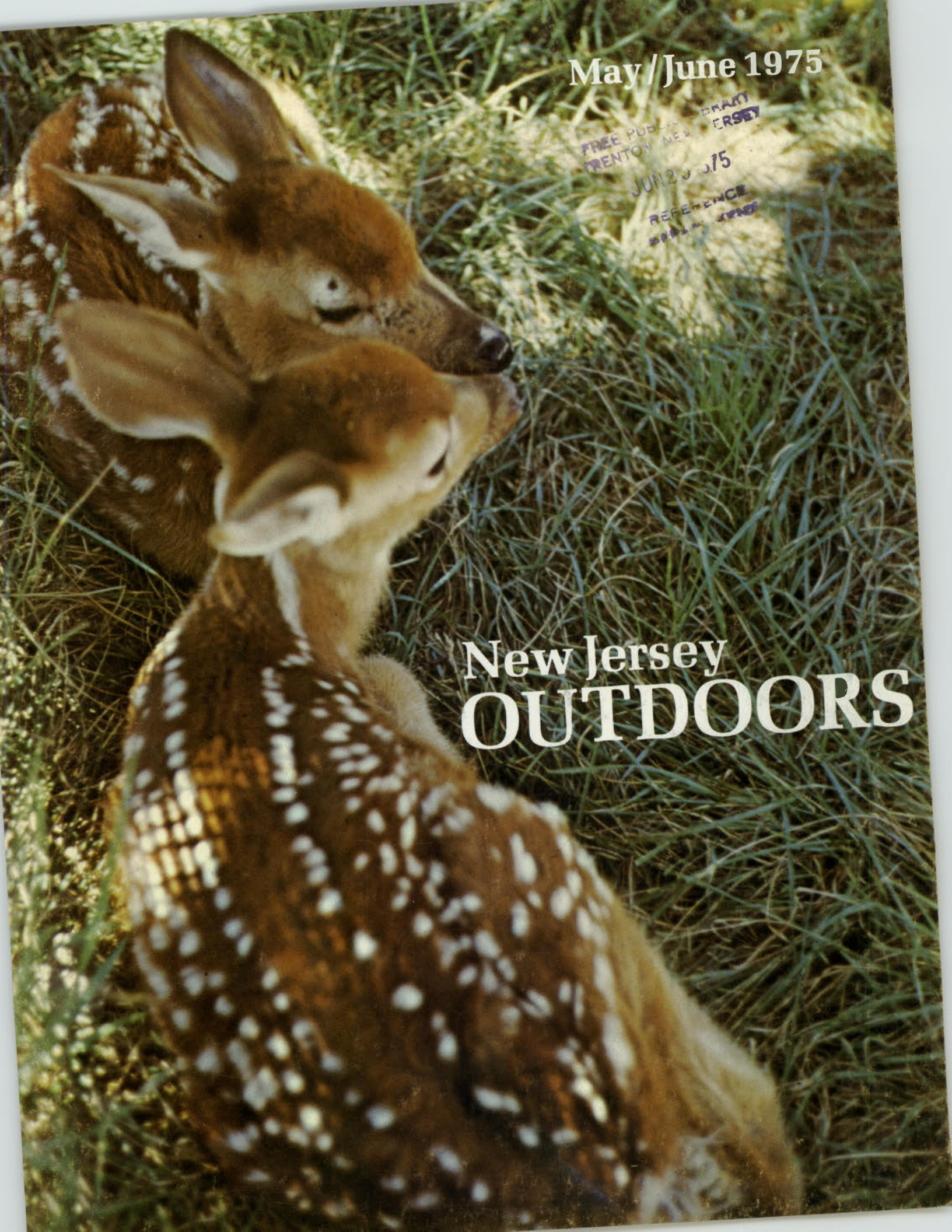


A photograph of two young spotted deer (fawns) in a grassy field. The fawn in the foreground is in sharp focus, showing its brown coat with white spots. The second fawn is behind it, slightly out of focus. The background is a dense field of tall grass.

May/June 1975

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NEW JERSEY OUTDOORS is the bi-monthly magazine of the Department of Environmental Protection of New Jersey. This publication is dedicated to the wise management and conservation of our natural resources and to foster a greater appreciation of the outdoors.

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land use management

Our November/December 1974 issue included a land use article called, "Transfer of Developmental Rights: A New Concept in Land Use Management" by B. Budd Chavooshian and Thomas Norman.

The Center for Analysis of Public Issues, a private research organization in Princeton, has proposed a land use management concept similar to the transfer of developmental rights plan previously published in NEW JERSEY OUTDOORS.

Our democratic form of government works best with an informed public—a public kept informed on all issues and on all sides of each issue—so that intelligent choices can be made for the benefit of all.

Therefore, we are publishing in this issue another viewpoint on land use management. The article by Phillip Alampi, Secretary of the Department of Agriculture, discusses the agricultural lands preservation recommendations of the Blueprint Commission.

A comprehensive land use management plan is a must in our small overcrowded state. New Jersey loses 10,000 acres of farmland each year to haphazard development. At that rate can you imagine what the Garden State can become in ten, twenty, or thirty years? Solid macadam from New York City to Philadelphia.

And how will it affect our living space? Our wildlife? Our recreational opportunities? Our farming in the Garden State? Can you visualize New Jersey without Jersey tomatoes?

Steve Perrone

FRONT COVER

Jim Fitzsimmons, H. Pentax, Kodachrome II, Wildlife in New Jersey—Don't pick up apparently abandoned fawns found in the wild. They are not abandoned—the adult deer is out searching for food and will return.

BACK COVER

Lou Perez, Kodachrome II, Sunset at the Inlet, Manasquan, N.J.

INSIDE BACK COVER

Great Horned Owl by — Ron Jenkins — An embossed and signed copy of this illustration is available free to all new subscribers to New Jersey Outdoors from the National Wildlife Art Exchange. This print normally sells for ten dollars.

getting started in freshwater fishing

BY GEORGE A. KIRSCHBAUM, Jr.
Captain U.S. Army



Author fooled this nice largemouth with a nightwalker rigged on a number eight hook, without bobber or weight (Bear Pond, Sussex County, N.J.).

An old fisherman I know who lives near Lake Hopatcong in Sussex County, is among that ten percent of elite anglers who catch ninety percent of the fish caught—or so it seems. I have seldom seen him return from one of his early morning or evening fishing trips without an enviable stringer of bass, pickerel, trout and/or panfish. Yet, he owns only one fishing rod and reel. Seldom using artificial lures, he keeps his terminal tackle in an old cigar box and carries his live bait in a tobacco can or minnow bucket. He attributes his success to knowing his tackle, and how and where to use it.

The example of the old fisherman should serve as a lesson to the neophyte angler who often brings with him a tackle shop of expensive equipment, most of which is obsolete for the type of fishing he is pursuing, and a library of angling literature that only serves to bog his mind in an overdose of fishing techniques which make it more difficult to master the basic skills required to catch fish. The secret to getting started in freshwater fishing is a simplified and uncluttered approach to the sport. About \$35-\$50 will buy all of the essentials to consistently catch fish—provided the fisherman has

mastered the basic angling skills, and fish are present in the water being fished (an obvious but often overlooked requirement).

Beyond any doubt, the most easily learned and most efficient type of equipment for the beginner is spinning tackle. Even a child can be making long, accurate casts within an hour of practice. Bait casting (not to be confused with live bait fishing) and fly fishing are deadly when accomplished by expert anglers, but for the novice, spinning is the surest and fastest route to success.



PHOTOGRAPHS SUPPLIED BY AUTHOR

Fishing with nightwalkers
 often results in a mixed
 catch like this stringer of
 golden rainbow trout,
 rainbow trout and perch
 caught from an outlet
 stream of Lake Hopatcong
 (Author's brother, Bob).

Fish are much easier to
 locate and catch on
 small, lightly fished waters
 such as these pictured.



The following is a list of essential equipment the new angler will need and the approximate cost:

Open Face Spinning Reel	\$18
Spinning Rod	\$13
Monofilament Line	\$ 2
Terminal Tackle	\$ 2
Total	<u>\$35</u>

Of course, angling tools such as a pocket knife and pliers are important, but most people have these items around the house. Nice-to-have items such as waders, a landing net and an inexpensive tackle box could be added to the list without going over \$50, but they are not essential.

The open face spinning reel will prove to be the most important and expensive item of your equipment. There is nothing more aggravating than a malfunctioning fishing reel, and there is no way around this than by buying a high quality reel. My favorite is the Mitchell 300. If you watch for sales, or buy through a mail order discount house, you can find one for under \$16. However, the Mitchell 300 is a personal preference, and most of the brand name freshwater reels in the \$15 to \$20 (discount) price range will perform satisfactorily.

High quality is also important in a spinning rod, though not so important as it is in a reel. If your budget is limited, by all means sacrifice quality in the rod rather than the reel. A light action hollow fiberglass spinning rod between six and seven feet is best suited to the beginner for most New Jersey freshwater fishing. Be sure to check that the guide windings are neat and secure, and that the handle is made of good quality cork. Since ferrules are a major cost in making a rod, you can save money by buying a one-piece rod. Of

effective rigs for live bait

course you will be sacrificing portability for economy, but a one piece rod normally has better action than a two piece rod made of the same material.

For as little as \$10 you can purchase a rod which will cast well, though it may not withstand the rigors of more than a few fishing seasons, depending upon how much you fish. Fifteen dollars will buy a good quality rod which should last more than several fishing seasons. Again, look for brand name rods on sale or in mail order discount houses.

The line should be quality monofilament. For light stream fishing, four pound line is tops whereas eight pound line is better suited for most New Jersey lakes and reservoirs. Six pound line is perhaps the best compromise for the beginner. Also remember that the heavier the line, the more difficult it is the cast.

Terminal tackle (hooks, weights, bobbers, swivels, etc.) should consist of packets of size six, eight and ten hooks. Some split shot will complete your inventory of essential items. Nothing more is needed.

You can have the best tackle made and still not catch fish if you do not use proper methods. Volumes of literature have been written on angling methods, most of which deal with artificial lures of some sort. But the beginner should start with live bait. It is the easiest method to learn, and once mastered, provides the background to pursue the use of artificial lures. Moreover, the combination of an open face spinning outfit and live bait is deadly on virtually all game and panfish found in New Jersey freshwaters.

