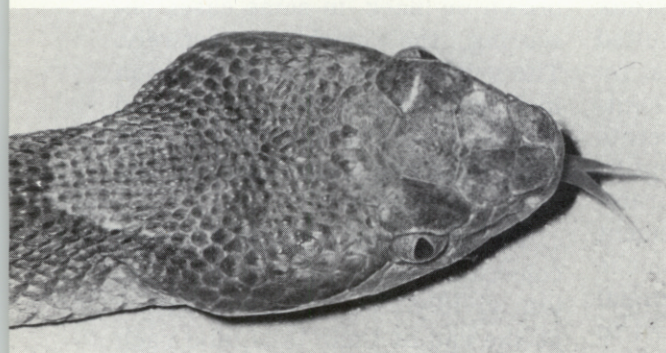
## . . . Snakes

nut, hourglass-shaped markings on a coppery background. The common water snake, with similar brown and orange markings is often mistaken for it. The young are born with bright yellow tail tips, useful in luring prey, which disappear with maturity.

Rattlesnakes and copperheads are both "pit vipers." This group of snakes is distinguished by facial pits, below and behind each nostril; sense organs which can detect temperature differences and enable them to locate warm-blooded prey in the dark. Their fangs, folded backward against the roof of the mouth when at rest, move down and forward to strike, in-

shade. Winter means hibernation—among tree roots in the swamps of southern New Jersey, and in the north, in caves or "dens" with even, above-freezing temperatures. There, they congregate in large concentrations and entwine together into large balls to conserve body heat and moisture. Copperheads and rattlers often share a den and wrap together in the same ball.

Snakes have no ears. They "hear" by picking up vibrations from the ground. Their eyes are always open, protected by a clear covering called a "spectacle." They smell with their noses, and a combination of their tongues and a peculiar sensory receptor called "Jacobson's organ." The tongue



*The head of a copperhead snake showing the triangular shape*

jecting venom from glands in the cheek. They have triangular heads and vertically elliptical eye pupils.

Like all snakes, they are cold-blooded—their body temperature varies with that of their environment and they die if exposed to extremes of weather. In the heat of a summer day they rest in the

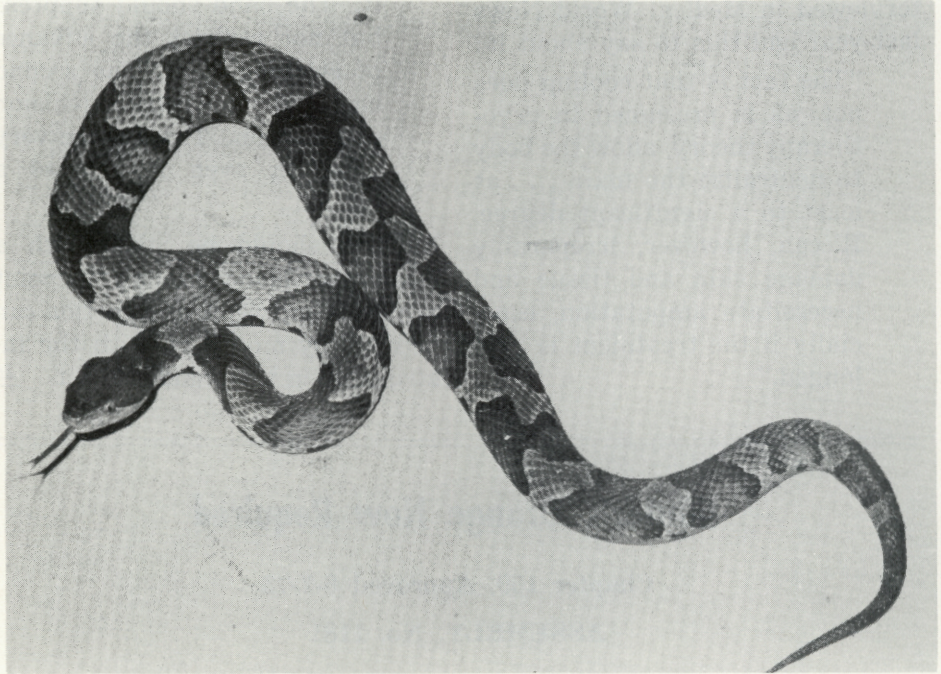
flicks out, picks up olfactory molecules, then touches the Jacobson's organ in the roof of the mouth. Its function is not known exactly, but scientists believe that it can identify food, differentiate the sexes at mating time, and, writes Hal Harrison, author of "The World of the Snake,"

"It certainly is used by the rattlesnake in trailing poisoned prey."

Spring is the most active season for all snakes. That is when they emerge from hibernation, seeking

ledges and beware of stone fences and woodpiles.

Since 95 percent of all snakebites occur on hands and feet, wear high leather shoes or boots, do not put



*The copperhead, which has a coppery color, has no rattles*

food and mates. Campers and hikers in poisonous snake country can avoid trouble by taking a few simple precautions:

Carry a snakebite kit, available at most drugstores.

Do not step over large rocks or logs—step up and then down from them, as snakes often lie just underneath.

Avoid pitching tents in areas of uncleared brush or rocky

hands or feet into places that you cannot see, and carry a flashlight when walking at night.

In the unlikely event of poisonous snakebite, the victim should be kept quiet to slow down circulation and taken to a physician or hospital emergency room at once. Pit viper bites produce swelling, pain and discoloration around the bite. Severe bites also bring on vertigo, vomiting, and bleeding from body

## . . . Snakes

orifices. Cryotherapy—treatment with ice or ethyl chloride—became popular recently as snakebite first aid. Dr. Joseph Gennaro, biologist at New York University, interviewed in *Medical World News* last year had this to say about it:

“The fact is that cooling does not, as is presumed in cryotherapy theory, allow the body to neutralize the toxin . . . at least to a significant degree. It can, however, irreparably damage skin and tissue and necessitate amputation, especially if the treatment is prolonged.”

The best first aid, says Dr. Gennaro, is:

“A wide tourniquet (between the bite and the heart) . . . should be tied around the leg or arm, loosely enough so that a finger can be inserted under it. The band should suppress but not restrict the advance of swelling . . . . The second emergency measure is incision and suction. This can be very valuable, even if delayed a bit . . . .”

Incision should be made with a clean razor blade through the point of venom injection, and suction can be done by mouth or with the instrument in the snakebite kit. #

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## Hunter's Orange Now Required

Chapter 169, Approved 6-7-73

ASSEMBLY, No. 1181

AN ACT to require the wearing of fluorescent hunter's orange clothing while hunting with firearms and supplementing Title 23 of the Revised Statutes.

23:4-13.1. a. Any person while hunting deer, rabbit, hare, squirrel, fox or game birds, other than waterfowl, with firearms in this State, shall wear a cap of fluorescent hunter's orange or some other outer garment containing at least 200 square inches of fluorescent hunter's orange material which shall be visible from all sides. The penalty for violation of this section shall be \$50.00 for each offense.

b. “Hunter's orange” means a daylight fluorescent orange color with a dominant wave length between 595 and 605 nanometers, excitation purity not less than 85%, and luminance factor of not less than 40%.

This act shall take effect on the first day of the month following enactment.

*Summer Inland Sighting of a*

# Pomarine Jaeger

*in Sussex County*

By John J. Padalino

*Teacher Trainer, New York University  
Adjunct Professor, Environmental Studies  
Montclair State College*

Two points of interest relative to this sighting of a pomarine Jaeger (*Stercorarius pomarinus*) are that the subject was observed inland and the observations occurred during the summer between 6 July 72 and 29 July 72.

