

July / August 1975



New Jersey
OUTDOORS

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a new lifestyle

from the
editor

Especially during the Spring and Summer seasons we receive an increasing volume of mail on trash and litter on our public lands. Some letters are plaintive but more are angry. They are written by concerned sportsmen, students, young people, and other segments of the public.

And these concerned citizens want some sort of government action on this trash problem. And they are absolutely right. It's disturbing and even shocking to see throwaway cans and bottles floating and tumbling down a sparkling trout stream, or to encounter piles of trash while hiking through a secluded woodland glen, or to see beer cans and bottles being tossed overboard while fishing in Delaware Bay.

I've been told that litter is a "people problem" and in many respects it certainly is that. But we have a generation growing up in a throwaway culture—a society weaned on convenience packaging, a new model every year, and other wasteful uses of our resources.

Maybe we need a "new lifestyle"—it's a statement being heard more and more these days. And one of the ways we can start this "new lifestyle" and curb some of our energy and resource-wasting practices and at the same time dramatically reduce our litter in New Jersey is to adopt a returnable container law which would prohibit the sale of throwaway beer and soda containers. This type of legislation has been successful in reducing litter and conserving energy and natural resources in Oregon. Why not New Jersey?

(See pages 30 and 31 for more on trash and returnable containers.)

IN THIS ISSUE . . .

For the salt water angler, this issue has an article on fishing in the Sandy Hook area by Al Nunes-Vais. His credits include *Field and Stream*, *Fishing World*, *Readers Digest* and *Popular Science*.

And do you think trout fishing in New Jersey was better 100 years ago? Read the nostalgic piece by fisheries biologist Bob Soldwedel and be surprised.

And if you've never heard of an urban forester, read the article by Janet Levy of the Cook College Communications Center at Rutgers University.

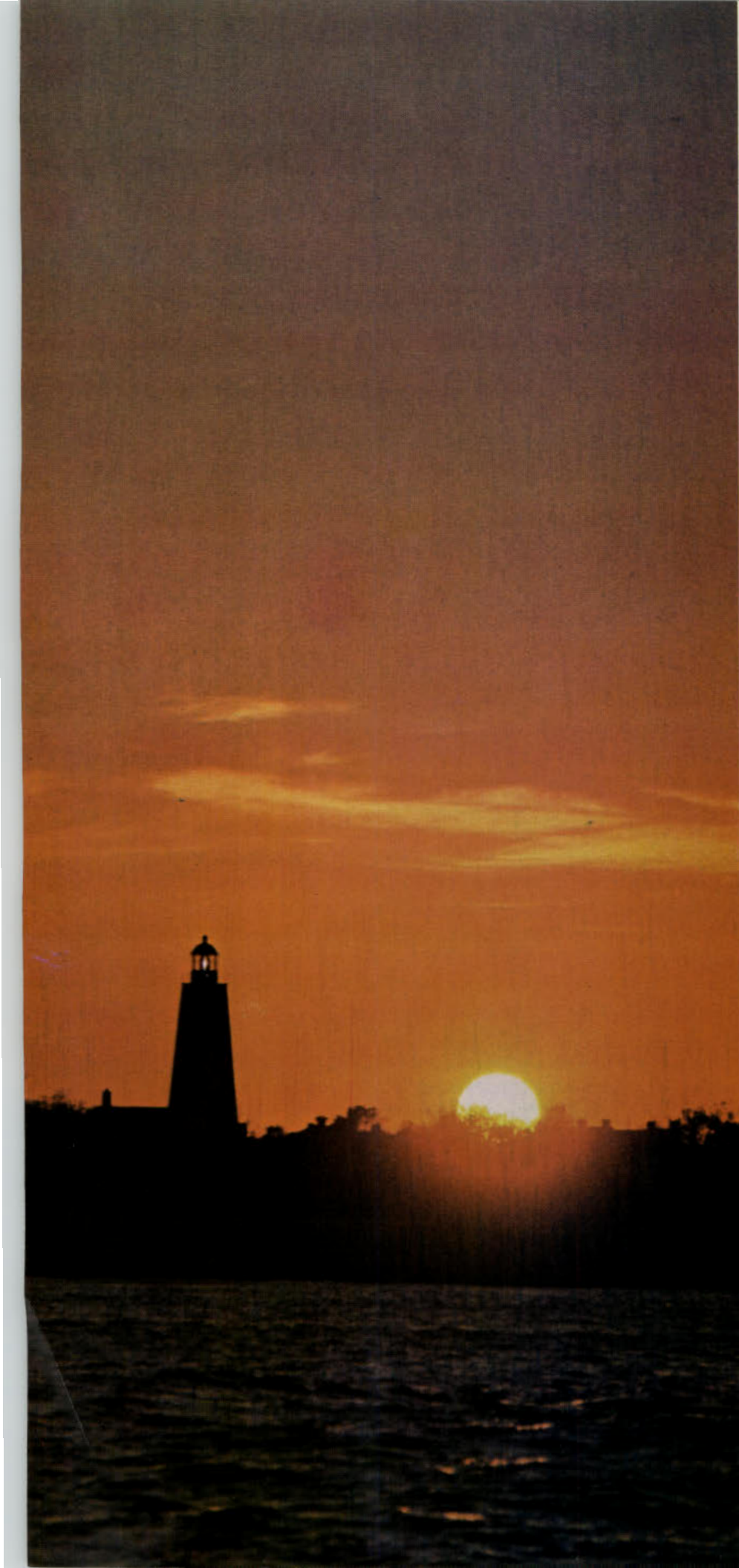
If nature study is your thing, the article on the Conservation and Environmental Studies Center at Whitesbog by Thomas H. Griffin, CESC administrator of curriculum and instruction, will arouse your interest.

In the same area, a piece on the Pine Barrens Tree Frog by J. Albert Starkey, nature photographer, lecturer, and retired science teacher will acquaint our readers with an unusual and uncommon threatened species.

And if you're interested in how acid rainfall affects our New Jersey environment, read the article by David W. Lecher, Associate Professor, Physics Department at Trenton State College.

And we have more: A bow fishing article by educator and sportsman Jim Fitzsimmons; a piece on the official state "insect" or "bug" by nongame biologist Joan Galli; and a story about a conservation art contest for kids by environmental reporter Lee M. Gant. And if you're not "chicken", try fishing for sharks as suggested by biologist Bob Mangold. Take your pick.

Steve Perrone



why not fish Sandy Hook ?

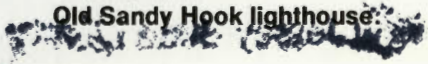
by AL NUNES-VAIS

The tip of Sandy Hook lies just about 15 miles south of the tip of Manhattan Island—and is the gateway to some outstanding salt water sportfishing. Actually, Sandy Hook is so close to the greater New Jersey metropolitan area, that many don't give it a fair chance. They by-pass it, and head further south. Once you come to know those waters of the area though, you can become thoroughly "hooked" by them. Not only is the fishing outstanding, but the scenery is a bit different. You have the green Highland hills in the background—a change from the usual flat Jersey shore.

Regardless of what your fishing thing may be, you will find it at Sandy Hook. If you are a terra firma angler, you can fish from the beach, either ocean or bayside. You can fish a tidal river, or a bit south, you might consider the Long Branch pier. If you have a small boat, you can restrict your activities to the Shrewsbury or Navesink rivers—or, if your craft is a bit larger go to sea. In that case, you can round the "Hook," and fish the famous "rip" for stripers, or head down to the Monmouth Beach area,

PHOTOS BY AUTHOR

Sunset, with
Old Sandy Hook lighthouse:





Sandy Hook party boat



A nice catch of fall striped bass.



Author's son Brian
with nice striper

where bluefish will play havoc with your gear.

If you don't own your own craft, you can rent a livery boat—or partake in the Sandy Hook area's outstanding party and charter boat fleet.

Actually, there is no such thing as a town of Sandy Hook, which is just a promontory of land separating the Atlantic Ocean from the Bay. However Highlands, Atlantic Highlands, Seabright and Rumson are all good locations to use as a base for a fishing expedition, whether you go to sea—or stay on land. Of course, on the peninsula itself, what used to be the Sandy Hook State Park, is now Gateway National Recreation Area, a part of the national Park System.

If you trailer a boat, Sandy Hook represents one of the better areas along the north Jersey coast, particularly for those who are new to salt water. The big advantage in departing from there in your own boat is that you will not need to face one of those potentially difficult inlets. Sure, at the Hook you may have to cope with the famous "rip", but most of the time that is easier than Shark River, Manasquan, or Barnegat Inlets.

One of the best launch ramps along the North coast is located at the Atlantic Highlands municipal harbor. Many boats can be launched simultaneously, the parking is good—and there are wash-down facilities. Once the boat is launched, you can head for the tip of Sandy Hook, about three and a half miles from the launch ramp—and then into the ocean. Alternatively, if the weather is questionable, you can stay "inside" where you will find striped bass, weakfish, blues, fluke and flounder. Of course, if you do go to sea, your horizons are much broader. You can stay in-shore and troll for bass and blues along the beach or you can drift for fluke, or cast at "weakies"! Later in the summer, you can head out towards the Mud Hole. In the blue water out there, you will find pelagic species, dolphin—and a variety of sharks.

If you ever have aspirations of coming home with a giant tuna, this is the place. In recent years, several fish over 700 pounds have been taken. In this connection, the Sandy Hook Bay Anglers fishing club has announced its tuna tournament for late September, should you be inter-

ested. Although there are some conservation concerns about tuna at the moment, and rightfully so, the club decided that the fish taken last year in the tournament did little damage to the resource. You can fish in this tournament from a private or charter craft, and last year a drawing was held for fourth prize—due to lack of fish—so anyone has a chance! For more information, write to Sandy Hook Bay Fishing Club, P. O. Box 220, Atlantic Highlands, New Jersey.

Speaking of charters, there are many fine boats, with experienced captains that sail in quest of most species available. There is a charter boat fleet at Atlantic Highlands municipal harbor; at Kesgal Snug Harbor in Highlands, and at the Quay in Seabright. Blackfin, Freddy-C, Wanderer, are but just a few of the craft who offer both all day, and half day trips, depending upon the season.

Party boats primarily sail from Atlantic Highlands, and you will find something to suit most every taste. There are the half day fluke boats, good for the kiddies on their first fishing expedition, and we have craft that offer overnight trips 80 miles off the beach. There are both day and night trips for blues—this species represents the main target of the party boat fleet during peak summer months. You will find a wide variety of boat types, ranging from the ultra modern Sea Fox to the older, but highly capable, Mistake II—and many others. In fact, during the fall season, Mistake II is one of the few party boats that sails for striped bass. For many, that party boat represents a good opportunity to catch their first striper—a somewhat elusive fish for the uninitiated.

If you would like to rent a livery boat, they are also available. Twenty bucks will get you one for the day, as well as a small engine. They are fine for the bay, but it is not advisable to take them to sea. Although you see them out there occasionally, remember that ocean conditions can change rapidly, and with dangerous consequences.

So much for boats. If you like solid land under your feet, you will find numerous spots for surf and bay fishing in the area. Up north, we have the Gateway National Recreation

Area, where certain beaches are reserved for anglers at all hours. Other beaches, like those used for bathing can only be fished from during evening hours. South of the Park, running down to Seabright, the seawall provides good striper fishing—but this area is not for novices, due to difficulty in landing a fish at that spot. In Seabright itself, and south, you can only fish the beach club areas in the evening. There you will find both beaches and rock jetties that jut out into the ocean—most of which produce striped bass—as well as blues, weakfish and fluke.

If you are new to the Sandy Hook area, regardless of how you plan to fish, it would not hurt to stop by and visit one of the tackle shop proprietors in the area.

They can be a wealth of information, and will be happy to steer you in the right direction, tell you what is biting—and sell you the favorite bait of the moment. Some of these are Julian's on Route 36 in Atlantic Highlands; Gioglio's in Seabright, where the surf crowd hangs out; Schupp's Landing and Chum Box North, both on the river, near the bridge in Highlands.

You can refuel at the latter two, and all these shops carry the normal complement of bait, such as squid, killies, blood worms, and clams. A couple of these places also carry goodies like live bunker, herring, and eels, when available.

If you are new to the area, when you arrive, take a trip up the Scenic Drive. You will get a good view and get a nice perspective of the waters that you plan to fish. From there, you can see the "Hook", the beaches, the bay, as well as the Verrazano bridge, the tip of Manhattan, and the south shore of Long Island. Don't miss that expedition, particularly on a crisp and clear day.

When is a good time to go to Sandy Hook on a fishing expedition? Actually most any time, however late Summer and Fall offer fine weather, the greatest fish variety, and a good probability of coming home with a fine catch.

Considering everything that the area offers, why not pack up the family or a group of friends and try the "Hook". Chances are that if you give it a fair chance, you too will become "hooked". □



Photo by Harry Grosch

A Potential Stress On New Jersey's Environment

by David W. Lecher, Ph.D. Physics Department Trenton State College

The lake trout were the first to disappear. A year later, in 1968, the slimy sculpin and white sucker fish were not to be found. Finally, by 1970 the lake herring, trout and perch left. The last species remaining, but on the decline, in 1971 was the lake chub. White suckers introduced in 1968 survived only a few months. Science fiction? Hardly!

Research reports by scientists at the Department of Environment in the Freshwater Institute in Winnipeg, Manitoba, have fully documented the slow disappearance of certain species of freshwater fish from some lakes in northern Ontario. Trout and salmon have suffered the same fate in Norway and Sweden.

Why are the fish disappearing?

Why are they failing to reproduce and develop? Evidence from these studies in Canada and Scandanavia points to a new environmental stress called acid rain.

During recent years an increasing number of research reports have established that the acidity of precipitation has increased to such a level that it may have already produced significant stress upon our environment. Data taken at a variety of geographical regions, ranging from Scandanavia to North America, have shown that precipitation is from ten to one hundred times as acid as it should be.

Effect on New Jersey

It is difficult to ascertain exactly what impact acid rain may have upon our

ecology. We can cite what has been discovered elsewhere and consider those findings in light of the measurements that have been made here in New Jersey. Of particular interest to us is the potential stress upon our soil, forest, and fresh water lake ecosystems.