The most serious mistake made by new (and many experienced) live bait fishermen is using too big and too much terminal tackle. The only terminal tackle required for most New Jersey freshwaters is hooks and possibly some split shot. The hooks should be no larger than size six and no smaller than size ten. For most of my fishing, I use size eight. The hook should be tied directly to the end of the monofilament line without a bobber, weight or swivel—just a hook!! A bobber is not needed to keep the bait off the bottom. If fish are present, they will spot the bait when it hits the water (if the water is shallow) or as it sinks slowly and naturally to the bottom. Besides, even a small bobber makes quite a splash when it hits the water, scaring most wary fish. Bobbers make the bait look unnatural and create too much resistance when the fish takes the bait.



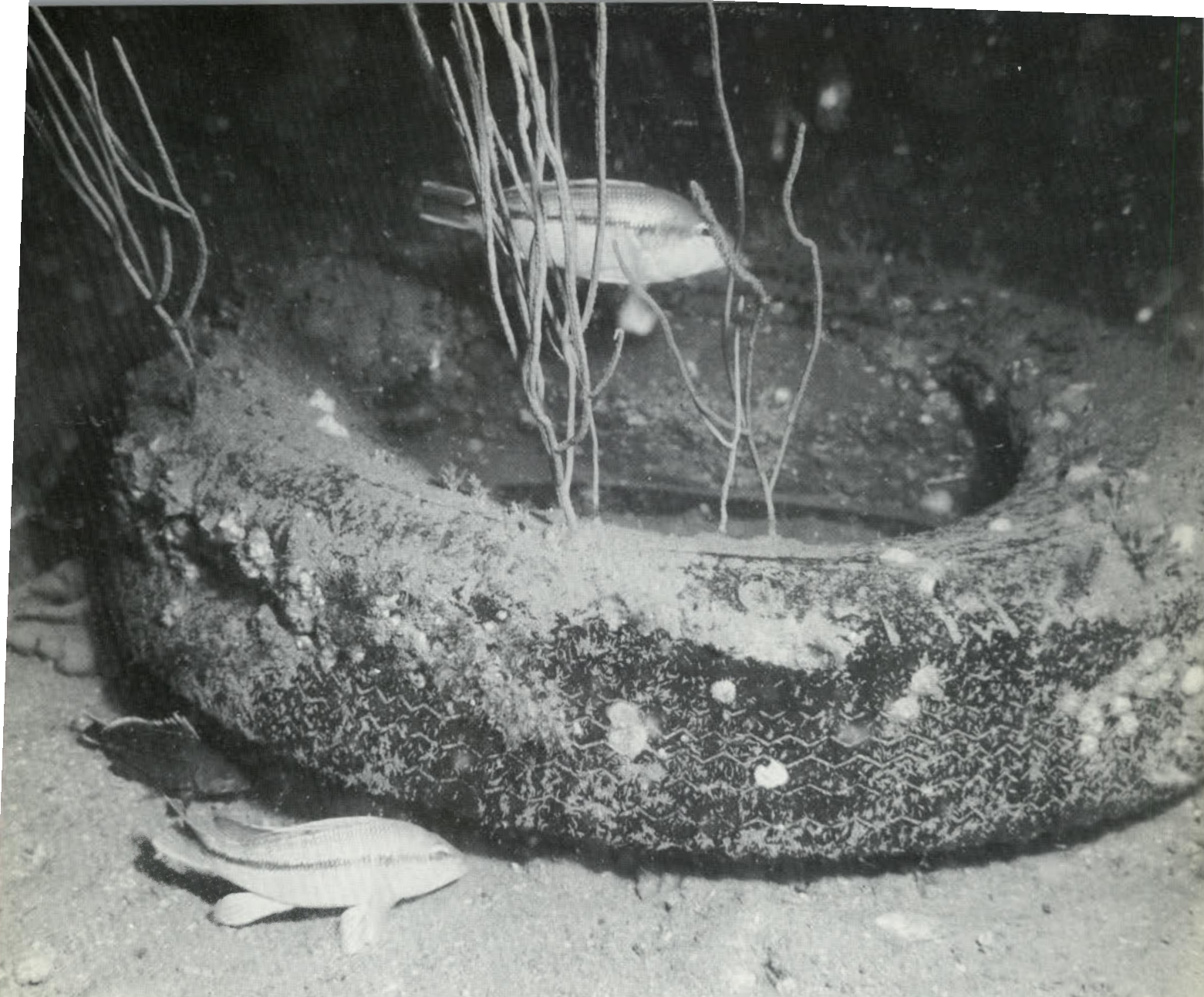
ILLUSTRATION BY JOHN D. ROLL

Weights are also unnecessary for most fishing conditions. The bait will sink to the bottom by itself; the slower the better. You will be surprised how far the spinning equipment I discussed will cast live bait without a bobber or weight. However, if you must use more weight to gain either more casting distance or to overcome a current, pinch two small split shot onto your line about two inches apart, and about eighteen inches above the hook. Always use two split shot; never use just one. For some reason, which can be better explained by a physicist, one split shot will tangle the line with the hook. With two split shot, this seldom occurs.

As for the bait, it is hard to beat nightwalkers which can be purchased at most tackle shops or gathered yourself by going out on a rainy night with a flashlight which has red cellophane tape or tied over the lens. Nightwalkers will catch virtually all New Jersey freshwater game fish and panfish, although not quite so good for pickerel and crappie. On bass, trout, and most panfish, they are simply murder. Hook the nightwalker once (only) through the middle or through the tip of the head. I find that hooking it in the middle is best for river and stream fishing, whereas hooking it in the tip of the head is best for pond, lake and reservoir fishing. Never wrap a nightwalker onto a hook as this will make it look unnatural.

Cast your bait smoothly, allowing it to hit the water with a natural sounding "splat" and then sink to the bottom—if the fish let it get that far! The bait should stay on the bottom for at least one minute, preferably,

(Continued on page 30)



Sea bass swimming around the sheltered habitat of a tire encrusted with marine organisms.

DEEP-SEA FISHING WITH TIRES

A Look at the Sea Girt Reef

BY PATRICK J. FESTA

Senior Fisheries Biologist

To many, the thought of reef fishing brings to mind tropical scenes of crystal clear water and exotic fish moving through catacombs of coral. Although few of us will have the chance to drop a line near such a spot, many pleasant aspects of reef fishing are available to New Jersey anglers. In loose terms, a reef may be described as any significant stable hump rising from the general level of the sea floor. Australia's Great Barrier Reef is perhaps the most specu-

example. Such things as rock piles and ship wrecks, as well as materials purposely placed on the bottom can function in the same manner as coral in attracting marine life. Since climatic conditions prevent the build-up of coral reefs off our coast, New Jersey "reefs" are, with a few exceptions, the result of man's activity.

The Continental Shelf extending off the New Jersey coast is, for the most part, a rather flat sandy plain



Boy Scouts contributing time and labor for the Sea Girt Reef.

PHOTOS SUPPLIED BY THE ARTIFICIAL REEF COMMITTEE OF NEW JERSEY



Lobsters prefer the protected habitat of tire reefs.

with little topographic relief outside of a series of gentle sand ridges. Although the sand bottom provides excellent habitat for a variety of burrowing and mobile invertebrates, other forms of life require a hard, stable substrate for survival. The latter species such as barnacles, various bryozoans and certain worms and algae quickly encrust hard materials in contact with sea water, as salt-water boaters are all too well aware of. These encrusting organisms secondarily provide shelter and food for other invertebrates including various isopods, amphipods, crabs and shrimp. The encrusting organisms along with the creatures they house offer a concentrated food source for certain fishes. Various fishes such as the black sea bass, cunner and tautog as well as lobsters and to some extent scup and hake, show a marked preference for sheltered habitats as opposed to open sand bottom. Thus, reefs attract fish by providing food and shelter. The better fishing found near wrecks and natural reefs long ago convinced fishermen of this fact.

The building of artificial reefs to improve fishing is a widely accepted management tool in the United States and has resulted in some 114 reefs along the Atlantic coast. Reef-building along the Pacific and Gulf coast has been even more extensive in many respects. These reefs built of construction rubble, shells, automobile bodies, scuttled vessels, tires and other materials have met with varying degrees of success depending upon materials used, size, and site

selection. In 1966 the National Marine Fisheries Service began experimenting and reviewing past reef projects in an effort to determine what materials and site selections produced the most productive reefs. As part of this program the Sea Girt Artificial Reef was initiated by the Sandy Hook Marine Laboratory. This particular reef is constructed of weighted scrap tires, the material found by the study to be one of the most practical and effective. Results of the Sandy Hook program are summarized in the report, "Scrap Tires as Artificial Reefs" by Richard B. Stone, Chester C. Buchanan and Frank W. Steimle (EPA publication SW-119). Five thousand tires were dropped in 65 feet of water off Sea Girt in 1969. Studies compared angler success over artificial reefs, natural bottom and wrecks. These studies indicated that man-made habitats off the New Jersey shore improved angler success for game species normally found in rocky habitats; and that artificial reefs proved to be an effective tool for increasing the amount of good bottom fishing sites in this region.

After this initial research phase, the Sandy Hook Laboratory was forced to withdraw from the Sea Girt reef project due to funding problems; however, the project results were so impressive that efforts were made to organize a group of sport and commercial fishermen to continue expansion of the reef. As a result the Artificial Reef Committee of New Jersey was incorporated in 1970 and has carried on the reef building work to date. The Reef Committee

is an all-volunteer organization. This group has been able to place approximately 80,000 tires on the Sea Girt site in four years. Until recently, the committee was very ably advised by Mr. Frank Steimle, a marine biologist and reef expert. Membership consists of partyboat captains, sport fishermen, scuba divers, and a variety of conservation and marine resource-minded citizens.

Before tires can be placed on the reef they must be weighted with concrete-filled cans and punched with holes to allow trapped air to escape. This entails a great deal of preparation work when 80,000 tires are involved, and the committee has relied on the help of youngsters from many schools, scout troops and other groups to get the job done. While the dedication of committee members has certainly contributed significantly to the success of the Sea Girt program, as most "volunteer group" members are aware of, a continued program requires results as well as dedication. And the present effectiveness and viability of the Reef committee certainly attests to its past success. The benefits of the Sea Girt program are also proclaimed by partyboat captains who fish the reef.