A pomarine jaeger was sighted on Culvers Lake, Frankford Township, Branchville, New Jersey, (ca. 41° 13', 74° 52' 15" W), and critically observed 10 July 72. The subject was under observation between the hours of 05:30 and 06:45 by Daniel Butler, John J. Padalino, and Frederick Tetlow. Optics used were: one telescope (Bausch & Lomb Zoom 15X-60X), binoculars (10 X 50 Zeiss Jena), and binoculars 7 X 35). Field guides, Peterson (1967), Pough (1951), and Robins *et al.* (1966) were consulted during the observation period.

Observation began from the West Shore, Culvers Lake, with the sun low in the sky to the left of observers, hence affording ex-

cellent light when the pomarine jaeger was sighted on the lake's east shore in the vicinity of the causeway. The subject was in flight trading over a ring-billed gull (*Lazarus delawarensis*) which was resting on the water. Within 15 minutes of sighting, the pomarine jaeger had flown to approximately 40 yards of the observers. Optics were focused on the subject continuously for the first 15 minutes. After the subject flew to the lake's north shore, it was possible to get an exceptionally fine view of it and to ascertain its species as *S. pomarinus*.

The pomarine jaeger's flight was falcon-like, strong, slow wing beats with a shallow amplitude. The subject was in flight throughout the observation time. It did not land on the water, nor did it soar; however, it did glide. Subsequent observers of the same bird, Floyd Wolfarth *et al.* noted the pomarine jaeger's soaring at high altitudes.

### . . . Jaeger

On the morning of 10 July 72, the subject was observed flying at a maximum altitude of 100 feet. Wolfarth *et al*, reported that the subject was sighted by local residents on 6 July 72.

During a period of critical observation it was possible to discern that the pomarine jaeger's head was dark. Yellow hackles were distinct. The bill was dark-tipped, yellow at the base and heavy. The plumage was light-phased, ashy brown on the dorsal surface and white to grey ventrally. A prominent grey to brown spotted band was distinctly seen on the subject's upper breast. Two spatulate central rectrices were protruding. The feet were black. The sex could not be determined.

While canoeing on 9 July 72, Butler sighted the pomarine jaeger and contacted Robert Webb to corroborate the sighting. Via canoe, Butler and Webb were able to approach the subject within 40 feet while it intermittently was resting on the water and in flight. They were able to note the central rectrices as protruding. In addition, Scott Mills observed the subject feeding on a yellow perch (*Perca flavescens*.)

A review of the literature pertinent to inland reports of pomarine jaegers in the eastern United States revealed that B.H. Warren (1890) reported that Professor S.F. Baird, during the summer of 1840 secured

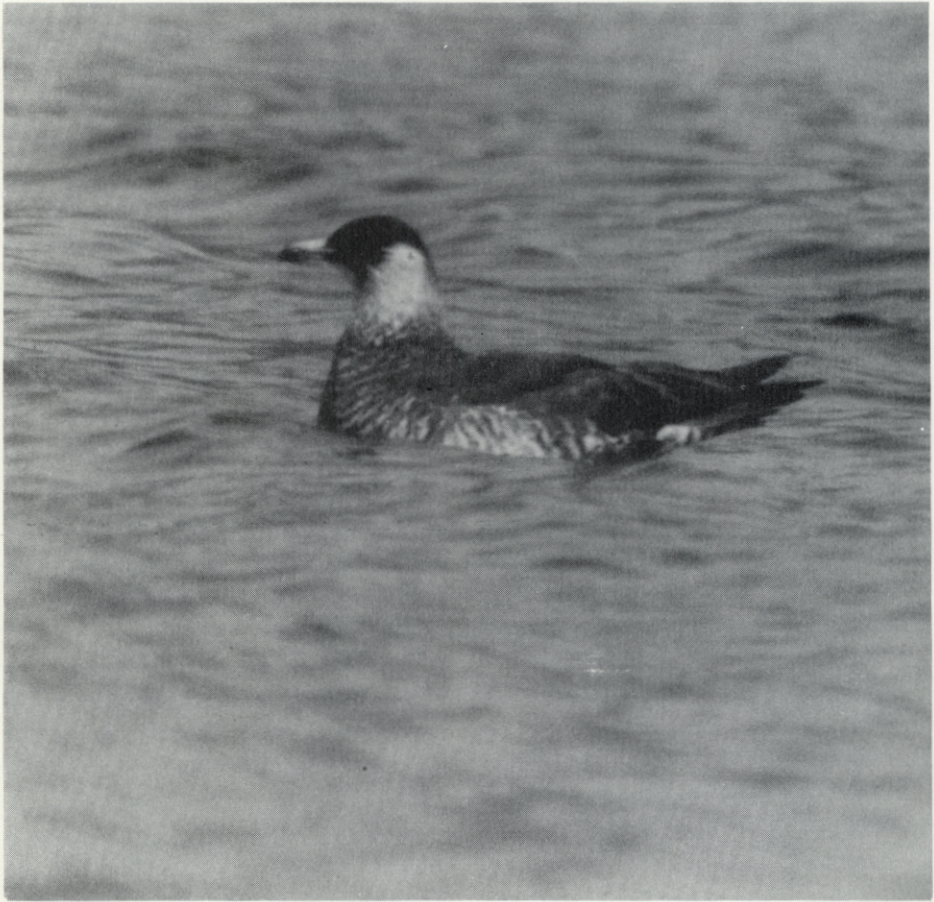
a pomarine jaeger on the Susquehanna River at Harrisburg, Pennsylvania. Warren also reported that Vincent Barnard secured a pomarine jaeger in Lancaster County, Pennsylvania on the Susquehanna River. Another inland record of the subject in Pennsylvania was reported by Warren as in the winter of 1885 or 1886 a Mr. Wood, taxidermist, mounted a pomarine jaeger shot in Sullivan County near Eagle's Mere. Earl C. Poole (1964) noted six specimens of pomarine jaegers shot in Pennsylvania since 1939. The last specimen, taken at Andalusis on the Delaware River was also noted by Witmer Stone (1908) as having been shot by Mr. Charles Vansciver in October 1898.

Eaton (1910) in New York referred to the pomarine jaeger as a rare visitant to the Great Lakes. He cites non-coastal sightings of the subject as, one by Dr. A. K. Fisher at Ossining, 18 October 1877, one by Truman R. Taylor at Lake Ontario, and two from Buffalo; one in the Buffalo Society Natural Science Collection and the other in the R. H. Reed collection by James H. Savage. Frank Chapman (1911) reported the subject as a common fall migrant and casual in the interior United States. Ludlow Griscom (1923) termed the subject very rare in spring with only one definite record in the area. Cruickshank (1942) noted a pomarine jaeger being sighted in upper New York Bay during October 1932. He termed the subject a rare

fall transient along the ocean. Bull (1964) noted the subject as a regular but common pelagic migrant, usually rare inshore.