First, let me briefly describe pH, the term that expresses exactly how acid or basic a chemical solution happens to be. Pure water has a pH of 7.0, which indicates a neutral solution. If we were to add sulfuric acid to the water, the pH would become lower than 7.0. The actual pH value would reflect the concentration of free hydrogen ions in our solution. If one were to add, for example, sodium hydroxide (lye) to the pure water, the pH would become greater than 7.0. The actual pH value of this basic solution would directly reflect the concentration of free hydroxyl ions in our solution. We have an analogy to temperature: temperature is a measure of hotness and coldness of a substance and pH is a measure of acidity or basicity of a solution.

Important Feature

Note, however, that the pH scale has

one very important feature: a change from one pH value to another, in either direction, indicates a tenfold change in acidity or basicity. This fact is a crucial one when you consider the potential stresses of acid rain upon our environment. Thus, for example, a solution with a pH of 5.0 is ten times more acid than a solution having a pH of 6.0. A pH of 4.0 is one hundred times as acid as a pH of 6.0.

PH of Blood is 7.4

Scientists and technicians in many disciplines recognize pH as an important aspect of their work. Your family doctor understands that the pH of your blood is normally 7.4. Agricultural scientists and farmers have been able to increase crop yields by recognizing that a given crop has an optimum soil pH for growth and development. Industrial processes such as sewage treatment, sugar manufacturing, water purification, and metal plating all depend upon proper pH control. Many common household liquids all have characteristic pH values: lemon juice, 2.5; orange juice, 3.0; milk, 7.0; soap solution, 10.0; household ammonia, 12.0;

battery acid, about 1.0. Our natural rivers and lakes range in pH from about 5.0 to 10.0. Rainwater normally has a pH of 5.7.

Raindrops are Falling

During the formation of raindrops, some of the naturally occurring atmospheric carbon dioxide dissolves within them leading to the formation of a weak solution of carbonic acid. Carbonic acid has a chemical formula H_2CO_3 and is a significant participant in the chemical weathering of our rocks and minerals. Given the partial pressure of carbon dioxide in our atmosphere, though, the concentration of carbonic acid thus formed is only able to produce a pH in rainwater of 5.7. Precipitation measurements taken at many places around the world have shown pH values ranging between 3.0 and 5.0, particularly in densely populated, industrial regions.

That ecological stresses may develop in New Jersey is based upon a study of rainfall acidity made during the last seven months of 1974 at Trenton State College.

The pH of rain was measured on a storm-by-storm basis. A total of 47 rainfalls occurred during this period and each one exhibited a pH which was significantly lower than the normal value of 5.7. The range of average storm pH, from the lowest to the highest values, for each of these seven months is shown in Table 1.

Table 1
Range in pH values for precipitation samples taken from June to December, 1974.

Month	pH range
June	3.69 - 4.10
July	3.87 - 4.48
August	3.89 - 4.54
September	4.16 - 4.72
October	3.60 - 4.52
November	3.70 - 4.79
December	3.98 - 4.79

Acid Rain in Trenton

The values clearly show that the rainfall at Trenton was from ten (pH of 4.7) to one hundred (pH of 3.7) times as acidic as normal. Thus, New Jersey's environment is receiving precipitation which is just as acid as those places in the world where significant ecological damage has been studied and documented. New Jersey's precipitation is relatively consistent in exhibiting low pH values. That is to say all storm types (drizzle, steady rain, moderate shower or thundershower with lightning) show low pH values. The last sample of 1974, on New Year's Eve,

was the only one that included snow and its pH was 4.25.

This reduction in pH has ostensibly come about because of increasingly higher concentrations of atmospheric sulfur dioxide, SO_2 , and oxides of nitrogen, NO_x . Like carbon dioxide, these oxides of sulfur and nitrogen can dissolve in rainwater and lead to the formation of sulfuric acid and nitric acid, respectively. Studies in New York State as well as in New Hampshire have shown that the dominant positively charged ion in rain water is the hydrogen ion, H^+ . The dominant negatively charged ions are the sulfate ion, SO_4^- , the nitrate ion, NO_3^- , and the chloride ion, Cl^- .

Precipitation that is between ten and one hundred times more acid than normal is capable of adding additional hydrogen ions to a given ecosystem.

We can speculate as to what stresses may develop and document some effects that have already occurred.

N.J. Soils

Consider the soils of New Jersey. Most of our soils are classified as mineral soils that are made up of air, water, organic matter, and mineral constituents. The mineral constituent is basically comprised of sand, silt, and clay. That humus and clay are the active portions of the soil has been long established by agricultural scientists. These tiny, colloidal particles act as sites for the exchange of essential ions so necessary for proper plant growth and development. These tiny particles, called micelles, prefer to hold onto hydrogen ions rather than essential plant nutrients such as calcium, magnesium, and potassium. Excessive inputs of free hydrogen tend to render these nutrient elements subject to leaching because the micelle tends to exchange the nutrient ion for a hydrogen ion. In an age of declining food reserves, concern should be placed upon a possible decline in soil fertility due to acid rain. This decline has been documented in their deciduous forest soils in New Hampshire and in Sweden. New Jersey soils may be subjected to this process as well, and the acidification may result in increased liming costs for the farmer.

PH and Decreased Forest Production

Because New Jersey's forests perform essential functions as recreation areas, wildlife habitats, and watershed regions, we should be concerned about a second stress, that of decreased forest production. This is extremely difficult to cite, but the potential is there, and evidence from Scandinavia

seems to bear this out. The evidence follows from three facts: first, forest productivity is correlated with the calcium content of forest soils which is declining due to acidification. Second, the productivity of Norwegian forests has slowly declined during this century as evidenced from tree-ring studies. Third, in the laboratory, alterations of forest productivity have been reproduced by acidification.

Fish mortality, lack of egg development, and the disappearance of a variety of species from freshwater lakes and rivers is a third concern for New Jersey.

Thousands of "anglers" take to the lakes and rivers of our state every year. Again, the potential stress of acid rain is there and these effects have been well documented in Canada and Scandinavia. A pH range of 5.0 to 9.0 is generally not directly lethal to most fish. The tolerable lower limit seems to be a pH of 5.0. As we saw in the opening remarks, not all species are affected in the same way by similar pH levels.

Ecological Effects

These three areas of concern do not exhaust the list of potential stresses due to acid fallout in precipitation. Cornell and Yale University scientists have outlined additional ecological effects that may develop but are as yet largely unknown. Increased leaching of nutrient ions from plant leaves, decreased pollen germination, a reduction in the general vigor of a plant, aquatic ecosystem changes, and structural damage to buildings and statues are all possibilities.

Rainfall acidity has become a new ecological hazard. It wasn't until the early 1950's that the pH levels began to drop. Presently, precipitation over the entire northeastern United States is consistently acid with slightly lower pH values in the summertime.

In March, 1973 the National Oceanic and Atmospheric Administration (NOAA) carried out a rainwater survey by enlisting the aid of 16,000 grammar school children across the nation.

East of the Mississippi River rainfall was found to be very acid and large areas of farmland were found to be influenced by the acid fallout.

In any event, the concern over acid rain is mounting. It has evolved into such a large study that recently in May of 1975 Ohio State University, the United States Forest Service, and the United States Department of Agriculture together sponsored the First International Symposium on Acid Precipitation. □

a bee is not a bug

JOAN GALLI

Nongame Biologist

Stop and think a minute. When was the last time you encountered a bee? Was it when your peaceful summer siesta in the hammock was shattered by frantic cries of "It's a bee, it's a bee!" Was it at the last picnic or while working in your garden?

Actually, I really don't mind bees as long as they keep their distance. I am sure that most of us have a healthy respect for the business end of a bee. For some people, maintaining their health and their life means avoiding bees at all costs. For the rest of us, a bee sting is only a temporary unpleasantness and we never really think much about bees beyond their sting. However, bees deserve our respect and regard for many other reasons.

If you ask a child what bees do, I am sure he will tell you, "They make honey." They also, through their role as pollinators, play an important part in assuring that we have cranberry sauce with our turkey, blueberries for our pies, and apples for the cider. Nearly one-hundred crops with a farm value of one billion dollars annually depend on honeybees for pollination.

Right now, the honeybee is in some trouble throughout the country. Their numbers have declined in the past decade due to accidental poisoning by pesticides, a declining market for honey which has resulted in fewer people keeping bees, and infection of the hives by foulbrood disease. The continued spread of suburbia into open fields of wildflowers has also contributed to the bees decline by eliminating valuable feeding habitat.

The school children of New Jersey, recognizing the value of the honeybee, prompted the state legislature to acknowledge the bee. In June, 1974, Assembly bill 671 was enacted into law and the honeybee became the New Jersey State Bug.

Actually a honeybee is not a bug at all, in the true scientific sense of the word. Scientists classify bees in the order Hymenoptera which means 'membranous wings.' They share this classification with other insects such as wasps, hornets, yellow jackets and ants. True bugs, such as the stink bug and the assassin bug, belong to the order Hemiptera—but that's another story.

Some people have spent a lifetime studying bees. Dr. Karl Van Frisch won a Nobel Prize for his work uncovering the bees unique communication system. A honeybee, returning to the hive after a foraging trip, will dance in a special pattern to tell other bees the location of the food.

Other people keep bees just for the fun of it. Beekeeping is neither an expensive nor a time-consuming hobby, once you get the hang of it. So, the next time you need a gift for the person who has everything—stop, and think a minute about bees. □



PHOTOS BY JIM FITZSIMMONS



The Good Old Days?

TROUT MANAGEMENT IN NEW JERSEY

1875-1975

ROBERT H. SOLDWEDEL

Senior Fisheries Biologist—Bureau of Fisheries

If you asked one hundred trout anglers if they thought the trout fishing was better one hundred years ago, one hundred trout anglers would probably answer, "Of course it was". If you asked this same nostalgic one hundred why they felt it was better one hundred years ago, some of the more popular explanations would be: (1) "Today everything is polluted", (2) "Today everything is posted", (3) "Today everywhere is overrun with other fishermen", (4) "Today there are less trout" or (5) "Today everything is too expensive". These reactions are typical of the "nostalgia syndrome" within which the mind only remembers the good things and blots out one's memory of the crummy conditions back then.

In fact, today more acres of New Jersey's waters are open to the general public and there are more and larger trout available than ever before.

The outlook for preserving the environment and cleaning up pollution has never been more optimistic. Today better fishing is available at a lesser price to more people than it was one hundred years ago. And, even back in the "good old days" the streams were crowded, posted and, in many cases, polluted.

Let us travel back in time and put everything in a proper perspective. Let us appreciate the efforts of those far-sighted individuals who dedicated their lives to preserving the priceless heritage that we now enjoy.

The modern history of trout management in New Jersey began in 1875. President Ulysses S. Grant was in office and the flag of the United States of America had but 38 stars. Queen Victoria ruled over the British Empire, upon which the sun never set, Bismarck had formed the German Empire and



Babe Ruth fishing for trout on the upper Metedeconk River in Monmouth County about 1936.

Spain had Cuba (Cuba had Boss Tweed, who had just escaped from custody in New York). In the year 1875, an Austrian named Marcus would get the first experimental motor car on the road, Wild Bill Hickock would draw aces and eights in Deadwood, South Dakota, the Molly Maguires would be running amok in Pennsylvania and a devastating drought would be all but

annihilating the brook trout population of New Jersey (according to John C. Roe, the game warden of Passaic County at that time).

So let's take Warden Roe at his word and assume that as far as brook trout were concerned, New Jersey's "slate" was virtually "wiped clean" in 1875.

The year 1876 wasn't much better than 1875. General Custer was massacred by Sitting Bull, Crazy Horse and others at the Little Big Horn in that year.

Obviously, Warden Roe was not alone in his assessment of the brook trout depletion problem for during the years of 1879 to 1881 the Fish and Game Commission directed its efforts toward the restocking of natural trout streams. A total of 416,800 fingerling brook trout were stocked during this period. The primary objective of these stockings was to reestablish populations of trout in streams where they had been depleted and these releases were the first made by the State. The stocking of trout by private clubs had long since been underway.

In 1882, the first recorded stocking of rainbow trout was made by the Commission. A total of 7,000 rainbows were divided between the Musconetcong River at Waterloo, the Pequest River at Andover and the Paulinskill River at Newton. The Commission obviously did not want to let the trout stocking situation get out of hand and issued the following policy statement in their Annual Report of 1885:

"The wardens and interested persons have frequently requested that certain waters be replenished with trout and applications are constantly being made to the Commissioners to supply designated streams with fish, but they have seriously questioned the advisability of making further expenditures of pub-

lic money for the propagation of a fish that can hardly be expected to furnish food for the masses, and which can only be looked upon as a luxury for the almost exclusive pleasure of the few who can command time and wealth to expend upon their pursuit. Hundreds of private streams in the State are well stocked with trout, and the supply is only maintained by the exercise of constant watchfulness upon the part of the owners. If the same care was observed in policing public streams, there is every reason to believe that trout would naturally maintain their position in the waters of the State, without further efforts in the direction of artificial propagation."

Not until 1906 did the Commission deviate from this position and again undertake trout stockings, and then only as a resource management measure.

In 1906, 45,000 brook trout were purchased from the Paradise Brook Trout Company of Henryville, Pennsylvania and stocked "as far up the headwaters as possible". In 1908 the first experimental stockings of brown trout (from the hatchery at Caledonia, New York) were made. The South Branch of the Raritan River and the Millstone River were selected as the sites for this introduction.

By 1909, contracts were out for over 100,000 trout to be purchased for stocking and in 1910 a state fish hatchery was recommended for New Jersey. Recreation was taking its place along side resource management as a priority of the Fish and Game Commission.

Trout fishing was no longer to be the exclusive sport of "gentlemen of leisure" but was to be made available to every man, woman and child.

The new philosophy was obvious from the following policy statement made in 1920 concerning the Rahway River: "This stream on account of its accessibility to the public, its proximity to their chief cities of the state, and its careful supervision by Essex County Park Police, is stocked every week by the state with rainbow trout. This furnishes much pleasure to many people unable to go a distance and is probably paid for by the increase in license

money". This statement is as valid an argument for a catchable trout stocking program today as it was fifty-five years ago.