The Reef committee has received no federal or state monies to date and is funded entirely by individual donations, primarily small contributions made by visitors to its displays at boat shows and fairs, and by committee members. Under the wise leadership of its past and present chairmen these small funds have been combined with the labor of concerned groups to produce the largest tire reef in the world.

The Artificial Reef Committee has benefited the people of New Jersey in a number of ways in addition to providing better fishing. It has provided the opportunity for literally thousands of people to participate directly in a marine resources management project. The committee leadership and members have on innumerable occasions conveyed their concern for environment and sportsmanship to young people. The success of the New Jersey committee has inspired the development of tire reef programs in other states, most of these receiving substantial aid from government agencies. And the Sea Girt reef has provided a partial solution to the severe environmental problem of scrap tire disposal. Scrap tires, which have long been a major solid waste problem, can be put to a use beneficial both to man and fish. The National Marine Fisheries Service report estimates that nearly one billion tires could be used on artificial reefs off the east coast alone.

The Artificial Reef Committee of New Jersey holds monthly meetings on the second Wednesday of each month at Colts Neck Inn in Freehold at 8 P.M. Officers can be reached and information obtained at Post Office Box 88, Bowne Avenue, Freehold, New Jersey 07728. The committee is always interested in obtaining new members. Plans have been finalized for initiating a second reef off the Sea Bright coast and construction will begin this spring. Now is a great time for interested sportsmen and conservationists to participate in this organization whose activities are becoming more exciting and effective each day. □

Party boat heading toward Sea Girt Reef with load of tires.



A days catch off artificial reef.



FOR A SPRING STRIPER BONANZA

FIRST CATCH A HERRING

BY RUSSELL WILSON

Photos supplied by the author



Picture shows the way we hook the herring. By hooking them in this way they live quite a long time. Also note the type hook used.

The line was flowing off the reel and I was counting to myself, a thousand, two thousand, three thousand, and finally at ten thousand I couldn't stand it any longer. I flipped the reel into gear and let the line come up tight on the fish. Out in front of the jetty he made a huge swirl and started a run along the beach parallel to the jetty and heading North. Great! With luck he would be mine. Finally after perhaps a 15 or 20 minute battle I had him in the wash and slid him up on the sand with the next wave, 43 ½ pounds of sleek and beautiful striped bass—another victim of a live lined herring.

Striped bass fishing with live herring is not new along the New Jersey coast, a lot of the regulars have been using this method for years. My father used to tell of live lining back in the late 1940's, but I never got around to trying it until 1959. At that time only a handful of regulars were using the herring and, being typical striper addicts, they were very closed-mouth about the fantastic results they were getting. Since that time live lining has grown by leaps and bounds until it is the most popular and rewarding way to fish for stripers in the Spring and early Summer. Most of the rivers and streams from Raritan Bay on down to Barnegat Inlet have at least a token run of these fine bait fish.

The herring or alewives as they are properly called begin to enter the lakes and rivers in late March, April and through most of May on their spawning run. They stay in the Fresh Water through most of June when they have finished their spawning chores. **THIS IS THE TIME TO BE LIVE LINING THEM FOR STRIPERS.** After spawning the herring are in poor condition and are easier for the stripers to catch. And herring can really MOVE when chased by a striper. Sometimes a herring will actually run right into the rocks in his efforts to escape those hungry jaws of the striper.

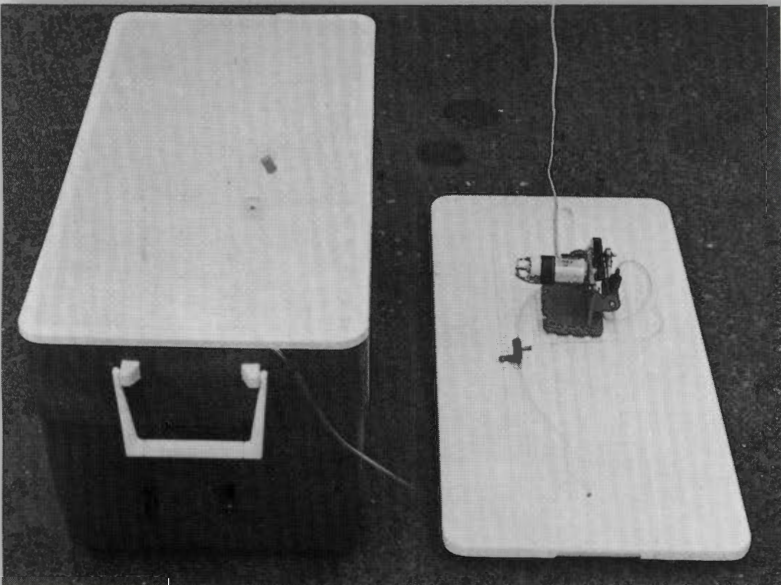
Live lining is perhaps both the easiest and at the same time the hardest kind of striper fishing. A lot of work is involved in getting the herring and then keeping them alive until time to use them. Oft times it is harder to catch the herring than it is to catch the bass. I have seen fishermen work for over an hour to catch a herring only to have it die because of improper handling. These fish are fragile and require lots of air and cool water to survive.

Most of us that use herring have a cooler of the type used by campers with at least a 20-gallon capacity. To this we connect an air pump of some type. I use one that plugs into the cigarette lighter of my car or hooks up to any 12-volt battery. Some of the more dedicated anglers have vans with large tanks up to 150 gallons permanently installed in them. These will hold 15 or 20 herring for as long as two or three weeks. Only seven or eight herring can live in the 20-gallon cooler but that is all I can use for a day's fishing. In use, we transport the herring from our cars to the jettys in five gallon buckets, taking only two at a time, one for our line and one extra. The others are kept in the car in the cooler with the air pump.

There are two ways to get your herring, either by netting them at the dams or spillways where they enter and leave freshwater, or by fishing for them with small darts of the type used for shad but much

Jerry Malanga removes hook from his prize, a 25 pound striped bass, that couldn't resist a live herring.





smaller. White and yellow are the preferred colors but sometimes gold also works well. These darts or jigs can easily be made by pinching a B.B. size split-shot onto a size 8 or 10 gold hook with a turned down eye and adding a few strands of bucktail cut short so that only one quarter inch of it extends past the bend of the hook. Finish off the dart by painting it either white or yellow. It can be lots of fun just catching the herring and some people come down just to do that. About the best outfit to use for the herring is a five and a half foot ultra-light rod, ultra-light reel and a two-pound test mono line.

Herring time along the New Jersey coast is somewhat like a carnival at a summer resort. You will see people running around with crab-nets, pails, boxes, buckets and almost any container that could possibly hold a herring.

Our group prefers netting our herring. The net we use is 18 to 24 inches in diameter with a deep bag of one-half inch nylon mesh netting. The herring are netted and then transferred to a live box that is kept in the water right where we are getting the herring. This is done since it might be fifteen or twenty minutes before the next herring is caught, and the first would die if kept in a small bucket for that long a time without air or water changes. The reason for the half inch mesh net instead of the larger sizes is to avoid gilling the herring which will kill the bait.

Now that we caught our bait, let's get to the fun part of live lining. Anyone can catch stripers when using live herring since little skill is involved with live lining. The toughest part of this fishing is catching the bait fish and keeping them alive until you want to use them. A couple of seasons back a beginner asked me how he could tell when a bass grabbed his herring. He showed me his reel and said the herring had run all the line out. I checked the line and told him there was a striper on it. When he finally got all the line back he discovered that the herring had grown a 37-pound striper.

The equipment used by most of the regulars is an 8 to 10 foot rod with lots of backbone and a conventional reel of the squidder type filled with either 20 or 30 lb. test monofilament line. The 20-pound line

Here is the type of set-up used by most of the regulars to keep their herring alive and kicking. The pump pictured on lid is powered by a 12-volt battery.

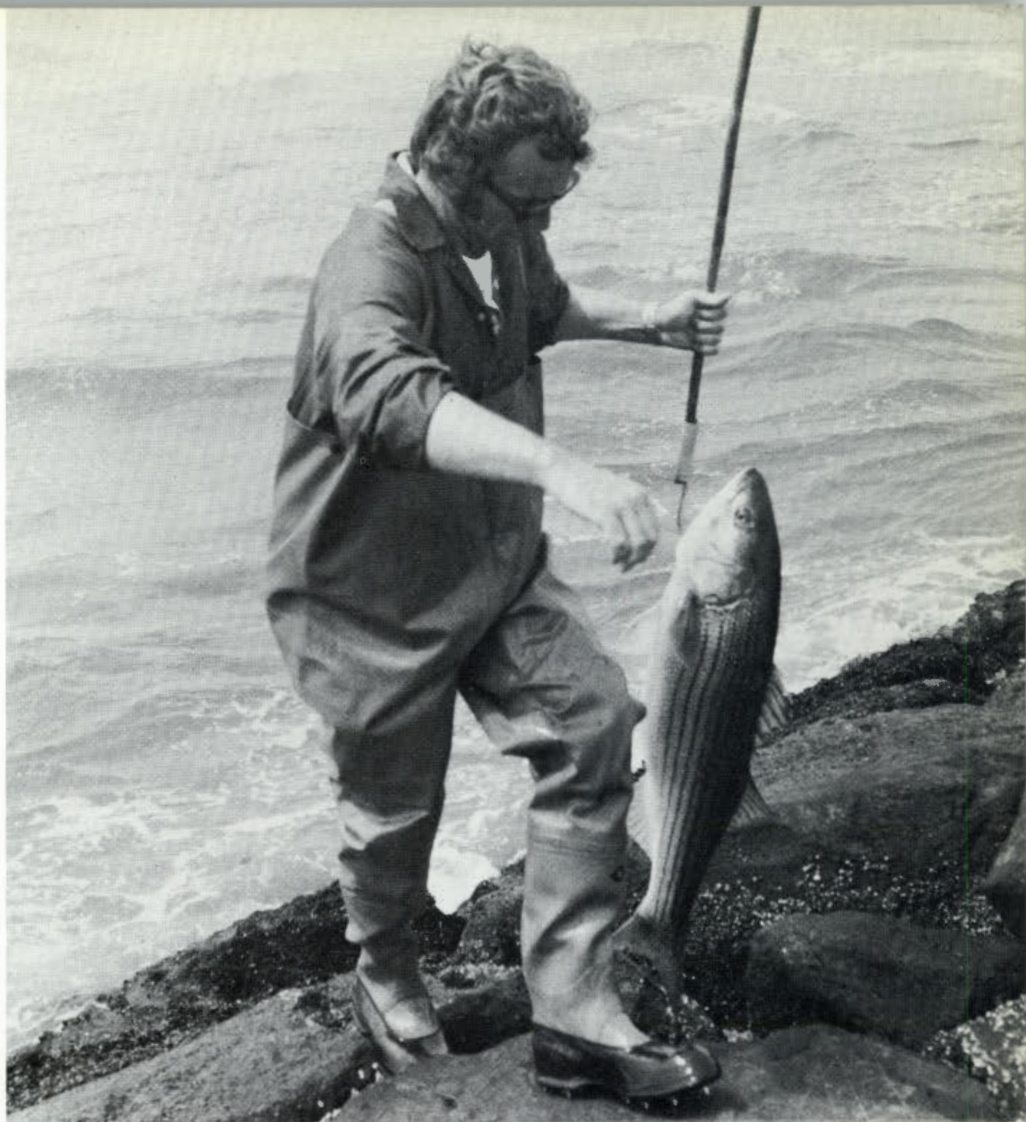
is preferred by most. Hooks are of the claw or tuna type in sizes 5/0 to 8/0 without the bait-holder barbs. The herring is hooked in the back either in front of the dorsal or right in back of it. One item of importance when hooking the herring with an offset hook: always hold the herring facing away from you and insert the hook from right to left. This may not sound like very important but if the hook goes in the other way it could turn back into the herring and miss the striper completely. Absolutely nothing is worse than fighting a trophy striper all the way back to the beach and at the last minute have him cough the herring up because the hook turned.