Presence of a pomarine jaeger at Culvers Lake along the Kittatinny

sion that most jaegers occurring in the Gulf of Mexico reach there by flying southward over the United States mainland. However, summer sightings of a pomarine jaeger at Culvers Lake, in Sussex County,



*The above photograph of the subject pomarine jaeger on Culvers Lake was taken by Scott Mills of Branchville*

Mountains, which according to Poole (1934), Edwards (1939), and Broun (1935) serves as a main hawk migration route, may substantiate Williams' (1965) conclu-

approximately 60 miles from the Atlantic Ocean may lend credence to Wynne-Edwards (1935) summer reference to jaegers offshore in the North Atlantic. Further field ob-

. . . Jaeger

servations would assist in the substantiating of Williams' and Wynne-Edwards' claims.

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John J. Padalino, TTT Project - Science Education, New York University, Washington Square, New York 10003 and Daniel Butler, North Shore - Culver Lake, Branchville, New Jersey 07826.

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**Now is a good time to subscribe to *New Jersey Outdoors*  
or renew your current subscription to the magazine**

# *A Miracle of Survival*

By Ann Camp Bresina

Adjacent to one of the busiest highways in the United States is a tiny remnant of a forest which once covered much of New Jersey. Trees that were mere saplings when the Declaration of Independence was signed, rise tall and majestic in this forest of yesteryear.

Although only a 41-acre tract, this forest contains 12 different varieties of soil. Upon these soils grow 45 species of trees and a wide variety of smaller plants—ferns, mosses, wild-flowers, and shrubs. Helyar's Woods, as this miracle of survival is named, is located near U.S. Route 1 and Ryders Lane in New Brunswick. As you drive, you can see it from the highway, behind the Sears and Roebuck store. Next time you drive by, take the Ryders Lane exit and visit the woods.

Helyar's Woods was named after and dedicated to the memory of Frank G. Helyar, who was the Director of Resident Instruction at the Rutgers College of Agri-

*The Frank G. Helyar Forest is a memorial woods that serves as a school*

*Photographs by Harry Grosch*

August, 1973





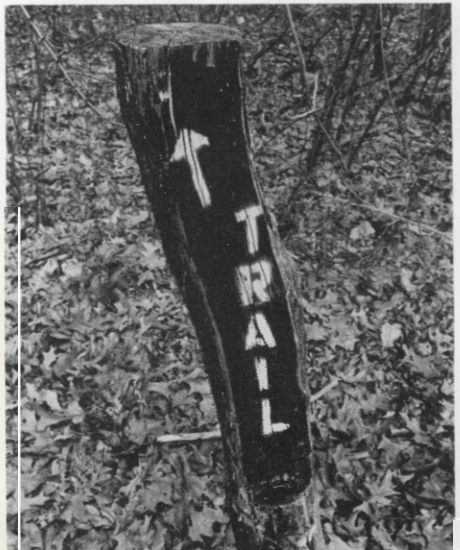


. . . A Miracle

*The Helyar Forest*



*The Helyar Forest is a producing forest. It yields timber, provides wildlife habitat, and serves as an outdoor classroom and a recreation area*



## . . . A Miracle

culture from 1927 to 1953. The forest is now managed and cared for by the forestry section of the "Ag School." Professors and students alike are justifiably proud of "their" forest, an outdoor laboratory where teaching, research, and demonstrations take place all year long. If you walk through in January the trees will have long since shed their leaves and will appear as tall, gaunt skeletons, beautiful in their simplicity. If, instead of looking up at the trees, you glance down on the snow, another world will meet your eyes. Tracks are everywhere—tiny trails of mice and chipmunks; larger tracks of squirrels, rabbits, opossums, foxes, and perhaps even a deer; footprints of dogs and their boys. Weston's Mill Pond, along the southeast edge of the forest, is frozen. Skaters and ice-fishermen abound.

Come back in early spring. The forest will be everchanging yet ever the same. The trees are still bare, but swelling buds promise new leaves. The trails are muddy. In the swamp that harbinger of spring, the skunk cabbage, offers the only bit of green yet to arrive in the forest. The days grow longer. Leaves finally appear on the trees. Dogwood and may apple are in bloom. The azalea and rhododendron gardens adjacent to the forest are a riot of color, while on the forest floor spring beauties and

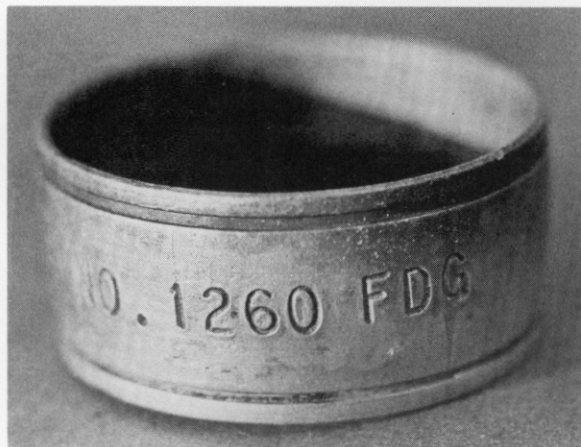
trout lilies are more subtle. Chipmunks, trillings, warblers sound and resound; the migrating birds are returning. Helyar's Woods is a paradise for bird watchers. Seventy-nine different kinds of birds have been identified in and around the forest.

Summer in nearby New Brunswick is a hot, muggy misery. In Helyar's Woods, the temperature may be 10-15° lower than in the city. The dense foliage provides a welcome shade. The drone of insects causes the air to vibrate, especially down in the swamp. An interesting place is this swamp. Entirely different plants than are found in the upland flourish here. Spicebush, jewel weed, catbriar, cinnamon fern, blue beech, red maple, swamp white oak, and black gum are but a few of the representative plants. If you are fortunate, you might hear or even catch a glimpse of a wood duck.

October is perhaps the best time to visit Helyar's Woods. Leaves crunch underfoot. Squirrels and chipmunks scamper about gathering the fallen acorns and hickory and beech nuts. The Virginia creeper is a splash of crimson on the brown, grey, and black bark. Red, orange, gold, and yellow, the leaves fall from the trees. Again the forest is filled with the calls of the migrating flocks. Soon, the trees will once again lift their bare branches skyward and the quiet of winter will descend upon the ancient forest. #

## Who Lost This Ring?

An unidentified alloy metal ring or band was found last fall at the northern end of Culvers Lake, Branchville, near a dock. Mrs. Dorothy Reidel of Short Hills sent the band to the Division of Fish, Game, and Shell Fisheries, logically assuming that the initials "FDG"



*The unidentified band is about an inch in diameter and a half inch wide*

stood for Federal Department of Game. (Editor's note: No such department name exists; rather the federal branch involved with wildlife is the Bureau of Sport Fisheries and Wildlife.)

The band is about an inch in diameter and a half inch wide. There is no seam so the band could not have been crimped on a bird's leg. The band was found three or four feet from shore on the bottom after the lake had been drawn down.

