

A photograph of a person with short dark hair, seen in profile from the side, fishing in a stream. They are wearing a light blue long-sleeved shirt and blue jeans. A fishing rod is held in their hands, and a fishing net is visible behind them. The background is a dark, wooded area. The person has a small white object in their mouth. On the back of their shirt, the words "FREE PUBLIC LIBRARY" are visible in purple.

March/April 1980

New Jersey  
**OUTDOORS**





Brendan T. Byrne  
Governor

APR 5 - 1980

TRENTON, NEW JERSEY  
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# from the editor

## Guest Editorial: Our 10th Anniversary

April 22, 1980 will mark the 10th anniversary of the establishment of the New Jersey Department of Environmental Protection. This date also marks the 10th anniversary of the first Earth Day. The people at DEP, along with many other New Jerseyans from all walks of life, are planning to celebrate this event and I would like to invite each and everyone of you to take part.

Within this issue of *New Jersey Outdoors* you will see some of the reasons why we at DEP plan to celebrate. You will understand that the past 10 years have provided us with the necessary tools to bring an end to the senseless degradation and endangerment of our precious air, water, and wildlife. You will see that a firm foundation has been laid for the preservation and enhancement of our often unique natural resources, such as the Pinelands and our coastal areas.

As readers of *New Jersey Outdoors*, you should be proud of the years of hard work and struggle which have been devoted to building this foundation. You can be confident in the level of professional and technical expertise which has been marshalled throughout the State to deal with our often unique environmental problems. And you can be secure in the knowledge that we have formed an effective partnership among the state's many competing public and private interests in order to resolve environmental conflicts and protect the environment.

Most importantly, however, I want the readers of *New Jersey Outdoors* to recognize that we face a crucial challenge as we enter the 1980's. The 1970's were a decade in which we laid a solid foundation for protecting the quality of life and the health of the

citizens of this state. During the past decade we launched aggressive programs for the protection and enhancement of all facets of the environment. But the crossroads at which we stand in the 1980's will be a test of our ability to mold this foundation to meet the needs of a diverse and ever-changing society.

I believe that our 10th anniversary is an appropriate time to foster a dialogue concerning how we can best face this challenge. The activities which DEP has planned throughout the State for celebrating Earth Week, which has been designated as April 19 through 25, are designed to promote this type of dialogue. Many other opportunities for involvement will be available at the local level, as local environmental and community organizations voice their point of view regarding pressing environmental issues.

As you read through the pages of this issue of *New Jersey Outdoors*, I think you will agree that this Department has every right to be proud of its past. But, as I stated above, I believe the second environmental decade will prove even more challenging than the first. The ravages of inflation, unemployment, and our current insecurity regarding future energy supplies, are the crucial issues at the forefront of the public mind. We must compete with these and other crucial issues in the months and years to come.

If we are to effectively meet the environmental challenge in this decade, the support and commitment of all New Jersey citizens is essential. This is why I urge you to be involved in the coming celebration of Earth Week; so that your voice will be heard among those pointing our direction for environmental action in the 1980's and into the 21st Century.

Jerry Fitzgerald English  
Commissioner

## IN THIS ISSUE:

Maybe the weather doesn't feel like it, but Spring is just around the bend. I know that's so because I read that April 12 is opening day for trout fishing in our state. And if you want to be a successful trout angler, read *The Angler's Diary* by Allen G. Eastby. Author Eastby, a frequent contributor, says "those who know the *wheres*, *whens*, and *hows* of fishing are the ones who catch the biggest and most fish." So take heed.

If you prefer salt water fishing and you don't mind that nip in the early Spring air, try *Stalking the Winter Flounder* by Dr. Oliver Donovan. Author Donovan tells us when to go, where to go, and how to get them. We're talking about winter flounder.

And since we're in a fishing groove, read *Portrait of a Fisherman* by Eileen M. Van Kirk. Author Van Kirk introduces us to Lois Tatham, a transplanted New

Englander, who has been fishing our New Jersey streams for over 20 years—and with some success I might add.

Also, during this time of year, Jack Kligerman will be *Watching Wildflowers* grow. Not only does Author Kligerman watch them grow, but he also photographs them, and sometimes makes a tea or tonic from some species.

In the article *Lake Edge* at *Absegami*, Ted Chando reflects on

*Continued on page 18*

**New Jersey State Library**



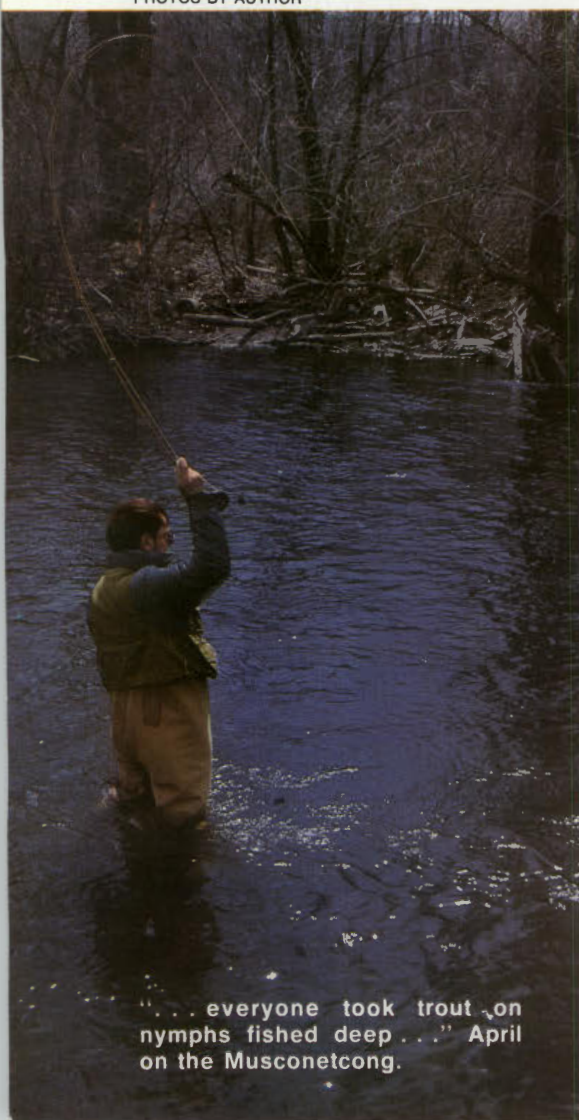


# The Angler's Diary

by Allen G. Eastby

PHOTOS BY AUTHOR

"... high water ..." June on the Big Flatbrook.



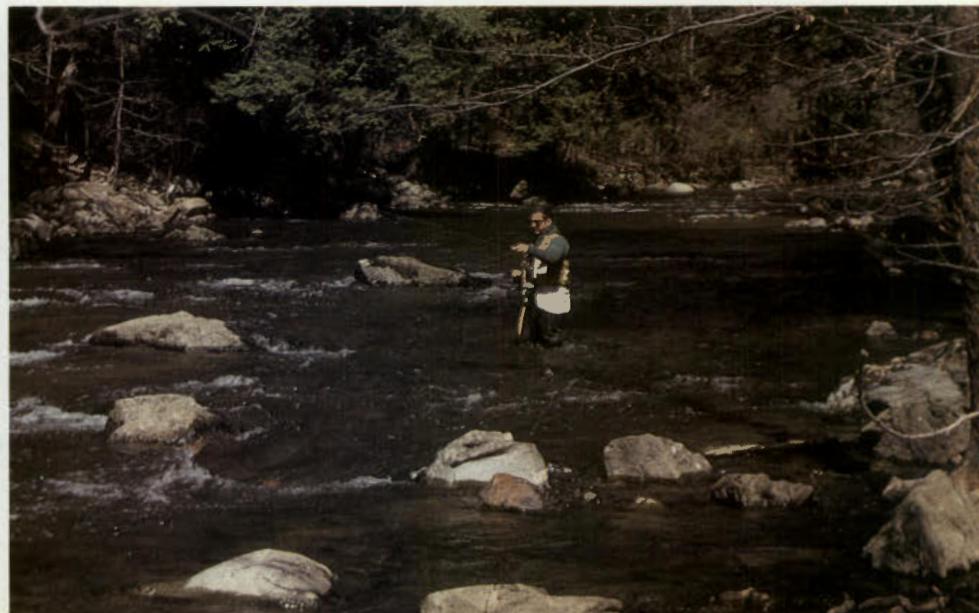
Everyone knows that knowledge spells the difference between "expert" anglers and other fishermen. Those who know the *wheres*, *whens*, and *hows* of fishing are the ones who catch the biggest and the most fish. It matters not if you stalk trout on a heavily fished stream, chase bass on a sweeping impoundment, or seek stripers in the tumbling surf, the key to success is *knowing* the quarry and

the water. The more an angler knows about fish, the deeper that person's understanding of the interaction of fish and their environment, the better the chances of taking fish of the size and number we all like to catch.

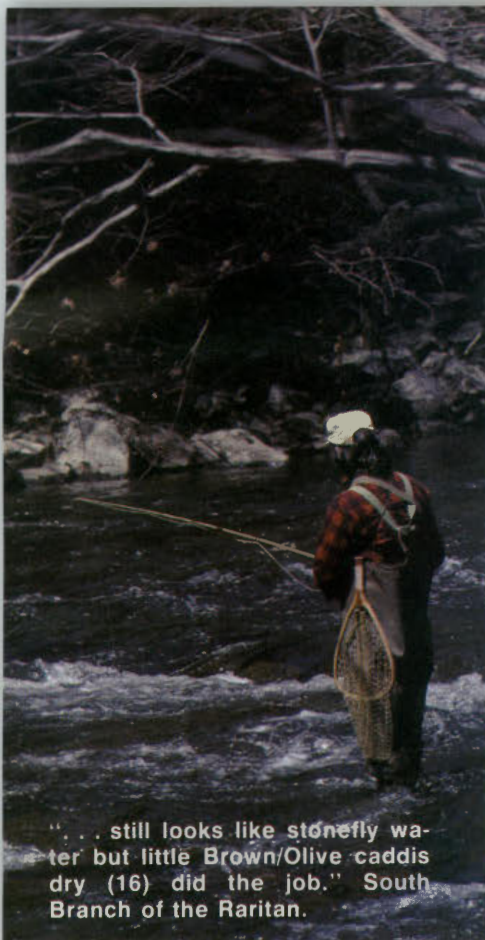
Much information—some good, some bad, but all useful—can be garnered from books and magazine articles. Friends and acquaintances often have insights to share or tips to

"... looks like stonefly water. Check it out." The South Branch of the Raritan.

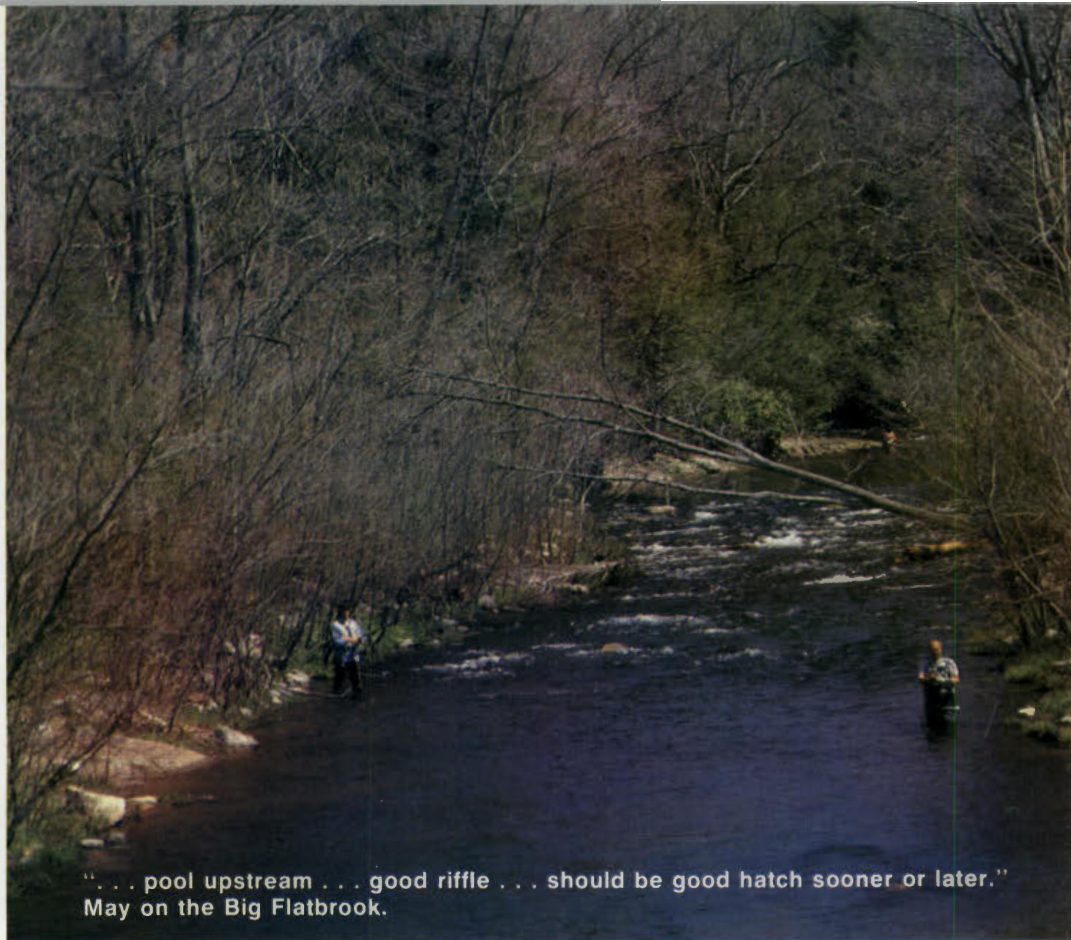
"... everyone took trout on nymphs fished deep ..." April on the Musconetcong.







"... still looks like stonefly water but little Brown/Olive caddis dry (16) did the job." South Branch of the Raritan.



"... pool upstream ... good riffle ... should be good hatch sooner or later." May on the Big Flatbrook.

pass along. But the best teacher is experience—experience gained while fishing.

Most of us believe we have good memories, at least when it comes to fishing. We like to think that we can recall every detail of those certain, special mornings when everything went right and every cast ended with a trout sliding into the net or that all-too-brief fall afternoon when the bass shredded every plastic worm in the tackle box. Perhaps the fly or lure used now resides in a little plastic box, a cherished memento of the best of days. But how accurately do our memories reflect the realities? Then there is another question of greater importance: Why were those days so exceptional?

While we may believe firmly that we remember the important aspects of our fishing experience, memory plays tricks on us. Seldom can we recollect everything, and as often as not the most significant things are forgotten—if they were ever recognized to begin with. Then too, a hazy, happy, smile-filled reminiscence of a day of extraordinary angling does little to help us enjoy other such

days. But it is not difficult to build up a body of knowledge about fish and fishing that will make better fishermen of us all without relying solely on memory.

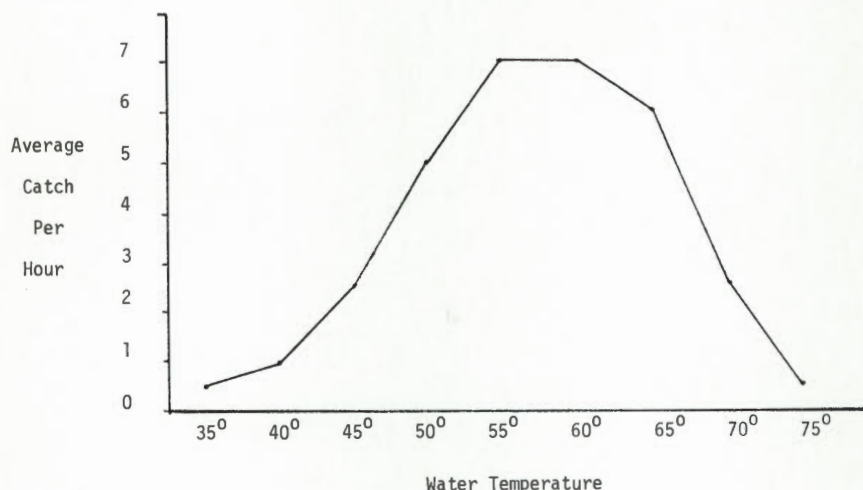
The key to using fishing experience is the angling diary: a record of where, when, and how fish were caught. Although some anglers have started keeping records, few do a really good job of it.

The details of a fishing diary are largely a matter of personal conviction about what is important, and entries can vary from the exhaustively complete to the sparsely simple. My diary, I like to think, strikes a happy balance between extremes. Needless to say, the date and the name of the lake or stream and a description of the area are necessary. Beyond that, I want to have a clear record of weather and water conditions. Temperature, wind (strength and direction—close estimates are ample), air pressure, clouds, and precipitation are noted morning, noon, and late afternoon as are water level, water temperature, and water clarity. Space is also re-

served for one of the most important salt water factors: tide. Since I prefer to use a fly rod wherever and whenever possible, I make as careful and complete a record as possible of the insects, both aquatic and terrestrial, encountered during a day's fishing. I also like to keep track of the species of small fish common to the water. Knowing that a particular lake holds alewives or a stream hosts black-nosed dace can be that little extra advantage that is needed. Then of course I note the fish caught: where, when, and on what.

There is a great deal more that I often include if I have the equipment handy or feel the inclination and if I'm not too busy fishing. In this age of gadgetry, many anglers, especially those specializing in lake fishing, deploy an arsenal full of instruments. Oxygen content, pH, and bottom contours can be readily ascertained with the help of meters and depth sounders that are part of the standard gear of many bass boats. However, stream or river anglers, or fishermen with a more direct approach, will not find themselves hampered by the lack of expensive technology.



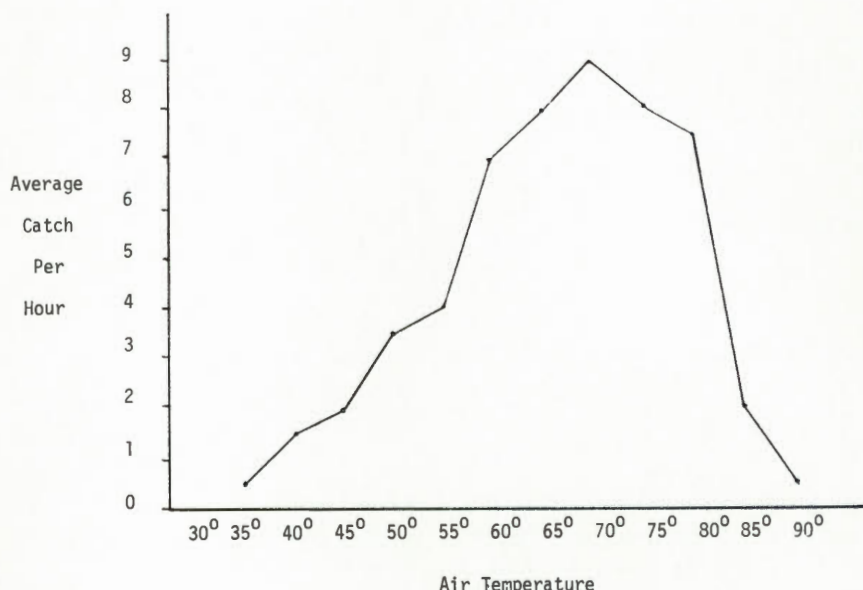


## TROUT AND TEMPERATURE

Every fisherman is aware of how crucial water temperature is for trout and trout fishing.