Trout production started at the state hatchery at Hackettstown under the supervision of Charles O. Hayford (for whom the hatchery is now named) in 1912.

A total of 152,000 trout were distributed from the hatchery in 1913 and in the ensuing years production continued to increase, finally leveling off at a little over a half million trout in 1932. The year 1932 is also significant in that this was the year that float stocking was initiated.

At the present time hatchery production continues to hover about the half million mark. The big difference between now and then was that in 1932 the 500,000 plus trout were stocked in 1,474 miles of streams while today the same number is being released in 542 miles of stream (many miles of stream have been "weeded out" of the program for a variety of reasons including the elimination of those waters which were too small to support a "catchable" trout fishery, posting, pollution, impounding, channelization, etc.) and 70 lakes. (Although the records show that such lakes as Hudson County Park Lake were being stocked as early as 1923, the lake stocking program didn't begin to approach its present magnitude until the late fifties.) The euphoria surrounding the "put-

and-take" trout stocking program relegated the fine survey and inventory work initiated in 1918 to a position of minor importance. It was not until the 1950's that research and inventories were to regain a role of major importance in the State's trout program with the organization of the Bureau of Fisheries Management (1956) and the institution of the trout research project (1962).

What transpired on New Jersey's trout streams during the interim must have caused the "gentleman of leisure" to trade in his fly rod for a polo pony. In 1930 Assistant (Fish and Game) Protector Cudney, of Warren County, reported that opening day looked "almost like a carnival", while Warden Small, of Bergen County, described the 1930 opening day at Saddle River with the following observation, "... two hundred fans shouldered each other for room to fish".

Unfortunately euphorias do not last forever, and as the cost of producing trout kept increasing and fishing didn't necessarily get any better, the more thoughtful among us began to wonder about the economics and the benefits of the program. The day of reckoning was near at hand. As costs increased, the Division could no longer afford to stock trout as generously as it had been doing, so in 1962 the trout research program was inaugurated to find out

Photos Supplied By Billy Barr



Getting the Trout Stocking trucks ready about 1936.

just what happened to the trout after they were stocked, to determine the best methods of stocking to make the most efficient use of the stocked trout, and what could be done to create new, or improve upon existing, trout fisheries.

An even greater realization was that the fishermen weren't the only ones that wanted to use the waters of the State and that some of these competing uses wouldn't be to the advantage of the trout. Therefore, it became necessary to take an inventory of what we had in the way of trout populations and trout water so that they might be protected.

The first extensive inventory of the trout resources of New Jersey was initiated in 1918. This work was conducted under the direction of four biologists: W. T. Foster, F. N. Miller, H. E. Schradieck and H. M. Spandau, and was concluded in 1920. Fifty years later, your author undertook a similar inventory (now completed). A comparison of the findings of both surveys illustrates just how much, or how little, things have changed.

For example, following the September 1920 survey the following comments were made about Dunnfield Creek: "This is one of the most beautiful natural trout streams in the state. This is an ideal brook trout stream. The water is very clear, cold, well aerated and (the stream) contains over a hundred pools that are 5 to 7 feet deep and 10 to 12 feet wide". Dunnfield Creek has changed little since 1920 and these comments are just as valid today, with the exception that now one will also find brown trout reproducing in its waters.

During the 1918-1920 surveys, the following streams were noted for their "native" brook trout populations: (Hunterdon County) Black Brook, Hakhokake Brook; (Morris County) Burnett Brook, Drakes Brook, Rhineharts Brook, Schooley's Mountain Brook; (Passaic County) Beach Brook, Burnt Meadow Brook, Cooley Brook, tributaries of the West Brook system; (Sussex County) Flatbrook drainage; (Warren County) Buckhorn Creek, Dark Moon Creek, Hance's Brook,



Inspecting the trout to be stocked, second from left, Conservation Officer Frank Clark, Fish and Game Commissioner Harry Armstrong, and on the extreme right Fish Hatchery Superintendent Charles O. Hayford.

Jacksonburg Creek, Mill Brook, Pequest River at Townsbury, Van Campens Brook. The latest surveys found that the natural reproduction of trout still occurred in all of these streams or in portions of their watersheds, although in some cases brown trout or rainbow trout had joined or replaced the brook trout.

Although in 1920 the brook trout was the primary salmonid species in New Jersey, such streams as the Paulinskill were already being described as "a good brown trout stream" and browns were being recommended for the "warmer" streams such as the Musconetcong, where it was felt that they would "thrive". Brown trout have indeed thrived and the 1968-1972 surveys found substantial naturally reproducing populations throughout much of northern New Jersey, with the most notable concentrations to be found in the upper portion of the Hakhokake drainage, in the streams of the Peapack-Gladstone area (Somerset County), the Paulinskill River drainage in the Stillwater-Fredon area, the Pequannock River drainage in the Newfoundland area, the upper portion of the Saddle River, and the tributaries of Spruce Run Reservoir.

The occurrence of rainbow trout was quite rare during the 1920 surveys, with rainbow trout reproduction being reported from only one stream, West Brook in Passaic County. There hasn't been much of an increase in the abundance of naturally reproduced rainbow trout. They still can be found in West Brook, the upper portion of the Whippany River drainage in the Brook-

side area and in the South Branch of the Raritan River drainage around Califon.

The 1918-1920 surveys were already too late to find trout in many waters as witness the following remarks: Black River ... "appearance of being somewhat polluted" (above Chester), Dead River "not a good place", Rahway River "polluted", Walkkill River "Dyes from color works and wash from Zinc plant discolors stream at times and makes it unfit for fish.", Shabbecong Brook "filled with rubbish", and a problem that still exists, Pequannock (Pequan-nock) "goes dry".

By 1920, the "state-of-the-art" was advanced enough that waters which would not hold trout for purely natural reasons could also be identified. For example, Beaver Brook near Hope was characterized as being better suited for largemouth bass than trout, and the Assunpink Creek was considered as a "good pike (pickerel) stream". These facts were also common knowledge to the layman. Witness the remarks of Henry Weaver, a farmer in the Bloomingdale area around 1920, "no streams here about are fit for trout".

The year 1920 was also late enough in recorded history to lament over the passing of the "good old days"; Post Brook "was good for trout, nothing but pickerel and eels recently"; Geng

Continued on page 32



Gas probe and meter to check for tree-killing gas main leaks at base of tree.



Forester John Lawrence checking girth of tree.



City Forester and crew using metal detector, air hammer, and concrete cutter to prepare site for a tree planting.

the urban forester / A New Kind of Forester Serves New Jersey's Changing Needs

BY JANET LEVY / PHOTOS BY HARRY GROSCH

Some New Jersey foresters are using mine detectors these days, and the wars they are fighting are in the concrete jungles of our sprawling cities.

Although New Jersey is one of the fastest growing urban areas in the country, forestry and wildlife has become the second largest area of study at Cook College, the environmentally oriented division of Rutgers. The state university enrolls 150 to 200 students in the program today as contrasted to 40 or less who participated 20 years ago.

Is this a paradox, or are the two factors more closely related than it would seem at first?

The relationship is both logical and necessary according to Richard F. West, who heads the forestry and wildlife section of the Department of Horticulture and Forestry.

"Because of population expansion and urban growth, New Jersey is 10 years ahead of most other states when it comes to environmental problems," he explains. "What this means is that

we have to be 10 years ahead when it comes to solutions as well."

This concern with finding solutions has lead to a new area of study at Cook College, that of urban forestry.

"Traditionally, forestry programs have emphasized timber production and the management of large forests. Although we're still very much involved in this area, in New Jersey we're moving more and more to modify and improve the city as a place for people," West notes.



Recently planted Bradford Callery Pear Tree developed by U.S. Department of Agriculture for urban planting.

One of the first Cook College graduates to put this new emphasis into practice is John Lawrence, city forester for the municipality of Jersey City. "When I tell people what I do, they laugh and say that I must have the easiest job in the State," he observes.

"What they don't realize," Lawrence adds, "is that there is a forest of sorts along the 220 miles of streets within the city—an urban forest of 18,000 trees—and trees must be continually cared for, maintained, planted, sprayed, inspected, and repaired. In addition, residents ask many questions about insects and tree diseases, and these all have to be answered."

"Even planting a tree along the sidewalk can be more difficult than it first appears," Lawrence adds, explaining that, since almost 75 percent of Jersey City's sidewalks extend all the way to the curb line, an opening must first be made in the concrete.

"It must be large enough to eliminate root problems and the soil underneath must be conditioned and fertilized if the tree is to grow. One of the pieces of equipment used in this operation is a mine detector. This is essential if we're to find any pipes or electrical lines that may be buried under the concrete so that they won't be severed when the pavement is broken," Lawrence explains.

A forestry student studies soils, physiology, tree growth, insects and diseases. "As far as the actual care of an individual tree goes," Professor West explains, "it doesn't make much difference whether it's in an urban area or a forest."

However, certain general problems related to specific conditions in an urban environment are the subject of continuing research. The U.S. Forestry

Experiment Stations and some progressive private nurseries are involved in genetic programs designed to breed trees suited to urban situations.

"They're beginning to develop trees with narrow crowns," West notes, adding that these are ideal street trees because they fit into small spaces. In addition, since they grow naturally into the desired form, less pruning is required.

"Scientists also try to develop deep-rooted trees that are resistant to smoke, dirt, pollution, and heat," he notes, adding that, although certain pollution-sensitive species of forest trees are important in alerting scientists when air-pollution levels rise, city trees have to be resistant to these man-made environmental hazards.

Basic as all these factors are, however, the aim of the urban forester is not just to adapt the tree to the city; it is to modify the city through the use of trees.

"In this area, aesthetic factors can almost be considered a fringe benefit because there are so many functional reasons for having trees," Professor West explains.

For instance, a green belt, or wooded corridor, provides visual screening and increases feelings of privacy in congested areas. It reduces wind velocity. It screens dust from the air. It suppresses loud noises, dissipates unpleasant odors, produces atmospheric oxygen and absorbs carbon dioxide, reduces pollutants, tempers the climate, serves as a habitat for birds and small animals, and prevents erosion, West explains.

"We're still studying the extent of many of these influences," he adds, "but there are some things we can be pretty specific about."

"For example, it's been estimated that one good-sized tree is equal to five or more room air conditioners in its cooling effects because it isn't just the shade that makes us cool," West notes. Through the process of transpiration, he explains, moisture moves from the soil through the trees to the leaves, where it is evaporated into the air.

"In the course of a hot summer day, a large tree, acting on the same principle as a refrigerator, evaporates up to 100 gallons of water," West contends.

Trees also absorb sound and make it less intense, he notes, explaining that each 100 feet of forest reduces sound passing through it by six to eight decibels. "What this means in practical terms is that a tree barrier 300 to 400 feet deep along a highway can suppress noise to a tolerable level for those living on the other side."

In addition, a dense planting of sev-

eral rows of trees and shrubs will reduce winds of 20 to 25 miles per hour by about 75 percent, close to the planting, Professor West notes, adding that well-designed windbreaks may reduce wind velocities on the leeward side for a distance equal to 40 times the height of the trees.

The leaves of trees also collect dust particles and filter them from the air. An 80 to 100 year old beech tree will intercept several pounds of dust throughout the summer, and evergreens perform this function all year round, West adds.

In addition, all species of trees give off natural odors, and many of them are pleasant. When objectionable odors pass through wooded areas, some of them are absorbed by the trees and others are given off deodorized or diluted.

"In urban areas where odors and dust are a problem, properly located belts and groves of trees can make the environment much more pleasant," West notes.

Most important, perhaps, is the fact that green plants play a vital role in maintaining a balance between oxygen and carbon dioxide in the air. Oxygen is a byproduct of photosynthesis, a process by which green plants use sunlight as energy to combine carbon dioxide from the air with water to manufacture food.

Man and his activities are consuming more and more atmospheric oxygen and emitting increasing amounts of carbon dioxide into the air. In the burning of fossil fuels such as coal, natural gas, and petroleum products, modern technology uses enormous volumes of oxygen and gives off large amounts of carbon dioxide. As a result, the total amount of carbon dioxide in the air is thought to be increasing, Professor West notes.

In the processes of photosynthesis and respiration, trees take in and expel large volumes of air. Exactly how much this reduces air pollution is not known, he explains, but research has shown that tree respiration substantially reduces the ozone content in the air.

"Ozone is a major cause of pollution," he adds, "and it is quite possible that other air pollutants are reduced in the same way."

At one time, almost all Cook College forestry majors had rural backgrounds. Today, it is much easier to find a student from Newark or Bayonne than from Bennett's Mill or Myrtle Grove.

Why is this?

"They know the problems first hand," explains Professor West, "and they know how crucial it is that we work toward a change." □

american tree farm program



Santiago Porcella III, representing the New Jersey Tree Farm Committee presents tree farm certificate to E. E. Hoisington, Manager Schiff Scout Reservation during dedication ceremony.

By Santiago Porcella III

Approximately 450 acres of woodland at Mendham, New Jersey owned by Schiff Scout Reservation, National Education Center, Boy Scouts of America, were enrolled May 14, 1975 in the American Tree Farm System, a nationwide program of good forest management which promotes the conservation and wise use of our nation's renewable timber resources.

The Tree Farm program, composed of more than 31,000 private landowners dedicated to scientific forest management on their nearly 75 million acres of forests, is sponsored by America's forest industries through the American Forest Institute, Washington, D.C., and administered in New Jersey by the Bureau of Forestry of the Department of Environmental Protection. Seventy-five private landowners in New Jersey who own more than 23,000 acres of forest land are certified Tree Farmers.

The area surrounding Schiff Scout Reservation is rich in the history of colonial America. The Jockey Hollow Trail leading to George Washington's Morristown headquarters traverses the property. It was heavily traveled by Washington's troops during 1779 and 1780. While using areas within the present boundaries as outposts, Washington camped frequently in nearby Jockey Hollow, now a national historical park. The area within Schiff's boundaries was accumulated from parcels of land sold originally by the group of East Jersey Proprietors.

Encompassing over 500 acres of wooded hills in Morris County, and operating on a year-round basis, its primary mission is professional training—the training of adults entering into careers as professional employees of the Boy Scouts of America and adults already within the professional ranks.