Opinions and guesses vary on the identity of the band—can anyone help us? #

—Teddy Schubert

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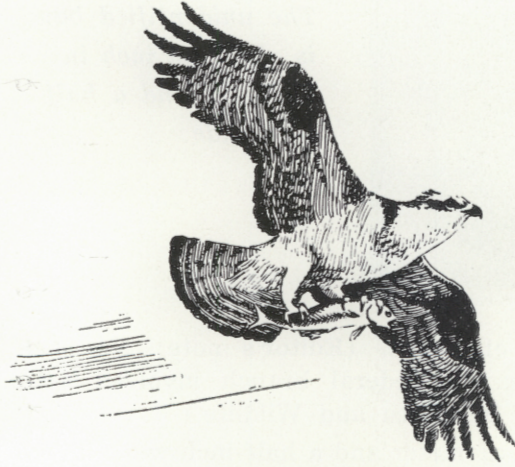
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### Initial Hunting License

All persons, adult or juvenile, applying for a Firearm Hunting License or a Bow and Arrow Hunting License must present to the issuing agent a previous year's license or a certificate showing that the applicant has satisfactorily completed the course in firearm safety or bow and arrow safety and proficiency, as the case may be, which shall be signed by an agent of the Division designated for the purpose. #

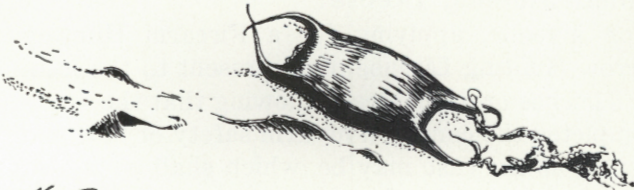
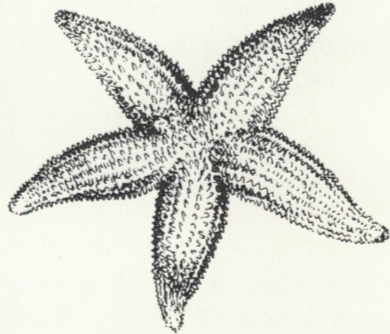
# the SEASHORE

A SEASHORE SOUND AS FAMILIAR AS THE ROAR OF BREAKERS IS THE CRY OF THE LAUGHING GULL, THE COMMON GULL SUMMERING ON THE ATLANTIC COAST. DURING THE FALL & WINTER IT IS REPLACED BY THE LARGER, WHITE-HEADED HERRING GULL.



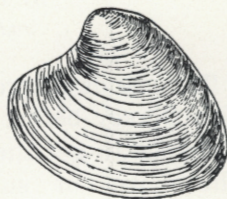
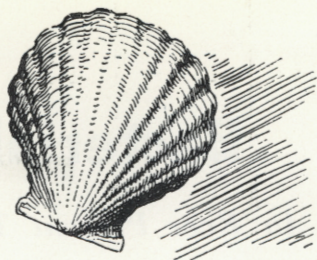
FROM HIGH IN THE BLUE THE OSPREY PLUMMETS INTO THE WATER TO CATCH HIS FINNY PREY, AND CARRIES IT HEADFIRST TO HIS HUNGRY NESTLINGS. HIS CRY IS A PIERCING WHISTLE.

THE UNERSIDES OF THE FIVE ARMS OF THE STARFISH ARE STUDDED WITH THOUSANDS OF TINY SUCKERS WITH WHICH IT PRIES OPEN THE SHELLFISH ON WHICH IT FEED. THE "MERMAID'S PURSE" (BELOW) FREQUENTLY FOUND ON THE BEACH, IS A SKATE EGG.

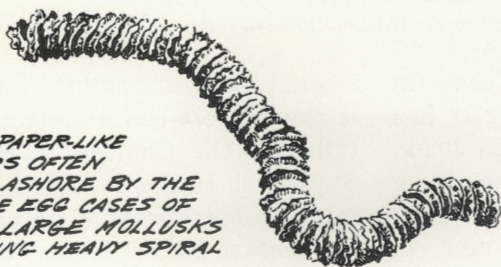


Ned Smith

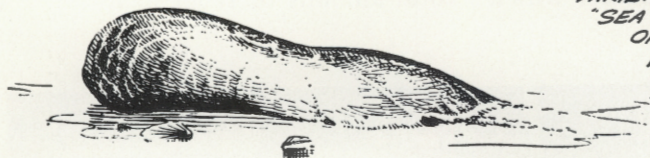
SHELL COLLECTING IS A FASCINATING HOBBY. BESIDES THE RARE AND BEAUTIFUL ONES YOU WILL FIND OTHERS THAT ARE QUITE COMMON BUT ECONOMICALLY IMPORTANT. TWO SUCH SHELLS ARE SEEN ON THE RIGHT. THE UPPER ONE ONCE HOUSED A SCALLOP, THE OTHER A CLAM. BOTH ARE COMMON EDIBLE MOLLUSKS.



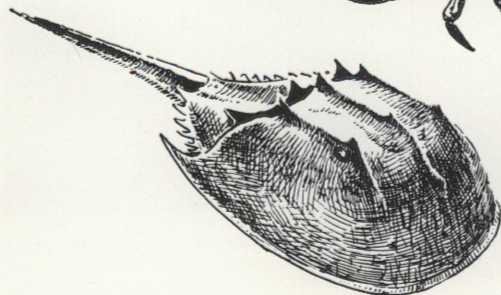
THESE PAPER-LIKE GARLANDS OFTEN CARRIED ASHORE BY THE SURF ARE EGG CASES OF WHELKS, LARGE MOLLUSKS INHABITING HEAVY SPIRAL SHELLS.



JELLYFISH ARE FREQUENTLY BEACHED BY STORMS. SOME VARIETIES ARE KNOWN AS "SEA NETTLES" BECAUSE OF THE STINGING-WOUNDS INFLICTED UPON BATHERS BY THEIR TENACLES.



BEST KNOWN OF THE EDIBLE CRABS IS THE BLUE CRAB (RIGHT) OFTEN SERVED IN RESTAURANTS AS "SOFT-SHELLED CRABS". IT AMBUSHES ITS PREY BY BURYING ITSELF IN THE SAND WITH ONLY ITS STALKING EYES SHOWING.



THE HORSESHOE CRAB IS A LIVING FOSSIL — ITS CLOSEST RELATIVES BECAME EXTINCT MILLIONS OF YEARS AGO. THIS CREATURE'S LEGS ARE FITTED WITH SPINES FOR "CHEWING" ITS FOOD BEFORE SWALLOWING IT.

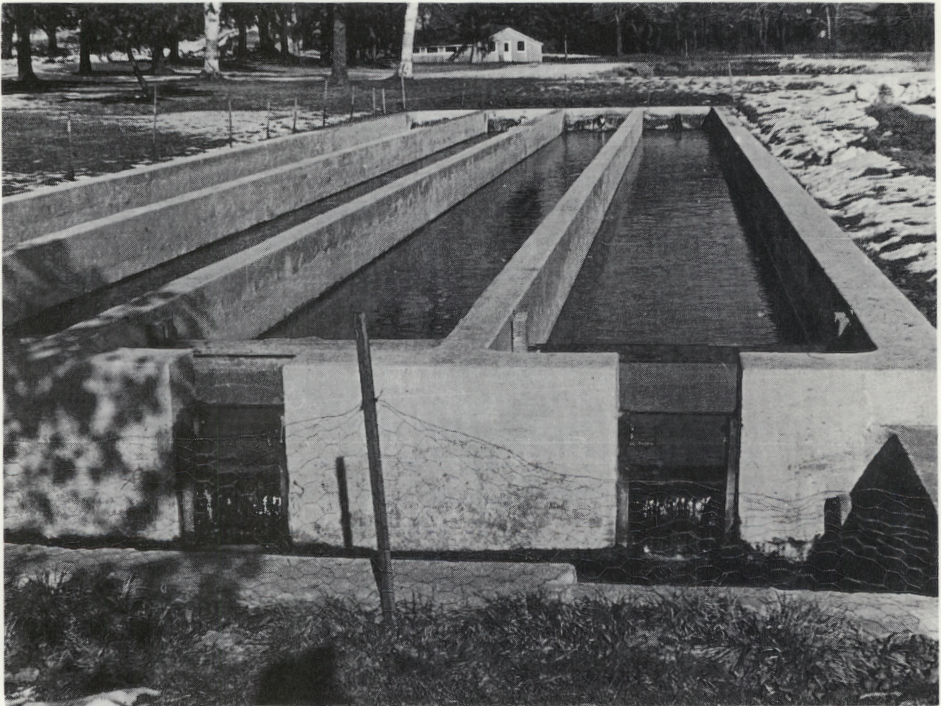
# Bacterial Gill Disease—

## *An Ever Present Threat to Trout Production*

By Robert Williams, *Principal Fisheries Biologist,*  
and John T. Lane, *Assistant Fisheries Biologist*