Based upon three years of records, I found that I had the best results when the water temperature was between 50 and 65 degree fahrenheit. Knowing this, and using a stream thermometer, I can accurately gauge when the best time to fish is likely to occur.

Air temperature, too, is apparently important. Surprisingly, I found little difference in the rate at which I have caught trout on days when the temperature was in the 60's and days when it hovered around the 80 degree mark. I also confirmed a suspicion: There is no point in risking frostbite or heat stroke. I just don't catch trout on cold or hot days.



Testing kits for oxygen and pH are available from biological supply houses. Furthermore, although I have what seems to me a mountain of data on pH (it probably wouldn't

impress a scientist, but then I'm only a fisherman), I find that it is not as useful on local streams as simple notations of air and water temperatures. But as you slide the boat

onto the trailer after a long day fruitlessly pounding the water and someone asks why you didn't get the big one, there is nothing quite as face-saving as to be able to say that the pH was off a couple of points or the oxygen was down and of course everyone knows the fish won't bite under those conditions.

Whenever I can I try to augment the bare facts of my diary with brief commentaries and little sketch maps of areas where fish were caught. I add these at the end of the day while events and scenes are fresh in my mind. Often, this practice has been the key to success. For instance, after reviewing sketches made over four years of fishing a medium-sized stream, I discovered that for a period of about three weeks every June brown trout will position themselves in the tails of pools where they will feed on small terrestrial insects (ants, beetles, and leaf hoppers). My diary indicates that they move into these feeding posts about eight o'clock in the morning and remain there until almost noon. Probably I would have recognized this behavior pattern sooner or later, but with the aid of my diary I quickly realized what was happening and have been able to take advantage of it.

After a season of assiduously collecting and recording information, the angler is confronted with a mass of facts. At first, it might seem that there is no way anyone could make sense of dozens—or scores, or even hundreds—of bits of data. When the season is done and I sit down to confront page after page of what appears pure gibberish, I begin to doubt the value of it all. But actually it is not all that hard to extract useful information. You definitely don't have to have a degree in data processing. I don't, and yet I never cease learning.

For example, I have records of almost 15 years of fishing one fairly large trout stream I visit during the last week in May or the first week in June. By simply flipping through the pages and checking the weather and water conditions on days when I caught good numbers of fish, I readily became aware of several points. On this particular stream, fishing is best on days when the barometer is rising, the wind is gusty, and the sky is clear. In the morning I now know to

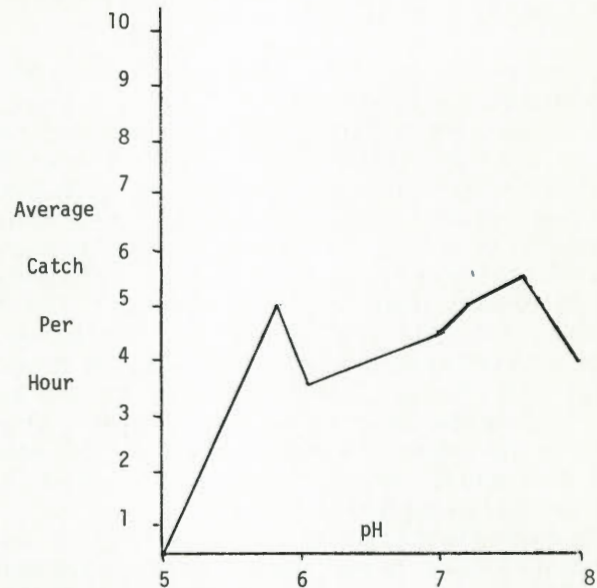
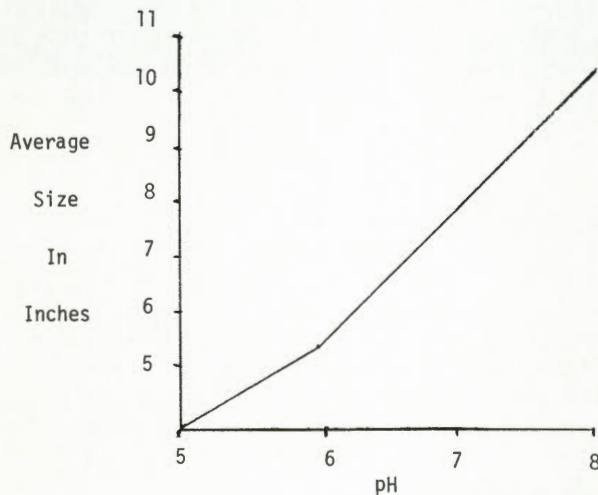


## TROUT AND pH

Increasing numbers of anglers are becoming aware of the meaning of pH. Originally a scientist's shorthand for the concentration of hydrogen ions, pH is now commonly viewed as a guide to good fishing. Generally accepted is that the higher the pH of a body of water the better the fishing will be.

Testing the validity of this theory is fun, but I do not believe that I have reached any profound conclusions. I have come to realize that the old fishery biologist's truism that the best trout streams have a pH of between 7 and 8.5 is true. But how important is this? Not very unless we

are prospecting on new water where a good pH (for trout, between 6.5 and 6.9 and 8.5 or 9, depending upon the testing technique used) combined with other favorable factors (water temperature, cover, and so on) can indicate that a stream has possibilities.

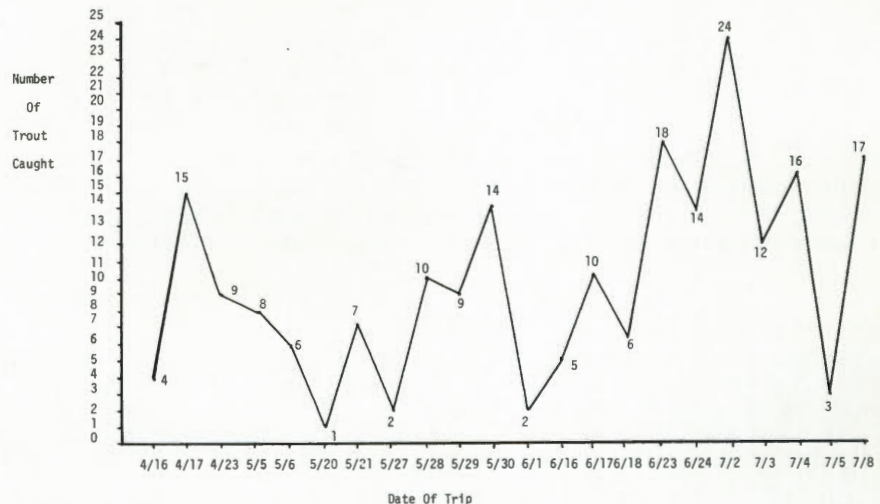


## THE BEST TIME OF THE YEAR

To try to determine when one of my favorite trout streams is at its peak, I devised a little chart based upon my visits to the stream during 1977.

Much to my amazement I discovered that I caught more and larger trout during June and the first week to ten days in July than during other periods of the season. Furthermore, this was true whether I figured the number of trout per trip or the number of trout per hour while on the stream.

For two years now I have postponed my trips to this stream until after Memorial Day and I have not been disappointed.



Number of Trout: 212  
Number of Trips: 22  
Time Span: April through July, 1977

expect hatches of two species of caddisflies and medium-sized blue-winged olive mayflies. There will be a pause in activity and then in the afternoon the *Stenonemas* (March Browns and Grey Foxes) will begin to emerge. There is another brief cessation of activity around dinner

time and the day closes with another hatch of *Stenonemas* accompanied by sulphur duns (*Ephemerella* species). Water temperature, level, and clarity are unimportant *on this stream at this time of year*. To confirm my impression—which had already been supported by other an-

glers with whom I shared this information—all I did was jot down on a sheet of paper the very best days (on which I caught 15 or more trout), then list the salient features of each day. The pattern that quickly took shape on my little chart was clear: I was right. Now, when I head for this

*Continued on page 26*



# Stalking the Winter Flounder

DR. OLIVER DONOVAN

As a number of articles in the January/February issues of *New Jersey Outdoors* have pointed out, late winter and the cold, wet days of early spring are not necessarily times to stay indoors dreaming of summer. For example, if you enjoy saltwater angling, don't forget that New Jersey's bays and estuaries remain heavily productive during this time of year. Among the numerous fish species taking advantage of this productivity is the particularly delectable winter flounder. The desirability of flounder as a table food is indicated by its price, with filets selling at well over \$3.50 per pound.

The winter flounder (*Pseudopleuronectes americanus*) is a flatfish rather commonly mistaken for the summer flounder, or fluke. Aside from the winter flounder's smaller average size and lack of teeth, the two can be distinguished by laying the fish on a flat surface with the belly cavity toward you. If the fish faces to the right (Right-eyed Flounder family) it's a winter flounder; if to the left (Left-eyed family) it's a fluke, or perhaps a windowpane flounder. For our purposes, though, the difference is only of passing interest since few fluke appear inshore until May.

The winter flounder is actually a year-round resident of our inshore and nearshore waters. Where it is to be found and in what numbers depends on such factors as the size of the fish and the time of year. Generally, smaller flounder tend to remain inshore all year round and larger flounder offshore. The main exception occurs during the period we're most interested in (late winter/early spring), when the big fish move into the



The writer's sons, Mike and Tom, with an early catch of flatfish—mouth of the Shark River

bays and estuaries to spawn.

Their arrival is evidenced by considerable numbers of stalwart souls willing to face the chill winds off bay and ocean for catches sometimes in excess of 50 fish per person. As long as one is properly dressed (layers of clothing, boots, waterproof gloves, warm headgear) cold temperatures will be no problem. On the positive side is the desolate beauty of the estuaries before the growing season begins and the absolute lack of those biting kamikazes of the insect world, the greenhead flies.

Winter flounder spawn from the depths of winter into early spring, each female releasing hundreds of thousands of eggs as an evolutionary adaptation to compensate for the very considerable predation of young flounder by other organisms (larger fishes, crabs) in the estuaries. The eggs sink to the bottom, adhere, and hatch when water temperatures reach about 38°F, thus producing a new generation of flounder to delight the palates of anglers. Although the great reproductive potential of the species tends to protect it against fishing pressure, not easy to protect

**Habitat—an isolated cove on the bay side of Sandy Hook**

PHOTOS BY CAROLYN DONOVAN





against are destructive changes in habitat caused by human activities such as waste disposal, the filling of tidal wetlands, dredging of navigation channels, and requirements for large volumes of cooling water at industrial facilities such as power plants. Given the recognition of the great biological value of the estuaries, though, as well as New Jersey's commitment to maintaining it, we should never run short of winter flounder.

Baits which can be used to hook the delectable flatfish reflect its feeding habits. Estuarine organisms commonly on the menu include crustaceans (shrimp and small crabs), marine worms, smaller fishes (killifish and silversides), and molluscs (clams, mussels). From this writer's observation the most popular bait would appear to be the bloodworm, a marine polychaete. Bought in bait and tackle shops, however, these can be expensive—as much as \$2 per dozen. Alternatives to buying bait abound, however. Small fish can be collected with a bait seine, softshell clams can be dug between the high and the low tide lines, mussels can be collected from rocks and pilings, and marine worms can be dug from tidal flats and taken from under rocks and wood between the tide lines.

The type of tackle used also reflects the feeding habits of the fish. Since winter flounder are bottom feeders, terminal tackle consists of baited hooks placed close to a sinker, usually on a flounder "spreader." This rig can either be cast from shore or dropped straight down over the side of an anchored boat. Although during peak runs shore fishermen do quite well, your success will be considerably increased if (a) you use a boat, and (b) you chum. The great advantage of a boat is that you can fish more spots in a given amount of time. Also, since fishing is done straight over the side, a four-hook spreader and chumming can be used. For those unfamiliar with the term, *chumming* is a method of attracting fish to your area with ground or chopped (or whole, for that matter) fish or shellfish. Since winter flounder are bottom feeders, a good way to chum is to fill a cloth bag or weighted wire basket with cut fish or chopped clams. This is lowered to the bottom and used to concentrate the fish in the area of your boat. If, like me, you are not always ambitious enough to catch and cut chum, try the old lazyman's trick of puncturing a can of cat food (tuna in oil) and lowering it to the bottom.

If the colder temperatures prevailing in late winter/early spring are not your cup of tea, winter-flounder fishing, after a summertime low point begins to pick up again in October and generally lasts well into December. In late December, January, and February, feeding diminishes because of both the very cold water and a lack of active feeding during the onset of spawning. The previously described techniques, of course, are effective during the fall peak as well as in March/April. One point that might be added here is that medium to light tackle is most appropriate for winter flounder, essentially because of the sensitivity of the rod to an often delicate strike. Also, inshore flounder are rather small fish, averaging between one-third of a pound and one pound with a maximum of about two pounds. Offshore flounder, however, will average one and a half pounds

to three pounds, with a maximum of eight pounds. An inshore fish weighing over one pound is generally considered to be fairly sizable.

Don't let the small size fool you, though. The ratio of meat weight to total body weight is quite large because of the small head and abdominal cavity. In other words, most of the weight of the flounder is meat, in marked contrast to many other species of marine fishes. In preparing winter flounder for the table (perhaps due to a general ineptitude in the culinary art), this writer prefers the basic approach considered primitive by those with a fancy for stuffings, sauces, etc. In other words, I like to taste the fish. Smaller flounder (under three quarters of a pound) are very simply, but deliciously, prepared by scaling, beheading, and gutting, then frying in a quarter inch or so of hot oil for 2-3 minutes on a side. To prevent the fish from curling in the pan, make diagonal slices just through the skin on each side. Larger fish are best fileted (four filets are taken from one flounder, two top, two bottom). The filets can then be dipped in flour, beaten egg, and bread crumbs, and fried as above.

Where should you fish? Virtually anywhere along the salt and brackish water shoreline of New Jersey. Winter flounder are caught in lower New York Harbor and all the way into Raritan Bay to the Perth Amboy shoreline. The writer lives in South Amboy and can attest to sizable catches off the South Amboy landfill (right across from the mouth of the heavily polluted Arthur Kill!). It is only fair to warn, however, that these fish may have an oily, somewhat rancid taste and can be outwardly blemished by such diseases as fin rot, both attributable to a variety of human influences on water quality.

Sandy Hook Bay is a hotspot within easy reach of city dwellers, offering lovely sandy beaches and all the facilities made possible by the incorporation of Sandy Hook into the Gateway National Recreational Area. Going South from the Hook, Shark River, Manasquan River, and Barnegat Bay offer excellent fishing. The length of Little Egg Harbor is very productive of winter flounder as is that most beautiful and pristine of New Jersey's bays, Great Bay at the mouth of the Mullica River. The fishery extends south and then north around Cape May and the Delaware Bay shore to the limits of brackish water on the Delaware River.

If you give it a go this spring of fall you may catch me, and probably some of my hardier students or friends, stalking the winter flounder somewhere on Sandy Hook or Great Bay. Good Fishing! □

#### An afternoon's catch







# 

BY EILEEN M. VAN KIRK

was that each fisherman is responsible for his own bait, and if you run out you have to learn to improvise.

"Go catch some flies," was the advice to one disconsolate young man who had emptied his bait box, and catch flies he did. Lois also insists they learn to bait their own hooks and clean their own fish. A strong, fiercely independent woman, Lois made her own way in the world long before the advent of Woman's Lib. When I asked her if she would prefer to be called a "fisherperson" I was greeted with hoots of laughter.

"I don't care what you call me," she said, "As long as you say that I can catch fish."

And catch fish she does, even when others go home empty handed.

"The most important thing to remember about trout," she says, "is that they like cold water. In early spring you'll find them in the shallows, where the river runs fast and swift, tumbling over rocks and rills. That's when I use minnows and salmon eggs." As the season progresses and the weather grows warmer, Lois switches to worms. She gathers them at night with the aid of a flashlight.

"The best time for worms is after a rain, but failing that a good watering will usually bring them to the surface. Then it's just a question of working the flashlight and being quick. They are amazingly fast."

We all know it's the early bird that catches the worm, but Lois believes it's the early worm that catches the fish. If you go fishing with Lois you've got to be prepared to get up early. Four thirty to five o'clock is when she usually starts out.

"It's especially important to get to the river early in the summer, before the bluegills take over. Once the sun hits the water the bluegills (sunfish) come out and the trout sink down into their holes, and you might as well pack up and go home."

One of Lois's accomplishments that always fascinated the boys was her ability to tell what kind of fish she had on her line.

"Can you really tell?" I asked her one day.

"Sure I can," she replied, "Rainbows are the best. They'll really give you a fight, run off with the line and make you work. When you see a trout leap out of the water in an arc of silver, that's a rainbow, and there's no more beautiful sight, even when he spits the hook right out at you and swims away. That happened to me one day. When you set your hook with a rainbow you've got to be fast."

"Lois, there's no fish here," exclaimed my son.

"Sure there is. Here, feel my line, feel that little tug, tug. There's a brown trout nosin' around down there. How do I know he's a brown? Because they're the inquisitive trout. You've just got to be patient and know your fish." A few minutes later Lois's line tightened, she tipped her rod, then, knowing her fish secure, carefully reeled in a respectable 12-inch brown trout.

Lois Tatham has been fishing the rivers and streams of New Jersey for more than 20 years. She is patient, and she does know her fish. Lois grew up in Massachusetts, and still speaks with the broad "a" of a New Englander, but in spite of the lakes and rivers of her native state, she didn't start fishing until she moved to New Jersey. One fine summer evening she went to the Rockaway River with a friend, and there she hooked her first trout. Or, as she puts it,

"He hooked me, and I've been hooked on fishing ever since."

Once Lois discovered the pleasure to be found in the tug of a rod and the singing of a reel she soon started to share her enthusiasm and knowledge with others. Although she has no children of her own, Lois has introduced numerous nieces, nephews, friends' and neighbors' children, including my own boys, to the art immortalized by Isaak Walton.

Lois is basically a bait fisherwoman, using minnows, salmon eggs, or worms depending on the time of the year. One of the first lessons the boys learned





PHOTOS BY AUTHOR

the secrets of Lois's success. She knows her river. She knows where the ground shelves, where there is a log jam, where it is deep, and where it is shallow. And she's sharp eyed. She surprised two youngsters she was fishing with one day by suddenly reaching down into the water and picking up two duck eggs that were resting on the bottom.