During its years of operation, Schiff has continued to offer the various types of training available on a national level serving as a proving ground for ideas, concepts, programs, and equipment to be tested. Wood Badge, National Camping Schools, Junior Leader Training, Conservation Training, Survival Training and Volunteer Weekend Training are examples of programs routinely offered.

Santiago Porcella, III, New Jersey Bureau of Forestry and Robert C. Lund, New Jersey Division of Fish, Game and Shellfisheries represented the Department of Environmental Protection in developing the overall Conservation Plan for Schiff Reservation. One phase of the Plan is in practice now, as the money received from the sale of harvested timber is dedicated towards the development of two wildlife ponds and the purchase of a wood chipper.

This Scout-owned property is not only growing repeated crops of wood for our nation's future needs, it is also providing improved wildlife habitat, improving the watersheds, the quality of the environment and providing recreational and educational opportunities for all. □



Dr. Vivian explains the results of testing for dissolved oxygen in the water to sixth grade students from Haddonfield.

In Search of an Environmental Ethic

by
THOMAS H. GRIFFIN, JR.

PHOTOS SUPPLIED BY AUTHOR

New Jersey is known as a great industrial giant. It is a state with the highest population density in the union and is contiguous with two of the largest cities in the world. Paradoxically, within its political confines, lies one of the major wilderness areas in the north-eastern United States.

The Pine Barrens, as they have been known for many years, consist of miles and miles of pine and oak trees, interspersed with huckleberry and laurel and occasionally interrupted by long, dark serrated stands

of Atlantic White Cedar. Periodically ravaged by fire, the charcoaled trunks of the fire-resistant pines and oaks stand as quiet sentinels, seemingly awaiting a human population that too often thinks in terms of development and economics.

Flowing from the headwaters of such rivers as the Oswego, the Wading, the Mullica, the Batsto, and the Great Egg Harbor are clean, pure waters that are characteristic of the Pines. Varying in color from a light tan to a deep brown because of the limonite or

bog iron in the soil, these waters, if protected, are an important future resource for the citizens of this state.

In the midst of all this wilderness beauty, lies a small nearly forgotten town, where a group of environmental educators are striving to aid the citizenry of New Jersey in adopting an environmental ethic.

The Conservation and Environmental Studies Center, Inc., located in the old blueberry and cranberry town of Whitesbog, had been the dream of a New Jersey native, active in the conservation movement for many years. Dr. V. Eugene Vivian, Chairman of the Science Department at Glassboro State College in 1966, applied for and received a planning grant from the U.S. Office of Education to develop a center that would foster the concepts of environmental awareness and knowledge in teachers and students throughout the state. Dr. Vivian relinquished his position as department chairman, and working as a full professor in the life science department at Glassboro State College and Executive Director of the Conservation and Environmental Studies Center, Inc. began the work that today has established him as one of the leaders in the environmental movement.

In 1968, armed with a Title III ESEA grant, Dr. Vivian persuaded teachers to bring their students for a one-week Resident Environmental Education Program in the Pine Barrens. During the following three years, he and an able staff of environmental educators worked with children and adults from almost every segment of our state.

In 1970, knowing that federal money would soon run out, Dr. Vivian diversified his program to include Teacher Workshops, Day-long Field Experiences and

Demonstration Lessons on the school site, as well as Resident Environmental Education Programing and curriculum development. Now the schools themselves, as well as the private and industrial sectors of society, would have to support the program, financially, as well as, philosophically.

The Conservation and Environmental Studies Center, Inc. has grown in the number of services it offers and in the population it reaches with its programs. Grants have been obtained from the National Science Foundation, the New Jersey Department of Education: Division of Curriculum and Instruction, and the United States Office of Education, enabling the work of educating and training people of New Jersey in an awareness and knowledge of their environment to continue to grow.

Today, the Conservation and Environmental Studies Center, Inc. is recognized as a National Environmental Education Landmark by the United States Department of the Interior and an example to one man's dream of an environmental learning experience for all people, in all the divergent environments in which they live. Dr. Vivian has received many awards and citations for his efforts over the years including the Conservation Educator of the Year from the National Wildlife Federation and the New Jersey Conservation Educator of the Year from the New Jersey State Federation of Sportsman's Clubs. But the greatest reward he says, "is seeing the expressions on children's faces when they directly discover something new about the environment in which they reside."

Dr. Vivian gives teachers from various districts in New Jersey a first hand knowledge of marine studies.



Wheelchairs and other ambulatory aids are sometimes cast aside as a child's interest swells to forgetful proportions.





Students display the cranberries they have collected after a fall lesson at Whitesbog.

In his most recent book, *Sourcebook for Environmental Education* (C. V. Mosby Publishing Company, St. Louis, Mo.), Dr. Vivian states; "Environmental education is not the same as either outdoor education or conservation education. Environmental education contains all of both but has the restrictions of neither. Its frame of reference is larger than a combination of both. Instead of being concerned chiefly with the management of resources, soil, water, forests, wildlife and air, environmental education is also concerned with all the aspects of the social environments of man, with man-made environments and their effects both on man and on all of the 'natural environment'. The focus is on man and his relationship to, and use and control of, all environments".

Presently, CESC is conducting Day-long Environmental Study Experiences at Whitesbog or at school and/or community sites; Demonstration Lessons on school grounds; Teacher Workshops; Assembly Programs; Resident Environmental Education Programs using rented facilities; and 10 week teacher education courses in environmental education.

School site surveys for which key CESC curriculum materials to specific grade levels and specific sites on and around the school property are being collated for districts which desire this service. This entails a CESC consultant going to the school and taking a number of photographic slides around the desired area. These are then keyed to a map of the area and for each slide, a written paragraph stipulating several environmental study activities which might be conducted at that location are provided in narrative form. Curriculum materials in the form of teacher lesson plans are then recommended to enhance these activities. This service enables teachers, with no specific environmental training, to embark on an environmental education program of their own design.

Environmental Resource Inventories, Impact Statements and Assessments are being offered to local municipalities and townships, as well as private engineering firms in accordance with state and federal regulations. These are conducted by trained CESC personnel and are devised to utilize the services of any

interested citizens who may wish to assist. This enables CESC to hold the costs to a minimum and involves local, experienced residents in community planning.

Tours of the Pine Barrens are currently being offered, under the auspices of the Pinelands Environmental Council, to groups and individuals interested in better understanding lands that the PEC has recommended the state purchase under the Green Acres Act.

The Friends of Whitesbog, a service arm of CESC, is also offering monthly presentations and field trips to members and guests interested in the restoration of a company town and exploring the Pinelands. These monthly meetings have met with continued success and currently include canoe trips, excellent slide presentations by members and friends, a hunting workshop, and an old fashioned square dance.

CESC has recently received a National Science Foundation Grant to train leaders of youth groups, senior citizens interested in working with non-affiliated youth groups, clubs and organizations, and extra-curricular school leaders in working with a new environmental program entitled, *Outdoor Biology Instructional Strategies*. OBIS activities are primarily oriented towards community sponsored youth organizations such as scouts, recreation clubs, summer camps, after-school clubs and nature center groups. The activities introduce basic concepts of ecology in ways that are palatable and exciting for youngsters.

Dr. Vivian has taught for many years that "environmental problems should be viewed in a truly ecological manner; considering, not only the natural world, but politics, economics, ethics, and all other disciplines. Search for alternatives and study the problem profusely before making decisions that might alter the lives of present and future generations. The sad fact is that environmental knowledge and environmental awareness don't always lead to environmental wisdom. This can only come after a critical analysis of each situation."

Many individuals and organizations have been espousing a doomsday philosophy with regard to New Jersey's environmental problems. These complex issues, involving economics, energy, employment, environment, and ethics, can only be solved with astute planning and consideration. CESC has, for many years, been contributing educational programs and activities that seek workable solutions to New Jersey's environmental difficulties.

CESC takes pride in serving the people of New Jersey in developing an environmental ethic and urges all segments of our society to take advantage of this unique resource that has been painstakingly afforded them.

For further information, please contact: The Conservation and Environmental Studies Center, Inc., Box 2230, RD 7, Browns Mills, N.J. 08015 Telephone: (609) 893-9151 □



Environmental News



ROCKINGHAM. The Continental Congress, which was meeting in Princeton, secured this residence, located in Rocky Hill (Somerset County), for General George Washington so that he could be nearby as they awaited arrival of the peace terms from France. The main house of this eighteenth century farm complex was used by the general as his final military headquarters (August to November, 1783) and it was in the study that he composed his "Farewell Address to the Army." He stood on the back balcony (see above) to personally bid farewell to his "life guard" of 300 troops encamped on the lawn. Preserved as a house museum, Rockingham is under the supervision of DEP.

HISTORIC SITES MOVE CLOSER TO FUNDING

Applications from administrators of 16 historic sites for more than \$190,000 in federal grants for preservation and restoration projects received preliminary approval from Environmental Commissioner Bardin in April. For final approval, project details will be sent to the National Park Service, U.S. Department of the Interior, which provides the 50-50 grants under terms of the 1966 National Historic Preservation Act. The federal program is administered in New Jersey by the Historic Sites Section of DEP's Division of Parks and Forestry.

The National Park Service apportioned \$190,156 to New Jersey as part of its 1975 fiscal year preservation program. The grants are issued on a matching fund basis which means the recipients must contribute equal dollar amounts.

David Poinsett, supervisor of the Historic Sites Section, said, "All properties receiving approval for grants are listed on the National Register of Historic Places, a prerequisite for the grant program." Poinsett said the matching funds can be used for acquisition, preservation or restoration work, but, "any physical work done to the historic properties must be under the guidance of a professional knowledgeable in the historic preservation field."

Here's a rundown by county of the 16 projects:

BERGEN: The Hermitage, Ho-Ho-Kus, exterior restoration of a Gothic Revival mansion, \$70,000; **Van Allen House**, Oakland, preparation of master development plan for restoration, \$4,000

CAMDEN: Pomona Hall, Camden, continuation of restoration work begun this year, \$12,000

CUMBERLAND: Pirate House, Greenwich, retain a restoration architect to prepare plans and specifications, \$3,000

ESSEX: John Ballantine Mansion, Newark, interior restoration, \$23,500

GLOUCESTER: Hollybush, Glassboro, restoration of exterior of 1849 Italianate villa on Glassboro State College campus, \$10,000

FLOODPLAINS REGULATIONS NOW IN EFFECT

The first part of DEP's regulations to control use and development of the floodway portions of flood hazard areas of the state went into effect on June 2. In the following paragraphs is a brief description of the regulations, and pertinent comments by Environmental Commissioner David J. Bardin.

Floodway standards

The regulations prohibit, among other things, the erection of any new structures or establishment of any new landfills in the floodways. This is the inundated land area where extreme flooding takes place.

(Not affected by the new regulations are such hazard-free activities as recreation, agriculture, soil conservation projects and similar uses which are not likely to cause obstructions, undue pollution, or intensify flooding.)

Commissioner Bardin said, "because incompatible development of the floodways poses the greatest potential danger to life and property, the immediate thrust of our regulations is to spell out just which land uses will be prohibited and which uses will require no regulation."

Until such time as rules are adopted dealing with regulated uses of the floodways," the provisions of the stream encroachment statute will prevail in regulating construction," said Bardin. (*The 1929 Stream Encroachment Law, NJSA 58:1-26 et seq., assigns to DEP the responsibility of approving or rejecting any kind of construction—such as bridges or embankments—within the high water mark of a stream.*)

Delineated floodways

Bardin said, "The regulations are a major step forward in the implementation of the Flood Plains Act of 1972. The regulations apply immediately to 487 linear miles of delineated flood hazard areas and to other areas of the state as the flood hazard areas are mapped and delineated," he pointed out.

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CURT J. HUBERT HEADS GREEN ACRES PROGRAM

Curt J. Hubert, 46, of Trenton, has been appointed administrator of the Green Acres Program by Commissioner Bardin. Hubert, whose field is planning, program and grant management, assumed his new duties on May 12. He will supervise the expanded Green Acres program approved by voters in the November 1974 elections.

For eight years immediately before joining DEP, Hubert was with the state department of Community Affairs: from 1967 to 1972 he was chief of the Bureau of Planning Assistance, and from 1972 to 1975 was deputy director of the Division of Housing and Urban Renewal. Hubert has been in state service since 1957.

Top assistants to Hubert are two long-time staff members of the Green Acres program: Howard J. Wolf and Bernard J. Daly. □

Agriculture would gain

PROPOSED AMENDMENTS OPEN BURNING RULES

Proposed amendments to the state regulations on the control and prohibition of open burning were brought to the public at a hearing held by DEP in Trenton on July 13.

State agricultural interests, particularly, would benefit from the new rules, which provide for:

- Accelerated procedures for obtaining permits to open-burn infested plant life
- Variance provisions for open burning of vegetation under specified conditions and circumstances
- A two-year lifting of the ban on open burning of orchard prunings under certain circumstances

Calls for reform of procedures

BYRNE PROTESTS U.S. OCS STRATEGIES

Governor Brendan Byrne, in a June 6 letter to Kent Frizzel, acting secretary of the U.S. Department of the Interior, protested the department's invitation to oil companies to indicate where they would like to drill for oil and natural gas on the Outer Continental Shelf (OCS).

The federal agency recently issued a "call for nomination" for tracts in the Baltimore Canyon area of the OCS. The "call" precedes the actual bids for leases. Much of the area where drilling would occur lies off the New Jersey coast.

Byrne said that the Interior department's policy is based more on concern for the oil companies than on concern to protect the public interest. The governor called for a reform of "outmoded procedures through which the department administers the oil drilling offshore."

The Governor said that the nation, and New Jersey in particular, require more energy, but that the approach taken by the Department was "foot dragging" and could delay necessary production. He added that the federal government "continues to have an unconscionable lack of knowledge about the resources it sets out to auction off, and maintains Byzantine secrecy concerning the little knowledge it has acquired."

Byrne recommended an overhaul of the leasing process so that further exploration and exploitation of oil and natural gas would be in the "public interest."