Thousands of trout suffocate in New Jersey before the angler has a chance to get them on the hook. The cause of suffocation is a myxobacteria, common in soil. Myxobacteria are also found in water, and their numbers increase during heavy or prolonged rainfall. Bacterial gill disease, which

is what biologists call the infection, is the biggest cause of trout mortality at the Charles O. Hayford State Fish Hatchery. In 1970, during an unprecedented outbreak of the disease 80,000 trout were lost. Annually the loss is estimated at between 26 and 55 percent of the total amount of trout lost.



*The key to minimizing trout losses due to bacterial gill disease is to provide the proper hatchery facilities*

What happens is that the gill bacteria irritate the gill filaments and cause them to swell. This causes the fish to secrete mucous in an attempt to reduce the irritation. If there is a heavy infestation of the gill bacteria, the large amount of mucous secreted blocks the exchange of gasses and the fish suffocates.

A trout under stress is more likely to contract the disease than one that is not. Low oxygen and high ammonia concentrations in trout waters, caused by excessive trout density, poor water exchange rates, ice or cloud cover, or excessive excrement accumulation often trigger outbreaks of bacterial gill disease.

The key to minimizing trout losses due to bacterial gill disease is to provide facilities that are healthy for the trout and that lend themselves to effective prevention and control of the disease.

Modern trout hatcheries are designed to provide healthy environmental conditions for trout. Linear

raceways with flow of 400 gallons per minute and three changes of water per hour are standard in the modern hatcheries of the federal Bureau of Sports Fisheries and Wildlife.

Treatment for control and prevention is accomplished by the timed introduction of chemicals. The effectiveness of such treatment depends upon the chemical concentration and the duration of exposure. However, because trout are only slightly more tolerant to the treatment than are the gill bacteria, extreme care must be taken. In situations where an infection has progressed unsuspected, treatment becomes increasingly hazardous as the fish physically weaken with time.

Minimizing trout losses caused by bacterial gill disease is one of the benefits the Division hopes to achieve in developing new trout rearing facilities that are currently being considered near Pequest in Warren County. #

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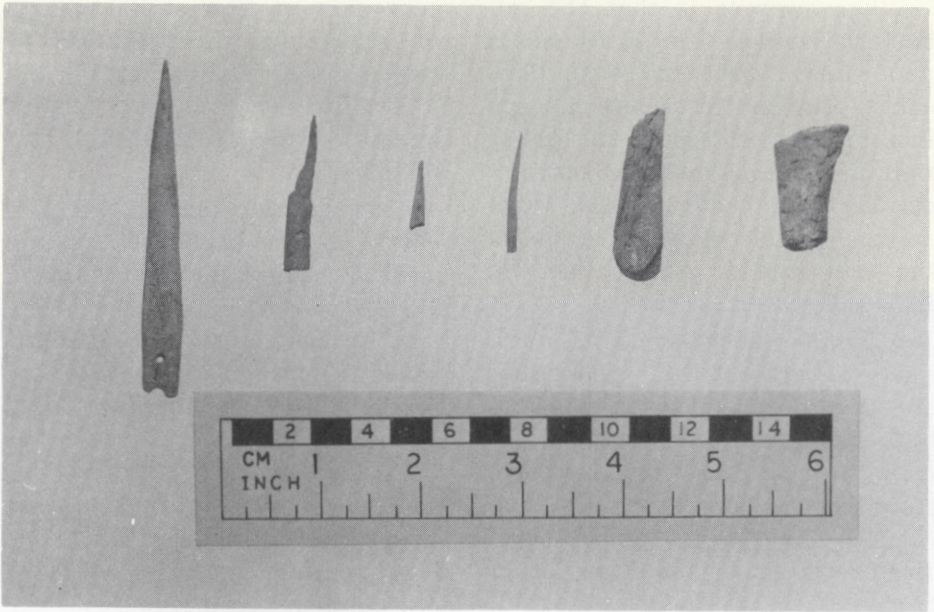
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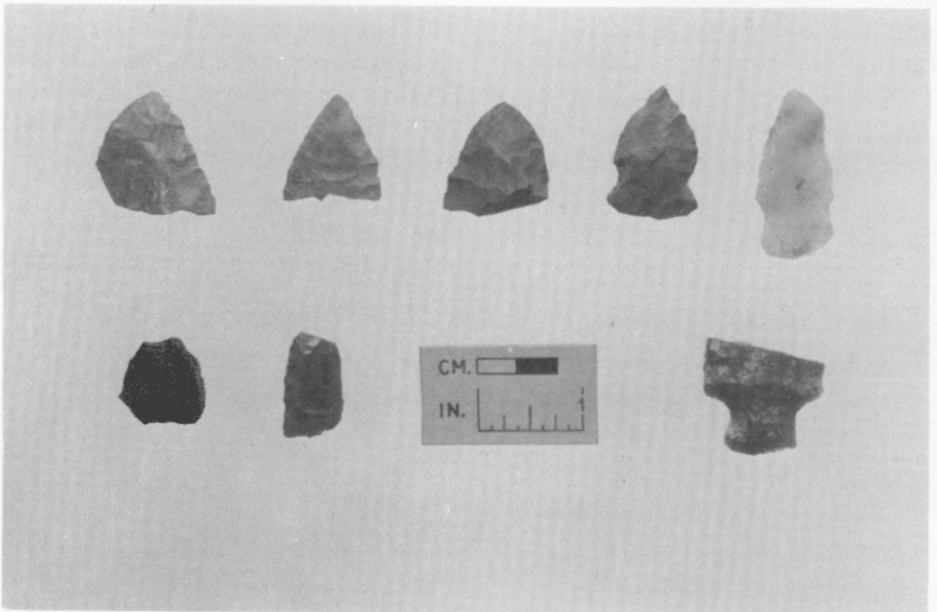
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*Bone and antler artifacts from the Cadwalader site*



*Chipped stone artifacts from the Cadwalader site*

# Archaeology

## *in the Maurice River Area of Southern New Jersey*

By R. Alan Mounier

The Maurice River is one of the most important streams of southern New Jersey. It rises near Glassboro and flows south for about 33 miles to its embouchure in the Delaware Bay at East Point. The watershed of the Maurice River, particularly the tidewater area, has yielded relics that indicate a lengthy period of human occupation, beginning perhaps as early as 9,000 years ago.

Most archaeological sites in this area produce no stratigraphic deposits so that artifacts of all ages occur mixed in the ground, and it is therefore usually impossible to distinguish the relics of one group of people from those of another. What this means is that except for typological differences it is not possible to determine when an artifact was made, who made it, or what other artifacts its makers might have used.