Fishing with Lois is always fun. One reason is that she doesn't demand silence, but enjoys chatting with her companions and other fishermen on the stream. According to her pupils she also talks to the fish.

"Oh, oh, I'm getting a message," she'll say, "Now let's see, are you a trout or a chub? My guess is a chub." She then makes a big display of reeling with her eyes shut so the boys can tell if she's guessed correctly, and to their delight she is always right.

Once Lois makes her cast into the stream she stays there until she gets her limit. No running back to the car for supplies. She carries everything she needs on a fishing belt, including bait box and creel; plus a candy bar to ward off starvation if the fish aren't biting.

"And dress warm," is her second rule. In early spring, she says, she wears so many layers of clothing that her fishing belt measures about 42 inches, but as the season progresses the belt gets smaller and smaller, until by midsummer she has trouble getting all her equipment on it. Her fishing gear consists of a 6-foot Garcia rod, a Mitchell reel, 2-3-lb.-test monofilament line, and a #10 trout hook.

I suppose one of the most difficult questions for an angler to answer is, Why do you fish?

"There's just something about it," says Lois. "The excitement when you feel that pull on your line, or the thrill of seeing a trout leap out of the water. But even if none of these things happens, there's the calm beauty of the early morning, the sun scattering diamonds on the water, and always the unexpected. One morning I was all alone on the stream. The only sounds were the birds calling to each other in the trees, and the water gurgling over the pebbles, when I heard a rustling in the woods right behind me. I turned around expecting to greet a fellow fisherman and came almost face to face with a family of deer. A big antlered buck, a doe, and a faintly spotted fawn broke through the woods. They paid me no mind, but waded into the river, heads held high. I just stood perfectly still and watched them. Once they reached the other side they broke into a run, and with a flash of white disappeared into the woods. Maybe you could say fishing brings you closer to nature, I don't really know, I just know I enjoy it."

And thanks to Lois there are several young men and women who have grown up to enjoy this same sport who have acquired an art, for it is an art, that will give them pleasure for the rest of their lives. For once a fisherman, always a fisherman, fisherwoman, fisherperson. Whatever the name, they are a special breed. □

"Now a brown is different. He likes to tease, taking little nibbles at your worm. Don't try and set the hook too early or you'll lose him. You've got to be patient, but once he's hooked you can usually reel him straight in without too much of a fight."

But according to Lois, the greatest challenge of all is the brook trout. This is the native American trout, and he has a lot of savvy; compared to a brookie, the rainbows and browns are tame. He has the sharpened instincts of a true wild creature. Brook trout are very, very wary, and you can scare them away very easily if they think something is the least bit unnatural. To match wits with a brookie is an unforgettable experience.

Lois casts upstream and lets her line drift downstream with the current. "I fish from the bank in the spring," she says, "But when the weather gets warmer I walk the stream. Only by wading into the river can you really discover the deep pools where the trout hide." Lois's biggest catch was a 21-inch brown caught in the Black River. She has also taken browns in Lake Hopatcong, "But there you have to fish deep," she says, "real deep. And when you're weighting your line don't put your sinkers too close to the hook. Allow at least 1-1/2 to 2 feet."

But most of the time she goes to the Rockaway River.

"I've done some of my best fishing within 15 minutes from my house," she says. "You don't have to travel far and wide to get fish." And that's one of



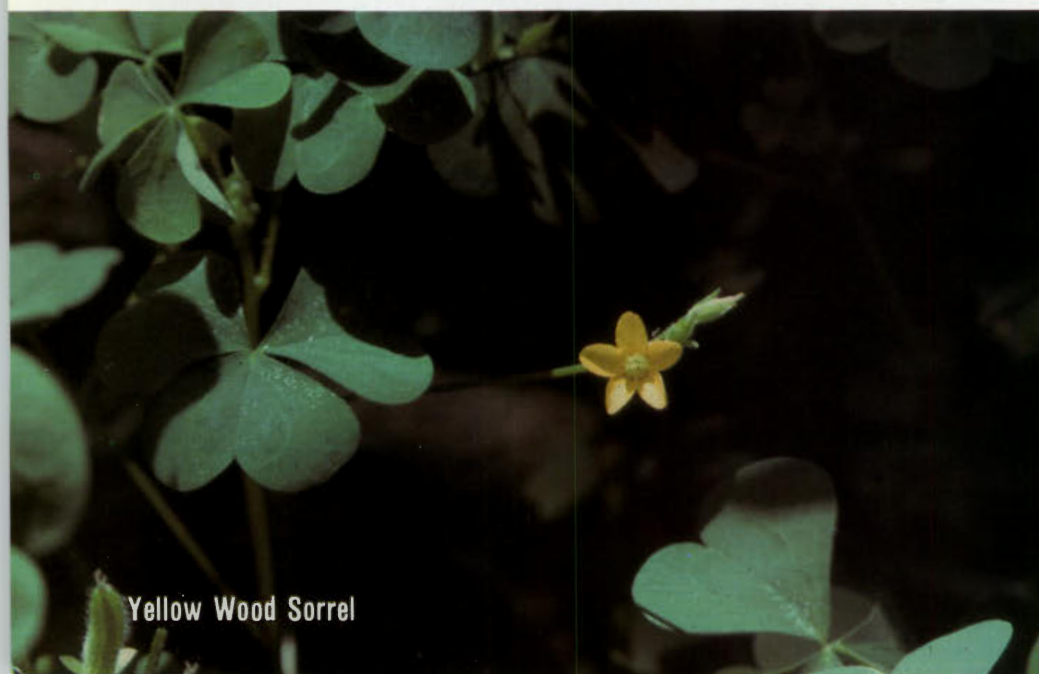


Creeping Buttercup

PHOTOS BY AUTHOR



Spring Beauty



Yellow Wood Sorrel

# watching wildflowers

Jack Kligerman

Delicacy is the word for wildflowers, though many people call them "stubborn weeds." Throughout spring and summer, a countless amount of human effort and ingenuity, let alone dollars and weed-killer, is given to destroying just those delicate plants which grace with their color what otherwise would be uniformly green lawns.

For me there is no majesty to a solid stretch of green. I look for vital signs, color patches which signify that no matter how much we humans try to control wildflowers—symbolically, therefore, wild nature—they will continue to insist on their presence and call into question our best designs. One could even say that wildflowers are a constant reminder that the land we "own" is merely held by us on loan: nothing more than a life-time lease, if that much.

My greatest pleasure with wildflowers comes from watching for them in spring and early summer. At this time, having had my fill of winter's dull browns, greys, blacks, and whites, I wait expectantly for and diligently catalogue their appearance. When the right moment comes, I go out with my camera to "stop" time and harvest whatever my lawn offers in the way of wildflowers.

A camera with a macro lens or a bellows system, incidentally, is the best way to gather wildflowers. Most of them begin to wither as soon as they are plucked, especially the earliest, smallest, most tender blossoms. Whenever I have been caught in a nearby field or by the





Asiatic Dayflower

roadside without a handbook and pick a wildflower to take it home for identification, it invariably loses its vitality by the time I arrive. Sometimes a matter of minutes is enough to render a glowing specimen unidentifiable.

Watching wildflowers would seem to be an easy task, and for the most part it is. The plants can get ahead of you, however, if you are not diligent. Ironically, it seems the best way to be diligent about wildflowers is to be lazy about one's lawn. Instead of cutting it *en masse* when I do, I set out preserves or demilitarized zones, as it were, where no lawnmower is allowed and wait patiently for whatever is going to appear. I tend to favor a wet spring with my watching, when the soggy ground gives me every excuse not to bring out the lawnmower and therefore to cultivate a plentiful crop.

Among the earliest wildflowers on my lawn are Gill-over-the-ground (*Glechoma hederacea*), Common Blue Violets (*Viola papilionacea*), Common Dandelions (*Taraxacum officinale*), Spring Beauties (*Claytonia virginica*), and Dutchman's Breeches (*Dicentra cucullaria*), the only species of wildflower I transplanted myself. This last-named flower usually appears first, blossoming about the second week in April. The other four appear within the next week or two, depending upon the harshness of the season. Whereas Violets and Dutchman's Breeches spring up in the shade of some very tall Norway spruces,

which line the northern edge of the lawn, the Dandelions and Gill-over-the-ground spring up everywhere. The Gill-over-the-ground stays with me from mid-April into July. Its purple color counterpoints the green of the lawn, lying low enough to be missed by the lawnmower on those rare occasions when not cutting the lawn makes seeing many wildflowers impossible.

One day when I get more adventurous about the wildflowers, I will think of them as herbs and use Gill-over-the-ground to make a tea or a tonic for a cough. It could be used to make wine, but my homemade wines are so notoriously bad that I hesitate to do this hardy adventurer such a disservice. I call it an adventurer since it creeps everywhere, even though it prefers the acid soil in full sun at the edge of the spruces.

As plentiful as is Gill-over-the-ground on the lawn, so scarce are the Spring Beauties. In fact, they have often been the cause of sin, making me envy several inaccessible spots on my neighbors' lawns where these flowers tend to appear in clumps. I find almost nothing so rich in spring-time as the fine pink veins tracing their delicate petals, which themselves shade imperceptibly from the lightest pink to white.

The month of May at our place belongs to Creeping Buttercups (*Ranunculus repens*). They simply take over the space between my garden and my neighbor's fence, their brilliant yellow "cups" of flowers just splashing the southern edge of

the property. When the lawn is cut, a standing order allows no one to run the mower closer than two feet from the fence.

Variety returns with June, as White Clover (*Trifolium repens*) over-spreads the lawn, Yellow Wood Sorrel (*Oxalis stricta*) replaces Violets in the shade, and Asiatic Dayflowers (*Commelina communis*) and Blue-eyed Grasses (*S. angustifolium*) add a touch of delicate blue. June is also the time of two of the tiniest wildflowers on my lawn: Mouse-ear Chickweed (*Cerastium vulgatum*), which in addition loves my garden; and the Speedwells, members of the *Veronica* family, a flower whose precise identification I have found as difficult as recognizing fall Warblers on the wing. These last two wildflowers challenge even the vision of my macro lens and wear my eyes out trying to get them in focus.

This spring and early summer, when you go out to cut your lawn, stop to think of wildflowers. Sit down and wait for them to blossom. I think they will win you over if you let them. They should encourage you to pack away the "weedkiller," put up your lawnmower for a while, and take out your camera. Or, if you are not photographically inclined, just go out to listen to them grow. But don't put off acting too long. In the words of the seventeenth-century English poet, Robert Herrick,

Gather ye Rose-buds while ye may,  
Old Time is still a flying;  
And this same flower that smiles today,  
To-morrow will be dying.

"To the Virgins, to Make much of Time"

Dutchman's Breeches





*Golden Club*

PHOTOS BY AUTHOR

# Lake Edge at Absegami

TED CHANDO

It drizzled. It misted. The sun tried to break through. It downpoured. The weather did everything but remain constant. It was the type of day when it was foolish to try and accomplish anything. So I headed for the lake edge, found a bed of pine needles to sit on, a broad pitch pine trunk to rest my back against, and defied the light drizzle to get through the pine boughs above me.

I had brought my pipe; the one with the deep, wide, wooden bowl which gives a long, cool smoke. The perfect pipe for when you have time on your hands. In the pocket of my raingear was an ample supply of matches. For when one truly enjoys a smoke it has to be indulged in slowly. The aroma of tobacco has to be drawn out patiently, for a hot bowl produces a harsh smoke.

One relights frequently and one can't hurry. And I was in no hurry.

I had found a place to enjoy a quiet solitude. Yet I was not alone nor did I wish to be. For a lake edge in the Barrens is a fusion of two ecologies. One I was leaning against, the pitch pine forest with its dry sandy floor and heath understory, and the other, the immediate lake edge with its cedar and red maple, its leatherleaf whose bell-like blossoms were just beginning to fade, and even an occasional shadbush now at the height of its flowering.

I had chosen this spot with a purpose, as I so often do. For here an intermingling occurs, particularly at the beginning and also, as now, at the end of the day. Here the creatures of the uplands can be found with those

who feed near the water.

In back of me a towhee rustled for insects among the brittle, spring-dry, oak leaves. "To-whee" he called, scratching the leaves aside, making all too much noise for a robin-sized bird.

Straining my neck to look upward I noticed a warbler alight on the pine branches above me. Flashes of yellow on the rump and chest easily gave this myrtle warbler away. Unlike the towhee, he only stopped in this pine forest briefly each spring on his way north to breed. His liquid notes sounded in pleasant counterpoint to the towhee's cheerful commands of "Drink-you-teeeee."

Then another songster revealed himself in the pine tops. Over my right shoulder, in the direction of my drifting pipe smoke, I heard a pine warbler trill. While I could not see him, up among the highest branches, I easily imagined his rapidly vibrating throat and uplifted head as he gave forth with his song. My mind pictured his olive green color that suits so well the pine branches he frequents.

But my back was toward most of these goings on and I was birding lazily mostly by sound instead of sight, resting like a basking turtle on a log in the middle of the lake. Then too, the lake edge competed for my attention and I sought the birds in that direction. In front of me the swallows became active as dusk approached. They twittered and buzzed in flight, making figure eights, turning, looping, changing direction instantly. Often they flew together, feeding where the insects were most plentiful. But they never appeared as if they were in a flock, for each bird flew its own erratic and ever changing course as they all dived and climbed for insects. There was no unity of motion and I feared a midair collision, but an appropriate swerve guided by a forked, feathered, tail rudder always averted such an event.

These were barn swallows, so named for their nesting habits which take advantage of man's architecture. Yet there is nothing tame and civilized about the way these birds fly. With their back-swept wings they are as graceful in the air as any bird I know. But put them in a pine tree or foraging on the ground and that forked tail would be nothing but a nuisance.

Along with these graceful fliers, the lake had its lumbering giants. Crows flew continuously over the park area,





*Water's edge on the Lake Absegami Nature Trail*



*Flowering Moss*



*Shadbush in bloom*

filling the air with their nasal "caw-caw-caw." They move slowly, with wide flapping wings—always on the lookout for a free campground dinner or for a nest to rob. Unlike the swallows, the crows band together like a gang of thugs, calling and screaming at one another, and often perching together in the same tree. Their raucous cries shatter the approaching dusk and drive the drowsiness from me.

When the birds desert me other sights gather my attention. On the path edge, where small sneakered feet run by on the weekend, the flowering moss is in bloom. Tiny white flowers dot a mossy green blanket and make a beautiful still life. Reaching down I pick one of these flowers and find that the white part with its five delicately formed petals is shaped like a perfect ship's propeller. If attached to a diminutive water craft what would power and move these five small blades? Perhaps red maple seeds spiraled by the wind? The craft itself would have to be light as an oak leaf. And the sea would have to be calmer than bog water on a windless day. Who would steer such a craft? Perhaps a water bug who weighs next to nothing. If so, how would he rudder it? With a pine needle? To dock such a craft a springtime-flowering stalk of golden club could be used with a spider's strand of webbing to tie it fast. What cargo could it carry other than a spring load of pine pollen? What a voyage one could make in such a water craft! Even my canoe pales by comparison. What an adventure it would be to put out to sea, or in this case, a pond or puddle! If I were small enough it would make me wish to be a sailor.

But I am not, so I sit here on the lake edge and daydream. Even the sandy footpath in front of me or the bed of pine needles at my side catches my attention. Carelessly I drop a match used to relight my pipe. Upon retrieving it I observe the shucked pine cones littered around me. The squirrels strip these cones seeking the seeds concealed under the woody scales. Of the two common squirrels in the Pine Barrens the red squirrel is the more active, vocal, and interesting to watch. Unlike his gray cousin, hardly ever stands still. Yet I would like to think that it just wasn't for the food that he rested here long enough to peel his pine cones. Could he enjoy the lake edge as much as I? □



# "Where Have all the Trout Gone?"

JUDITH CONNELL HADUCH

A hand was raised in the second row as I looked to the right side of the room, that first day back to school in the environmental chemistry class at Vernon Township High School.

"Yes, Ron?"

"Mrs. Haduch, you know the stream (Glenwood Brook) that runs past our school and ends up down by my house?"

"Yes."

"I used to catch a lot of trout there until last year. Now there are none. Why?"

"I couldn't say offhand—perhaps septic contamination? Detergents? Would you like to study the brook as a class project and see what we can find out?"

The 20 students in the class were eager. Thus began a three-month study of Glenwood Brook.

First, we went to the library to find out how best to go about our study and how to recognize abnormal levels of material in the water. We decided to follow the plan laid out in the environmental series "*Contours*" published by Prentice-Hall, and to use water testing kits by Hach and LaMotte. The steps we followed included:

1. A study of the needs and tolerances of trout. Trout are extremely intolerant fish and are quickly killed by disruption or mismanagement. They require cool water that is well oxygenated. They require sections of gravel bottom for spawning. Their water must be clear for catching food and must have occasional feed-

ing pools. There must be adequate insect food, falling from surrounding vegetation or aquatic species present in adult and larval forms, in the stream.

2. Examination of a topographical map and a U.S. Geological Survey map which included Glenwood Brook from its source at Lake Glenwood, at the top of Glenwood Mountain, to its intersection with Route 517 where it enters low-lying marshland in Vernon, Sussex County.

3. A study of the regions through which the water flowed, with possible effects considered. Glenwood Brook flows through a wooded area below the dam of the lake, then out in the open through a short pastured valley, then cascades steeply through the woods down Glenwood Mountain, leveling through two new housing developments, and then continues steeply downward through an established old neighborhood, through a pond-turned-cattail-swamp, over a waterfall at an old mill, and plunges in steep cascades down to the marsh.

4. Determine, on a map of the stream, likely study locations where features differ. We identified 12 locations along the stream where we would perform our tests and give descriptions.

5. Gather together the needed equipment and materials and learn how to use them. It was mid-October before we were ready to take to the field to do our study. We hiked the three miles upstream from the school with one car carrying all our equipment—map, notebooks, jars, vials, buckets, examination trays, preservatives (25% formalin for fish and 70% ethanol for invertebrates), labels, markers, thermometers, water-testing kits, stopwatch, measuring tape, string of known length, buoyant object, sieves, nets, forceps, droppers, and field guides to freshwater organisms.

6. Organize teams. We organized 10 teams with each student responsible for one or two determinations at each study site. All had practiced with samples in the lab and were familiar with the necessary procedures. The teams included the following:

- a. Physical characteristics: cross-sectional profile; velocity of flow; volume of flow; temperature; color; turbidity; (here is where we used stopwatch, buoyant object, string of known length, measuring tape).

- b. Oxygen (dissolved) in mg/l ( $\text{MnSO}_4$  method)

- c. Free carbon dioxide in ppm.

- d. Cyanide, ammoniacal nitrogen, nitrate, and nitrite nitrogen.