Some fishermen cast the herring out but I prefer to ease them into the water so as not injure them in any way. The first thing the herring will do once you have put him in the water is to swim right to the bottom so no sinker is needed. Let him swim out anywhere from 25 to 50 feet from the jetty and stop him there. But leave the reel in free spool. Most of the hits will come at least this close to the jetty. You will know when a striper is after the herring because the herring will get frantic and start to swim in circles on the surface. Although stripers will hit one deep, most hits are on top. The beauty part of this fishing is that you see most of the hits when the bass grabs the herring and starts to run off with it. Let the bass have this run. Don't try to hook him until the herring is down his throat. To help your timing, count to ten thousand by thousands, then throw the reel into gear, sock it to him and hang on. If everything goes according to plan you will soon be eating striper steaks.

Many fishermen let a fish run with a live bait until he stops and then hook him when he starts up again. But I have found that bass seldom if ever stop to swallow the herring and, if you wait too long, you may be looking at an empty spool. Usually the stripers grab the herring around the middle and zip through the water forcing the bait down. I don't think they stop to scale the bait. They hit it so hard the scales are knocked off. In clear water you can actually see the scales shining in the water where the striper has grabbed the bait. Most of the stripers will be hooked deep in the throat because they take these baits with such force; so if you intend to release any, don't use stainless hooks as they won't rust out like a regular hook will.

It used to be that we only fished the herring near where we caught them but a few years back we took some from Deal Lake in Asbury Park down to one of our pet jettys in Spring Lake. That day I had four herring with me and these four baits accounted for stripers weighing 29, 23, 16, and 9 pounds. Now we

*The wait pays off. John
Wagner climbs up the
rocks with striper in tow.*



use them everywhere from Sandy Hook on down to Barnegat Bay from both surf and jetty and catch stripers at all locations.

We seem to have our best fishing during the hours of daylight and also most of our biggest fish are taken then. That is not to say that the live baits don't work at night because they do. Last year on Memorial Day we caught three while fishing in the dark. However you do miss the excitement of seeing the bass attack the herring.

The stage of the tide doesn't seem to matter when live lining nor does the direction of the wind unless it is blowing too hard for the herring to swim against it. Personally, I prefer a dropping tide and a modest wind from the South-East only because this combination has brought me some of my best catches. Not the most fish, but the largest and that's the reason I use live bait. There are lots of other ways to fish that produce more fish.

But this is perhaps the only way some striper fishermen will ever get a shot at a fish over 40 or 50 pounds. And you can imagine the excitement of seeing a fish of this size chasing your herring and all the while (it seems as if it takes hours for the bass to catch the herring) you are wishing and praying that

the herring doesn't outrun the bass. I have been fishing with the live herring for 15 years and the excitement never dies. There is something special about fishing with live bait, maybe because every bass that hits could be a 50 pounder.

This past season was one of the best in memory. There were more fish of over 50 pounds than ever were taken before, and stripers under 40 pounds never turned a head. Fishermen who never tried live bait before caught loads of stripers from 20 on up to big cows of over 50 pounds. One novice caught a 53 pound fish and immediately considered himself an expert.

There is one dark cloud on the horizon for the herring fishery that is disturbing to myself and many of the other live herring fishermen. We have observed some people taking 20 or 30 herring when they could only use between five and eight, at most. The remaining herring are left to die on the jettys or end up in a trash can. We feel that fisherman should be more responsible to the need to conserve this fishery resource, and by doing so they will prevent some of the need for costly enforcement laws that other states have enacted. □



BLUEPRINT PLAN WOULD

PHILLIP ALAMPI, Secretary of Agriculture

The Report of the Blueprint Commission on the Future of New Jersey Agriculture has received much interest since its release about two years ago. New Jersey's sportsmen, in particular, have good reason to consider the proposal carefully. One of its 13 recommendations calls for the establishment of an agricultural open space preserve on which future residential, commercial or industrial development would not be permitted. These areas of prime farmland would be kept open and in agricultural production. The owner would be compensated for the sale of this development easement to the State.

Of particular interest to sportsmen and other resource-minded citizens are the conservation benefits which come as a "spin-off" of farmland preservation. In fact, these benefits will affect every citizen in the State in some manner. Some of the major areas of these contributions are as follows:

OPEN SPACE

New Jersey needs its agriculture to provide productive,



BENEFIT ALL N.J. CITIZENS

Photos supplied by N.J. Department of Agriculture

tax-paying, privately maintained, open space with its many environmental benefits. The continued conversion of farmlands to residential or industrial subdivisions would further diminish open space which contributes to visual aesthetics and the psychological well-being of residents. Agricultural open space establishes a land reserve for future generations and prohibits premature and unwise development. Multiple use of open lands should be encouraged to maximize agricultural income and ease land consumption pressures. Realistic economic incentives should be made available to encourage farmers and other owners of productive open

land to allow compatible land use, such as hunting, fishing, hiking, camping or other recreation use.

AIR QUALITY

Conversion of farmlands to residential subdivisions results in increased air pollution from home heating systems and motor vehicles. Although farming operations contribute a very small amount of air pollution, it is far less than that contributed by residential and industrial development. Furthermore, open space and its vegetation help purify the air.



WILDLIFE HABITAT

Farmlands, even those which are intensively used, support wildlife populations, especially birds and small mammals. The well-fed deer herds in Hunterdon County attest to the fact that field corn, soybeans, and small grains are harvested not only by farmers. Furthermore, hedgerows and small adjacent woodlots provide habitat for wildlife. Residential developments invariably drive out much of this wildlife by destroying or disrupting its habitat.

FOOD

New Jersey agriculture provides consumers with a ready access to wholesome, locally grown food products and protects the consumer's buying power for food. It encourages the productive use of land and natural resources which contribute significantly to the income and employment of many citizens of the State and to the New Jersey economy in general.

GROUND WATER SUPPLY

Aquifers which recharge our ground-water supplies exist on New Jersey's prime farmland and woodland areas. It is essential that the ground water supply not be depleted. Farming operations, even those which practice supplemental irrigation, use far less water than do residential subdivisions.

NOISE

Although farming operations do generate some noises, these are usually less frequent and intense than those commonly associated with more urbanized areas. Urbanization results in increased motor vehicles (both on- and off-road types) and the use of such noise-producing equipment as power lawn mowers.

WASTE DISPOSAL

Agriculture allows for the recycling of sewage waste on land as a partial alternative to existing methods of waste disposal. As energy constraints become even more restrictive, the recycling of wastes will become more feasible.

LAND USE RECOMMENDATION

Land use has become a key issue in New Jersey as urbanization continues to demand more prime farmland and woodland. Because of the pressure placed on New Jersey's agriculture, the Farmland Assessment Act of 1964 was adopted.

When the Farmland Assessment Act was signed into law, it was fully realized that this alone would not solve the problem of agricultural land retention. It was designed to give the farmer tax relief and to thus permit him to be able to be in a more competitive position.



BLUEPRINT COMMISSION REPORT

The report of the Blueprint Commission on the Future of New Jersey Agriculture recommends the adoption of an agricultural open space plan administered jointly by the State and local municipalities. Under the plan, each municipality in the State would be required to designate an agricultural open space preserve within its boundaries composed of at least 70 percent of its prime farmland as determined by the State Soil Survey or other means. The preserve would become part of the local master plan and should reflect the local community needs for open space and other agricultural benefits. Landowners whose property is located in a preserved area would be able to sell the development easement to their land to the State administering agency.

The rate of compensation for these easements would be the difference between the market value for the land as compared to a like situation outside the Agricultural Open Space Preserve and its farm value. The landowner could request payment from the State for his easement values in lump sum or in annual payments over a period of several years.

The program would be financed by a tax on all real estate transfers in this State. The rate would be at four mills, or 4/10ths of 1 percent of the transfer value at the time of the sale. Based on 1972 figures, this tax would generate annually approximately \$22 million. In nearly all instances, the tax would be paid from the realized capital gains of the real property transfers.

IMPLEMENTING PROCESS

As you know, Governor Byrne's administration began just over a year ago and other pressing problems dealing with the school funding issue and the tax proposals demanded higher priorities. Governor Byrne has said several times that land use will have a very high priority in his administration and that the Blueprint proposal will be given careful attention.