The governor expressed particular concern about the more than \$2-billion shore recreation industry in New Jersey, which depends upon clean beaches and clean air. □

Under the new rules, there would be a service fee of \$10 for the issuance of variance permits for burning plant life and orchard prunings. This is the minimum fee legally allowable.

The present general regulations on open burning, (including the prohibition of open burning for salvage operations and disposal of refuse such as rubbish, garbage, trade and building wastes, leaves and garden wastes), remain in effect and will continue to be enforced. □

**FOR INFORMATION
WRITE TO NJO
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Watersheds expert

IAN WALKER JOINS DEP

Ian R. Walker, 38, of East Windsor, has been appointed as the department's chief water resources environmental analyst by Commissioner Bardin. Walker, who for the past five years was executive director of the Stony Brook-Millstone Watersheds Association, began his new duties with the state on July 7.

Walker serves as a key aide to Assistant Commissioner Rocco D. Ricci and will lead a professional staff of 12 in developing environmentally sound water resource programs and projects for the Division of Water Resources. The programs include water supply, solid waste, flood plain management, water pollution control, notably including sewer facilities planning and design.

Walker received a master's degree in geology from the University of South Dakota after earning a bachelor's degree in the same subject from Ohio Wesleyan University. He later served as a geologist with the Soil Conservation Service (USDA) in New Jersey, the Cape May County Planning Board, and the New Jersey Bureau of Geology before going with the Stony Brook-Millstone Watersheds Association. □

WATERFOWL WAY STATION

The U.S. Fish and Wildlife Service has declared three sections—more than 6,600 acres—of the Brigantine National Wildlife Refuge (Atlantic County) as specially protected wilderness preserves for migrating waterfowl. The "wilderness preservation" designation means that the area is protected from development and from motorized vehicles. The Refuge, which consists of more than 20,000 acres, is 11 miles from Atlantic City. The Refuge headquarters is located less than a mile east of the village of Oceanville on U.S. 9. □



JOE KLEIM

Among the virtues of the DEP mobile laboratory is its effectiveness for on-site analysis in connection with water quality surveys. Driving right up to the edge of a stream, the van can pump water directly from the stream into the van's laboratory via the port hole which can be seen midway on the lower portion of the body of the van.

Inside the van special laboratory equipment for biological, microbiological and chemistry tests, depending upon the type of water quality survey undertaken. Paul Olsen is shown screening out small aquatic organisms.

MOBILE LABORATORY FOR WATER RESOURCES

(Members of the Technical Support Unit of the Water Resources Division, DEP, chief among them Frank Takacs, project director, cooperated in developing the following article with a writing assist from Cliff Ross of the Department's Information Office)

It was a chilly morning for late March, but the sky was cloudless and the ocean green. The white van, a new mobile laboratory for Water Resources Division, shifted gears and moved up the ramp where the Atlantic Highlands bridge and Route 36 intersect at the entrance to the Sandy Hook spit. The vehicle then cruised smoothly down the sloping exit to meet the Sandy Hook roadway, barely six feet above sea level and steered a course north up the "Hook."

For the van, this was a shakedown cruise, appropriate for a van with a special purpose, the latest acquisition of the Water Resources Division of DEP assigned to the Division's Technical Support Unit.

For this shakedown cruise, it was a matter of seeing how well the vehicle could be maneuvered into areas where instant water quality testing could be done, according to Robert Kotch, Assistant Environmental Engineer and field coordinator for the Technical Support Group. Project leader, Frank Takacs, Principal Environmental Specialist, could already testify to the mobile lab's capabilities on paper. The shakedown cruise was simply proving that on-site lab work was feasible and could provide technical support to Water Resources Division planning and management functions.

"What came to mind, at once," Takacs said, "was the value of this mobile lab when the 'red tides' are in evidence; and it's safe to say they'll be with us about the middle of July or August, showing up in North Jersey's coastal waters. This means there may be closing of beaches, because of ocean waters turning toxic and unpleasant for swimming."

There's nothing new about the red tide story. But for DEP, a fully equipped laboratory on wheels capable of cruising the state on special assignments, including the instant reporting of red tides, is an exciting prospect. Saving ocean swimmers a trip to the beach where the risk could be skin and eye irritations, sore throats, headaches or nausea is a useful public service.

"We can move the van to the scene at the first evidence of red tides and set up for analysis at once, checking water samples for toxicity, getting through on the telephone to the Trenton "hot line" number. And we can stay at the site as long as needed. Our van can remain in the field overnight, since it is equipped to sleep two men," said Takacs.

Water Resources Division views the van as valuable in other ways, chief among them the function of surveillance. Fish bioassays on toxic industrial effluents are possible, and analysis of microscopic plankton and macroinvertebrate organisms that are found in clean or biologically-stressed waters also can be made.

"It is a facility that can be used for collecting and analyzing data in con-

nection with new water pollution control projects as well as a training grounds for technical water quality management people," Takacs noted.

With a \$1.25 billion water pollution construction program ahead in the next five years, it's easy to see how the mobile laboratory can prove valuable. It can be driven up to a stream in the vicinity of a proposed waste treatment plant and take samples and evaluate them to measure the capacity of the stream from the standpoint of ecological impact.

"We can evaluate a stream's carrying load with regard to BOD, Ph, chlorophyll, algae counts; and we can measure water conductivity, get a DO reading of the stream—a pretty complete profile in other words—evaluating all of it in terms of ecological impact," explained Takacs.

"It is possible, in short, to produce a report from on-site lab work that can predict the impact of a new plant before it is on the drawing board. Our input on the proposed project might conceivably show that tertiary levels of treatment must be designed into the project rather than simply designing a secondary system."

The 26.5 foot long, air-conditioned van is fully equipped with pumps, refrigerator, a 12-volt AC electrical system with water cooled generator, fresh water and wastewater storage tanks and 12-volt battery charger, two 28-pound cylinders for LPG gas, and an external hookup connection that enables piping and pumping right from a stream or lake right into the van.

The van which came to DEP without cost from the U.S. Environmental Protection Agency makes possible intensive samplings. □



SALUTE TO NEW JERSEY

"New Jersey State Day" was celebrated in Washington, D.C. on May 19 as part of the capital city's Bicentennial salute to the States. District of Columbia Mayor Walter E. Washington greeted Governor Byrne's representative, State Assemblyman Richard Codey, and members of New Jersey's congressional delegation. Congressman Peter W. Rodino and other members of the delegation spoke briefly during the ceremony held on the Capitol steps. The day-long celebration included performances by several college and high school choral and band groups representing various sections of the state. □

PORT AND STARBOARD

Summer sailors should have no difficulty knowing whether they are in the channel or out of it in the state's waterways. The job of marking the waterways was completed by DEP's Division of Marine Services on May 16—well ahead of the traditional May 30 opening of the boating season. The state maintains 137 lighted pile structures, 150 buoys and over 4,000 stake day-marks to guide boaters through more than 200 miles of navigable channels.

Captain B. Russell Henry of the New Jersey Marine Police, who supervises the annual repair and replacement of aids to navigation, said the early completion of the work this year will aid in boating safety. "For a happier summer, free from trouble on the water, I'd advise all skippers to become familiar with the channel marker," said Captain Henry. □

MEYNER NAMED CHAIRMAN OF 'BICEN' COMMISSION

Robert B. Meyner, governor of New Jersey from 1954-1961, was appointed chairman of the New Jersey American Revolution Bicentennial Commission by Governor Brendan Byrne on May 12.

The 'Bicen' commission has the responsibility to help plan and promote New Jersey's celebration of the bicentennial. It has 33 members—10 public and 12 ex officio or appointed from the legislature; and 11 nonvoting advisory members. Environmental Commissioner Bardin is an ex officio member. □

DEP OPENS NEWARK OFFICE

A Newark-based departmental field office became operational on April 28. The branch office, which is staffed by onboard personnel who have been reassigned, is located in the State Office Building, 1100 Raymond Boulevard, Newark. The office was opened in order to better serve the people in the highly urbanized areas of the city of Newark and the counties of Bergen and Hudson. □

GREEN ACRES APPROPRIATION

The state legislature in late May approved the release of \$60 million in new Green Acres money. This is the first appropriation under terms of the 1974 \$200 million Green Acres bond issue approved by voters in November.

The appropriation measure provides that the \$60 million be apportioned in equal shares of \$30 million for the local matching fund program and for the state portion of program, with \$15 million of each share to be used for acquisition of land for recreation or conservation purposes, and \$15 million of each share to be used for development of parkland. □

U.S. BORROWS DEP EXPERT

State Firewarden William B. Phoenix of DEP's Bureau of Forestry is "on loan" to the United States Department of Agriculture Fire Service to work on a research project at the Pacific Southwest Forest Fire Laboratory in Riverside, California. Phoenix, who will work on the federal project ("Fire Operational Characteristics Under Simulation") for one year, assumed his new duties on July 1. □

HISTORIC SITES

Continued from page 16A

HUDSON: Hudson County Courthouse, Jersey City, restoration of the Howard Pyle murals, \$10,000

MERCER: William Green House, Ewing Township, preservation plans for restoration of an 18th century house on Trenton State College campus, \$2,500; William Trent House, Trenton, restoration of gardens, landscaping, and brick walls surrounding property, \$7,656

MIDDLESEX: Old Cranbury School, Cranbury, restoration of late 19th century brick public building, \$10,000

MONMOUTH: Burrowes Mansion, Matawan, exterior restoration of bicen-

FLOODPLAINS

Continued from page 16A

Mapping and delineation of major flood-prone areas has been going forward for several years. Bardin said, "Most of this work has been centered in the Raritan basin where 346 linear miles will be regulated. The first goal was to delineate a section of the Raritan River basin, to protect it from the ravages of development that have occurred in the neighboring Passaic River basin. Other areas mapped and delineated include 106 miles in the Delaware basin and 36 miles in the Atlantic basin."

Prohibited uses

Prohibited uses under the regulations include placing, depositing or dumping solid wastes on the flood delineated areas; processing, storing or disposal of pesticides, domestic or industrial wastes, radioactive materials, petroleum products or hazardous materials; erection of structures for occupancy by humans or livestock or kennels for boarding of domestic pets; storage of materials or equipment or construction of septic systems for residential or commercial use.

Nonregulated uses

Nonregulated uses include private and public recreation (playgrounds, picnic areas) agriculture (grazing, nurseries, farming, forestry) and soil conservation activities which: do not require fill borrowed from outside the immediate floodway; do not require erection of structures; do not require channel modification or relocation; do not obstruct flood flows; do not affect the water carrying capacity of any delineated floodway or channel; do not increase offsite flood damage potential, and are undertaken with full onsite flood damage risks accepted by the owners of his assigns in the event of transfer or lease. □

ennial-related property, \$12,500; **Christ Church**, Middletown, roof restoration to historically authentic period, \$4,500; **General Clinton's Headquarters**, Freehold, restoration of 18th century gardens, plantings and landscaping, \$3,800

PASSAIC: Van Duyn House, Wayne Township, restoration of 18th century building as historic house museum, \$8,700

SOMERSET: Blackwells Mills Canal House, Franklin Township, restoration of bridge tender's house on the Delaware and Raritan Canal, \$5,000

UNION: Miller-Cory House, Westfield, interior kitchen and fireplace restoration, \$3,000 □

CO'S CORNER

by Conservation Officer Carlton Smith



CO OF THE YEAR AWARD TO OFFICER LENTHO BURNS!

Conservation Officer Lentho Burns was selected CO of the year for New Jersey by the Northeast Conservation Law Enforcement Chief's Association at a Wildlife Conference held recently in New Haven. Photo shows Officer Burns receiving the award plaque from Division Director Russell A. Cookingham and Chief Conservation Officer John C. O'Dowd at a ceremony in the division's Trenton office.

POLICE OFFICERS LEARN ABOUT FISH & GAME!

CO Arthur Wendelken, Division Training Officer, has been accredited as a professional police training instructor by the New Jersey Police Training Commission. In his new capacity, Officer Wendelken has instructed both the 29th and 30th Basic Police class at Union College.

WELCOME, ROOKIES!

Two new Conservation Officer trainees were recently assigned to the Northern District for area familiarization and field training under guidance of veteran CO's. They are Steven Kammer and Michael DeLuca, both of Bergen County. Glad to have you with us, men.

WE'RE PROUD OF YOU, MARTY!

Conservation Officer Martin Morales, one of our new young officers, was recently graduated from the Burlington County Police Academy with a high scholastic score. CO Morales placed second in a class of 39 officers.

ANOTHER VIEWPOINT

Although I agree with most of what Mrs. June Gourvelac wrote in her letter to you (N.J. Outdoors, March/April 1975), I cannot agree with this statement: "So, unless a person is contributing funds for conservation, is a vegetarian, is familiar with all aspects of hunting, that person has no business commenting on the sport."

A person does not have to contribute funds for conservation—be a vegetarian—or be familiar with all aspects of hunting to comment on the sport or abuses by it. In 1896, the United States Supreme Court ruled that all wildlife within the territorial limits of the United States is the property of the American people. In short, wildlife belongs to all of the people. The Supreme Court ruling gives all Americans—hunters and nonhunters alike—the right to be concerned about what happens to wildlife, which is their natural heritage, whether they contribute funds for conservation or not . . .

Let me hasten to add that I am not an anti-hunting fanatic. As an animal scientist and conservationist of more than 40 years of experience, I know the value of controlled hunting as a wildlife management tool. I am also aware of the important contributions financial and otherwise, made by responsible hunters to wildlife conservation and management . . .

I, too, lament the fact that many persons who condemn hunters and hunting are woefully ignorant of what it's all about. However, denying these people the right to speak their thoughts—no matter how misguided or illogical they may be—is not the solution to the controversy of hunters versus anti-hunters. Education may be one way to help set the record straight, but such education must not consist of mudslinging or name-calling for these two tactics have never solved anything.

Perhaps when the anti-hunting faction learns more about the number of deer and wildlife species killed by cars and trucks on our highways—when they understand that allowing wildlife to overpopulate limited habitats ultimately leads to the destruction of that habitat and death by starvation and disease—and when they are given to understand (but not in an imperious manner) that hunters and fishermen have done and are doing more for wildlife conservation and management than most militant conservation organizations or individuals—then it may be that these people who now sweepingly condemn hunters and hunting may come to realize that the hunter and fishermen are not enemies of wildlife but advocates—and that wildlife dead from starvation, disease, and highway accidents is a prime example of a waste of natural resources.