- e. Calcium, magnesium, manganese, copper, iron, hardness

- f. Phosphate, sulfate, alkalinity, sulfide, detergents (this test done in lab)

- g. pH, chlorine, chloride

- h. Soil (stream bottom) potassium, phosphorous, nitrogen, pH

- i. Dissolved solids

- j. Biological samples; coliform test

7. Data study. This involved compiling data from all the groups and identifying the problem.

Our studies were somewhat boring until we reached site 7, where a new housing development was built on a steep hill adjoining the stream and fluctuations from the previous readings showed up. Oxygen levels were good along the entire stream length, exceeding 7 mg/l; no septic contamination existed along the stream; no detergent contamination existed; no heavy metal contamination was found. The problem, to our surprise, was caused by sediment run-off from the new and excessively bulldozed housing development. In one inch of water at sites 7 and 8 we could not see bottom; traces of copper were present for the first and only time; dissolved solids quad-

Steve Grube waits for precipitate to settle in oxygen testing at Site #1.



Testing kits in hand, environmental chem students approach site #1 at the dam of Lake Glenwood.





Environmental chemistry students prepare for the hike to The Source of Glenwood Brook, after loading the car with equipment.

**Front:** Tom Smith, Ken Walker, Adam Boltz

**Rear:** Tom Conn, Ron Capalbo, Steve Williams, Joe Coles, Brett McMillen, Bill Chivit, Steve Grube, Ann Ryerson, Sue Marcy, Sue Yennello, Jayne Vander Hey.



rupted from 4 ppm to 16-18 ppm, sulfate went from 20 ppm to 100 ppm, and calcium from 56 to 96 ppm. Potassium levels were also high at the construction site and biological organisms were vastly different here. Suddenly there were no clams, no planarians, no caddis fly larvae, no mayfly larvae, no stonefly larvae, no crayfish, no salamanders, but an abundance of water beetles, dragonfly larvae, mosquito larvae, and water skates were found in the still water and thick claylike muck in which we sank to our knees. No trout could ever feed or spawn there. Downstream, the values returned to normal, except for turbidity. The water was brown and sediments had completely filled in the pond above the waterfall at the mill, the largest "troutpool" on the brook.

8. Recommendations. After our studies we called the DEP hotline number for water pollution, made a report of our findings, identified the polluter and asked for action or recommendations. We were thanked and received township soil statutes in the mail, after the Sussex County Soil Conservation District was contacted by DEP.

It is possible to create silt traps called *gabian baskets* (made of wire, containing rocks) and install plantings along steep drainage banks to control and manage such conditions. The frustrations of environmental enforcement are with us constantly. The Vernon statute (code) of May 15, 1978, states "No grading and excavating or removal or destruction of topsoil, trees or other vegetative cover of the land shall be commenced by any developer until such time as a plan for erosion and

sediment control has been processed with and approved by the Planning Board. The following principles shall apply to the soil erosion and sediment control plan: (1) Strip-dusting of vegetation, grading or soil disturbance shall be done in a manner which will minimize soil erosion (2) Whenever feasible, natural vegetation shall be retained and preserved. It is the responsibility of the developer to maintain, as nearly as possible, streams in their present state and to return them to their original or equal condition after such activity is completed." Such statutes sound protective and proper on paper. Unenforced, they invite ravages of the landscape that have far-reaching and often permanent effects. A special vigilance is necessary in rapidly developing areas—township officials and citizens must not ignore their responsibility in upholding the codes and statutes they write.

The soil erosion problem is not merely a local one but a national one. It involves not just the loss of recreational fishing sites but has more far-reaching and serious ramifications. Both the National Parks and Conservation Association (NPCA) and the National Resources Defense Council Inc. (NRDC) are fighting battles to save soil and farmland.

In Iowa, 8 inches of the 16-inch topsoil layer have been washed into the Missouri River system, carrying fertilizers, pesticides, animals wastes and other pollutants. Government farm visits to eight states revealed that 84% of the farms suffered soil losses which threatened crop productivity. From 1974 to 1977 NRDC battled in court to include farmland in the Federal Water Pollu-

tion Control Act, bringing about a measure called the Rural Clean Water Program, which ties soil conservation measures into federal support programs.

In New Jersey, the two biggest battles have been fought by the NPCA. The first has been an effort to protect the Pine Barrens from development and pollution. The fight continues there to prevent a system of high voltage electric lines, and oil and gas lines from traversing this area (which would disturb habitats, use chemical defoliants, open paths for off-road vehicles and disturb cranberry farms). The second New Jersey battle is to protect the fragile Sandy Hook barrier island, marsh and historic Fort Hancock from pollution, overuse erosion, and neglect. Work is still underway on this project.

Soil is a precious resource. It must be conserved, kept in place, respected and used wisely. Siltation of our streams, ponds, lakes, and rivers is a serious problem too seldom recognized because of its seemingly minimal impact on our daily lives. To ignore the problem is to leave a legacy of eroded lands and barren, muddy waters to those who follow. We must as a nation and as individuals give priority to the soil crisis and in so doing, protect the scenic and aesthetic value of our surroundings as well as protect public health, water resources, wildlife and historic resources.

#### Reference:

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pp 145-155, Prentice-Hall 1973. □



# DEP's decade of accomplishments

BY JERRY FITZGERALD ENGLISH

***April 22, 1970: The first Earth Day. Also, Day One in the history of the New Jersey Department of Environmental Protection (DEP).***

To most, it was society's official launching of a grand crusade to achieve peace with nature and make amends for past environmental sins. And there was no coincidence in DEP's startup on Earth Day. Both events came with a movement rooted 25 years ago when "The Silent Spring," a book by the late Rachel Carson, first warned society about perils of careless use of pesticides. This helped bring growing realization that people were threatening their existence with the byproducts of the good life.

The fight for cleanups was underway, and so was a continuing argument about the relative dollar costs of improvements which remain less tangible.

Environmental improvements are demanded by society when it can no longer ignore visual insults such as smoke, pollution and desecrated landscapes. But, being human, society tends to ignore something once it becomes less obvious.

Today, entering the second decade of awareness marked by that first Earth Day, and the birth of DEP, we still have tough problems and a society which may be more relaxed about them than the situation merits. That is because 10 years ago things looked bad and were bad. Today they look better, but we mustn't be deceived.

The stars are brighter and the water is clearer, and many think the battle has been won. What we have won in 10 years of coping with grossly visible kinds of pollution is the ability to recognize more subtle threats to humankind; things which unobtrusively threaten our state and our world with a legacy of cancer, genetic damage and birth defects.

No thoughtful person can deny that DEP has, over the past 10 years, done immeasurable good, regardless of whose yardstick is used. New Jersey in 1974 became the first state with mandatory auto emission testing, and was one of the first states with an air-monitor-

ing network to quickly pinpoint problem areas.

Environmental enforcement grew during the 1970's, with over 200,000 air pollution investigations made and nearly \$3 million collected in fines for violations. The Bureau of Air Pollution Control instituted emission standards to dramatically decrease dangerous emissions from industrial and commercial operations and developed its Emergency Response Team concept to cope rapidly with emergencies threatening human life.

A notable example of response to new awareness of dangers emerged in 1976 with discovery of asbestos, a suspected carcinogen, in the air inside Howell Township schools. Further investigation found airborne asbestos in 268 New Jersey schools, triggering corrective action.

Pesticides, the major cause of initial environmental alarms, remain the object of joint state-federal actions, including enforcement of use restrictions and registration of dealers and applicators.

***Even noise, often a bother but only newly identified as a potential threat, has been under DEP regulatory control since 1974.***

The people of New Jersey and the thousands of visitors to this state have benefitted immeasurably from the accomplishments of the Department of Environmental Protection over the past 10 years. Our waters are cleaner; the fish and shellfish are returning, and our air is measurably improved.

The use of pesticides, both for agricultural and home use, is one area which has been the subject of intensive investigation, not only by the state, but by federal authorities as well.

Upgrading and maintaining the quality and supply of New Jersey's surface and ground waters is one of DEP's most important activities. Most take clean water for granted, but making sure that water coming out of the tap is both safe and pure tasting grows more complex.

Over the past decade the DEP's Division of Water Resources has administered \$2.5 billion in federal EPA-state bond issue funds for new, expanded, and upgraded wastewater treatment plants to abate water pollution. The Division also set water quality standards to upgrade streams, bays and estuaries. Also developed was a comprehensive statewide water supply master plan to insure adequate water supplies for the foreseeable future.

Among the most significant projects dealing with water supply completed during the 1970's was the 3.5-mile Round Valley outlet pipe installed at the

north dam in 1977. It provides an outlet for the 55 billion gallons of water in the reservoir and thus meets the needs of much of northern New Jersey.

Again taking the lead, New Jersey agreed to assume primary responsibility for administration of the federal Safe Drinking Water Act, as approved by the U.S. Environmental Protection Agency.

DEP, through its Division of Water Resources, created the Office of Oil Spill and Hazardous Substances, a virtual flying squad to cope with dangers of spills of oil and other dangerous substances. Adoption of the Spill Compensation and Control Act reinforced this activity and established a spill compensation fund to pay for cleanups.

Flood control was a major area dealt with during the 70's with 1,130 miles of floodways and flood plain areas delineated to implement the flood plain management law, enacted in 1962 and substantially revised in 1972. Floodway regulations were adopted in April of 1975.

***Flood plain insurance became available to 540 municipalities throughout the state, offering property owners low-cost, federally subsidized flood damage insurance through a state-administered program.***

New Jersey in 1977 was one of the first states to enter into a federally funded dam inspection program in cooperation with the Army Corps of Engineers. This program, inspected all public and private dams for deficiencies, and, in cases of a critical nature, ordered repairs to insure public safety.

Completion of eight areawide water quality studies (208 program) as blueprints for water quality protection were accomplished during the latter part of the decade. The federal "208 program" strengthened involvement of local and county governments in resolving emerging water supply problems.

The Division of Water Resources formulated a Lakes Management Program, for restoration of publicly owned lakes and their future protection from destructive impacts of over use and over development. This program was started with a \$100,000 grant from the federal EPA and initially involved 30 priority designated lakes.

***New Jersey's natural resources were a major focal point during the 1970's and will remain so during the '80's to protect the parks, beaches, wetlands, wildlife management areas and open spaces.***

Prior to that first Earth Day, New Jer-

*Continued on page 30*





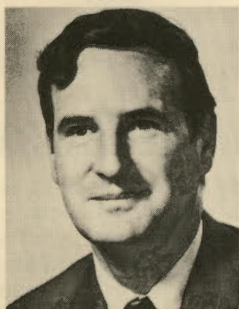
# Environmental News

## COMMISSIONERS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION: 1970-1980

Each of these men and women has served as New Jersey's top environmental administrator at some time during DEP's first decade.



**JERRY FITZGERALD ENGLISH**  
1979-



**RICHARD J. SULLIVAN**  
1970-1974



**JOSEPH T. BARBER**  
February-May 1974



**DAVID J. BARDIN**  
1974-1977



**ROCCO D. RICCI**  
1977-1978



**DANIEL J. O'HERN**  
1978-1979



**BETTY WILSON**  
July-August 1979

## NEW LAW INCREASES FUND FOR TOXIC WASTE CLEANUP

Legislation (assembly bill 3542) amending the "Spill Compensation and Control Act" to more adequately deal with the cleanup of toxic waste in New Jersey was signed into law by Governor Byrne on January 23. One of the primary changes brought about by the measure is that the chemical industry will pay up to \$7 million per year to the Spill Compensation Fund, approximately the same amount as is paid by the oil industry.

DEP Commissioner English explained the measure will do three things for New Jersey's environment and for the protection of our citizens' health and welfare:

- It not only gives the department a mandate to begin another environmental clean up job but also provides the financial resources necessary to do the job. Too often in the past, DEP has been faced with awesome responsibilities and too little resources.

- It will allow DEP to remove or take appropriate measures with hazardous materials that have the potential to do harm but have not yet leaked into the environment. Until now, the department had to wait until a leak occurred before it could remove the materials.

- Chemical wastes have been disposed of at sites over the last 30 years or more, prior to our understanding of the health risk they pose. Many of these sites, which have been abandoned, now need attention. These amendments, for the first time, provide monies to evaluate and mitigate the environmental contamination from those sites.

*Continued on page 16D*

## DEP'S TENTH ANNIVERSARY

The New Jersey Department of Environmental Protection enters its second decade this year, and remains steadfast in the goal set at its creation on the first national Earth Day, April 22, 1970—to assure a better quality of life for the citizens of New Jersey through the protection, conservation and preservation of our natural resources air, water, land, flora, fauna; and our historic heritage.





## BLUEPRINT FOR THE 1980'S

Each January the Governor delivers a "State of the State" message to the Legislature in which he touches on accomplishments of the previous year and presents proposals for the future. In his Sixth Annual Message to the Legislature, Governor Byrne said the Pinelands protection program implemented last year capped earlier achievements in the development of the Meadowlands, the construction of the Sports Complex and the start of Atlantic City's rebirth. He remarked that the Hudson River Waterfront Planning Study and Development Commission (created in 1979) is expected to submit its recommendations this year for revitalizing the now decayed Hudson River Waterfront. He said the success of Liberty State Park in converting the Jersey City shoreline to the true gateway of the nation will be even more evident "as we open the railroad terminal for concerts, theater, and exhibits, and as a center for water transportation to the Statue of Liberty, Ellis Island, and, we hope, to other points in New York City and New Jersey."

Other proposals relating to environmental protection (in brief) include: developing ways to handle hazardous waste; establishing a regular summer performing and visual arts program at appropriate major parks; returning the Battleship *New Jersey* to the state; developing new or expanded museums of various types—toy, fire and railroad; new commercial and recreational facilities on Cape May and elsewhere in Ocean and Monmouth counties; providing technical and financial assistance to local governments to resolve waterfront problems; passing

*Continued on page 16D*

## HAZARDOUS WASTE GROUP RECOMMENDS FOUR MAJOR ACTIONS

The Hazardous Waste Advisory Commission recently submitted to Governor Byrne a 70-page report presenting an overview of the hazardous waste situation in New Jersey and outlining recommendations for the establishment of a comprehensive state program to deal with the problem.

The Commission, which termed hazardous waste management "one of the most critical environmental, public health, and economic issues facing the State of New Jersey," recommended four major actions to be taken in order for the state to develop an effective strategy for hazardous waste. They are:

- The establishment of a public, non-profit management corporation to be responsible for planning, preparing and managing a hazardous waste program and assuring that needed facilities are built. It would determine the need for such facilities, develop siting criteria and select sites, and solicit proposals from the private sector for construction and operation of needed facilities.

- The development of an effective public participation program and public education program to be used in the decision-making process for all aspects of the hazardous waste program.

- Changes in the regulatory structure so that enforcement actions can be

*Continued on page 16D*



## STEVEN J. PICCO NAMED ASSISTANT COMMISSIONER

Steven J. Picco, of Pennington (Mercer County), recently became DEP's Assistant Commissioner for Regulatory and Governmental Affairs. His responsibilities include supervising and coordinating the department's legislative, regulatory and enforcement activities. He will also be responsible for the public participation programs within all functions of DEP. Formerly Assistant Commissioner for the state department of Energy (1978-79), Picco, an attorney, had earlier been employed with DEP (1975-78) and served as Chief of the Office of Legislative and Regulatory Affairs for the department from August 1977-June 1978. Picco received his bachelor's degree in Economics from Rider College and Juris Doctor degree from Seton Hall. □

## SELLING WHAT YOU BAKE FOR WILDLIFE'S SAKE



Quite often the wildlife professionals are asked by enthusiastic appreciators of wildlife, "What can we do to help?". One important way that the average citizen can aid the wildlife conservation effort is to raise funds that can be used for various wildlife projects. An excellent example of this type of involvement was demonstrated by Mrs. Roscoe's fourth grade class at Mendham Township Grammar School last year. A bake sale was held which generated over \$50.00 to the wildlife cause. All of this money was donated to the New Jersey Chapter of the Wild Turkey Federation which will use the money to help in the effort to restore the wild turkey to New Jersey's habitats. This bake sale, conducted by the students themselves, is part of a teaching unit on wildlife that Mrs. Roscoe uses in her classroom during National Wildlife Week. □



# Casino development and the rebirth of Atlantic City

## *Environmental perspective—*

**Background:** Atlantic City has splendid natural setting, with expansive beaches along the Atlantic Ocean backed by the internationally famous Boardwalk, and four to six miles of coastal wetlands between Absecon (the barrier island upon which the city sits) and the mainland. Founded in 1856 Atlantic City reigned as one of the most popular family seashore resorts in the nation, reaching its peak in the 1920's. The depression in the 1930's followed by WW II and the advent of air transportation to distant resort areas played a part in the decline of Atlantic City as a prime family resort and national convention site. The once elegant hotels faded over the years with the decrease in visitation and the area suffered as jobs normally associated with a resort region disappeared.

When New Jersey voters in 1976 approved casino gambling in Atlantic City—a step designed to revitalize the area through infusion of resources and visitors, and the thousands of short- and long-term job opportunities they will generate—the state Department of Environmental Protection was handed a tremendous challenge. Besides such issues as beach access and conditions, water supply, water and air quality, wastewater treatment, regional patterns of development, historic sites, etc., DEP is equally concerned with wetlands protection, suitable locations for hotels and casinos, motels and restaurants, adequate transportation, parking and housing facilities, and the prompt and efficient management of the department's permit process.

Within two days of the referendum's passage, two DEP officials met with municipal and county representatives and the state legislators from that district to pledge DEP's cooperation and assistance in helping Atlantic City and its surrounding region to cope with the changes (environmental impact) that would affect the built, natural, social and economic environment of that area as the inevitable result of casino development. This "partnership," along with the cooperation of private and commercial interests, has helped to ease the planning process for the revitalization of Atlantic City not just as a "casino town," but as a first-class family resort and convention site while remaining a fine place to live.

State law, in particular the Coastal Area Facility Review Act (CAFRA) of 1973, entrusts DEP with the responsibility of reviewing development proposals and issuing permits for all major construction projects in the state's coastal region (about 17 percent of the



**The famous Atlantic City Boardwalk. The first three hotel-casinos to open in Atlantic City are located along the "boards." Resorts International, Caesar's Boardwalk Regency and Bally Park Place were in operation by the end of 1979.**



**Shuttle bus systems, such as the one operated by Resorts International between its hotel-casino and outlying parking lots, will cut down on traffic congestion.**

Garden State Parkway including Atlantic City. (The CAFRA permit complements traditional municipal development reviews and building permits.) The department's Division of Coastal Resources is in charge of the coastal permit program.

Given below is the State's position on each of six key environmental issues in Atlantic City:

- **Wetlands protection:** The quality of the wetlands in Atlantic City is high. The strong New Jersey wetlands policy in effect since the early 1970's must continue in Atlantic City as well as the rest of

the area covered by the Wetlands Act of 1973. This is national policy too. Major wetlands will not be filled and developed for hotel-casinos, roads, etc. not unquestionably in the public interest.