When the Commission decided to become inactive and let a broad implementing committee function under my chairmanship, Dr. William L. Park of Cook College, along with Richard D. Chumney, Director of the Division of Rural Resources in the New Jersey Department of Agriculture, began to look at the research and planning needs to achieve our goal. Subsequently, Dr. Park committed some of his research funds to this work so that we could seek answers to some of the very basic questions.

These questions, which have been posed by the citizens who have reviewed the report, as well as by governmental officials who will be implementing such a program, cannot be answered fully at this time and emphasize the fact that more specific research is needed. The Blueprint Report presents a carefully thought out concept, but it does not purport to have the complete plan and operating program finalized. That is our challenge now.

QUESTIONS ASKED

Let me share with you some of the types of questions asked: What will the program cost? Can we afford it? How will the easement values be determined? What will the effect be on the value of land outside the preserves? How would the easements be related to my farmland? Who would appraise my land? How could we prevent the fragmentation effect of subdividing a 100-acre farm into five 20-acre farms? Isn't this an invasion of my Constitutional rights to my land? Can the land ever be changed back to a developable area?

Charles E. Lambert joined the staff at Cook College as a consultant working with Dr. David J. Burns. Although their work has not yet been published, I have their permission to briefly mention some of their accomplishments:

1. A computerized study was made of the cash flow requirements of a development easement purchase program. Using a variety of assumptions and criteria, we now know that, with some minor modifications, our funding proposal of a four mill real estate transfer tax is feasible.
2. A study was made of our farmland inventory and the numbers of farmers in New Jersey this year. Preliminary results indicate that we may in fact have a larger inventory of farmland and more farms than previous projections had indicated.



The survey, which was taken as a part of this study, indicates that of those owner-operators having an opinion, slightly more had a favorable impression about the easement purchase plan than had an unfavorable impression. However, about 25 percent of all owner-operators knew *nothing* about the proposal.

3. A study was completed by the Eagleton Institute at Rutgers to determine the public reaction to the Blueprint proposal. The results show that over 79 percent of the citizens think our farmland should be preserved for open space and food production, rather than used for housing, stores and industry. Eighty percent feel that the State government should try to preserve the farmlands and over 60 percent of these people feel that a tax of less than 1/2 of one percent on all real property transfers would be acceptable.

SURVEYS

It is interesting to note that two other informal surveys, which admittedly could show some bias, were taken in the State to determine public interest in this proposal. John M. Hunter, Cooperative Extension Service, managed a survey at the 1973 Flemington Fair which revealed a startling 98 percent of the nearly 1,000 respondents supported the preserving of farmland in permanent agriculture. Of these, 75 percent favored public financing to achieve the purpose. In this survey, 80 percent of the participants were nonfarm people from all New Jersey counties except Atlantic.

Another survey was made under the Morris County Board of Agriculture's leadership at the New Jersey Flower and Garden Show at Morristown in early 1974.

Here the same strong favorable attitude was found—over 96 percent of the 3,101 ballots cast indicated that they would support a Constitutional referendum calling for State acquisition of development easements on farmland and a dedicated tax to finance the program. In this survey, information indicated that the support came from property owners and nonproperty owners, city dwellers, rural dwellers and suburbanites, and from many different counties.

In a nutshell, our experience has been that people have difficulty in understanding the concept. Because it is new and complicated, some of them oppose it until it is explained carefully. In most instances we find that once people understand the program they like it.

That is not to say that there is no one against it. Our greatest opposition comes from some of the farmers. They just don't want the State to get involved in their business. And yet, there are a great many farmers who endorse the plan completely and who are solidly behind it.

We realize that there will have to be a continuing research effort as we proceed in setting up the program and as we get more experience in the workings of a development easement approach to save farmland. It is likely that some of our original ideas will be somewhat modified as we gain this insight.

We think we've got a good idea—we know we have a great need—we are willing to put our shoulders to the wheel and do what needs to be done to keep this the Garden State. □



Environmental News



BATSTO MANSION AND VILLAGE

The state Bicentennial Commission has set aside \$50,000 to aid in the restoration work needed to get the Batsto complex ready for our nation's bicentennial celebration. Founded in 1766, Batsto was the site of an early bog-iron furnace. The village produced munitions for the Revolutionary War and for the War of 1812. In the 1840's the village turned to glass making. The restoration of Batsto was begun in 1954. Guided tours take visitors through the Batsto Village restoration including the mansion (furnished with valuable antiques), gristmill, sawmill, blacksmith and wheelwright shop, general store, workmen's houses and Visitors' Center. The second floor of the general store contains a display of early iron and glass manufacturing and a post office (still in operation) that was established in 1854. Located in the Wharton State Forest (in background) off Route 542, near Hammonton in Burlington County. Guide service charge. □

APPEALS COURT UPHOLDS FISHKILL FINES

The Appellate Division of the state Superior Court, on March 21, reaffirmed a lower court ruling in favor of DEP which had brought action against the Jersey Central Power and Light Company (JCP&L) for a massive fishkill at its Oyster Creek nuclear generating station three years ago.

Utility must pay \$6,935

The appeals court ruled against the power company which sought to overturn a precedent-setting decision handed down on July 27, 1973 by Superior Court Judge Robert H. Dougherty, Jr. in which JCP&L was ordered to pay \$935 to the state as damages for the 500,000 men-

haden fish which were killed. The power company was also fined \$6,000 for polluting the waters of Oyster Creek. Both the penalty for thermal pollution and the state's claim for damages for the fish killed were upheld.

Commissioner David J. Bardin called the court's decision a "milestone ruling which upholds the state's right to a proprietary interest in a valuable natural resource. It clarifies the statutes on the theory of heat being a possible pollutant," said Bardin, "and should alert potential polluters that any future destruction of these resources can prove to be an expensive occurrence." □

DEP goal: Funding 30 sewerage projects by midsummer

U.S. SUPREME COURT RULING SPURS RELEASE OF FUNDS

The nation's top court, in a decision handed down on February 18, ruled that the federal government exceeded its authority when it withheld \$9 billion in water pollution cleanup funds from the states. The ruling forced the administration to comply with the Federal Water Pollution Control Act amendments of 1972, which provided specific funds to the states for water pollution control programs including the planning and construction of waste treatment plants.

Of the \$9 billion impounded by the Nixon administration, \$4 billion had been released by President Gerald R. Ford on January 27 of this year. Within a week of the Supreme Court decision, President Ford released the remaining \$5 billion for fiscal year 1976, which begins on July 1, 1975. The federal Environmental Protection Agency (EPA) administers the program.

New Jersey's share of the \$9 billion in released funds is \$660 million. Adding to this an earlier allotted amount of \$284

(continued on page 16B)

'BICEN' PLANS TAKING SHAPE

Governor Brendan Byrne recently announced a statewide observance in 1976 and 1977 of the "10 crucial days" of the Revolution in New Jersey. The state Bicentennial Commission is planning a celebration which will include historical reenactments, major cultural events, ethnic festivals and historic films.

The 10-day period to be celebrated began Christmas Night, 1776, when General George Washington led his army across the ice-choked Delaware River and marched into Trenton to defeat the Hessian mercenaries in Battle of Trenton, December 26, 1776. The American troops were again victorious in the second battle of Trenton on January 2, 1777, and overcame the enemy for the third time in the 10-day period at the Battle of Princeton on January 3, 1777. □

ATTENTION: MOTOR VEHICLE OWNERS

Two DEP actions on auto emission standards were taken on April 1: The more stringent phase two of the state's auto emissions program was postponed from April 1 until August 1; and, standards were adopted for 1975-76 autos, effective October 1.

Phase Two Delay

The phase two delay was made at the request of Attorney General William F. Hyland acting in behalf of the Division of Motor Vehicles. Commissioner David J. Bardin said the division plans to reorganize its inspection procedures so that private state-licensed service stations and garages would handle reinspections for failing vehicles, thus easing the workload on state inspection stations. Legislation to implement that change (A-3010) is now pending. Bardin said that "it should be clear by August 1 which course the Legislature will choose. If that legislation is enacted, a further extension of time would be necessary to permit an orderly implementation of the new inspection program."

1975-76 Autos

The standards for 1975-76 autos had been considered in a public hearing on June 11, 1974, but adoption was held up in order to accommodate requests made by automotive manufacturers that 1975 cars be evaluated under actual usage before developing regulations.

Commissioner Bardin said, "Recent analyses of emission testing experience in the state of Oregon and the cities of Chicago and Cincinnati as well as data supplied to DEP by the Ford Motor Company and Chrysler Corporation demonstrate that not only are the standards for the 1975 models reasonable and attainable, but that new vehicles are in fact performing well within the emission rates permitted by the New Jersey standards we proposed last June and are now adopting."

Over 70 percent of the vehicles employ the newly developed catalytic converter to clean up exhaust emissions. Commissioner Bardin has expressed concern on the use of this new technology and the possible side effects of other harmful emissions. □



Parks & Forestry Division GUIDO IS ACTING DIRECTOR

Alfred T. Guido, 40, of Hamilton Square, became acting director of DEP's Division of Parks and Forestry on March 5. Guido, was chief of the Office of Environmental Review for the previous 17 months. He joined state government in 1961 and until 1965 was a principal planner with the state Division of State and Regional Planning. He then became a special assistant to the commissioner in the Department of Conservation and Economic Development and remained in that position when it was reorganized as the Department of Environmental Protection. Guido graduated from Eastern Michigan University with a B.A. degree in political science and studied public administration at the Maxwell School of Citizenship and Public Affairs, Syracuse University. □

U.S. SUPREME COURT RULING

(continued from page 16A)

million, brings the total amount of grant money available to \$944 million. These funds will provide 75 percent grants and will support the construction of waste treatment facilities costing \$1.25 billion. These funds will bolster the state's economy and employ as many as 66,000 people on the construction of environmentally sound projects. The program is the largest public works program in the state and has been given the highest priority of DEP.

Commissioner Bardin said, "We have established an immediate objective of processing and approving 30 projects valued at \$300 million in construction cost by midsummer of this year (1975)."

"Achievement of this goal will require an extraordinary effort from the staff of the Division of Water Resources and continued close coordination and support from EPA," said Bardin. The commissioner said that equally significant is the fact the DEP is continuing to increase the project review staff as a direct result of the continuing support of Governor Brendan Byrne. "Our objective," said Bardin, "is to develop a joint program with EPA to eliminate duplication and expedite the approval of projects."