N.J. OUTDOORS is doing an excellent job of educating the public in the overall wildlife conservation and management picture. The magazine should be in every school and library.

Sincerely yours,

Joseph J. McCoy, author of

SAVING OUR WILDLIFE, WILD ENEMIES, THE NATURE SLEUTHS, OUR CAPTIVE ANIMALS, etc.



DOES THE PINE BARRENS

BY J. ALBERT STARKEY

In spite of the pressure of encroaching land developments, the Anderson Tree Frog still thrives in the Pine Barrens of New Jersey. First reported in Anderson, South Carolina in 1853, only six specimens were known by 1904. All but the first had been found in New Jersey. The first comprehensive and definite survey and studies were made in the 1920's and, since that time, the frog has become known to herpetologists everywhere, and New Jersey continues to be the best source of information.

The Anderson, now more appropriately known as the Pine Barrens Tree Frog, is present in the bogs and

swamps of New Jersey's Pine Barrens. It is also known from many localities in North Carolina. In recent years, some new locations have been reported in South Carolina, Georgia, and Florida. It is not known to occur north of New Jersey and temperature is probably the controlling factor.

The sexes are look-alikes and the differences are not apparent on the casual look. The female is larger than the male and may be distinguished by the white band on the edge of the green patch under the jaw. The same patch on the male has a narrow white line or none at all. The throat of the male is dark to light





*Adult Pair,
Female Left,
Male Right*

Adult Pine Barrens Tree Frog



PHOTOGRAPHS SUPPLIED BY AUTHOR

TREE FROG HAVE A FUTURE?

Tadpoles



gray whereas the female has a very light gray or white throat. Color changes are limited to shades of green and are due to excitement, light, and possibly other factors.

The green color and retiring habits of the Pine Barrens Tree Frog make its detection difficult. It can be found only by a deliberate attempt to search it out. The frog will be found most frequently on highway blueberry bushes, scrub oaks, small pines and cedars. Occasionally it will be seen on the lower branches of big trees.

The Tree Frog prefers the small pools or ponds and the slow moving waters of the swamps for its breeding activities and does not move far from the water during its entire life. The typical breeding pond will contain the acidic brown waters so common in the Pine Barrens. This water promotes the growth of sphagnum moss which is a usual but not critical part of the habitat. The moss provides concealment and protection for the eggs and tadpoles. Sometimes the pools are of shallow depth and in drought conditions may become dry before the tadpoles mature and thousands of young frogs are lost.

In the typical location, the same breeding pools may have been used at an earlier date by the Spring Peeper, the Wood Frog, and possibly the New Jersey Chorus Frog, and the Carpenter Frog.

Studies of hydrogen ion concentration of the water in various breeding ponds indicate that this factor may well be the critical one for survival of the species. The waters of the Pine Barrens are notably acid by the specific location, the vegetation, the composition of the soil, and the sources of the water all help to determine the actual pH values. The pools favored by the Pine Barrens Tree Frog and the ones where they are successful, as measured by reproductive success, have a quite constant level of acidity of pH 3.5. Unusual weather conditions occasionally decrease the acidity to pH 4.5 to 5.0. It is probable that greater divergence from the normal level makes it impossible for the tadpoles to survive.

The increasing acidity of rainfall may have some future long term effect on the conditions for survival.

The Pine Barrens Tree Frog is a late caller with the height of its breeding season in May and June. The frequency of calling of the frogs on a warm spring evening decreases as the temperature drops after nightfall with a rather sharp cutoff of all voices in the 65 to 70 degree range.

This frog has only one call, best described as a "Quonk", which is repeated at short intervals for a more or less lengthy series of calls. One individual starts calling, others join in, and for a short time the entire colony, not including the females, is vocal. Almost suddenly all stop to repeat the performance a few minutes later. The interval between the group calls shortens as the temperature rises. Rain is a trigger and will cause the Pine Barrens Tree Frog to call at any time during the summer, after the breed-

ing season, and even into September.

During the early season most calls will be heard 50-100 feet from the ponds. As the days pass and the temperature slowly rises, more individuals approach closer to the perimeter of the pond. All of the frogs are not in the same state of readiness. The ready males, now on the ground, will call from the sphagnum at the edge of the wet area. The voice of the male is the principal factor to promote the actual meeting of the sexes. The females moves in as the male calls from the moss and amplexus usually follows shortly after.

Egg laying may begin within an hour after the pair has moved into shallow water. The two individuals do not separate from the first embrace until the egg laying process is completed. The eggs fall to the bottom of the pond individually although some may adhere to the plant life in the water. Swelling of the eggs begins quickly and they will hatch in four to five days.

The tadpoles are brown above with a gold to light gray belly. The tail fin is short and narrow. The newly hatched tadpoles feed on algae and other bits of organic matter. The bladderworts are a favorite food. They will also quickly skeletonize any of their own kind which do not survive from day to day. As the tadpoles continue to grow, a characteristic dark line appears in the upper half of the tail, with brown patches above and below.

The tadpoles will reach an average length of 30-35 millimeters before metamorphosis and will retain the brown color. The green coloration of the adult first appears after the four legs are grown and the tail fin is being absorbed. The time from egg to adult varies from as little as 40 days to 75 days or more. Local conditions, especially water temperature and food, influence the time required.

The young adult will not reach maturity until the second summer following its metamorphosis. It will eat any small insects, especially soft-bodied nymphs and larvae, which appear on the bushes which it frequents. It also feeds on the ground in moist areas. Sometime in October the Pine Barrens Tree Frog is ready for hibernation and a period of cold weather will cause it to hide and rest until the warm weather of the next spring.

There is present concern that the Pine Barrens Tree Frog will be unable to survive in the New Jersey Pine Barrens. Development pressures are enormous and the impact on the remaining open space is increasing. Thousands of acres of the Pine Barrens are presently being developed for housing or are being purchased for speculation. The larger ponds and bogs are being expanded for shoreline homesites, and the small ponds and swamps are being filled. If development of the continuous eastern city proceeds at its present rate, not only will the tree frog disappear, but the Pine Barrens itself may not survive.

If it can be recognized that a large portion of the Pine Barrens must be left untouched as an asset to society, the Pine Barrens Tree Frog, together with other wildlife can survive. □

Assunpink Wildlife Management Area

STONE TAVERN LAKE

Stone Tavern Lake is the product of the joint efforts of the U.S. Soil Conservation Service, the New Jersey Division of Fish, Game and Shellfisheries and the New Jersey Green Acres Program. It was built to provide flood protection for the Assunpink Creek drainage, fish and wildlife habitat and recreation; and it was first filled in 1971.

The fisheries management program here is directed toward a warmwater fishery based on largemouth bass as the major game species. Largemouth bass and bluegill were originally introduced in 1971.

Parking and launching facilities for both car top and trailer boats are available at two sites; one at the extreme eastern end of the lake and the other on the lake's south shore off of East Branch Road. Only electric motors are permitted. The majority of the impoundment's shoreline is readily accessible to bank fisherman.

During the fall the lake is a popular resting spot for migratory waterfowl which also makes it popular with duck hunters.

Location:

General: Assunpink Fish and Wildlife Management Area in western Monmouth and eastern Mercer Counties.

Specific: Near the center of the Fish and Wildlife Management Area, on Roosevelt Rd. which runs from Roosevelt to the Stone Tavern Crossroad on Monmouth County Route 524.

Chemical Factors:

pH: Slightly acidic, generally ranging from 6.0 to 6.8.

Dissolved Oxygen: Adequate for fish life at all depths except in summer when it is generally adequate only between the surface and a depth of 10 to 12 feet.

A variable level water release capability is a feature of the dam. It benefits the fish production capabilities of both the impoundment and the

stream below. Cold oxygenated water is maintained in the stream below and the volume of lake water capable of supporting fish is increased by the drawing off of some of the deep oxygen depleted waters that are present during the summer.

Productivity: Moderate

Biological Features:

Aquatic Vegetation: Limited to the perimeter shallow waters.

Water Color: Normally a slight reddish-brown (cedar) tint.

Fish and Fishing:

Largemouth bass: Excellent. Population checks have invariably found large numbers of bass in the two to three pound class. Reproductive success has not been sufficient to maintain year class strength in some years and in these instances supplemental stockings of yearling bass have been made.

Sunfish: Both bluegill and pumpkinseed are present, with the bluegill being the more numerous. Possibly as a result of their abundance, the growth-rate of the bluegill appears to be below average. Fishermen are encouraged to fish for and harvest these species.

Brown bullhead: Present, but not taken in great numbers.

Chain pickerel: Limited number present, none larger than 12" taken during surveys to date. Expected to increase in abundance and size.

Brook trout: An occasional "native" taken. Brook trout were present in the stream prior to its impoundment.

Other species: The following have been verified:

Creek chubsucker
Golden shiner



Take the plunge

SKIN/SCUBA DIVING OK'D IN TWO PARKS

Skin and scuba diving enthusiasts can enjoy the sports in both Round Valley and Spruce Run recreation areas as a result of revised regulations effected by DEP in late May. These water sports are now permitted provided a special use permit is obtained at the Spruce Run parks office.

Both recreation areas contain large bodies of water which are used for reservoirs as well as for boating, fishing and swimming. The areas, located near Clinton (Hunterdon County), are administered by the Bureau of Parks in DEP's Division of Parks and Forestry.



Author with a 20-pound carp.

bowfishing for carp

by Jim Fitzsimmons

PHOTOGRAPHS SUPPLIED BY AUTHOR

Carp busting has become a very popular sport these days and it is suspected that those who participate are really bow-hunters looking for some exciting and rewarding off-season action and are adding a whole new dimension to their bow sport. And all this is with good reason, for fishing is the oldest of all uses of the bow.

Regulations vary from state to state as to "what" and "when" concerning bow and arrow fishing. In New Jersey any species other than trout, bass, pickerel, walleye and northern pike may be taken by bow with a proper fishing license. That leaves bowfishermen open to take carp, eel, sucker, shad, turtle, herring and catfish as well as panfish. In New York the bowfisherman may shoot for ling, turbot, whitefish, mullet, carp, catfish, dogfish, bullheads, suckers, garpike, eels, herring and sheephead.

Gear for carp or other bowfishing is quite simple since the line-holding attachment can be store-bought or home-made as long as the line (50 to 70 lb. braided nylon works well) flows freely upon the release of the arrow. Any bow will do but 25- to 50-pound pull works



Carp taken from the Passaic River near its headwaters.

the best. Best thing is to use the deer-hunting bow to get better used to handling it! The arrow must be heavy —glass is best—and it should also be longer than your usual hunting arrow. For only a few dollars you can purchase proper fishing arrow with an attached fishing head. Polaroid-type sun glasses are almost essential to help you cut through that glare on the water's surface.

Carp are wary and fast and have to be stalked as one would stalk a game animal. In early spring during the spawning period the carp can boil the water all around —offering great and easy bowfishing. Later on, however, carp fishing becomes a good deal more of a contest between the bowfisherman and the fish. This is when you find the carp rooting up the weeds and the mud in shallow waters and you have to look quick and long to find a sign of the fish.

More importantly—don't look down your nose at the carp as a food fish. There are plenty of recipe books that give good and tasty blueprints on how to make the common fish a delight to eat. □



Dick Neubert of Nutley with carp catch.



poor man's big game

And the quarry is Shark!

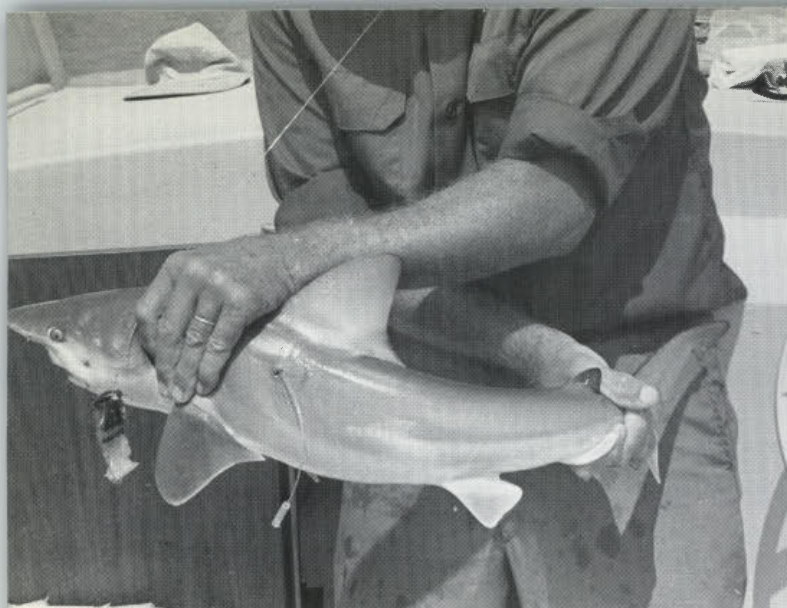
by bob mangold

At some time in the life of the average salt water fisherman, he gets an "itch". In some of us this "itch" grows into an incurable disease; in others it just remains an unsatisfied desire. I'm talking about big game fishing. Some of us have the financial ability to get rid of that "itch", while others are able to scratch the "itch" in some other way.