- **Hotel-casino location:** From DEP's perspective, hotel-casinos should be located in two general areas—the first is the colorful area of the Boardwalk, which connects a variety of facilities in the established resort-commercial district; the second is a new resort area developing around the State marina.

*Continued on page 16D*





### **SORRY! WRONG I.D.**

"Murphy's Law" caught up with us. The man standing next to Richard Treloar in the picture on page 16A of the Jan./Feb. Environmental News section is Bernard Moore, chief of DEP's Office of Coastal Engineering. □

### **PLANT A TREE ON ARBOR DAY**

School children throughout the state will be taking part in tree planting ceremonies the last Friday in April. Arbor Day is celebrated around the country at different times, depending on climate. The celebration of "our friends, the trees" is not limited to the United States—many lands honor this wonder of nature. □

### **WILSON ON TRANSIT BOARD**

The July 1979 law establishing the New Jersey Transit Corporation provided for a seven-member board of directors, DEP First Deputy Commissioner Betty Wilson, State Treasurer Clifford A. Goldman and Transportation Commissioner Louis J. Gambaccini are the Administration's statutory appointees to the board. Governor Byrne named Ms. Verdell Roundtree of Plainfield, William Rodgers of North Brunswick, John McGoldrick of Princeton and Martin Brody of Short Hills as the four public members. Gambaccini is chairman of the board. □

### **HISTORIC GRAIG HOUSE OPEN**

The Craig House, located at Monmouth Battlefield State Park in Freehold, has been restored to its 18th Century appearance and is open to the public Wednesday through Sunday (closed Monday and Tuesday). The house, built in 1710, has been decorated with period furnishings. The Craig home supposedly was used as a temporary field hospital by the British during the Battle of Monmouth in June 1778. The entrance of the Craig House is on Schifanoff Road, off Route 9 in Freehold Township. □

### **A LITTER BAG IN THE CAR MAY SAVE YOU MONEY**

A state law on the books since 1975 says: "No person shall throw or drop any bundle, object, article or debris of any nature from a vehicle whether in motion or not when such vehicle is on the highway..." The law further provides that violators "shall be subject to a fine of not less than \$25 nor more than \$200 for each offense." So, use a litter bag and the ashtray in your vehicle—the highway environs will benefit and so will your wallet. □

*Continued from page 16C*

### **Atlantic City**

state). The area embraces those parts of Atlantic County generally east of the

- **New hotel, motel and restaurant location:** Major development proposals in the past three years have focused on new hotel-casino development. But, much of Atlantic City in the 1980's will depend on the refurbishment of existing hotels, motels and restaurants and other new facilities for visitors. To succeed as a family resort and convention site, Atlantic City needs thousands of rooms with various characteristics to serve diverse markets.

- **Transportation and parking:** It is extremely important that transportation be improved so people can get to and from virtually all parts of Atlantic City without continued reliance on automobiles. Traffic congestion and its effects on air quality and public health are concerns in most downtown commercial areas of the United States, and Atlantic City is no exception. Several solutions, including shuttle buses and park-and-ride facilities, are under study.

- **Housing:** The collective goal in Atlantic City and its surrounding region is to recreate a community with jobs and homes for its residents—housing construction, renovation and rehabilitation. Vigorous public and private sector efforts are needed. DEP will do its part by helping to select appropriate sites and then processing expeditiously all CAFRA permit applications received for new housing.

- **Swift, predictable decision making.** The first hotel-casino application submitted to DEP for a CAFRA permit was reviewed and approved in less than 90 days. While subsequent applications have been more complex, DEP is committed to making consistent decisions, so that competition between hotel-casinos and other facilities will not be affected.

As of December 31, 1979, DEP had issued coastal construction permits for more than 4,000 hotel rooms, about 3,000 new parking spaces and approximately 500 new dwelling units in Atlantic City.

Division of Coastal Resources Acting Director David N. Kinsey, from whose report this article was written, said that DEP "has worked hard to earn a reputation as a responsive, responsible public agency and it will keep working to maintain that reputation. It will continue to provide preliminary analyses of permit applications before public hearings in order to give everyone written indications of staff views. And it will continue to process serious proposals for new development in Atlantic City as quickly as possible, while respecting various rules and laws that govern coastal permits."

*Continued from page 16A*

### **TOXIC WASTE CLEANUP**

The Commissioner pointed out that this is by no means an end-all to such site problems. She said, "I have sent a list to all county officials of up to 300 potential sites in New Jersey that may present us with contamination problems, and we will evaluate those on a priority basis in the months and years ahead. The total clean up cost for handling hazardous chemical waste in the past is staggering, both nationally and in New Jersey. Compared to our 300, the federal Environmental Protection Agency (EPA) estimates 30 to 50 thousands sites nationally. The only way we can expect to have sufficient resources to clean up a problem of this magnitude is through the enactment of national legislation known as "Superfund." The New Jersey measure is complementary to that federal legislation. Until "Superfund" comes into being, New Jersey will be using its own resources to attack the most serious problems. □

*Continued from page 16B*

### **BLUEPRINT**

laws to protect dunes on the shore; continuing the aggressive program to stabilize and enhance the urban environment through upgrading existing park facilities and using \$100 million from the 1978 Green Acres Bond fund earmarked for acquisition, development and rehabilitation of city open space and recreational facilities; and expanding the air monitoring network. □

*Continued from page 16B*

### **HAZAROUS WASTE GROUP**

based on violations of record-keeping, registration and licensing requirements along with existing enforcement efforts which have relied primarily on "catching people in the act" of illegal dumping.

- The establishment of an interim Hazardous Waste Management Board in the Department of Environmental Protection to be responsible for beginning the implementation of a comprehensive hazardous waste program until a permanent institutional arrangement is agreed upon. □

**TO REPORT ABUSES  
OF THE ENVIRONMENT  
CALL ACTION LINE  
609-292-7172**





**Conservation Officer Carmine LaCava, Middlesex County, received three special awards at the graduation ceremonies of the Ocean County Police Academy classes this past Spring. The awards were:**



1. High Overall Average of 96.88  
This award was for scholastic and firearms training and marksmanship.
2. High Marksmanship Average of 96.21  
This award is for highest average range score.
3. Physical Fitness  
This award was based on a point system determined by performance in various exercises. Received highest score in points.

## Don't Forget Opening Day Trout on April 12



Tommy McDowell and his Lab watch Conservation Officer Glen Hawkswell stock trout in a New Jersey stream.

## Limited Edition Wild Turkey Prints

By Carol Decker



Fans of Carol Decker, the artist whose work has graced the inside back cover of *New Jersey Outdoors* for the past two years, will be pleased to know that for the first time, a limited edition print of one of her acrylic paintings is now available. The print, entitled "Struttin' Time", is featured on the front cover of this month's (March/April 1980) issue of *Turkey Call Magazine*, the official publication of the National Wild Turkey Federation.

This beautiful work of art celebrates the successful reintroduction of the wild turkey into New Jersey's habitats after an absence of nearly 100 years.

Carol has been an active supporter of the turkey restoration project since its beginning in 1977 and is also a charter member of the New Jersey State Chapter of the Wild Turkey Federation.

This limited edition is comprised of 500 signed and numbered full color prints. An additional 200 signed artist's proofs have been donated equally to the National Wild Turkey Federation and the New Jersey State Chapter to further the conservation of this noble bird.

Each print is reproduced on heavy museum quality, acid-free paper. Overall size is 16 by 20 inches; image size is 12 by 16 inches.

For more information on ordering contact Wildlife Art Studio, R.D. # 2, Box 24, Sharp Road, Branchville, New Jersey 07826.



## Osprey Fledglings



# ENDANGERED SPECIES IN NEW JERSEY

**Outdoors**  
**Film Documentary,**  
**March 24, 10:30 PM**  
**UHF Channels**  
**23, 50, 52 and 58**

Probably the wildest—but most welcome—thing that might have happened to the NEW JERSEY TV crew that went into the caves of northern New Jersey in search of an Indiana Bat would have been to find one. The crew, filming “Endangered Species of New Jersey,” for broadcast on March 24, knew the bat has long been suspected of having abandoned its adopted habitat more than 50 years ago.

But the crew dutifully tried. It was working on a documentary which would, according to producer Lowell Shaffer (“Return of the Peregrine Falcon”), present a close look at more than a dozen of the state’s wildlife species which are endangered or, in cases like the Indiana Bat, apparently have vanished from the Garden State.

Filmed on locations ranging from the mountains in the north to the Pine Barrens and southern shore areas, the program outlines the work of the Endangered and Nongame Species Project, under the aegis of the Department of Environmental Protection. It is scheduled for Monday, March 24, at 10:30 p.m., on UHF channels 23, 50, 52 and 58.

The Bald Eagle, Peregrine Falcon, Osprey and Cooper’s Hawk are among the species beautifully portrayed in the new production. Narrated by Paul (Pete) D. McLain, deputy director of the Division of Fish, Game and Shellfisheries, the film reports on some of the successes in restoring some species

and gains in encouraging others to return to their habitats.

Describing the Garden State’s unique environmental heritage, and how it has been altered by urbanization, pesticides and other pollutants, the film focuses on the effects of careless mis-use of the state’s rich inheritance. As pollutants and urbanization took their toll, the need to know more about the state’s wildlife resources became more acute. “Endangered Species of New Jersey” extends to NEW JERSEY TV viewers information already known to conservationists, environmentalists and wildlife lovers.

It provides for them a rare look at species such as the Black Skimmer and Least Tern, the Bog Turtle and Timber Rattlesnake, the Loggerhead Turtle and the Pine Barrens tree frog. “It shows what is being done and what can be done to preserve the populations and habitats of our endangered species,” says producer Shaffer, “so future generations will enjoy the bounty of the unique environment past generations in New Jersey enjoyed.”

Today’s generation, however, should enjoy Shaffer’s effort—despite the fact that his film crew did not succeed in finding and photographing an Indiana Bat; a fact a chorus of croaking tree frogs at the conclusion of the half-hour documentary seems to find amusing, if one elects to hear amusement in their song. □

*Continued from Editorial page*

## IN THIS ISSUE:

the diversity of wildlife at this lake edge in the Pine Barrens.

Our wildlife in New Jersey article in this issue is *The Eastern Hognose Snake* by Gary K. Meffe, a new author to our publication. The Hognose snake, which is harmless, has been needlessly destroyed by man and misnamed “Puff Adder,” “Spreading Viper,” and “Death Adder” because it was thought to be venomous.

A new series, *New Jersey Saltwater Fish and Shellfish*, is introduced in this issue. In the following issues this year and next we

intend to publish articles on all the important marine species in New Jersey waters. The material on the Atlantic Mackerel, Whiting, Weakfish and Crab was compiled by marine biologists Bill Figley and Ray Townsend. The color illustrations were provided by Anthony Hillman, and the inside back cover illustration was provided by Carol Decker.

*Where Have All the Trout Gone?* by Judith Connell Haduch, documents a three-month study of Glenwood Brook by the environmental chemistry class at Vernon Township High School. Author Haduch teaches chemistry and is Science Department Chairman.

Spring is here for sure when you see a robin. In *It’s a Robin’s Life* by

Carleton V. Brairton, we are introduced to courtship, mating, nest building, egg laying, incubation, feeding of young—in short, everything you wanted to know about robins.

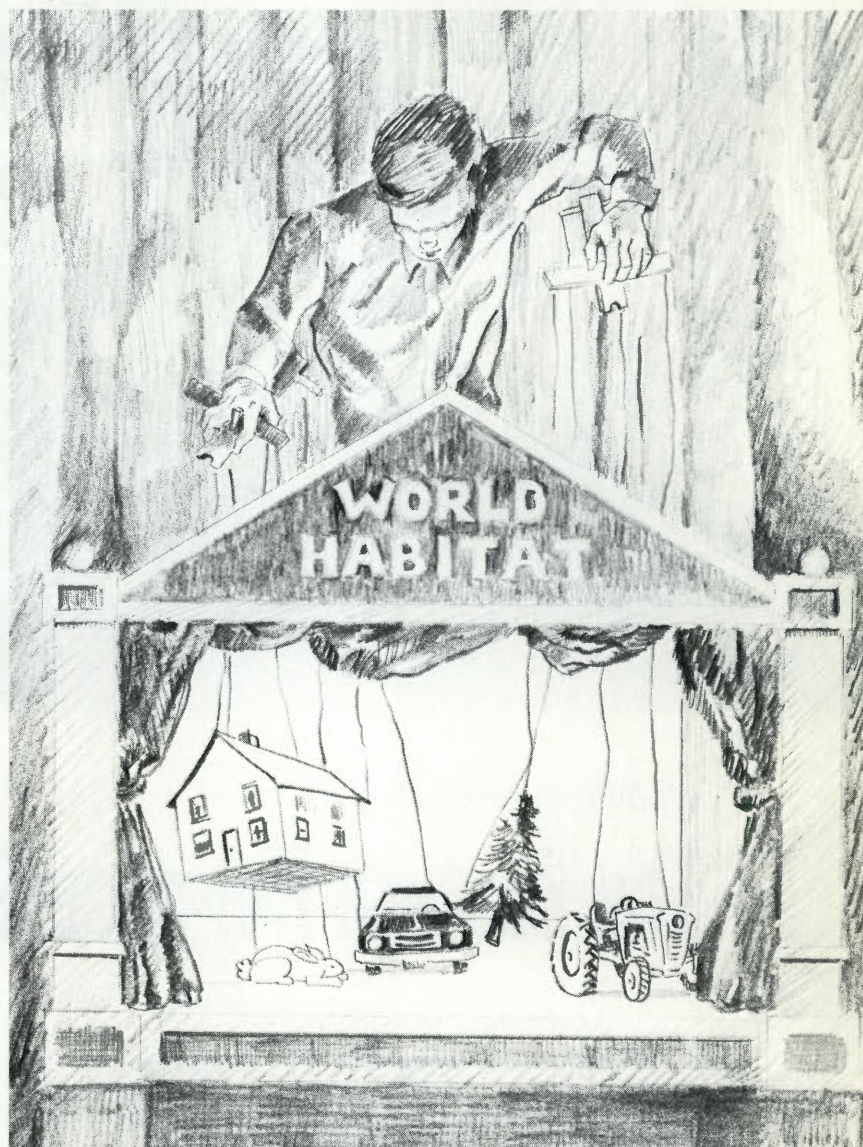
April 22nd. is the 10th Anniversary of the Department of Environmental Protection and the anniversary of Earth Day. The Guest Editorial by Commissioner Jerry Fitzgerald English makes note of this occasion, and the article *DEP’s Decade of Accomplishments* summarizes some DEP accomplishments and milestones of the last decade.



Available to Teachers

## Wildlife and Environmental Education Teaching Unit

The unit is titled "Man's Manipulation of the Ecosystem: A Curriculum Guide for Primary and Secondary Teachers." This 16-page illustrated booklet includes concepts, behavior objectives, applications, supportive activities, a glossary of terms, references, and an evaluation sheet.



*"Man's Manipulation of the Ecosystem . . ."*

The Wildlife and Environmental Education Teaching Unit has been developed under the auspices of U.S. Office of Environmental Education. The need for this educational package was recognized after DEP's Division of Fish, Game, and Shellfisheries conducted several Teachers Workshops regarding natural resource management. It became apparent that very little curriculum material was available that dealt with resource management in a way that included man as user and manager of these resources. There was an even greater assumption that certain student entrance level skills and knowledge were firmly established when, in fact, they were almost non-existent. Hopefully, this material will help overcome these problems.

The topics covered are somewhat controversial in focus but rather straightforward in content. A broad format has been chosen so that it can be easily adapted to meet the needs of individual school systems. Although most of the topic areas have a science orientation, a special effort has been made to include Humanities, Social Sciences, Arts and Mathematics activities.

Originally, the project intended to develop separate

activities for both the primary (targeted for 5th grade) and secondary (targeted for 10th grade) levels. However, during the course of the work, it became apparent that many of the activities overlapped these grade levels and could be easily adapted to meet the needs of upper or lower grade levels. To avoid duplication we elected to combine the curriculum into one booklet.

We have included suggested grade levels with each activity; however, these are only guidelines. The activities were written with the teacher in mind and not as something to be handed directly to the students.

All of the activities have been tried and tested within selected school systems.

The evaluation sheet included as part of the guide will aid the Wildlife Education Unit in making further improvements in the project. Your evaluation of these guides will be greatly appreciated.

**The Units are free. Write to:**  
**WILDLIFE EDUCATION UNIT**  
**STATE FISH HATCHERY**  
**HACKETTSTOWN, N.J. 07840**





## Wildlife in New Jersey

# The Eastern Hognose Snake

GARY K. MEFFE

One of the most intriguing and fascinating snakes in the world is found right here in New Jersey—the eastern hognose snake, *Heterodon platyrhinos*. It is a member of the world's largest family of snakes, the colubrids, and as is true for most of its relatives, the hognose is non-venomous and totally inoffensive to man. Ranging throughout the state, it is also found in most of the eastern half of the U.S., from Massachusetts southward to Florida and westward to the eastern slopes of the Rocky Mountains. There are only two other closely related species (all are restricted to North America), the southern hognose (*H. simus*) and the western hognose (*H. nasicus*), neither of which is found in New Jersey.

They are stout-bodied snakes, adults measuring from 20 to 35 inches in length, with a record specimen of 45.5 inches. Coloration is quite variable, the basic ground color being yellow, brown, olive, gray,

orange, or red. The back is usually covered with a series of large central blotches alternating with smaller lateral spots. Some specimens are totally black, with no other distinguishing coloration. The belly may be mottled gray or greenish on a background of yellow, light gray, or pink. General coloration is dull, due to keels, or grooves, in the scales. The name *hognose* derives from the snakes' upturned snout, giving the face a strange resemblance to a hog.

If you were to come upon a hognose snake in the field, it would indeed be a treat—you would witness a most incredible behavioral display designed to discourage you (or a real predator) from tampering with this harmless creature. When confronted, the hognose does not attempt to escape, as it is not very fast and is usually found in open country, away from potential hiding places. Rather, it will stand its ground and put on an act intended to make itself look ferocious. So con-

vincing is this fakery that the uninitiated might well be terrified by this wily serpent.

The ruse begins when the snake rears its head back and flares out the ribs of the neck region into a hood, exposing brighter colors and looking quite like the deadly cobra. It adds to this a loud, menacing hissing noise by expelling air from the lungs, and then begins a series of strikes at the intruder. These strikes almost never involve a bite; the animal simply butts against you with its upturned snout and does no harm.

If this tactic does not work, Act II unfolds. The snake begins by opening its mouth, tongue hanging, and goes into what appears to be a convulsion. It falls on its back, thrashes about for a short time, mouth still agape, and eventually becomes totally motionless, apparently dead! It may also vomit or defecate and might even emit a rotting smell. For all intents and purposes the snake has just died before your eyes, and I have even witnessed flies crawling into the mouth, exploring this choice morsel of "decaying" flesh. You can pick it up, jostle it about and even stick your finger down its gaping throat, but will get no response. Just turn the hognose on its belly though, and it will promptly flip over onto its back, thereby giving itself away! Apparently, it feels that, in order to appear dead, it must lie on its back. The snake will remain in this position until the danger passes.