Recent research undertaken by the archaeological section of the Maurice River Historical Society

of Mauricetown has alleviated this problem through the discovery and excavation of the clearly stratified Fralinger site and two small uncomplicated stations on the Cadwalader Wildlife Management Area. This work has considerably advanced our understanding of the prehistory of this poorly known area.

In all cases the research was carefully planned and conducted under the rigid standards required in any controlled excavation. All work was executed with the permission and co-operation of the landowners.

The Fralinger site lies along the east bank of the Maurice River about eight miles north of the Delaware Bay. Two distinct superimposed strata were in evidence at the Fralinger site. The uppermost, Stratum 1, was a very dark sandy humus about a foot thick containing artifacts of Late Woodland derivation including cord-marked, fabric-impressed, and

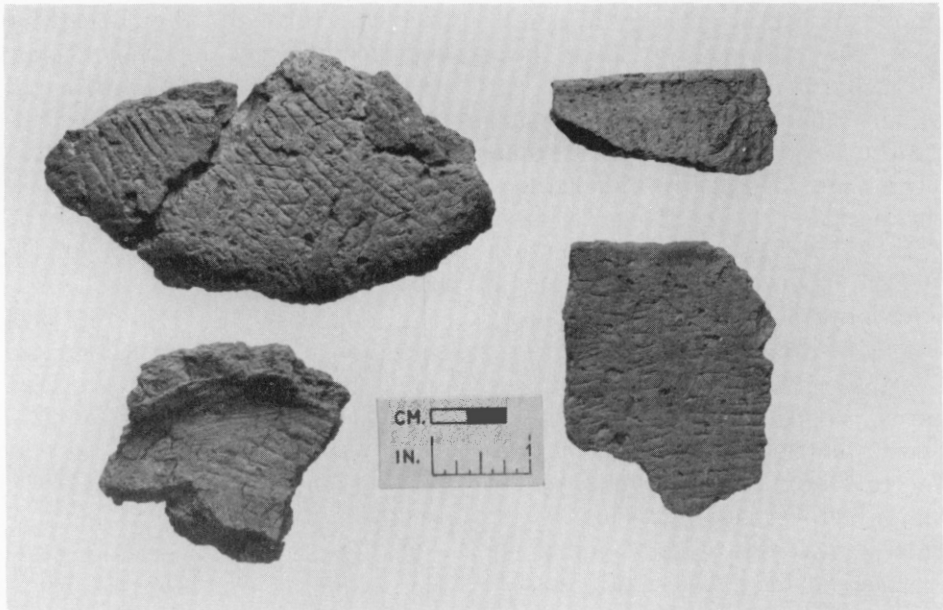
### . . . Archaeology

plain potsherds, small triangular stone projectile points, scrapers, fragmentary ceramic smoking pipes, and historic artifacts. This stratum clearly relates to the late prehistoric to early historic occupation of the site, probably terminating about 1650 A. D. on the basis of associated historic objects.

Directly underlying the humus was Stratum 2, the typical South Jersey yellow sand. In it were

or period and antedate the relics in Stratum 1 by some 3,500 years. The age of the artifacts discovered in Stratum 2 is rather accurately known since an associated hearth in that stratum produced charcoal which yielded a radiocarbon date of 1880 B. C. + 100 years.

Two other sites were also investigated by our field crew. Both of these stations—the Cadwalader and Cadwalader Annex sites—are on the state-owned Cadwalader Wildlife Management Area near



*Ceramic potsherds. Basal sherds, left, and rim sherds, right, from Cadwalader*

found large square stemmed projectile points, a chipped celt or adze, and a small piece of soapstone, evidently a fragment of a stone bowl. These artifacts are typical of the Late Archaic stage

Heislerville and we are grateful to the New Jersey Division of Fish, Game, and Shell Fisheries for permission to investigate these sites.

The Cadwalader site is a small island of dune sand in the salt

meadow. Only one aboriginal occupation is in evidence here while on the surface occurs scant historic material not associated with the prehistoric remains. Vestiges of an aboriginal occupation on the Early Woodland level include a series of broad side-notched projectile points, crude flat-bottom ceramic vessels tempered with oyster shell, an assortment of bone and antler artifacts, notched pebble netsinkers, and midden deposits containing oyster shell and refuse bone.

We know from an examination of the discarded animal bone that the prehistoric inhabitants of this site were hunting white-tailed deer, turtles, waterfowl, and fur bearing mammals including beaver and gray fox. Our excavations also produced the first evidence in this area of the domestic dog which probably served as a camp scavenger, a hunter's companion, and evidently as food.

The chronological placement of the site has not been precisely determined. A guess-date based on ceramic typology puts the Early Woodland occupation of the site at c. 750 B. C.

The same complex of Early Woodland materials appears at the Cadwalader Annex site, and here clam shell scrapers, whetstones, and mulling stones are added to the artifact inventory.

Deeper than the Early Woodland level, and hence earlier, are found two poorly defined Late

Archaic occupations, represented solely by distinctive projectile points. The more recent of these occupations is characterized by small lozenge-shaped points while the earlier is represented by large stemmed points. These artifacts differ in material as well as in form. The lozenge-shaped points are manufactured from local jaspers while the stemmed points are made of argillite and shale probably from northwestern New Jersey.

Throughout time the Indian inhabitants of this area were apparently hunters and gatherers, that is they hunted and fished for their food and collected edible nuts and berries in season. In comparatively late times horticulture—centered around maize, beans, and squash—may have played a modest role in the food quest of these people.

The non-material aspects of aboriginal culture as a rule cannot be directly observed in the ground and must be inferred from the archaeological remains. Therefore the social organization, religious customs, and other intangibles are very dimly perceived except under special conditions, and data relating to these phenomena still await discovery.

Our research has provided for the first time some hint of order in the chaotic state of prehistory in southern New Jersey but much remains to be learned and considerable critical work lies ahead. #

## **New Jersey Sport Fishing Today and Tomorrow**

*By Paul D. McLain*

*Federal Aid Coordinator*

(The following paper was presented at "Sport Fishing Today and Tomorrow on April 7, 1973 at Convention Hall in Ocean City, Maryland.)

When talking about New Jersey's saltwater sport fishery we must remember that New Jersey is the third smallest state with the highest human population density in the country. At last count there were over 970 persons per square mile. This population is supposed to double within the next 20 years. It could well be that my state will give up the title of the "Garden State" and be known only as the "bedroom state".

However, in spite of the fact that we simply have too many people, all trying to use too little land and water areas, we still have some of the best saltwater fishing in some of our estuaries to be found on the Atlantic Coast. We still provide saltwater sport fishing recreation to about one million anglers!

Our spring surf and bay fishing for striped bass is excellent. We have both inshore and offshore bluefishing, and the spring, summer and fall weakfishing has returned and is now providing tremendous recreation. The fall run of surf stripers can be spectacular, the fluke in the summer, and spring

and fall flounder fishing is probably amongst the best you'll find anywhere.

In addition we have good cod, whiting, ling, mackerel, striped bass, bluefish, dolphin, billfish and tuna, all within a short run of our several inlets along the coast.

However, we may be living on borrowed time!

Let's review the past history of New Jersey's marine sport fishery to see what has happened in certain areas of the state; what possibly might happen in other areas; and what threats might drastically reduce the quality and quantity of our present sport fishing.