'Operation Readiness' meeting

The plans for utilization of the federal money and the orderly development of projects, as well as other matters relating to the construction of waste treatment facilities, were the subjects of an "Operation Readiness" meeting chaired by Assistant Commissioner Rocco D. Ricci on March 17 in Trenton.

Ricci stated that consulting contracts for the design of sewerage projects should be awarded on the basis of clearly-defined procedures, including: soliciting of proposals only from qualified consultants; evaluation of proposals by a qualified review board; ultimate selection based on the recommendations of the review board.

The project workload will be handled by the Public Wastewater Facilities Element on a river basin basis as established by the recent reorganization of the water resources division. This element, under Acting Assistant Director Anthony R. Riciigliano, includes the following key personnel supervising the four basins:

Neil Goldfine — Atlantic Basin,
phone: 609-292-7764

Steven Nieswand — Delaware Basin,
phone: 609-292-5562

Paul Kurisko — Passaic-Hackensack
Basin, phone: 609-292-6528

Russell Nerlick — Raritan-Interstate
Coastal Basin, phone: 609-292-3997 □

ROUTE 18 EXTENSION GETS CONDITIONAL APPROVAL

The state's Natural Resource Council, a quasi-legislative body in the Department of Environmental Protection, on March 25 gave conditional approval to an application from the state Department of Transportation (DOT) to purchase and use riparian lands to construct the Route 18 extension along and across the Raritan River in New Brunswick.

The project would involve 6,250 feet of riparian land along the southerly bank of the river in addition to the construction of a bridge across the Raritan.

The council's action is still subject to approval by Commissioner Bardin, Attorney General William F. Hyland, and, finally, Governor Brendan Byrne.

Riparian lands are those which are flowed by the mean high tide. The Natural Resource Council's primary function is to protect the public interest in riparian lands. It has the responsibility of reviewing all applications for riparian grants, leases, licenses or construction work to be performed on riparian lands. □

Next step: Congressional help

STATES GET 'THUMBS DOWN' FROM U.S. SUPREME COURT

The issue of who owns the Outer Continental Shelf (OCS)—the states or the federal government—has been resolved by a recent U.S. Supreme Court ruling in the U.S. vs. Maine case. (Eleven other Atlantic coastal states, including New Jersey, had joined Maine in the suit.)

In a unanimous decision rendered March 17, the Supreme Court said that the federal government has exclusive rights to any underwater resources lying beyond the three-mile limit on the Atlantic Outer Continental Shelf. This is interpreted to mean that any revenues from offshore oil and gas production will not go to the coastal states, but to the federal government.

Governor Brendan Byrne's statement following news of the decision against the coastal states sets the direction of the next steps to be taken in the concerted effort for recognition of the states' interest in OCS development.

Governor Byrne said, **"The decision of the Supreme Court today (March 17) does not end the states' interest in offshore oil. I think it changes the focus of that interest from the courts to the Congress and the administration. Our states' are still interested in the orderly development of offshore oil. We're interested in not having it develop so as to seriously endanger our environment; and we're interested in proper compensation for the onshore effects of offshore drilling. I am sure that the Congressmen from the offshore states and all Congressmen interested in the fair apportionment of the revenues will continue to have a concern."**

Bardin in Washington

There are several pieces of legislation pending in the U.S. Senate regarding the offshore-leasing program. Commissioner David J. Bardin gave testimony relative to the bills before the Senate Committee on Interior and Insular Affairs, Washington, D.C., in mid-March. He said New Jersey's position "exemplifies the balance" sought by different states in federal legislation.

"Our largest industries, petroleum and chemicals, include the most refinery capacity of any state of the East Coast. Our second largest industry, tourism, is dependent on beaches, surf and bay, clean, fresh air and the ambience of our Atlantic shore," Bardin said.

"At the same time," he continued, "our citizens value a quality environment and are seeking the path to orderly land uses and developments. Such a situation requires a 'good balance' in any federal

(continued on page 16D)

From The Governor TO THE CITIZENS OF NEW JERSEY

During these times of energy shortages the "outer continental shelf" has become a familiar phrase. Many persons believe that this shelf, particularly offshore New Jersey, contains recoverable quantities of oil and gas.

The United States Department of Interior has embarked on a crash program to lease these public lands for private exploration and development. (Parenthetically, the issue of which public entity owns these lands was argued in the Supreme Court on February 24). Even if this crash program proceeds at its intended pace oil and gas from the shelf, if there is any there, will not reach consumers for approximately seven years.

Decisions made in a crisis situation are often finalized without a thoughtful consideration of the consequences or alternatives. The decisions which have been made by the Interior Department concerning offshore lands are classic examples of this one dimensional approach. They propose to lease huge tracts of shelf without any idea of whether minerals will be found at these locations. Who will benefit from this type of decision-making? The oil companies or the public?

I am not unmindful of the need to develop new domestic sources of energy. New Jersey is more heavily dependent on imported oil than most other areas of the nation and has suffered severe consequences as a result. We in New Jersey have not avoided our responsibilities and have done more than a fair share of the refining for the east coast. While the State constitutes less than 2% of the land area of the eastern coastal states, 33% of the refining is done here.

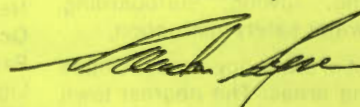
We are willing to continue to assist in the solution of regional and national problems. But most Governors will not sit by silently as the federal bureaucracy rushes headlong into a program which will benefit the oil companies at the expense of a State's priceless Atlantic coastal beaches and tourist industry.

The State of New Jersey in conjunction with several other Atlantic coastal states has developed and submitted a positive program for the continental shelf to the federal government. This program is not intended to unnecessarily delay the search for energy resources. In fact, it would expedite that effort by avoiding protracted inter-governmental disputes, improving the current leasing system and assuring that the public interest is protected while the search for oil and gas proceeds.

A key element in the program would be to initiate prompt exploration to determine the extent of recoverable oil and gas. To assure that the public interest is adequately protected, the exploration should be subject to thorough controls and be separated from any decision to extract the resources. In addition, the utilization of the continental shelf should be consistent with a national comprehensive and balanced energy policy developed in cooperation with the States and the public. The environmental impact of various leasing and development arrangements should be thoroughly analysed so that alternatives which minimize harm to the coastal states are identified and implemented. In the event that the Supreme Court ultimately decides that the federal government is the proprietor of the offshore areas, the revenues which are derived should be shared with the coastal states to compensate them for unavowed adverse effects. Additional federal efforts to assist the affected state plan for the onshore impacts of a substantial drilling and production should be undertaken. The program which I have briefly outlined would not delay the nation's quest for oil and gas. In fact, if the federal government accepts these proposals it is likely that these efforts will proceed more expeditiously.

It is time that the federal government began to share responsibility for critical continental shelf decisions with the States. Many of the questions which have been raised (what is the environmental impact of the program, what alternatives are available, and how can the leasing programs be designed for maximum public benefit) should be addressed in a new environmental impact statement, to replace the inadequate document which was issued. By involving the coastal states in this process, the Department of Interior can demonstrate that it has learned from its past mistakes and the nation will be closer to a determination of the extent of mineral resources on the continental shelf.

Sincerely,



February 26, 1975



PROTECTING OUR FORESTS

Approximately 55 percent of New Jersey—or more than 2.5 million acres—remains in tree cover. For seven of the past eight years, New Jersey has held its forest fire damage to under 10,500 acres. (The exception was the year 1971 when one fire in the Manahawkin (Ocean County) area burned 21,000 acres of forest land on a Sunday afternoon in April.) During 1974, there were 1,742 fires which burned 7,044 acres of lands which fall under the surveillance of DEP's Forest Fire Service.

William B. Phoenix, state firewarden, said the major factors in this accomplishment were "the use of modern firefighting techniques and equipment, intensive training of forest fire personnel and good individual conservation practices of hunters, fishermen, picnickers and residents."

This year's spring forest fire season is in progress as this article is being written. Historically, the forest fire danger in New Jersey is greatest between March 15 and May 15, with the peak usually occurring in April. ☐

DO YOU QUALIFY?

New Jersey residents age 62 or older are eligible for free clamming and oystering licenses. (One license is issued for both activities.) Applications are available from the DEP Division of Fish, Game and Shellfisheries, Box 1809, Trenton 08625. ☐

150 Lifeguards

SWIM SEASON OPENS AT STATE FACILITIES

Get those swimsuits ready—bathing areas in the 15 state-owned inland recreation facilities will open on May 24 and in the two oceanfront parks on June 21. All are operated by DEP's Bureau of Parks.

The 150 young men and women serving as lifeguards had to pass a difficult series of performance tests given at the various facilities during May and early June. In addition, the lifeguards participate in a summer-long organized program of physical conditioning including calisthenics, swimming, running, rowing, surfboarding, first aid and water safety instruction.

Here's a list of state-operated facilities with swimming areas. The nearest town and the county location are included.

BEWARE OF BOATNAPPERS

The proverbial "ounce of prevention" by boatowners could save them the grief of losing their craft or outboard engines to thieves. Captain B. Russell Henry, chief of DEP's Bureau of Marine Law Enforcement, said that more than half of the 574 reported thefts in 1974 were of the spur-of-the-moment type and could have been prevented.

Captain Henry recommends the following precautionary measures be taken by boatowners:

1. Chain and padlock small boats to a pier, tree or other solid object
2. Chain and padlock outboard engines to the hull
3. On larger boats, install a hidden master switch to cut off all electrical supply, or install a hidden shut-off-valve to cut off the fuel supply, or remove the rotor from the distributor
4. Keep boats in a well lighted area at night
5. Take key out of the ignition
6. Keep a written record of the engine serial number and the hull serial number. (It is necessary to have an engine serial number to identify any engine suspected of being stolen, according to Captain Henry. And, even if a boat is stripped and painted over, it can still be identified by the original hull number.)