If you back away and watch from a distance, the snake will, after a few minutes, cautiously lift its head and look around. If no danger is seen it will slowly turn over and crawl away. Approach it again, and it will quickly go into the death act once more.

Why this strange behavior? The first part is obviously intended to frighten away an enemy by convincing it that the hognose is a formidable opponent. The death-feigning, however, is not as easy to explain. Many predators will take only live food and will ignore any dead animal they find. Perhaps this death act is an evolutionary adaptation that discourages a predator from eating this otherwise defenseless snake.

Another question arises, namely, why the upturned snout? This is, in fact, an adaptation to burrowing. The hognose is generally found in sandy





PHOTOS BY WADE WANDER



*Playing Dead*

areas or areas of otherwise loose soils such as farmland, and frequently burrows beneath the ground, using the snout to drill in and push away the soil. The reason for this burrowing behavior is not fully understood, but it may be used for hiding, hunting, or even for egg-laying.

Other fascinating adaptations of the hognose involve feeding. Although it will take a variety of food items including insects, frogs, other reptiles, small mammals, and occasionally a small bird, the hognose is known primarily as a toad specialist, with toads (*Bufo* spp.) accounting for anywhere from 40% to perhaps 100% of the diet. There are several problems associated with this, however. First of all, toads inflate their bodies with air when threatened and become difficult to swallow. The hognose snake has circumvented this problem by the development of two enlarged maxillary teeth in the rear of the mouth which serve to puncture and deflate the toad, there-

by making it much easier to swallow, and to provide a better grip on the struggling prey (the hognose does not constrict, poison, or otherwise kill its prey before swallowing it). Once it is eaten though, a more serious problem arises—toads are highly poisonous if eaten, particularly to small animals. Their skin produces three types of toxins that can cause heart dysfunction and death if ingested. (There is one known instance of a human death after mistaken ingestion of a giant toad, *Bufo marinus*; toads are entirely harmless to handle, though, provided they do not come into prolonged contact with the mouth.) The hognose snake deals with this problem by producing compounds in the adrenal glands which neutralize the effects of the toad poisons. This has resulted in the evolution of exceptionally large adrenals in this species and in fact, the hognose has by far the largest adrenal glands of any snake in North America.

Little is known of reproductive activities in these snakes, but mating probably occurs in April, with fertilization being internal as in all reptiles. The time of egg-laying varies geographically, but it most likely occurs sometime in June in New Jersey. Clutch sizes vary from 4 to 40 (one specimen in Minnesota produced 61); the eggs are off-white, thin shelled, and ellipsoid, measuring about 0.75 by 1.25 inches. Simple nests are made by hollowing out a small burrow and the eggs are buried under a few inches of usually moist soil. The female may remain to guard the eggs, but this is all the parental care the young will ever receive. The incubation period lasts from 55 to 60 days, during which time each egg will increase in size by as much as 50% owing to intake of moisture from the soil.

Hatching begins when the young snake makes a slit in the shell with its egg-tooth, a sharp projection from one of the head scales. The hatching process takes from 30 to 60 hours, after which a 6.5 to 8.5-inch baby hognose appears, fully able to care for itself in its new environment.

Hognose snakes overwinter in a semidormant state known as pseudohibernation. Their hibernacula (places of overwintering) consist of relatively shallow areas

under rocks or stumps or in burrows. They enter these singly, as opposed to such species as rattlesnakes (*Crotalus* spp.) and garter snakes (*Thamnophis* spp.), which congregate in large underground dens. Low temperature is the most important environmental cue that sends the hognose into its pseudohibernation and this usually occurs in October, later than in many other reptilian species. A warm spell in winter may bring them out into an active state, and one specimen in Ohio was found to be active in January. They will permanently leave the hibernaculum in March or April.

Natural enemies of the hognose include predaceous birds such as the red-tailed hawk, the snake-eating kingsnake (*Lampropeltis getulus*), some mammals, and even large spiders. The greatest enemy of course, is man, mostly through ignorance of the facts. Because of the terrifying nature of the bluff act, the hognose is thought to be venomous and extremely dangerous, and many are needlessly slaughtered. They have earned such inappropriate names as "Puff Adder," "Sand Adder," "Blow Adder," "Spreading Viper," and "Death Adder." Many people still entertain the notion that even the breath of the hognose is venomous, and that to inhale it is almost certain death. Of course, all of this is sheer nonsense and the snake is as harmless to man as any creature could be.

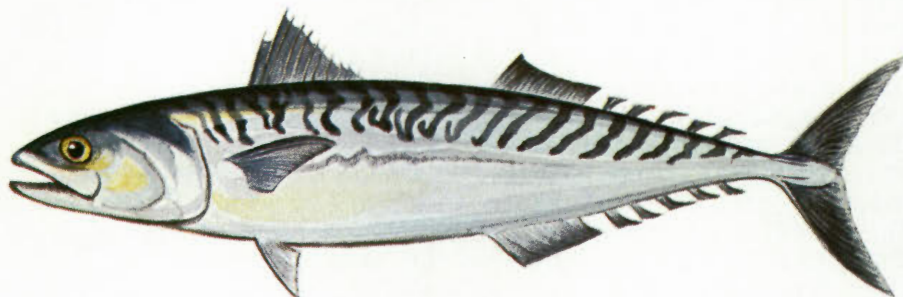
The hognose is still fairly abundant in New Jersey, although continued habitat destruction will surely endanger its existence, as it does to all our native species. This is particularly true in the Pine Barrens region, where development is occurring at an alarming pace, destroying one of the largest remaining wilderness areas in the East. Rather than augment this process, why not slow it down by an increased knowledge of, and respect for, our wildlife? And if you're lucky enough to come upon an eastern hognose snake, don't destroy it, for you will be doubly rewarded. In addition to the knowledge that you have allowed this harmless creature to continue its complex role in the ecosystem, you will also bear witness to one of the most astonishing behavioral adaptations in all the natural world. □



# NEW JERSEY SALTWATER FISH AND SHELLFISH

*The four species discussed here are the first in a series of articles that will collectively cover all of the salt and fresh water game fish present in New Jersey.*

## ATLANTIC MACKEREL



### BIOLOGY

**Common names:** Atlantic mackerel, common mackerel

**Scientific name:** *Scomber scombrus*

**Range:** Labrador to Cape Hatteras

**Size:** Average 14" to 18", occasionally to 22", length/weight relationships: 14" = 2 to 2 1/2 lbs., 22" = 4 lbs.

**Food:** plankton, fish eggs and a variety of small fish and fry.

**Migration:** In the spring, mackerel travel from North Carolina north to Labrador, returning south in the fall. They winter off of the continental shelf in 50 to 100 fathoms of water.

**Habitat:** Mackerel are pelagic, preferring cool, well-oxygenated open ocean waters.

**Spawning:** Mackerel spawn between the last half of May and June, during the night. Each female produces 400,000 to 500,000 eggs which drift in the water column. Hatching takes place in 50 to 150 hours, depending on water temperature.

### RECREATIONAL AND COMMERCIAL IMPORTANCE

Surveys by the National Marine Fisheries Service indicated that New Jersey anglers caught 2.1 million mackerel in 1978; two-thirds of the catch was taken on party and charter boats, while private boats accounted for the remaining third. Recreational catches exceed current commercial landings.

Commercial landings reached a peak of 13 million pounds in the late 1940's, declined sharply in the 1950's and 1960's and began to increase slowly in the 1970's. Almost all of the catch is taken by

otter trawl during the spring run. Prior to the enactment of the 200 mile limit, the Russian fleet heavily exploited U.S. mackerel stocks causing substantial declines in abundance. The foreign fleet is now limited to a small quota and mackerel stocks are rebuilding. U.S. commercial mackerel landings have been characteristically low because they are considered poor tablefare in this country. About 250,000 pounds sold each year for recreational fish bait in New Jersey.

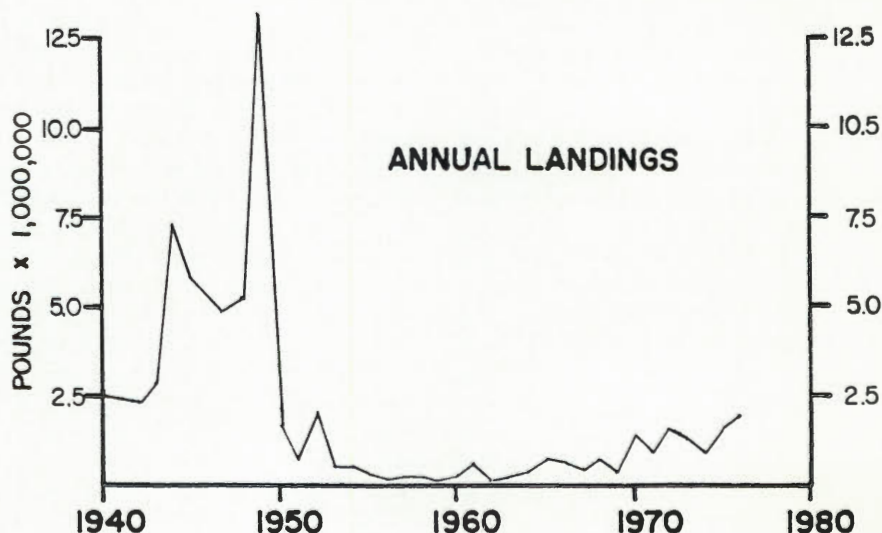
### SPORTFISHING FACTS AND TECHNIQUES

Like the old gold rush days the appearance of the first mackerel schools off the Jersey coast in early spring signals the surge of party, charter and private boat fishermen eager to hook

their first fish of the season. There are usually two runs of mackerel along our coast, one during April or May and the other late in the fall; the former is by far the larger and provides the majority of the angler harvest. The main ingredient to successful mackerel fishing is finding them; this is usually done with a depth finder or by locating slicks on the surface. Once located the fishing technique is quite simple. Most anglers use a rig designed specifically for mackerel, consisting of three or four small tube lures attached at one foot intervals to a main leader weighted with a three or four ounce diamond jig or other shiney metal spoon. Mackerel are a mid-water species and it is important to have your rig at the exact depth of the school. To find this depth, send your rig to the bottom, then begin working your rig back to the surface in ten foot intervals, pausing to jig at each interval. Note the depth at which the fish hit. Chum is often used to attract and hold the fish near the boat.

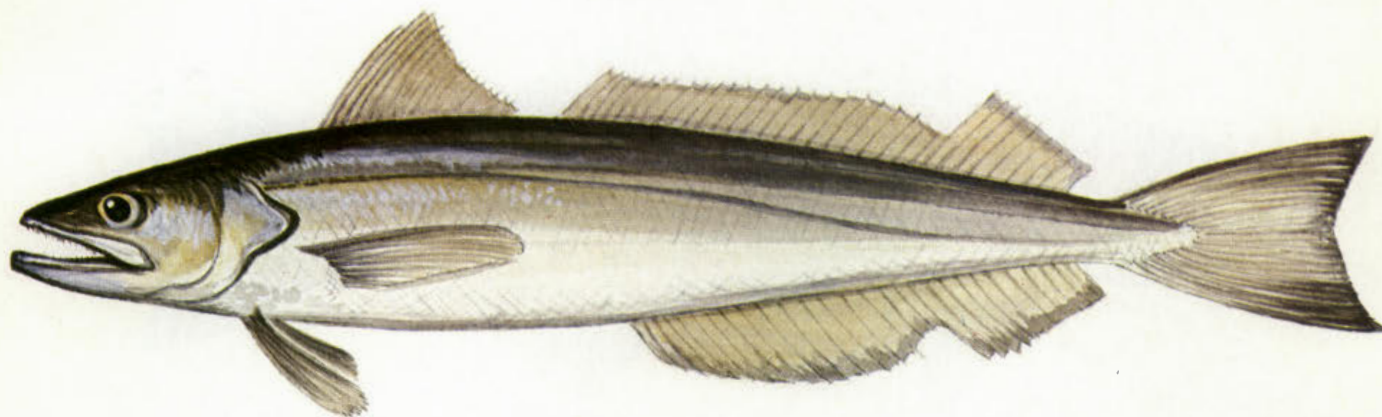
### ACKNOWLEDGEMENTS AND REFERENCES

Anthony Hillman (art), Barry Preim (graph), Bigelow and Schroeder (1953), Hildebrand and Schroeder (1972), Geiser (1977), McHugh (1977).





# WHITING



## BIOLOGY

**Common names:** whiting, silver hake, frostfish

**Scientific name:** *Merluccius bilinearis*

**Range:** Georges Bank to South Carolina, occasionally south to the Bahamas in deep waters

**Size:** Average 14" to 24", as large as 8 pounds, although over 4 pounds is rare. Length/age relationship; 7" = 1 year, 11" = 2 years, 14" = 3 years.

**Migration:** Appearance of whiting along New Jersey's coast is dependent upon water temperatures. They prefer water temperatures between 36° and 52°, moving inshore in late fall and early spring when this range is prevalent along the coast. Whiting stay in deeper waters (300 to 600 feet) when inshore temperatures vary outside of this range.

**Habitat:** Whiting prefer sandy and pebbly bottoms, ranging in depth from the surface to 600 feet.

**Spawning:** Occurs along inshore waters from Maine to New Jersey and offshore on George's Bank. Spawning takes place from June to September. The eggs are buoyant and drift along with the current. After several weeks of drifting the larvae migrate to the bottom. Hatching occurs in about 48 hours.

The whiting is an extremely voracious feeder and a very strong and swift swimmer. Not generally being a school fish, they are often found in large groups pursuing herring. In their pursuit they often strand themselves on shoals and in shallow waters. Events of this sort are most often reported after spawning which is the height of their feeding activity.

## RECREATIONAL AND COMMERCIAL IMPORTANCE

With declines in cod stocks, whiting has increased in importance as a sportfish for party boats during the winter and early spring. Small numbers of these "frostfish" are taken in the surf during

early spring. A Rutgers University survey indicated that over 71,000 whiting were caught by New Jersey anglers in 1975.

Whiting has been an important commercial species in New Jersey since the 1920's. Landings have risen since the early 1950's, but have fluctuated widely due to differences in abundance and market demand. All of commercial catch is taken in otter trawls between December and May. Whiting provide high quality, white fillets that make excellent fish cakes and sticks.

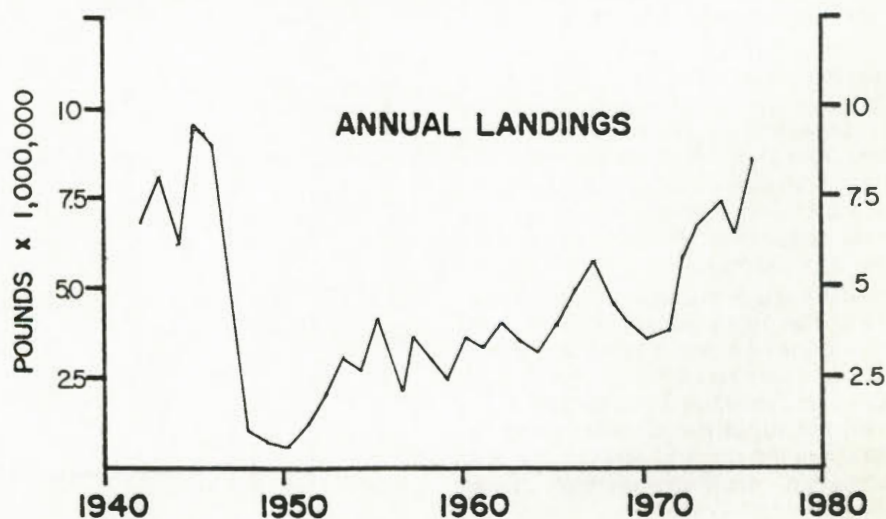
## SPORTFISHING FACTS AND TECHNIQUES

Whiting, also known as frostfish, are one of the few game fishes available to New Jersey anglers during the winter months. They are normally present close to shore between December and May. Whiting seek water that ranges in temperature from the low 50s to the mid 30s, moving inshore and offshore to accommodate changes in water temperature. Fishing is done primarily from party boats although surf fishing can be quite productive when the fish are near the beach.

Most party boats anglers use top and bottom rigs with 2 to 3 hooks and 8 to 12 oz. sinkers. It is a good idea to use short leaders on your hooks as this alleviates excessive tangle up on a crowded boat. The most used baits are strips of squid, mackerel, bunker and herring. However, fresh whiting or ling is thought to be the best by many anglers. While surf or pier fishing also use a top and bottom rig but with lighter weight, 2 to 4 oz., but you can use the baits listed above for these rigs or cast small lures—bucktails, spoons and tube lures. Whiting are most active close to shore at night. They occasionally come so close to the beach in pursuit of baitfish that they are washed ashore and can be netted or grabbed by fishermen.

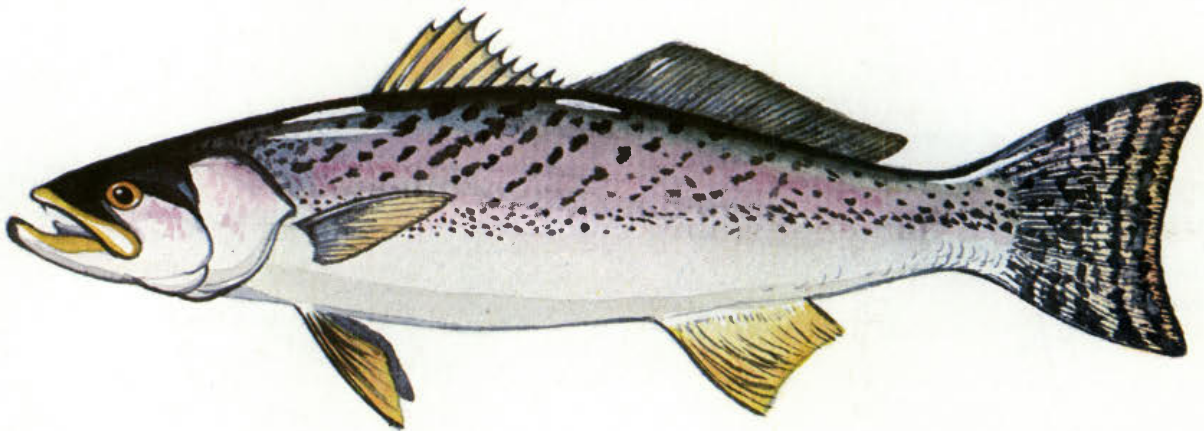
## ACKNOWLEDGEMENTS AND REFERENCES

Anthony Hillman (art), Barry Preim (graph), Bigelow & Schroeder (1953), Breder (1948), Hildebrand & Schroeder (1972), Fritz (1973), Millo (1979), Giessuebel (1977), McHugh (1977), Geiser (1977).