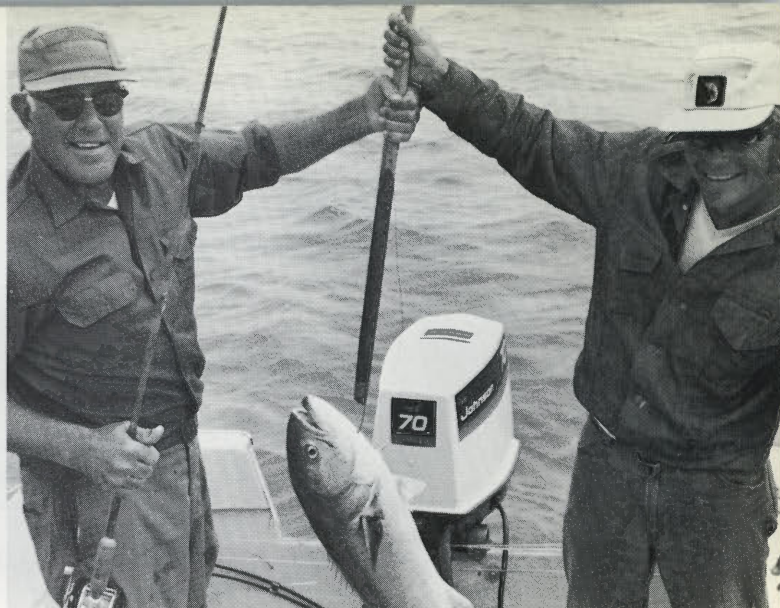
In my case, a 14-foot boat and a reasonable set of tackle—such as an inexpensive rod and conventional reel capable of holding 200 yards of 30- to 40-pound monofilament line, a coil of leader wire, and a handful of 8/0 hooks is enough equipment to provide hours of fun and excitement on nearly any day between the end of June and early September.

I fish for shark in New Jersey's Great Bay, but there are probably other estuaries where this sport is practiced. Delaware Bay has a number of sharks, also.

Let's try a trip and see how it goes. First, the bait and chum. In April, the mackerel are off our coast, and it's no trouble to catch a quantity—in fact, it's a lot of fun! These I put in groups of five in plastic bags and drop in the freezer. A bag of mackerel provides both chum and bait. Cut up or ground up, one or two fish provides plenty of chum for a couple hours' fun. Another mackerel is cut into quarters, halves, or fished whole if you want larger sharks. Use smaller chunks if you're "chicken." Mossbunker, weakfish, or any fish will also work well.



Tagging the Shark



A Bonus Blue

To rig up, I wrap about four feet of wire leader onto an 8/0 hook, bend a swivel onto the other end, and attach a float, usually a square of styrofoam, slit and held by a rubber band, onto my line. If I'm looking for larger sharks, I also use about 15 or 20 feet of 80- or 100-lb. monofilament leader.

Anchor the boat, cast the bait out 15 or 20 yards, put the click on and the reel in free spool, set the rod in a safe place and proceed to get the chum line going. Seldom do I have to wait more than a quarter or a half hour before — zzzzzz — off goes the click. On some days I don't even have time to get the chum line started before the first "customer" tries the bait. Let him take it so the line runs out steadily, then — sock it to him! And hang on!

The sharks usually found in our bays during summer months are three — the Smooth Dogfish, which has no teeth; the Sandbar Shark or Brown Shark; and the Sand or Sand Tiger Shark. When using a float, I've never caught a Dogfish. Nearly all of the toothed sharks in the bays turn out to be Sandbars, which range from "pups" of 18 to 24 inches to adult females up to about seven feet and 125 to 150 pounds. One out of ten or so will be a Sand Shark. Those I've tangled with range from about five to seven feet and probably weigh less, per foot, than the Sandbar, but can range up to eleven feet in length. It's also possible to hook into a Bull Shark which may go to eleven feet.

You don't just haul in one of the bigger sharks, it takes some time. In fact, I usually have a float tied to the anchor line, so I can cast off and chase a big one. I've had to do just that on several occasions.

Why are they in this shallow water? I don't know about the Sand Sharks, but the Sandbar Sharks come in to "pup" — have their young, which are born alive. They probably also feed on crabs, turtles and schooling fish such as weakfish.

I've had the best luck by getting where I want to fish at high tide and fishing a couple hours on the ebb. The best locations seem to be in sloughs adjacent to bars, just behind the inlets. The tide runs too fast in some locations, so I look for those places where I have six or seven feet of water and a moderate flow. If I don't have any "hits" within half an hour, I move. When the ocean is calm, I've gone outside and jigged up weakfish for bait. In the ocean near the beach, I've caught three species of shark; Sandbar Shark, also the Dusky Shark and the Hammerhead. The Dusky will hit slowly trolled bait, and even artificial lures at times. The Hammerhead is usually seen on the surface, and baited by sight. It sometimes takes a bit of teasing to get him to take the bait.

What do I do with so many sharks? I tag nearly all of them and release them. The tags are provided by the U. S. National Marine Fisheries Service. In 1974, I tagged 89; in 1973, about 75; and in 1972, about 90. The best year for recoveries was 1972, when five Sandbars and one Dusky were reported caught. The Dusky was about 280 miles south of where I tagged him. Nearly all of the sharks are caught in the corner of the mouth, and by using care, a shark can easily be tagged and the leader cut, leaving the cheap hook to rust out. The Sandbars, if hurt or gut-hooked, can be killed, cleaned and put on ice immediately, to be made into poor man's swordfish steaks.

The last time I went shark fishing, I took a couple friends along, as the accompanying photos indicate. We tagged about ten sharks, but also got an unexpected bonus in the form of a 16-pound bluefish.

If you should catch the "poor man's big game", look closely for a tag placed near the dorsal fin. Instructions are found inside the capsule, and upon return to the address provided, a five dollar reward will be sent to you. □



ALLAIRE STATE PARK

Allaire State Park is 2,500 acres of woodland located in the southern part of Monmouth County bordered on the South by the Manasquan River. Allaire combines the unique features of having a historic village, a day use arena, and overnight camping all within the same area.

Allaire is located just outside Farmingdale on Route 524, just minutes from the Garden State Parkway. Nearby points of interest include Point Pleasant Beach (20 minutes), Asbury Park (30 minutes), and Great Adventure (30 minutes).

The camping facilities at Allaire were originally opened in 1963 and remained open until the fall of 1970 when they were closed for major renovations. The campsites again opened for public use in 1973 with a new water and sanitation system in conjunction with a modern laundry shower house facility. There are 55 family campsites which will accommodate almost any type of camping equipment or recreation vehicle. However, there are no hook-up connections available. The park also offers two group camping areas and the campgrounds are open year round. The park is very popular during the summer months when a family can camp for \$3.50 a night and visit nearby ocean beaches during the day.

The historic village of Allaire is open during weekends in March and the full time, 7 days a week, 10 a.m. to 5 p.m., from April through October. The village consists of buildings dating back to the early 1800's most being restored to near perfect condition.

The Allaire Nature Center offers environmental and educational programs during the summer. The Nature Center is located off of Hurley Pond Road. This is also the starting point of some of the park nature trails. Allaire offers one of the few Braille trails for the blind.

Other activities available at Allaire State Park include fishing on the Manasquan River, large picnic areas, childrens play field, horseback riding trails (approximately 6 miles), and old time narrow gauge railroad train rides.

Allaire was the site of a bog ore furnace and forge where iron was smelted and made into numerous products and utensils of that era.

Bog ore, the source of iron in the New Jersey Coastal Plain, is unique in its formation. It consists of iron oxides deposited in decaying vegetation in swampy areas.

The site of Allaire, first known as Monmouth Furnace, and then Howell Works, was originally occupied by a sawmill in 1750. Benjamin B. Howell is the first known operator of the property as an iron works. He leased the property in 1821 and it became known as the Howell Works at that time.

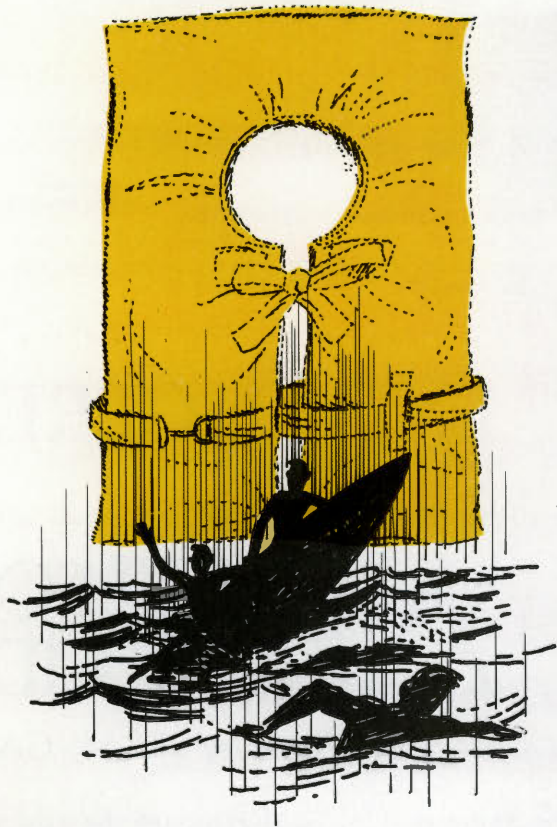
In 1822 James P. Allaire, of New York, purchased the works and commenced operations. Allaire was originally a brass "founder" in New York City and later established an iron foundry there, where he built engines and boilers. He cast with his own hands the brass air chamber for Robert Fulton's famous Clermont. In his New York shop the cylinder of the Savannah, the first American steamship to cross the Atlantic, was cast in 1819. He developed at Allaire a complete and self-contained community with church and school, employing as many as 500 men in a diversity of crafts.

Allaire is significant in our industrial history because most of the buildings used during its heyday as an operating furnace and forge are still standing.

After Arthur Brisbane, famous newspaperman, acquired the property, the Monmouth Council Boy Scouts used Allaire as a headquarters for some years, contributing to its restoration during that period. In 1941, Mr. Brisbane's widow deeded the Deserted Village and other property to the State for park purposes. Only in very recent years have funds been provided to establish recreational facilities.

In 1957 a non-profit corporation to raise funds from private sources for restoration purposes was sponsored by the Monmouth County Planning Board. The corporation, composed of representation from important groups of Monmouth County and representatives of the Department of Environmental Protection, acts through a Board of Trustees for the purpose of raising funds for restoration. Through this medium the Historic Howell Works is being restored to its former charm.

More available information contact: Allaire State Park, P.O. Box 218, Farmingdale, New Jersey 07727. Telephone: 201-938-2371. □



**Keep Life Jackets On
or Nearby!!!**

NEW JERSEY MARINE POLICE CASE M5002

(Based on actual cases. Places, names and times may have been altered to preserve anonymity of participants and/or victims)

As Joe drove into the marina about 8:30 A.M. he spied with happy anticipation the boat his friend Sam had recently bought. It was a 28-foot "Cigarette" type ocean racer with 8 foot beam, on which Sam had added a 12 foot tuna tower. "I figure this baby'll get me out to where the fish are, fast" Sam had explained, "And maybe some day I'll want to race it." Joe had chuckled at this.

In his opinion, men of his age had no business ocean racing; it pounded the bejabbers out of you—and Sam was nearly sixty, two or three years older than Joe.

But she sure looked fast with her needle nose and slim racy lines. Joe thought it was real nice of Sam to have invited him out in her for today's fishing trip and he hoped that the 20-25 mile winds and pretty rough chop would lessen, or at least get no worse.

Sam and his father-in-law were already on the boat with the engines warming up, and within a few minutes of Joe's arrival the trio, in the boat's rear cockpit, headed for open sea.

Within minutes that fast boat was 5 or 6 miles from shore, and Sam looked about for other boats or groups of boats fishing so as to get a clue to where the fish might be biting. Very few other boats were out in the heavy chop and brisk wind, and none were fishing. "We'll try a spot closer in shore" Sam shouted over the roar of the engines, as he swung the boat about.

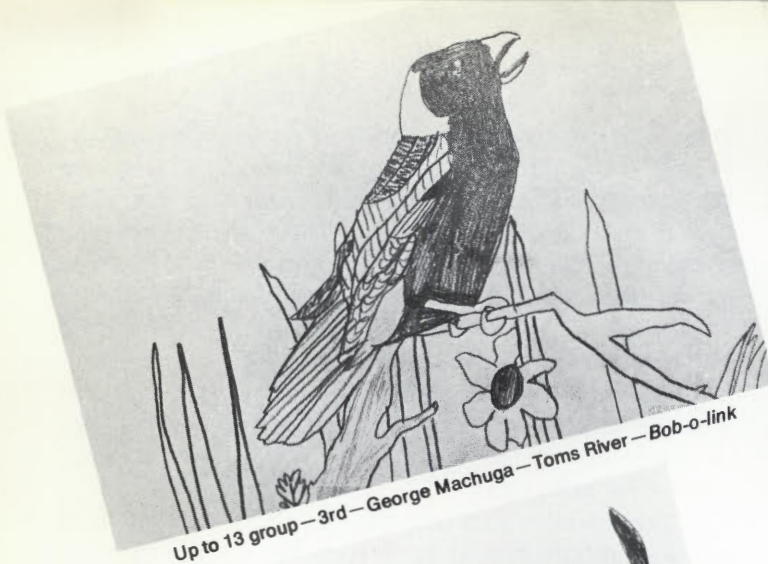
Running in to about 3 miles offshore, Sam cut the throttle on the fast moving boat which, dropping from semi-plane, squatted into the water. The following seas and the boat's wake rolled up and over the stern, flooding the after cockpit. In an instant, the boat was sinking, stern first. The three men found themselves in the water with no chance of reaching the life jackets which were "safely" stored in a compartment in the forward cockpit.

For a few minutes a small portion of the bow remained above the water with the three men clinging to it. No other boats were in sight. Knowing that Sam had a heart condition and feeling that neither he or his father-in-law, a man in the eighties, could possibly keep afloat for long, Joe determined to try to swim ashore for help. Just before the last inches of the boat disappeared into the depths, Joe managed to help the other two make emergency floats out of their trousers—then Joe struck out for the distant shore.

Six hours later, only semi-conscious and barely still swimming, Joe was spotted a few hundred yards off the inlet jetty by a boat going out. He was quickly hauled aboard; help was summoned by radio, and the rescuing boat sped to the nearest pier.

Before Joe was whisked off to a nearby hospital, he managed to tell the story of the sinking; and a massive search began for his two companions. Hour after weary hour the New Jersey Marine Police boats and Coast Guard boats and helicopters searched the area for the missing men—but to no avail. Both had drowned and their bodies were not recovered for many days.