Without a question the greatest threat to our marine sport fishery is the loss, or drastic altering of fish habitats. This includes spawning, nursery, summering and wintering areas. We presently have entire estuarine systems which have been destroyed for sport fishing by industrial development, urbanization and pollution. Prime examples would be the Hackensack and Passaic Rivers, Newark Bay and Arthur Kill and even the upper

portion of the vast Raritan Bay. These were historically highly productive fishery habitat, but they now represent almost biological deserts supporting little or no fish life.

Even the Atlantic Ocean off the Jersey coast has been altered and certain areas have been destroyed by dumping of sewerage, sludge, chemical wastes, oils and other pollutants. Studies have shown areas of the ocean bottom off New Jersey which are totally lacking in all marine life, other than the little sludge worm!

On the Delaware River between Philadelphia and the Delaware Memorial Bridge there exists a "pollution block" of such magnitude that during some years the dissolved oxygen becomes so depleted that portions of the ancestral spring run of shad cannot penetrate the "block" to reach their spawning grounds on the upper Delaware River. Likewise, in the late summer and fall the young shad cannot return to the sea.

During the past ten years foreign commercial fishing has taken a heavy toll on some of our most important bottom fish. The whiting, ling, and codfish, in particular, have shown a marked drop in sport fishing catches. There could well be an over exploitation of the sport fishery resource by highly efficient foreign fishing which might reduce certain fish populations to the level where sport fishing would not be worth the effort.

In the past, legislation prevent-

ing the destruction of fishery habitat and the manner and means of harvesting the fishery resource has been ineffective or unenforceable. The lack of uniform and comprehensive regulations which supersede individual state boundaries have added to the difficult problem of a coordinated and effective marine sport fishery management and enforcement program.

With the loss of habitat, pollution, commercial fishing pressures; the lack of a clear understanding of the problems facing the resources, and also the lack of funding to get our teeth into these problems; we have seen entire sport fishing areas lose their potential. We have also seen estuaries, which still provide some saltwater angling, lose their productivity. We have now witnessed a general decline in the sport fishing in a number of rivers and bays which should be providing better quality fishing.

I mention these facts because New Jersey is in the unenviable position of having experienced the intense urbanization and industrialization which just has to come to other states on the Atlantic Coast. The great megalopolis will gradually consume everything from Boston to Virginia and eventually most of the east coast. Perhaps other states can profit by New Jersey's experiences.

### **Where Do We Stand At the Present Time?**

On a little brighter note, during the past four or five years certain aspects of the New Jersey salt-

### . . . Sport Fishing

water sport fishery outlook has taken a turn for the better. We appear to have reached the bottom of the public apathy ladder and maybe we are starting to climb back up.

One of the most significant pieces of legislation in New Jersey, from the environment standpoint, is the recently enacted WETLAND ACT. Generally speaking, and without going into detail, this legislation delineates what types of activities can be conducted on the wetlands and tidal marshes along the Atlantic Coast and the Delaware Bay and River. The state has asserted its rights to the valuable wetlands and restricted the use of others to activities which are not detrimental to fish, wildlife, shellfish and other natural resources. We are happy to say that fishery and wildlife biologists had considerable input in the wetland legislation, its review and implementation. Initially it was the biologists who called attention to the value of the wetlands for maintaining fish and wildlife populations.

In addition, the state has revised its entire riparian grant and permit program to drastically reduce or eliminate the sale of the states interest in riparian lands to individuals or corporations for their personal use and development. State biologists now review every grant and permit application to determine if there might be adverse environmental impact, and they

recommend accordingly for approval or disapproval.

Presently fishery and wildlife biologists are reviewing environmental impact statements from private citizens, corporations, local governments and other state agencies. Public utilities and corporations seeking federal licensing and funding must submit impact statements for review. Considerable time is spent on consultations and reviewing of various projects and proposals for altering the wetlands and riparian lands. The Division biologists were a major force in the classification of all the state's waters and in setting the present water quality criteria.

However, one of the major stumbling blocks in our present saltwater research program is the lack of suitable funding to allow biologists to accumulate and provide the basic information necessary to make sound and scientific recommendations when reviewing environmental impact statements. Also in understanding and evaluating the importance of the various habitat types to the overall fishery resource. There are also great voids in our basic knowledge of the biological requirements of some of our most common and popular saltwater sport fish. In addition, there is a lack of personnel to assemble and evaluate information now available.

Presently the New Jersey Division of Fish, Game and Shell Fisheries takes in less than \$40,000 a year from the licensing of men-

haden boats, sale of net licenses and other fees from the saltwater commercial fishermen. Only a few years ago we received over \$50,000 a year from the same source, but reduced commercial fishing catches have resulted in a decline in the commercial fishing effort along the Jersey coast.

At the present time we are spending about \$50,000 a year on a Commercial Fishery Investigation which is mostly an inventory project to evaluate the resource, the public utilization, distribution of the fish species and basic biological and water chemistry studies. We are spending another \$20,000 a year on Dingle-Johnson Sport Fishery Research Project to determine the productivity of several estuaries as they relate to sport fishing.

New Jersey is involved in a four state and two federal agencies cooperative Delaware River Anadromous Fishery Study on the shad, and we are providing one-fourth or \$31,000 of the annual cost. We have a Federal Aid (Pittman-Robertson) wetland research project on wildlife which contributes about \$20,000 a year to tidal marsh studies and makes possible much of our riparian grant and environmental assessment activities. All told, the New Jersey Division of Fish, Game and Shell Fisheries is contributing over \$120,000 a year toward com-

mercial and sport fishery research for marine species. Other than the \$40,000 we receive from the commercial fishing interests, the bulk of our research is supported by the fresh water anglers license money, the Dingle-Johnson (Federal Aid) excise tax on certain types of fishing tackle and equipment, and the Commercial Fishery Act funds.

The saltwater laws are enforced primarily by the Division of Marine Services. It is estimated that they spend about \$100,000 a year on this enforcement. Again, there is no direct support from the saltwater angler other than boat tax revenue which is derived from all boatmen.

During the past thirty years the State of New Jersey has been acquiring prime Atlantic coast and Delaware Bay and River marshlands as fish and wildlife management areas. We now have about 41,500 acres of highly productive tidal marsh and about 70,000 acres of adjacent uplands under state ownership. This type of management will help preserve the productivity of these essential marine fish spawning, nursery and rearing areas. Again most of the lands acquired have been with the hunters and fresh water angler's monies, and also with funds from the Green Acre Bond Issues.

To be continued in the next issue

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# Black Willow

(*Salix nigra*)

This tree is usually found along stream banks, around bodies of water, and in swamps. It cannot tolerate shade; therefore, it often grows in open areas.

## Range:

Largely in the Eastern United States and west to North Dakota and Texas.

## Leaves:

Alternate, simple, lanceolate, 3 to 6 inches long,  $\frac{3}{8}$  to  $\frac{3}{4}$  inch wide with a finely serrate margin and falcate tip. Leaves are smooth and dark green on top and a lighter green on the bottom. (See figure A.)

## Twigs:

Slender, brittle, drooping, and reddish brown to orange. They do not have a terminal bud, and lateral buds lie close and flat against the twig. (See figure C.)

## Flowers:

Male and female flowers, 1 to 3 inches long, are borne on separate



*Black Willow*

A. Leaf

B. Fruit

C. Twig

trees in terminal drooping aments. They appear in March or April before the leaves.

**Fruit:**

A reddish-brown, smooth capsule, one-fourth inch long, occurring in elongated clusters containing many fine hairy seeds. (See figure B.) Seeds are distributed by the wind. The willow also reproduces itself from twigs that come in contact with soil, such as those broken off by the wind.