# WEAKFISH



## BIOLOGY

**Common names:** weakfish, squeteague, trout, gray trout

**Scientific name:** *Cynoscion regalis*

**Range:** Massachusetts Bay to southern Florida

**Size:** Average 1 to 6 pounds and 14" to 26" long, occasionally to 18 pounds; females are usually larger than males; length/age relationship: 15" = 4 or 5 years, 18" = 5 or 6 years, 22" = 6 or 7 years, 24" = 9 years and 30" = 12 years.

**Food:** Weakfish feed throughout the water column on a large variety of fishes and invertebrates, including butterfish, menhaden, thread herring, round herring, sandlance, silversides, mackerel, anchovy, shrimp, squid, crab and worms.

**Migration:** Weakfish migrate northward in the spring, spending the summer inshore. They move southward again in late autumn.

**Habitat:** Usually found in shallow waters along open sandy shores and in large bays and estuaries, including saltmarsh creeks and sometimes into river mouths, but never into freshwater.

**Spawning:** Mature weakfish are three to four years old. Spawning occurs in the nearshore and estuarine zones along the coast from May to October. The number of eggs produced is a function of size. Eggs are buoyant and float to the surface where they drift for one and one half days until hatching.

Weakfish are a member of the croaker family. The family name is derived from the ability of the males to make a drumming or croaking noise. It is often suggested that weakfish and bluefish cannot share the same habitat. The voracious blues eat the fry and food of the less aggressive weakfish, thereby driving them out of an area.

## RECREATIONAL AND COMMERCIAL IMPORTANCE

When abundant, the weakfish is one of New Jersey's most sought after gamefishes. The catch by sportsmen far outweighs that landed by commercial fishermen.

In the 1880's, tremendous numbers of weakfish were taken in pound and gill nets. Since the 1920's, commercial catches have generally declined. For unknown reasons, weakfish populations dropped sharply during the 1950's and 1960's, but made a strong comeback in the 1970's. Weakfish are taken in New Jersey between May and October. About three-quarters of the catch is landed by pair trawlers, the remainder are caught in gill and pound nets. All of the catch is marketed as fresh fillets.

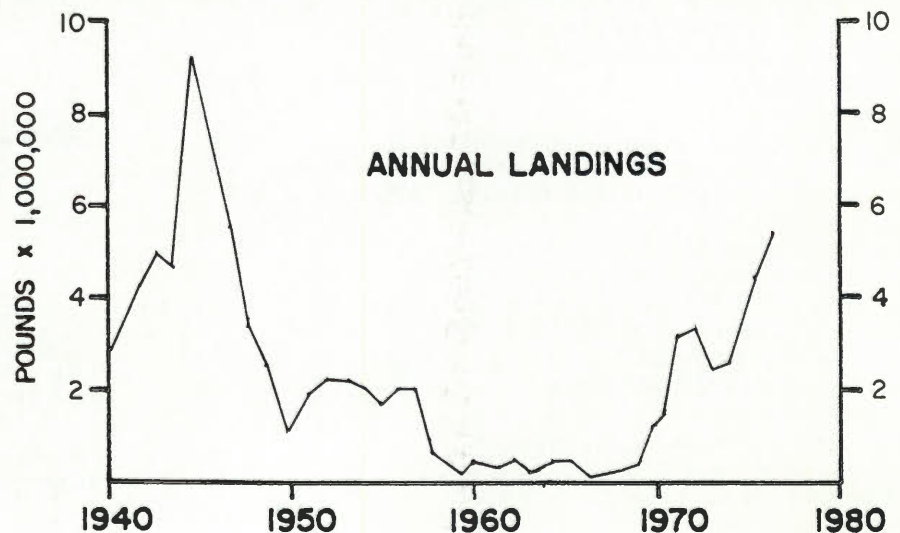
## SPORTFISHING FACTS AND TECHNIQUES

Weakfish are found throughout New Jersey's bays and nearshore ocean waters. During the past few years, Delaware Bay has provided some of the best fishing, especially during the spring spawning

run. At times weakfish are very fussy eaters and will take only certain baits. One of the most effective methods in shallow bay waters is to chum with live grass shrimp. Place two shrimp on a number 10 or 12 hook and let the bait drift back in the slick. This method will work from a boat or the bank. Another reliable method is to cast and retrieve a bucktail tipped with squid or shedder crab across creek mouths and along sod banks. In the surf, still fishing with cut bait or live spot or snappers is an old standby; casting with plugs, spoons, and bucktails will also produce results. Weakfish can be taken in nearshore ocean waters between May and November. Two of the most often used methods are jigging with spoons, bucktails or tubelures and drifting top and bottom rigs baited with squid or fish strips.

## ACKNOWLEDGEMENTS AND REFERENCES

Anthony Hillman (art), Barry Preim (graph), Dave Shirley, Bigelow and Schroeder (1953), Hildebrand and Schroeder (1972), Wilk (1976), McHugh (1977).





# BLUE CRAB



## BIOLOGY

**Common names:** blue crab, blue claw

**Scientific name:** *Callinectes sapidus*

**Range:** Cape Cod to Texas

**Habitat:** Bays and estuaries, sometimes found in fresh water, spend their winters in the mud.

**Migration:** Blue crabs are relatively stationary and make only local movements. Females prefer saltier waters near inlets for both carrying their young and spending the winter. Males, on the other hand, move to less saline waters at the heads of bays or in tidal creeks. Young hatch in salty waters and move back into bays and estuaries as they grow older.

**Spawning:** Blue crabs spawn between June and August, producing 700,000 to 2,000,000 eggs which the female carries on her abdomen. Females may spawn 2 to 3 times before dying. Eggs hatch in 9 to 14 days.

**Feeding:** plant or animal matter, alive or dead.

In order to grow, blue crabs must shed their hard chitinous shells. Shedding is a precarious time, for the crab may get hung up in its old shell and die; if it does emerge successfully, its new shell is very soft, rendering the helpless crab vulnerable to predators. For this reason, crabs usually seek the protection of shallow grass beds during the molt. Young crabs molt every few days, while older crabs molt every 20-30 days. After 15-20 molts, female crabs reach maturity. During the last molt, while the female is still soft, mating takes place. The female mates only once, storing the sperm needed for several spawnings.

## RECREATIONAL AND COMMERCIAL IMPORTANCE

Of all New Jersey's marine fish and shellfish, more effort is expended in

catching the blue crab than any other single species. Surveys conducted by Rutgers University indicate that three-quarters of the state's saltwater fishermen go crabbing and that crabbing comprises roughly 30 percent of all marine fishing activity. Recreational crabbing is particularly important in the Upper Barnegat, Little Egg Harbor and Maurice River estuaries, comprising 65 to 86 percent of the total recreational harvest in these areas. The blue crab is especially popular with rental boaters.

The blue crab supports a valuable commercial fisheries in Delaware Bay. Over 80 percent of the catch is taken during the warmer months in wire traps. The remainder is harvested during the winter with dredges. Since 1940, New Jersey landings have fluctuated widely,

with a peak of 2.9 million pounds in 1975. This peak reflects the recent increased abundance of blue crabs.

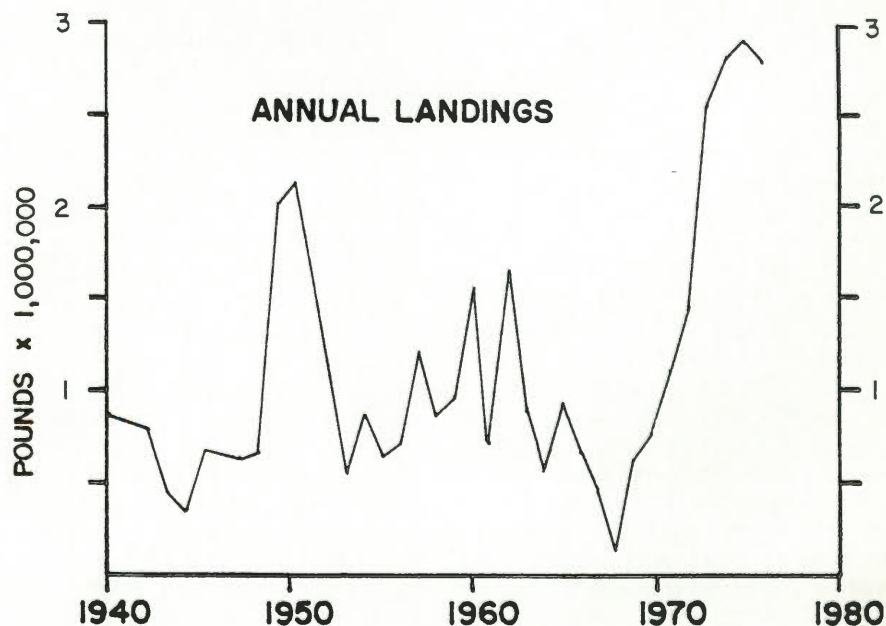
## SPORTFISHING FACTS AND TECHNIQUES

Crabs are abundant all along the Jersey coast, from the Hackensack River to Delaware Bay. The best places to catch crabs are in tidal creeks, rivers and shallow bays. One of the most popular methods is to use baited lines or traps from the bank or a boat. Most common baits are bunker and chicken necks, but any fresh fish remains will work well. A very inexpensive bait line can be made by tying a 6 oz. sinker and a large (8/0) hook to 15 or 20 feet of cord connected to a small stick for securing and storing the line. A longhandled net is needed to scoop up the crabs which are brought to the surface clinging to the bait. When crabbing from a boat it is a good idea to use both hand lines and traps for sometimes one will produce better than the other. It is also effective to anchor your boat at the bow and stern, to prevent unnecessary movements of the baits. Another technique, especially effective for soft or shedder crabs, is to wade the shallows with a scoop net. This method works only when the water is clear and calm. Remember to release all females bearing an egg mass or sponge.

## ACKNOWLEDGEMENTS AND REFERENCES

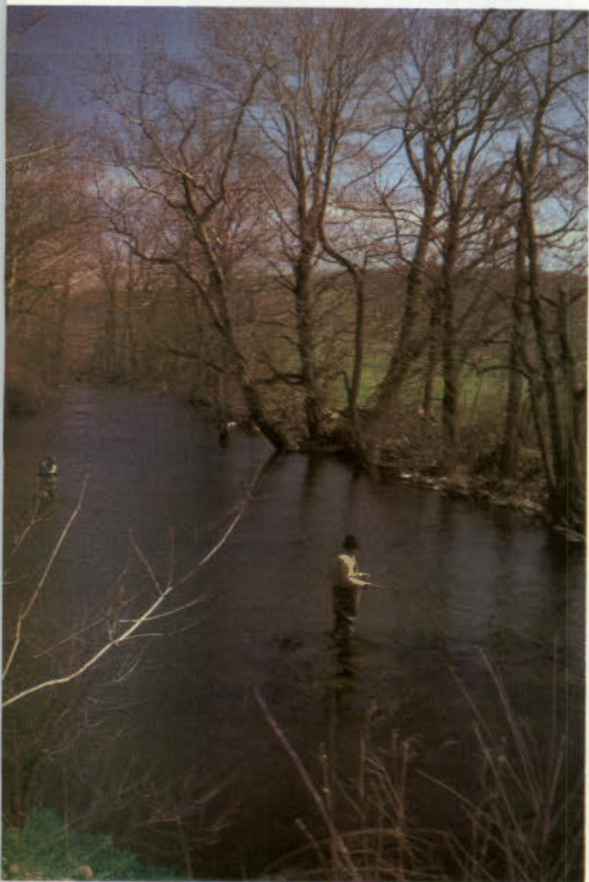
Anthony Hillman (art), Barry Preim (graph), Hamer (1955), Engel (1973), Cargo (1973), Wojcik (1973), Applegate and Sterner (1975), McHugh (1977), Eagleton Poll (1977).

*Prepared by Bill Figley and Ray Townsend*





## The Angler's Diary



**"Took first trout on damselfly nymph! Soft banks and silt bottom usually hold plenty of them." April on the Musconetcong.**

stream, I know what to expect and am prepared with the right flies and I know when to fish them.

Sometimes it does take a little more effort to develop valid guidelines from an angling diary. Sometime ago, during a cold mid-winter week when the snow was deep on the driveway, I spent several evenings reliving past triumphs. With the aid of a little pocket calculator I began to compile some statistics. Simple addition, multiplication, and division suddenly became tools for catching fish.

Among the areas I explored were the relationships between fishing success and water and air temperature and pH. I also took a hard look at what is the best time of day to fish for various species and what is the best time of year. Then I sat down and figured out which flies are best for particular streams. I found

that I catch more and larger trout on dry flies than on nymphs, wets, and streamers combined on the South Branch of the Raritan. I learned that on the Musconetcong the most effective patterns for early season trout are nymphs imitating aquatic insects neglected by most fly tyers: damselflies, beetle larvae, and fishfly larvae, to cite a few. Equally rewarding has been the discovery that during mid-April on the Big Flatbrook there is a brief, easily overlooked morning hatch of small caddis that brings trout to the surface. The list of such "secrets" that the pages of my diary have revealed is almost endless.

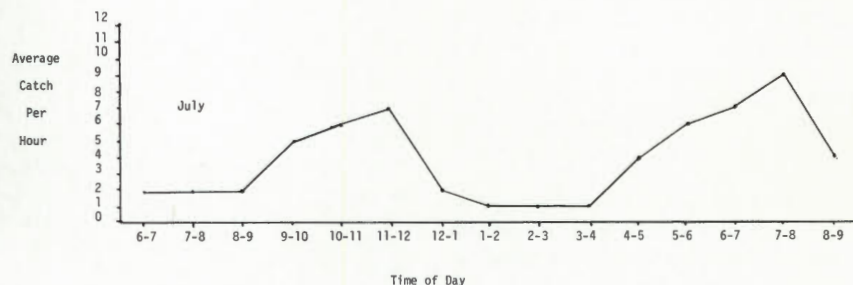
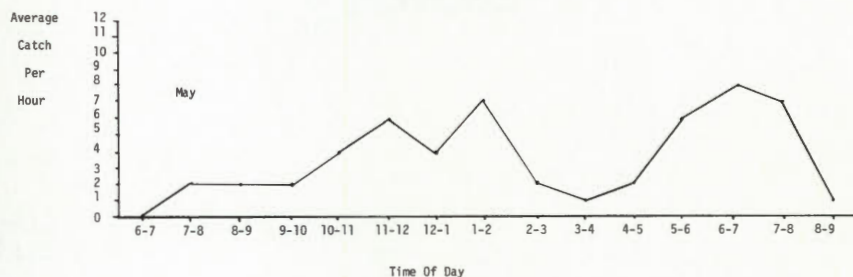
But does any of this make me a better fisherman? I know it does. No longer do I have to puzzle over emergence charts in "hatch-making" books and then make a wild guess about what to expect on a

given day. I *know* when the different aquatic insects that are so important to flyfishers will be active. No longer do I have to rely on someone else's structure map of Round Valley. I have my own based on my experience and tailored to my style of fishing. I *know* it will guide me to where I can catch bass. I still listen to advice, I am very receptive to suggestions, I listen patiently to whatever anyone has to say, and I read everything about fishing that I can get my hands on. But the foundation of my fishing is my own unique, highly individual history as an angler. That history, as recorded on sheets of looseleaf paper in a tattered high-school binder, is a sure, bright beacon, helping me find my way to the promised land of big fish. It is the key to solving the riddles every fisherman faces: *where, when, and how* to catch fish. □

### THE BEST TIME OF THE DAY

Ask any two anglers when the best time of day to fish is and you'll get two different answers. Traditionally, trout fishermen have held that the crack of dawn and again in the evening are the hours to fish. My records indicate that while evening is a good choice both in spring and summer, I might as well sleep later than usual and plan to be on the stream in mid-morning.

Even in the summer, when everyone says you have to get your trout early or not get them at all, I found that the peak occurs in mid to late morning and, at least on our local streams, is centered around terrestrials rather than tiny mayflies. Perhaps some would dispute this. But that's the purpose of the angling diary: to teach every angler how to fish in his own, personal style. □





### The Warblers of America

*Edited by Ludlow Griscom and Alexander Sprunt, Jr.*

*Revised and updated by Edgar M. Reilly, Jr.*

*Illustrated by John Henry Dick*

*Doubleday & Company, Inc.*

*Garden City, New York*

This book is a revised and updated version of the classic *The Warblers of America*, published in 1957 and now long out of print. Many of America's finest ornithologists contributed to this work, making it a first-rate book appealing to both the amateur birding enthusiast and the professional ornithologist.

There are interesting and very readable chapters on the classification and geographical ranges of warblers, techniques of warbler study, and the songs of warblers. Individual species accounts comprise the bulk of the book and contain both popular and scientific information including descriptions of field characters, nesting data, voice, food habits, and range for every species of warbler from Canada to South America and the West Indies. There are 35 full-color plates of about 118 species and subspecies. Most morphological age and sex differences are depicted—an excellent identification feature of the book.

While the paintings are large and nicely done I found many species colored inaccurately—usually too brightly—and not representative of birds one would see in nature. Some plates, at least my copy, appeared slightly blurry owing to the colors being out of register. Overall, I think that these illustrations, though more attractive, are technically inferior to those found in field identification guides.

Otherwise I found the book well written, fairly well organized, and very authoritative, reflecting the most recent nomenclature changes. It offers a great deal of fascinating information to enhance our otherwise fleeting appreciation of warblers—so beautiful in spring and so puzzling in fall. In my opinion this is a desirable book for anyone—whether amateur or professional—wishing to build a complete ornithological library and especially for those spring warbler enthusiasts who dust off the old binoculars in April only to put them back in mothballs in June.

This book is only available hardbound, measures 9" x 11", and sells for \$19.95—a very reasonable price for a book offering so much. □

Wade Wander/Research Biologist/N.J. Audubon Society

### The Masters of the Nymph

*Edited by*

*J. Michael Migel and Leonard M. Wright, Jr.*

*Illustrated by Dave Whitlock*

*Price \$14.95*

*1979*

*Nick Lyons Books*

*Doubleday & Co. Inc., Garden City, NY.*

Don't look for *The Masters of the Nymph*, edited by J. Michael Migel and Leonard M. Wright, Jr., to appear soon as a major new motion picture. But, if you want to increase your knowledge of nymph fishing or, if a beginner, to learn what it's all about, then this is the book for you. Consisting of 19 chapters, each written by a different contributor, it covers just about any aspect of nymph fishing you might be interested in. But don't look for any entomology lessons; after Ernie Schwiebert's *Nymphs*, published a few years back, anything else on the subject would be presumptuous.

What's especially nice about the book is that you need not follow any particular order: If you see something that catches your fancy in the table of contents, you can get right to it without worrying about what came before. While some of the contributors write better than others, they are all readable, the most enjoyable perhaps being Brian Clarke on stillwater fishing.