Reminder to boaters

Boat registrations and operator's licenses are now processed by the Division of Motor Vehicles (DMV). The documents can be obtained at any of the 55 Motor Vehicle Agencies in the state, or by mailing the forms to DMV in Trenton. ☐

Inland Facilities: Bass River State Forest and Penn State Forest, New Gretna (Burlington); Belleplain State Forest, Woodbine (Cape May); Lebanon State Forest, New Lisbon (Burlington); Atsion Lake in Wharton State Forest, Hammon-ton (Atlantic); Cheesecake State Park, Matawan (Monmouth); Prospertown Recreation Area, near Freehold (Mon-mouth); and Parvin State Park, Elmer (Salem).

Also: Hopatcong State Park, Landing (Morris); Stokes State Forest, Branchville, (Sussex); High Point State Park, town of Sussex, (Sussex); Shepherd Lake in Ringwood State Park, Ringwood (Passaic); Spruce Run Recreation Area, Clinton (Hunterdon); Saxton Falls in Stephens State Park, Hackettstown (Warren); and Swartswood State Park, Newton (Sussex).

Ocean Facilities: Island Beach State Park, Seaside (Ocean); and Barnegat Lighthouse State Park, Barnegat (Ocean). ☐

DEP 1974 ANNUAL REPORT AVAILABLE

The Annual Report of the New Jersey Department of Environmental Protection for fiscal year 1974 has been published.

To obtain a copy of the report, please write to DEP, Public Information Office, Box 1390, Trenton 08625. ☐

FREE PARK PASSES

New Jersey residents, age 65 or over, may obtain a Senior Citizen Pass entitling them to free admission and free parking by presenting proof of age and social security card at any state park or forest field office, or historic site. Other fees are not covered by the passes. The program, which began in 1971, is administered by the department's Bureau of Parks. ☐

STATES GET 'THUMBS DOWN'

(continued from page 16C)

legislation." Bardin said existing legislation concerning offshore development was inadequate.

States meet

Representatives of five Mid-Atlantic states (Delaware, Maryland, New Jersey, New York and Virginia) met in the Baltimore office of Maryland Governor Marvin Mandel on March 26 to discuss their position of legislation pending in Congress which would establish new rules for the management and administration of offshore oil exploration and development.

Governors of the Mid-Atlantic states unified their position at a conference held in Cherry Hill (N.J.) on April 10. Calling on the federal government to give coastal-state governors more of a voice in any OCS oil drilling, the conference passed two resolutions introduced by Governor Byrne. One asked for legislation requiring the U.S. Department of the Interior to make both environmental and economic impact statements delineating the effects of offshore oil production on the coastal states. Following public hearings on the statements in the affected region, approval of the governors would be necessary before leasing could proceed. The other called for legislation creating a regional advisory board of coastal-state governors and other public representatives to advise the federal government on each significant step in the exploration and production process. ☐

FOR INFORMATION
WRITE TO NJO
FEATURES, BOX 1809
TRENTON, N.J. 08625



WARNING ■ POINT PLEASANT CANAL CAN BE DANGEROUS TO YOUR BOAT'S HEALTH (AND YOURS) — *New Jersey Marine Police*

Point Pleasant Canal is one of the most hazardous of New Jersey waterways. It is man-made, approximately $1\frac{3}{4}$ miles long, varying from 160 to 200 feet wide with a controlling depth of 10 feet and is spanned by two bridges. It provides access to the ocean from northern Barnegat Bay through the Manasquan River, and is heavily travelled.

Although the "controlling" depth is listed at 10 feet, there are "holes" up to 35 feet deep, and a few spots, close to the side bulkheads, shoal to 8 feet.

During incoming and outgoing tides the tidal current rushing through the Canal often reaches 7 or 8 knots, although the difference in water level between high and low tide rarely exceeds two feet.

To stabilize and protect bridge footings from washing out with this current, rip-rap rock has been dumped in present and former bridge sites to a depth of about 12 feet below low water level. The variations in depth and width of the Canal, plus the presence of the rip-rap and bridges produce variations in current speed, eddies and rips.

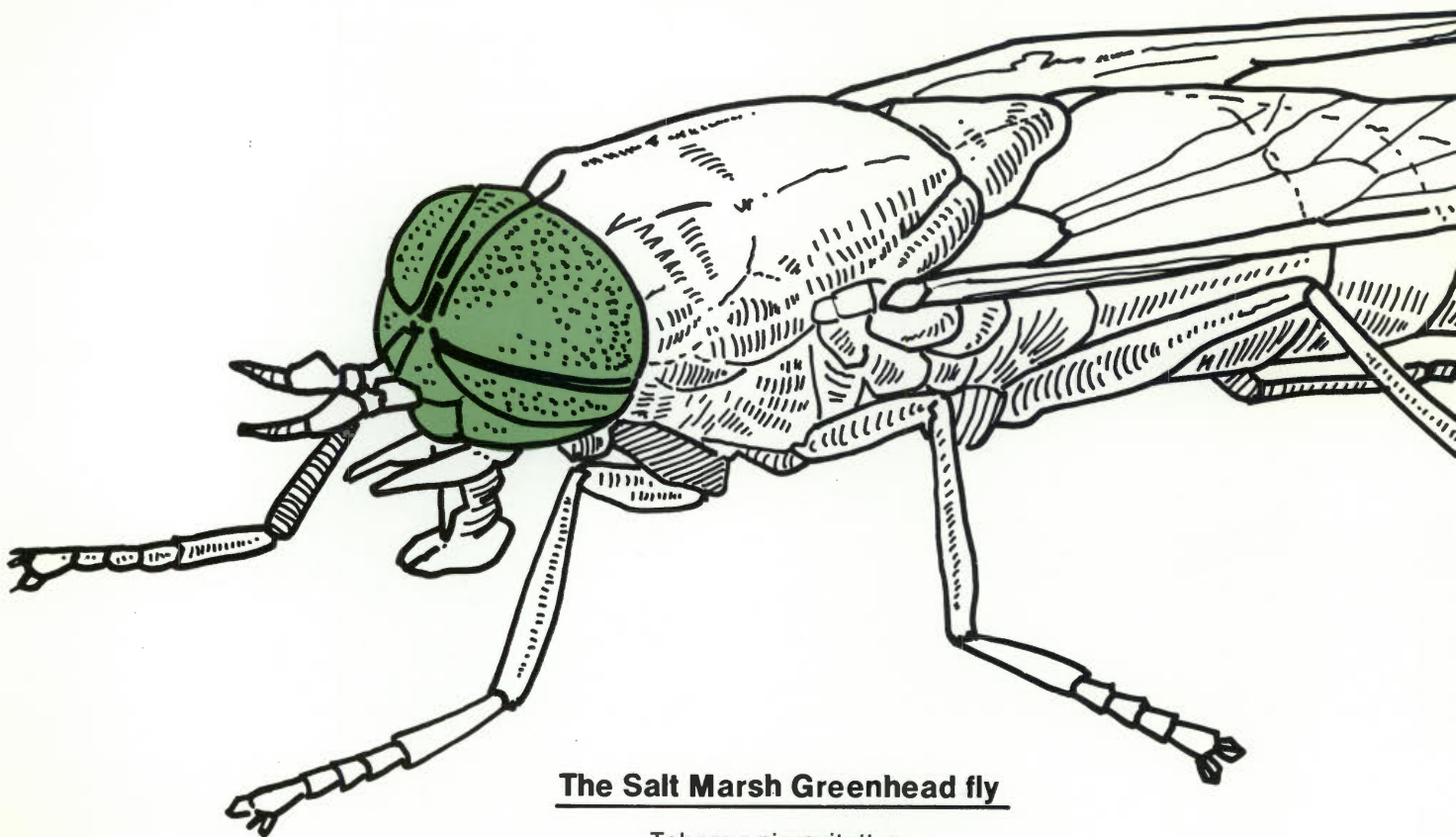
Inexperienced boaters seem to think they can only negotiate rips, eddies and bridges under full power. This has resulted in many accidents in the Canal, especially at the bridges; for a boat, under full power entering an eddy and swerved by it from its course, often cannot at such speed correct its swerve before ramming into bridge abutments, bulkheads or other craft. Also, even should a boat under full power pass through unscathed, the thrust of such power

increases the force of the eddies and rips, and makes the passage for the next boat more difficult.

Sailboats with low auxiliary power meet with frequent difficulty. Often they manage to buck the current until they reach a bridge, then, meeting the increased current flow there, cannot make headway through. This, of course, causes traffic jams, and additional traffic problems when they must turn around in the narrow Canal to return to the Bay or River. Sailboats whose auxiliary power cannot produce at least 9 or 10 knots of speed through the water should lay-to in the River or Bay until the Canal current slacks off at high or low water.

Once in a while a sailboat with no auxiliary power attempts passage through the Canal (there is no law against this—except common sense). Almost all get into trouble and must be towed to safety by the New Jersey Marine Police. But amazingly, some of them have made it; and a few without scratches or hull damage. But imagine the consternation and confusion to other vessels when a sailboat suddenly changes tack in such confined space!

The New Jersey Marine Police advise boaters to negotiate this canal with caution. Take your time. Use enough speed to keep your headway, but DON'T try to plow through at high speed. Even if you are lucky enough to make it through safely at high speed, you probably put other boats in jeopardy. And remember, YOU are held responsible for any damage caused by your wash and wake. □



The Salt Marsh Greenhead fly

Tabanus nigrovittatus
(female)

TO BUILD THE BETTER

E. P. CATTS— *Professor, Entomology and Applied Ecology, University of Delaware*
ELTON J. HANSENS— *Professor, Entomology and Economic Zoology, Cook College, Rutgers—The State University*

The salt marsh greenhead fly is an abundant and bothersome summertime pest along our eastern coastal marshes. Because the female greenhead bites during daylight, and because of its high numbers, long flight range, and persistent attacks, these pests can limit recreational use of coastal areas throughout much of the summer. Livestock on adjacent uplands also is attacked by these blood-seeking flies and can result in decreased weight gain and milk production.

To anyone who has not visited our coastal areas during "fly season," the impact of these flies on daytime activities is hard to imagine. We have collected in

excess of 1000 greenhead flies per hour, all seeking a blood meal. Greenhead fly populations reach peak numbers during July, but extend from late June into early September.

Conventional methods of biting fly control such as those used for mosquitoes, are either environmentally dangerous or economically impractical.