**Uses:**

One of our larger willows, usually 30 to 40 feet tall and 10 to 15 inches in diameter, but it may grow 80 or more feet tall and 3 feet in diameter. The wood is used for fuel, boxes, baskets, excelsior, and wooden ware. The tree is planted for stream-bank erosion control. It is not an important forest tree species in New Jersey #

—Austin N. Lentz, *Extension Specialist in Farm Forestry*  
*Drawings by Aline Hansens*

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## National Hunting and Fishing Day

National Hunting and Fishing Day for 1973 is September 22, a Saturday. For details and suggestions see the inside front cover of this issue. The order blank below may be used to order the material mentioned in the article.

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## List of Delaware River Boat Access Sites

Name	Location	Facilities	Charge
<b>Sussex County</b>			
Del. Water Gap Nat'l. Recreation Area			
Milford Beach	Milford, Pa.	Launch	Free
Howard Angle	N. J. above Dingman's Ferry Bridge	Launch & Rent	Charge
Riverview Tavern	Dingman's Ferry, Pa.	Launch & Rent	Charge
<b>Warren County</b>			
D. W. G. N. R. A. - Van Campen Access	0.5 mi. above Calno School - Pahaquarry Twp.	Cartop Only	Free
D. W. G. N. R. A. - Pahaquarry Access	1.4 mi. below Calno School - Pahaquarry Twp.	Cartop Only	Free
D. W. G. N. R. A. & Pa. Fish Comm.	3.0 mi. above Shawnee On Delaware, Pa.	Launch	Free
Smithfield Beach			
Copper Mine Inn	7 mi. above Water Gap	Launch & Rent	Charge
N. J. Div. of Parks & Forests			
Worthington Tract	4.5 mi. above Water Gap	Launch	Free
Div. of Parks & Forests			
Worthington Tract	3.5 mi. above Water Gap	Cartop only	Free
D. W. G. N. R. A. - Kittatinny Point	Water Gap - N. J.	Launch	Free
Gray's Service Sta.	Delaware, N. J.	Rent	Charge
Al's Fixit Shop	Rt. 46, Ramseyburg	Rent	Charge
Riverside Trailer Pk.	Belvidere	Launch	Charge
Belvidere Bridge	Belvidere	Launch	Free
S. S. Diana	Hutchison	Launch	Charge
Phillipsburg Municipal	Hampton St.	Launch	Free
Riegel Paper Co.	Riegelsville	Launch	Free
<b>Hunterdon County</b>			
Pa. Fish Comm.	Upper Black Eddy, Pa.	Launch	Free
Frenchtown	Sewage Treatment Plant	Launch	Free
Div. of Parks & Forests			
Bull's Isl. Recr. Area	Raven Rock, N. J.	Launch	Free
Del. River Power Boat Assn.	Lambertville	Launch	Free
<b>Mercer County</b>			
Pa. Fish Comm.	Yardley, Pa.	Launch	Free
Mercer Co. Ramp	Lamberton St., Trenton	Launch	Free
<b>Burlington County</b>			
Bordentown Municipal	Bordentown	Launch	Charge for Permit
Curtin-Hope Marina	Burlington	Launch	Charge
Dan's Boat Yard	Delanco	Launch	Charge
<b>Camden County</b>			
Joe's Marina	Creek Rd.—Bellmawr	Launch	Charge
<b>Gloucester County</b>			
Halscheid's Ramp	Almonesson Rd., Westville	Launch	Charge
National Park Marina	National Park, N. J.	Launch	Charge
Sweeten's Dock	Mantua Cr., Mount Royal	Launch	Charge
Mullen's Dock	Rt. 130, Bridgeport	Launch	Charge

Name	Location	Facilities	Charge
<b>Gloucester County—continued</b>			
Bridgeport Boat Yard	Rt. 322, Bridgeport	Launch	Charge
Oldman's Cr. Marina	Rt. 130, Nortonville	Launch	Charge
<b>Salem County</b>			
Marina	Pennsville	Launch	Charge
Salem (Several ramps)	Salem River and Cove	Launch	Charge
Alpha Marina	Hancocks Bridge, N. J.	Launch	Charge
Div. of Fish, Game, and Shell Fisheries			
Mad Horse Cr. Wildlife Mgt. Area	Stow Neck Rd., Canton	Launch	Free

## Make Haste Slowly

Fish like to feed near shore and along shallow underwater reefs where food is more plentiful and easy to obtain. But they are also more wary in such areas than if in deep water; shallow water offers little protection from enemies.

Keep this in mind the next time you see a likely shoreline or weed-bed. When frightened by a potential danger—such as the noisy approach of an eager angler—fish will rush away to deep water and safety. Too much haste may ruin the fishing before you get started.

On the other hand you'll never go wrong by approaching fishing areas with exaggerated caution. Sneak your boat into the right spot . . . and keep things quiet while there.

When searching the shore for places to fish, stay as far away from shallow water as possible. You can usually tell how deep water is near shore by mentally projecting the underwater terrain as it goes away from the shoreline.

Select where you want to fish and slow your motor some distance away. Take several minutes to move into position; time spent doing this will be worthwhile if it means fewer fish frightened away.

If you change locations to another nearby area, do it slowly. Fish aren't always spooked by boats—they see them all the time—but unnecessary noise and movement by a fisherman is quickly recognized as something unusual, and therefore potentially dangerous.

If you stay in one place to fish, slip the anchor quietly overboard letting it enter the water without splashing. Use rope on the anchor instead of chain.

And a final thought is to have the right tackle and learn to cast long distances. This keeps you farther away from the fish, with less chance of them spooking because of shadows, reflected light, or sudden movement.

#

# **Mad Horse Area**

## **Salem County**

The Mad Horse Fish and Wildlife Management Area located south of Canton in Salem County, is one of the state's better waterfowl hunting areas.

Acquisition of the area was begun in October, 1957. Today this tract comprises 5,737 acres of tidal marsh and a small portion of upland habitat. Three thousand some acres of the tract were purchased with Federal Aid-to-Wildlife Funds; the rest of the area was purchased under the Green Acres Program and then assigned to the Division.

The tract is maintained by the Bureau of Wildlife Management primarily for waterfowl and upland hunting and as a resting area for ducks during their migration. Muskrat trapping is permitted on the area during the open season.

### **Boat Ramp**

A boat ramp and a launching site are available at Mad Horse Creek. This ramp provides access to the tract and to the Delaware Bay.

### **Fishing**

Salt water fishing opportunities are very good in the streams and creeks within the tract and in the Delaware River. The major species of fish present in the area are striped bass and white perch.

### **Waterfowl**

Waterfowl hunting is very good in this area. The species of ducks found most often are black duck, mallard, blue-winged and green-winged teal, and gadwall. In the early portion of the season, Canada goose hunting opportunities are excellent. The tract is a study area for waterfowl brood production, a waterfowl resting area, and is used as a mosquito-wildlife study area.

### **Upland Game**

There is a small area of upland habitat which supports good quail and rabbit hunting. Pheasants are also available through the Division's program of pre-season and in-season stocking.

The Division's Bureau of Wildlife Management welcomes all sportsmen to make use of these facilities maintained by license money of the sportsmen.

#  
—William M. Smith  
*Bureau of Wildlife Management*



**NATIONAL  
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