Also, you might want to turn to what Byron Dalrymple has to say on nymph fishing for fish other than trout. I think you'll find this chapter extremely interesting and informative.

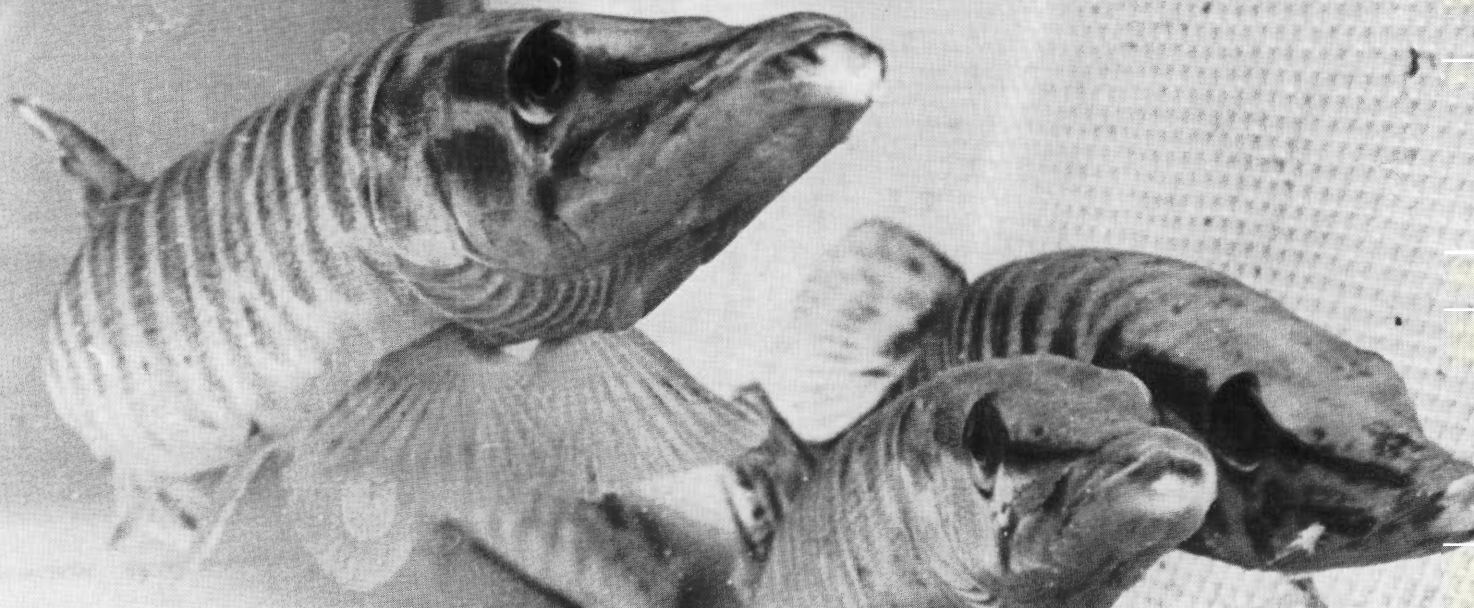
Overall, there is a little something for everyone. Each writer gives his favorite patterns. Tying instructions are not always given, but there are many fly-tying books (some probably on your shelf now) that can show you the way.

Nicest of all, this book can save you some money. Instead of having to buy books which treat nymph fishing in only a single general chapter, you can find it all here.

A certain fly-fishing magazine likes to say that there are no real "experts" in our sport, just guys like you and me who travel a bit more and fish a bit more. Don't you believe it: They are experts, and what they have to say in this book can well help you become a more satisfied and successful fly fisherman. □

Michael Waldman





**WHAT:**  
**Open House**

**WHEN:**  
**Sunday, March 23 10 A.M. to 4 P.M.**

**WHERE:**  
**State Fish Hatchery—Hack-**  
**ettstown\***

**WHY:**  
**A Family Fun Day Outdoors**

**ACTIVITIES:**  
**For the Young and the Young-**  
**at-Heart**

- Free bags of fish food to youngsters so they can feed the fish in the raceways.
- Free issues of New Jersey Outdoors magazines.
- Guided tours of the Fish Hatchery.
- See the tens of thousands of fish of all sizes in the raceways.
- Display tanks of Brown, Brook, Rainbow and Lake trout for viewing and photography.
- Display tank of Tiger Muskies.
- Artist's Concept of the New Fish Hatchery at Pequest; also fact sheets on the new hatchery.
- The place to purchase your 1980 fishing license, trout stamp, and Wildlife Management Guide.
- The place to find out everything you wanted to know about fish, fishing, and wildlife in New Jersey.

\*The Fish Hatchery is located one mile south of Route 46 from the center of Hackettstown on Rockport Road.





## Editorial Comment:

# CONFRONTATION AT THE GREAT SWAMP DEER HUNT

It's unfortunate that just about the only New Jersey 1979 season hunting news reported by the three major television networks was the anti-hunting demonstrations by less than 100 demonstrators at the Great Swamp National Wildlife Refuge in Morris County. The networks have been making this Great Swamp hunt a news event for the past several years. We say this because the demonstrators arrive in time to do their thing in front of the cameras—directed by a leader or organizer with a hand-held battery-powered bull horn, then several hours later they board a bus and some out-of-state automobiles and they are gone until the Great Swamp deer hunt next year. We spoke to many of the anti-hunting demonstrators and most of them were from the New York City area. On the other hand, all the pro-hunting demonstrators were residents of the towns surrounding the Great Swamp. This year a new wrinkle was added—as the bus pulled away from the area, the anti-hunting demonstrators unfurled a nazi flag.

What is unfortunate about this event is that the real news about hunting in New Jersey is not covered by the networks. The *real* news might be that more than 120,000 hunters spent some 350,000 man-days in the woods and fields hunting deer as their forefathers did

before them. And that this activity generates millions of dollars in our economy and is important to the proper management of our wildlife resources.

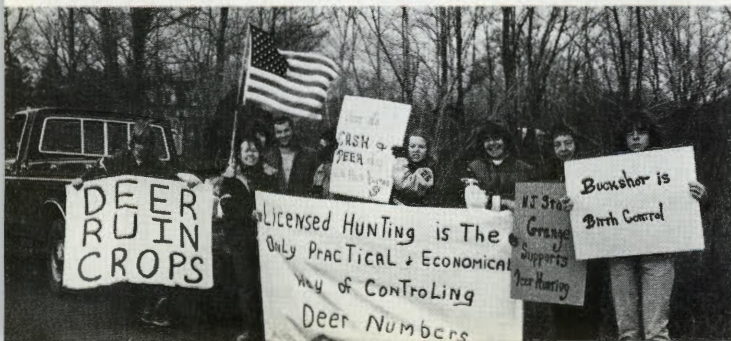
We have commented on this subject in other issues but it's worth repeating that hunting is not an *in* recreational activity—like tennis, jogging, racquetball, bicycling, and other outdoor activities popular in urban and suburban environments. And probably many television news directors live and work in urban/suburban environments and are expected to select news stories that will attract a larger portion of the urban/suburban viewing audience. So when this large regional audience in the New York City/Northern New Jersey area views this Great Swamp demonstration on the 6 and 11 o'clock news and it's carried on several channels, then the impression is created that what they are viewing is a spontaneous grass-roots demonstration against hunting in the state of New Jersey. But we know it's not grass roots at all, and it may even be staged for the TV cameras.

But we expect and should get the news reported in depth, not show biz type film bits to hype the station ratings. But maybe we've been spoiled by *60 Minutes* and the memories of Edward R. Murrow, Chet Huntley, Eric Severeid, and many others? □

## PRO



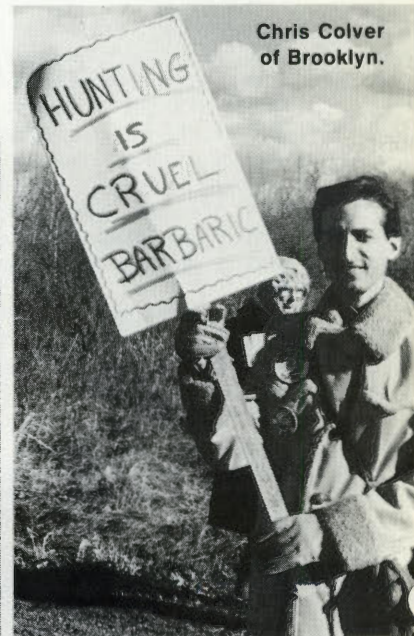
Litty Hado of Meyersville dishes out venison stew.



## CON



Carol Plamondon of New York City.



Chris Colver of Brooklyn.





## decade of accomplishments

sey's 122 miles of coastline might well have been listed as an endangered species, as random development and the lack of shore protection programs contributed to the steady erosion of one of the state's biggest assets.

On July 1, 1979 the former Division of Marine Services was reorganized as the Division of Coastal Resources, reflecting its role as a comprehensive resource management agency.

Its accomplishments began in 1970 with passage of the Wetlands Act, bringing 242,000 acres of coastal wetlands in 11 counties under state regulation and protection. Since then less than 55 acres have been filled in each year, and then only with state approval and usually for water-dependent uses. Prior to adoption of wetlands laws filling in destroyed some 1,900 wetland acres yearly.

Two years later, in 1972, the state adopted the Coastal Area Facility Review Act (CAFRA), one of the most significant pieces of environmental legislation ever adopted. This act brought under stringent state control 18 percent of New Jersey's total land area. In its CAFRA zone, New Jersey regulates virtually all industrial facilities, major commercial facilities and residential developments of 25 units or more.

Specifically, it provides that coastal development will occur in an environmentally acceptable manner. While most projects received CAFRA approval because of being designed in accord with the law, the denial of a permit for a high-rise apartment project in 1976 resulted in an appeal which ended in an affirmation by the New Jersey Appellate Division of Superior Court that CAFRA was a legitimate and legal regulatory tool.

On September 29, 1978 the National Oceanic and Atmospheric Administration approved New Jersey's Coastal Management program—Bay and Ocean Shore Segment, ending a four-year study and participation in the federal Coastal Zone Management Program. This made New Jersey eligible for nearly \$1 million in annual grants to help protect and preserve the shore, a precious natural resource.

This program spells out a process under which coastal resource decisions will be made, with policies to guide state regulatory and funding activities. A proposed management program for the state's entire coastal zone will be submitted for federal approval later this year.

Easily the most popular state program in terms of public acceptance and

awareness has been Green Acres. It was started in 1968 to preserve open spaces for generations yet to come. The initial \$60 million was spent in short order so the state went back to the voters in 1971 for approval of a second \$80 million, Green Acres Bond Issue. Massive support from many sectors was rewarded with voter approval.

Within three years the entire amount was committed towards the purchase of 34,000 acres of state land, and 16,325 acres of local recreation land. In 1974, voters ok'd a third Green Acres Bond Issue of \$200 million. Of this, \$50 million was for direct State purchase of property; \$50 million for development of state-owned land; \$50 million as matching grants to counties and municipalities for open space acquisition, and \$50 million in matching grants to counties and municipalities for development. More than 90 local land acquisitions were made and 170 local facilities were developed under this program. State acquisitions included 3,380 acres of the Appalachian Trail in Sussex County; 455 acres at Higbee Beach in Cape May County, and additions to Liberty Park, Round Valley and the Pinelands.

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**Many state facilities were also improved and developed, including Island Beach State Park, Monmouth Battlefield, Washington Crossing State Park, Liberty Park, Round Valley and Spruce Run.**

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Overwhelming public acceptance of the Green Acres program led to a fourth bond issue in 1978. This \$200 million program was again approved by the voters, but this time emphasis was placed on acquisition and development of urban parks with \$100 million designated to the concept of bringing the parks to the people. The other half of the money is divided between further state purchases and non-urban land, and matching grants to counties and municipalities.

Liberty State Park, New Jersey's first urban state park, stands out as the outstanding accomplishment of the Division of Parks and Forestry. Under this restoration program the rundown terminal building and Jersey City waterfront are being transformed into a spectacular recreation facility with the Statue of Liberty, New York Harbor and the Manhattan skyline as a backdrop. The park has finally provided access from New Jersey to both Ellis Island and the Statue of Liberty via tourboats which operate between spring and fall.

New parks opened to the public during the decade include Liberty State Park, Spruce Run Recreation Area, Round Valley Recreation Area, Round Valley Wilderness Camping Area, Allamuchy

Mountain State Park, the Delaware and Raritan Canal State Park, Wawayanda State Park, Atsion Lake Recreation Area, Spring Meadow Golf Course (the first state-owned golf course), Ramapo Mountain State Park, Monmouth Battlefield State Park, and Warren Grove.

Major improvements were also made to Round Valley, Spruce Run, Island Beach State Park, Wharton State Forest, Washington Crossing State Park, Monmouth Battlefield, and the Allaire State Park.

The Division of Fish, Game and Wildlife has progressed since 1970 in expansion and improvement of hunting and fishing opportunities as well as in protecting and preserving New Jersey's endangered and nongame species. The recent awarding of contracts for the construction of the Pequest Fish Hatchery represents the successful conclusion of several years of efforts to replace the inadequate and outmoded Charles Hayford Hatchery in Hackettstown. Construction of the new hatchery and its educational and recreational facilities will begin shortly. It will enable the state to conduct a major trout stocking program that was only possible before through the use of federal aid.

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**Of all of the accomplishments of the Department of Environmental Protection over the past decade, perhaps the preservation of New Jersey's vast Pine Barrens ranks as the most significant because of both its immediate and long-range impact.**

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New Jersey has accomplished a long-standing goal of preserving approximately one million acres of the southwestern portion of the state, an area rich in pine and oak forests, cedar swamps and extensive surface and ground water resources. This is an area which represents nearly one fifth of the state's total land area.

Thanks to the continuing efforts of Governor Brendan Byrne this unique natural resource has been brought under the protection of state and federal law and will be spared from the ravages of uncontrolled development.

This is but a brief accounting of the accomplishments of the New Jersey Department of Environmental Protection during the so-called "Environmental Decade."

The efforts of the past 10 years haven't been wasted. We can see that our waters are cleaner; the fish and shellfish are returning to waters once considered polluted beyond redemption; harbor seals have been seen in Great South Bay; blue claw crabs are being caught in the Hudson River, and the Bald Eagle is holding its own in New Jersey's Pine Barrens. □



# It's a Robin's Life

CARLETON V. BRAIRTON

There is no season more welcome to New Jerseyans than spring. Around the middle of March, after a seemingly endless confinement in stuffy buildings and heavy clothing, we look for any sign of release—a patch of crocuses, the buds of forsythia, and of course the return of the robin. Although we are keenly aware of the robin's presence in early spring, we soon lose track of his activities. As we immerse ourselves in preparing gardens, cleaning attics and basements, and conversing with neighbors we haven't seen in months, the robin, whose presence is now commonplace, is easily forgotten. Unless we spot a nest sequestered among the branches of evergreens or deciduous trees, we are unaware that their lives are filled with as much activity and ritual as our own.

The first robins, usually males, arrive in March to establish territory for feeding and mating. In a week to ten days, the females appear, and the noisy pursuits and battles for mates begin. The rivalry for mates and territory is so intense that occasionally males will attack their own images in reflective objects such as windows, hubcaps, or mirrors.

After courtship comes the building of the nest. Although the male may bring materials for the nest, it is constructed chiefly by the female. She gathers and weaves the grasses and twigs, molds the inside with a layer of mud, and finally lines the nest cup with fine grass.

Upon completion, its inside measurements average two and a half inches deep and four inches wide. Nests are usually built in the branches of trees, but robins, somewhat tamed by civilization, will also nest in porches, barns, bridges, and other manmade structures.

The incubation of eggs follows shortly after the nest is completed. The female lays three to five eggs, one a day in the late morning, and begins incubation after the laying of the second egg. For approximately two weeks, the female sits upon the eggs while her mate stands guard.

After the eggs hatch, the young spend another two weeks in the nest. During this time, both parents devote the entire day to gathering insects, cutworms, grubs—whatever food supply is available. The task is enormous. Since it is estimated that the nestlings require a total of 200 grams of food a day, at 2 grams per visit we can see that the adult robins must leave the nest 100 times a day to keep the young alive. While photographing this family of robins, photographer David Bast observed that the adults left the nest

*Continued on the next page*



WILLIAM D. GRIFFIN



DAVID A. BAST



*Continued from the preceding page*

## **It's a Robin's Life**

for food every 10 to 15 minutes. Before returning to the nestlings, the cautious robins landed first on a roof, branch, or wire—never twice in the same place—to survey for enemies.

When the fledglings are ready to leave the nest, the male assumes the responsibility of protecting and feeding them for the next 14 days. Once on the ground, the young robins sit, waiting to be fed—easy prey for neighborhood cats. If the presence of a cat threatens the young, the adult robin becomes very bold, screeching and swooping to peck at the offender. However, the young soon learn to avoid enemies by running or flying. Within two weeks they are able to feed themselves, and the adult male returns to his mate, who is already preparing for the next brood.

For the second group of eggs, the female sometimes

builds a new nest at a different site. Frequently if the first nest is in an evergreen, the second will be in a deciduous tree. If she uses the old nest, she will remodel it for the next brood. The processes of egg laying, incubation, and raising the young repeat until the middle of August when the second brood leaves the nest.

When their broods have been reared, the adult robins also abandon the nest to flock with other robins. Instead of lawns, they now choose fields and woodlands as their habitat and change their primary diet to berries instead of insects. Before the end of October, most of these flocks begin their southern migration, sometimes traveling as far as Mexico. A few, however, may stay to brave the winter, feeding on such persistent fruits as sumac and bayberry.

By this time, New Jerseyans have plowed under the gardens, closed the pools, and cleared the yards of leaves. Confined indoors again, we resign ourselves to the long interval until next year when we once more welcome the robin's return. □

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### **FRONT COVER**

Young Angler with bubble gum,  
Jerry Wetzel, Jr., fishing the  
Musconetcong—Photographed by  
Allen G. Eastby

### **INSIDE BACK COVER**

Mackerel—Illustration by Carol  
Decker

### **BACK COVER**

Two red foxes symbolize the  
theme for National Wildlife Week  
1980: "Save A Place for Wildlife".  
The National Wildlife Federation  
marks its 43rd annual sponsorship  
of National Wildlife Week from  
March 16 through 22, 1980.  
Sponsored by The National  
Wildlife Federation, 1412 16th  
Street, N.W., Washington, D.C.  
20036







# Save a place for **Wildlife**

A close-up photograph of two red foxes in a natural, wooded environment. The fox in the foreground is looking down and to the right, with its head resting on a piece of weathered wood. The second fox is positioned behind it, looking towards the camera. The background is filled with green foliage, creating a sense of a wild habitat.

March 16-22, 1980

## **National Wildlife Week**

Join and Support the  
National Wildlife Federation  
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