Joe will always remember his terrifying experience—and the New Jersey Marine Police hope all boaters remember that personal flotation devices are of no value unless they are readily accessible to persons on board. Sam and his father-in-law might be alive today had they been able to get to theirs. □



Up to 13 group—3rd—George Machuga—Toms River—Bob-o-link



14-18 group
3rd—Eric Sambol—Toms River
Red Shouldered Hawk



Senior Group Winners—ages 14-18
PHOTO BY PETE McLAIN
Left to Right: Mort and Betty Cooper, Karen Ann Yaksich,
Ricky Tilton, Eric Sambol, and Lorraine Dey; Rear Row,
John Pastore

ENDANGERED SPECIES ART FOR KIDS

Story and Photos by LEE M. GANT

The Ocean Nature and Conservation Society, an active group of nature lovers from the fast growing Ocean County area, recently launched an art contest for youngsters.

It involved picking out one of the known species of birds and animals on the endangered or threatened lists, doing a good bit of research, and entering a black and white drawing in the contest.

The purpose was twofold, according to Betty Cooper, president of the club. First and definitely not the most important she was quick to point out, it would offer artwork for future Society publications. This, club members felt, would motivate the artists.

The real reason, although they didn't shout it out, was that in the process of entering the contest many people, youngsters and their parents, would become more aware of the plight of the endangered and threatened species. It would focus attention on these birds and animals which was by far more important than merely obtaining art work. It was sort of like giving a kid a dose of medicine that tasted like candy.

Mrs. Cooper said the response was so spontaneous that two sets of prizes were awarded instead of one. There were almost 200 entrants and five awards were given in the group to age 13 and five were given to those from 14 to 18.

The contest was advertised through the local news media and all contestants were given only the lists of endangered and threatened species. The choice was his or her own and research was a necessity.

In the older group the prize winners were:

- 1st—Karen Ann Yaksich, 16, Jackson Township, Pine Barrens tree frog;
- 2nd—Ricky Tilton, 16, Toms River, bobcat;
- 3rd—Eric Sambol, Toms River, red shouldered hawk;
- 4th—John Pastore, 16, Toms River, bobcat, and
- 4th—Lorraine Day, Toms River, red shouldered hawk.

The younger winners were:

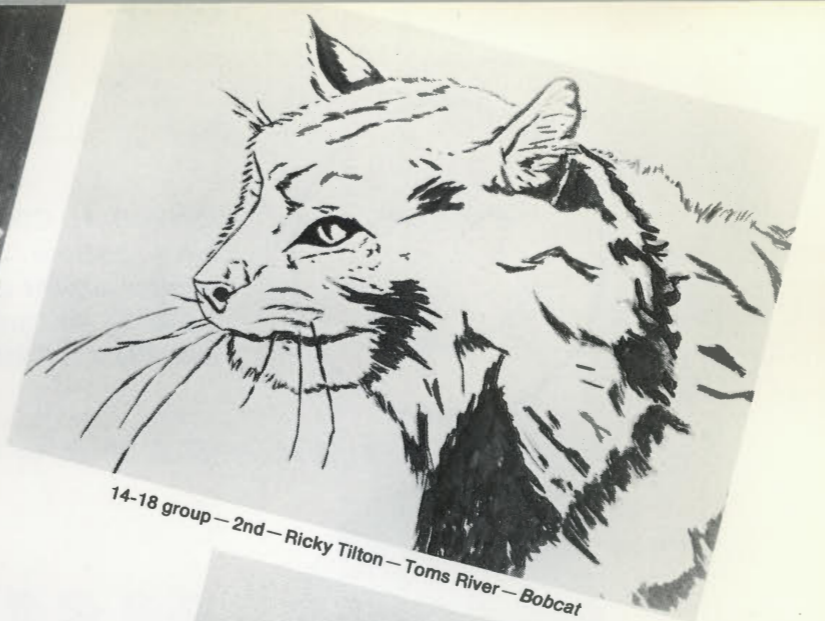
- 1st—Ellen Doboy, 12, Toms River, Eastern tiger salamander;
- 2nd—Larry Dobeck, 11, Toms River, short nosed sturgeon;
- 3rd—George Machuga, Toms River, bob-o-link;
- 4th—Ellen Doboy (see above), Pine Barren tree frog, and
- 4th—Andrew Ciufra, 9, Toms River, redheaded woodpecker.

A special award was presented to seven year old Keith Campo for his picture titled "Conservation in Action."

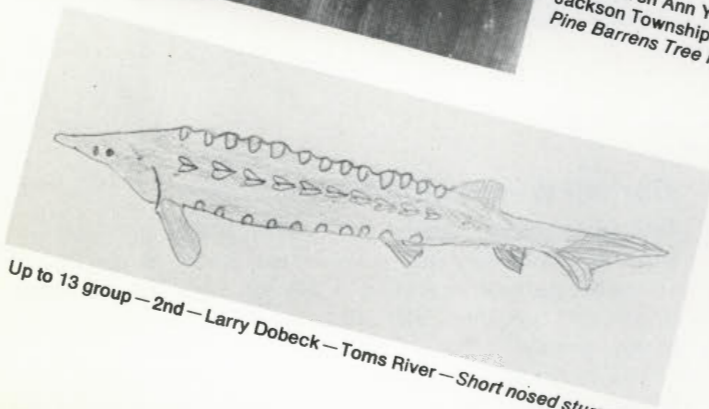


Pine Barrens
Tree Frog

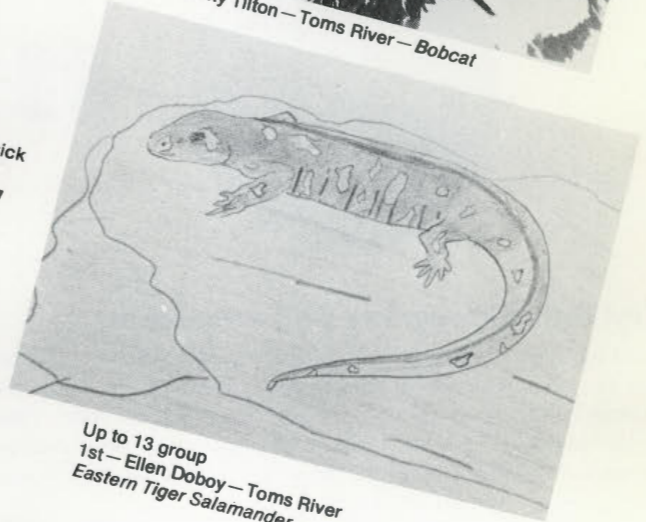
14-18 group
1st—Karen Ann Yaksick
Jackson Township
Pine Barrens Tree Frog



14-18 group—2nd—Ricky Tilton—Toms River—Bobcat



Up to 13 group—2nd—Larry Dobeck—Toms River—Short nosed sturgeon



Up to 13 group
1st—Ellen Dobby—Toms River
Eastern Tiger Salamander

The active Ocean Nature and Conservation Society was founded in February of 1966. A. Morton Cooper and his wife, Betty, both active nature lovers and conservationists, felt the need for some kind of a nature club in Ocean County.

They contacted many people and the response was almost always the same; I don't have the time to do anything but I would support such a venture was the gist of the responses.

It was with some hesitation and a lot of reservations the Coopers and four others called their first meeting. They were prepared for the worst but felt they had to try.

But the response was overwhelming. Eighty people signed up the first night and today there are more than 500 members. Meetings are held in the Ocean County Courthouse once a month.

Many local guests are featured, speaking on a number of important and interesting subjects. Colorful and informative slide shows are common and often times draw overflowing crowds, like the latest one last month on wild flowers at Double Trouble Cranberry bogs in Berkeley Township.

Once or twice a year, as funds permit, a nationally

or internationally known speaker is scheduled.

Society members take many field trips and it isn't at all uncommon to see caravans of cars, sometimes 20 or more, winding their way through the back roads in the pines or heading to one or another of the bird sanctuaries.

Several trips have even been taken out of state.

Members of this society are doers and take definite stands on pertinent issues of local, state and national importance. They are constantly bombarding people with letters where they think it will do the most good.

This group was one of the first to take a stand against the proposed jet port in the pines of a few years back. This airport would have cut a swath through the mysterious and magnificent Pine Barrens causing irreparable damage.

There are those who feel the State of New Jersey could use more groups as active and as positive in their thinking as the Ocean Nature and Conservation Society.

Through their actions with such interesting and constructive ventures as the recent art show, the public is being made aware of some of the ecological and environmental problems being faced by New Jerseyans. □



EDITORIAL COMMENT: *In line with our editorial posture and in support of material printed in past issues of NEW JERSEY OUT-DOORS, we are presenting some excerpts and fillers reprinted from a variety of sources.*



nuff said?

EPA Sets Throwaway Ban Precedent

The Environmental Protection Agency is drawing up rules to ban the sale and use of throwaway cans and bottles at all federal installations to save energy and reduce litter. This action will give another boost to the state and local movements to ban non-returnable beverage containers that have been gaining momentum in recent years.

Audubon Leader



EPA predicted a 5.4% increase

in employment in the beverage industry under a returnable system, and it could save consumers as much as \$1.5 billion a year because each use of a returnable container would cut beverage company costs and such production savings could be passed along to consumers. Sierra Club National News Release.

Echo Issues, Buffalo Museum of Science, New York



No Deposit—No Return

The Task Force on Critical Problems of the New York State Senate has recommended enactment of mandatory deposits on all beer and soft drink containers, whether they be refillable, non-refillable or cans. The task force predicts that mandatory deposits would result in a dramatic shift to 80-90% refillable container manufacturing.

It is estimated that the energy costs saved by the use of refillable containers would be equal in gasoline energy to a cash value of \$96 million. The environmental impact? Container litter would be cut by two-thirds; reduction in beverage container solid waste by three-fifths; and a decrease in consumption of 615,000 tons of glass, 60,000 tons of steel and 10,000 tons of aluminum.

Environmental Synopsis—Cornell University

Cornell Wins Bottle Bill Victory

Environmentalists, led by the tireless efforts of Professor Richard B. Fischer, won a significant victory as the Cornell University Senate approved a bill requiring the University to sell only reusable, refillable soft drink containers on parts of the campus.

The move was applauded by Ralph Nader's New York Public Interest Research Group. They plan on using the Cornell example for a high-priority effort to bring about such legislation on campuses across the nation.

Congratulations have also been received from the President's Citizens' Advisory Committee on Environmental Quality. Director Lawrence Stevens, writing from Washington, D.C., stated Cornell's action, "will set a fine example for other institutions elsewhere." It has caused the University "to assume a leadership role on an emerging issue of great national importance."

Other colleges and universities interested in the Cornell Plan should address their inquiries to Dr. Fischer at 16 Stone Hall, Cornell University, Ithaca, New York.



The South Dakota "Bottle Bill"

goes into effect in July, 1976—bans all soft-drink and beer containers that are not refillable or biodegradable, decomposing naturally over a period of time. The law is ambiguous in its present form say experts, and will have to be clarified by court action or additional legislation.

U.S. News and World Report, 13 May 1974.



Harrisburg, Pa.

The Pennsylvania Federation of Sportsmen's Clubs (with 180,000 members) have joined PAR in helping to pass returnable bottle legislation.

Penna. Alliance for Returnables, Harrisburg, Pa.



Trash Dumped at Turkey Swamp Wildlife Management Area.
Photo supplied by L. Perosi Jr. and J. T. Macones

Crusade for a Cleaner Environment

says that more than nine million people could be supplied with electricity for an entire year by the energy wasted during 1972 through use of throwaway containers rather than returnable bottles for soft drinks and beer. The group also estimates that the energy wasted by throwaway bottles and cans last year was the equivalent of approximately 1.7 billion gallons of gasoline—enough to operate nearly 1,700,000 automobiles averaging 10 miles per gallon for a typical driving year of 10,000 miles.

Econotes, Harrisburg, Pa. April 1974.



**To: The Editor, Fortune Magazine,
 Washington, D.C.**

**From: N. E. Norton, President, Dr. Pepper-
 Royal Crown Bottling Co., Texas.**

As an environmentally-concerned soft drink bottler, I was somewhat surprised and disappointed by your June editorial in opposition to the pending Senate bill . . . you appear to have accepted without question many of the anti-returnable bottle claims made by a coalition of large bottlers, retailers and container manufacturers. . . . If present trends toward throwaway containers continue, less than 2,000 soft drink bottlers will be in operation in the U.S. by 1980, whereas in 1960 there were over 4,500. This same process of concentration in a few large companies took place in the beer industry about 15 years ago, reducing the number of breweries in the U.S. from 262 in 1958 to the present 64, and to a predicted 30 by 1980.

While we wait for beverage container recycling technology to mature, our energy and resource supplies will be further depleted, consumers will continue to pay more for their soft drinks and beer, and more small bottlers will be driven out of business. Or we can solve the problem now by returning to the returnable-deposit system.

Vermont

After one year, Vermont's bottle deposit law has won the support of farmers who have found that they saved at least a week's work of cleaning up bottles and cans off their land before spring planting. Representing a number of environmental groups which favor the law, Tom Kimball of the National Wildlife Federation testified how much energy and materials would be saved by a return to returnables—the equivalent of 115,000 barrels of oil per day plus two to three million tons of raw material each year.

Organic Gardening, Sept. 1974.



**From: Mr. Will Osborn, President,
 Northern Arizona Audubon Society
 To: Senator Paul Fannin, Washington**

Your letter of February 15 stated that state-level solution of this (throwaway container) problem was closer to the people and preferable for that reason. I don't believe this. I believe U.S. Senators and Congressmen are as close to the constituents who write them as the state legislators to whom they must write if the issue is on a state-level.

If the ban of throwaways is achieved nationally, the only enforcement needed is that packaging plants convert to reusables. No new bureaucracy is needed for this, as some aver.

The giants in the industry who do so well with throwaways know that return shipping costs for reusables will be too much at big distances. This will give back business to local bottlers whose franchises have been bought by the big ones, as it has worked out in Oregon.

Annually throwaways waste power equal to amount produced by ten nuclear power plants operating at maximum capacity.



**Environmental Action Bulletin
 EPA's deputy administrator
 John R. Quarles Jr.**

Rebutted contentions that severe job dislocations would occur. He quoted studies showing 60,000 jobs would be lost in the container-making industry, but that 60,000 jobs would be created in the retailing and distribution businesses. He said that the Bureau of Labor Statistics estimates the displaced workers would have 70 other jobs open to them "in the same occupational category."

BATSTO