Both adults and larvae of greenhead flies are large by comparison to other, non-target organisms. Generally, more insecticide is needed to kill larger insects. Thus if insecticide application is used, the higher concentrations or

greater amounts of toxic material needed to obtain greenhead control could have adverse effects on the salt marsh ecosystem. In addition, marsh water management by ditching may enhance greenhead production.

Five Year Study

Over the past five years, we have been studying cooperatively, the life history and habits of the salt marsh greenhead in order to better understand its behavior and to discover and test alternative methods of control. In the course of these studies we have developed several types of traps to capture greenheads in large numbers. In combination with what



FLY TRAP

we've learned of greenhead fly behavior, these traps show promise as an inexpensive yet effective means of reducing numbers of these biting flies during midsummer.

Tremendous numbers of greenhead flies are produced from our coastal marshes. We've found as many as 70 larvae in a single square yard of marsh sod. Developing larvae concentrate along the upper vegetational zone reached by daily high tides. These larvae are predaceous and cannibalistic. They forage through wet thatch, surface muck and vegetation to attack and devour a variety of invertebrates, including some of their own kind. Larvae overwinter

and pupate after a brief period of spring foraging. The adult emerges from the pupa in late spring.

Seek the Blood Meal

Adult flies mate on the open marsh. Within a few days and without seeking a blood meal, the female lays her first egg mass, consisting of several hundred eggs. However, to produce additional egg masses, the female needs a blood meal.

Among biting flies, blood serves as a rich protein source necessary for egg development. In the case of the salt marsh greenhead, protein for the first egg mass development probably is

carried over from the protein-rich diet of predaceous larvae, but for additional egg masses, a blood meal is needed.

To seek suitable blood sources the older female greenheads move from the open marsh to nearby wooded or shrubby headlands. Here they await and attack wildlife, livestock and people that venture close enough for them to detect.

These flies are relatively long-lived, surviving for from three to four weeks in the headlands before they become too weak to bite. Because of this long life, large numbers of blood-hungry flies build up in areas near salt marshes.

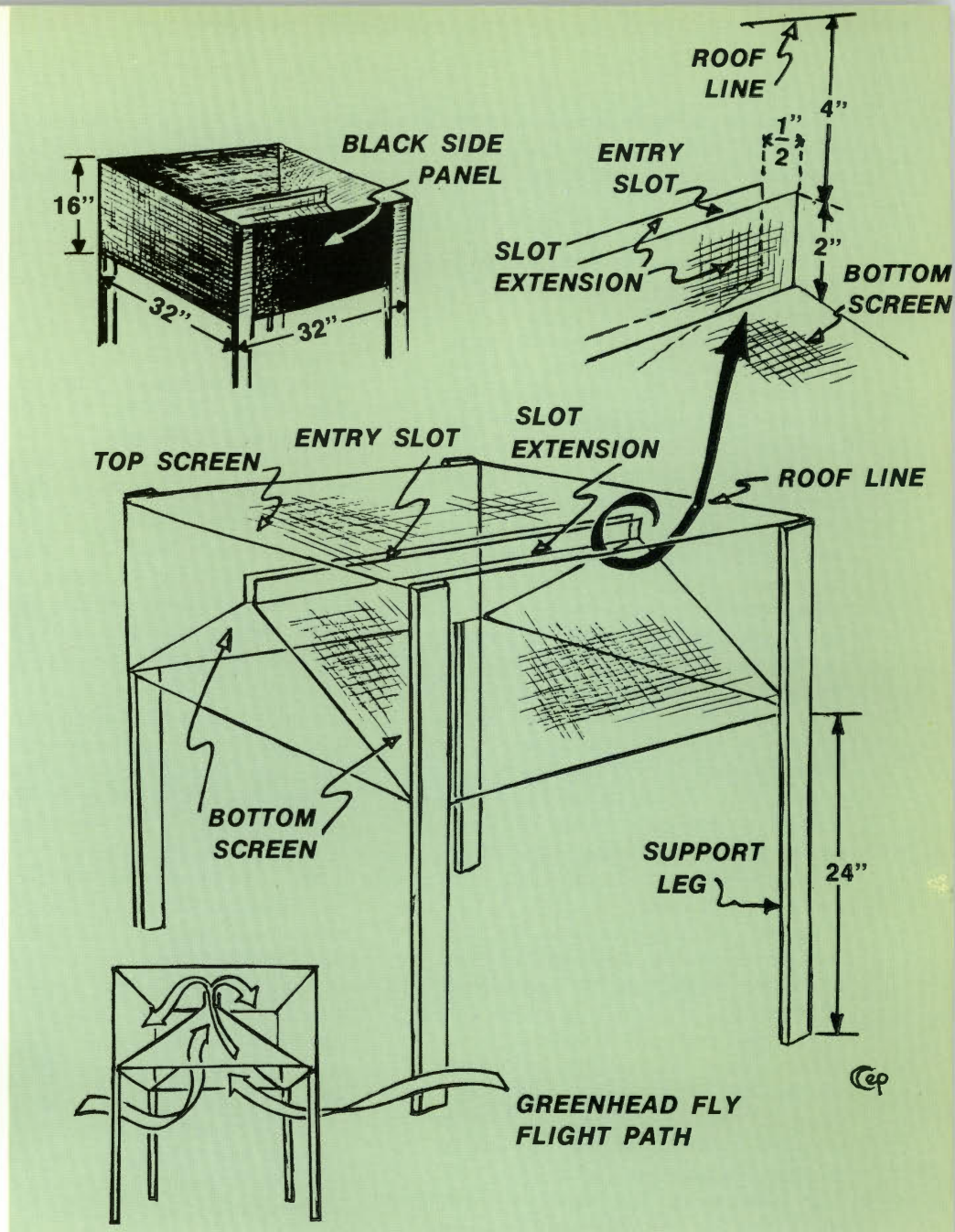


FIGURE 1. BOX TRAP

The physical removal of large numbers of these flies can reduce this buildup and thus decrease the greenhead fly problem locally.

Greenhead Control by Traps

Traps developed to sample flies in these studies do, in fact, efficiently remove large numbers of hungry flies. If such traps are located at the edge of the marsh or in adjacent headlands where flies concentrate, they may entrap flies and thus serve as an alternative means in greenhead control.

We explored this idea in the coastal town of Woodland Beach, Delaware and at the Seaview Country Club, Absecon, New Jersey over a period of three or more years. At Woodland Beach a dozen traps removed nearly one million flies during the three-year study. Single trap capture of 3000 flies per day was not uncommon. Residents and visitors of this small community enjoyed a marked reduction in greenhead annoyance and were enthusiastic about the results.

The New Jersey experiment also showed a promising reduction in fly levels. In 1972, 40 traps captured 186 thousand flies and in 1973, 45 traps took 105 thousand.

Further, the use of three to five traps near isolated human dwellings has given noticeable reduction in greenhead attacks.

After two years of refinement in trap design as well as the study of optimal trap location, we are confident that such traps will capture flies in great enough numbers to decrease the salt marsh greenhead problem in local areas.

In order to put the results of these studies to good use, we are encouraging all interested coastal dwellers to build and maintain one or more of these simple trapping devices.

We have experimented with traps of two general designs: the box trap and the canopy trap. Because the box trap is easier to build and to maintain, we recommend it as the design of choice.

BUILDING THE BOX TRAP

The basic box trap design is diagrammed in Figure 1. Essentially the trap is a black four-sided box on legs having a screen top and inverted "V" shaped bottom. Flies enter the trap from below through an entry slot at the top of the "V." The design is simple and the sides of the box can be made of nearly any kind of paneling including plywood, cardboard, or plastic sheeting tacked to

wooden framing. The trap dimensions have been developed through experimental trial and error and we urge the wise builder to pay strict attention to the following points:

1. The optimal size for each side panel is about 16 x 32 inches. In our tests, larger and smaller box traps were less efficient. Furthermore, these dimensions allow five sides to be cut from a standard 4 x 8 foot panel with minimal waste. This means that the sides for five traps can be cut from four 4 x 8 sheets of material.
2. The box is fastened to corner support legs so that its lower edge is 24 inches above the ground surface. This is important because the greenhead fly usually flies at about this altitude.
3. The bottom of the box consists of a gabled screen with a one-half inch trap entry slot at its ridge. The screen is folded at the entry slot so as to extend the slot two inches upwards and thus lessen the chance of escape by captured flies. The top edge of these slot extensions should be four inches below the flat screen top, or roof, of the box. Field tests showed that slot extensions doubled a trap's capture success.
4. The trap should be painted a glossy black to contrast with its surroundings and to absorb heat from the sun. Greenhead flies are attracted to glistening, or shining, warm targets.
5. The top and gabled bottom of the trap should be made of metal insect-proof screening. Plastic screening or sheeting will be damaged readily by birds seeking to get at the trapped flies.
6. The box sides must fit tightly against the screen top and gabled bottom so that the only access for fly entry or exit is the entry slot.
7. The cost of materials for a box trap is reasonable. Even without the use of salvaged or less durable materials, a trap can be built for less than ten dollars.

BOX TRAP USE AND MAINTENANCE

Traps should be set out during the last week in June and kept operational

through August. Generally, maintenance is a simple matter. Tears or holes in the screens or sides should be patched or plugged. Trapped flies usually die in less than 24 hours. Removal of dead flies is not necessary because they dry and decompose rapidly. However, traps should be cleaned of flies when they are brought in for winter storage.

Selection of trap location is important. There is a great amount of variation in trapping success at different locations. The following suggestions will help you find the best location for your trap. Traps should be placed on the marsh edge near the upland or along the open edge of wooded or shrubby areas. The best locations are at breaks, or openings of low vegetation in screening stands of trees or tall brush near the marsh. We call these breaks "fly-paths" because most of the fly traffic from marsh to upland passes through these points. Clusters of two or three traps in a fly-path tend to capture more flies than the combined totals of isolated traps.

Vegetation beneath and around the trap should be kept low, four to six inches high, for about a 12-foot radius.

This box trap gives an ecologically safe, inexpensive, effective means of greenhead fly control available to anyone with the energy and manual dexterity to build one. Why not try this summer to build and operate one or more of these traps. Maybe your efforts will improve the design further. We'd be happy to see you succeed. Remember, for every fly you trap, there is one less free to bite.

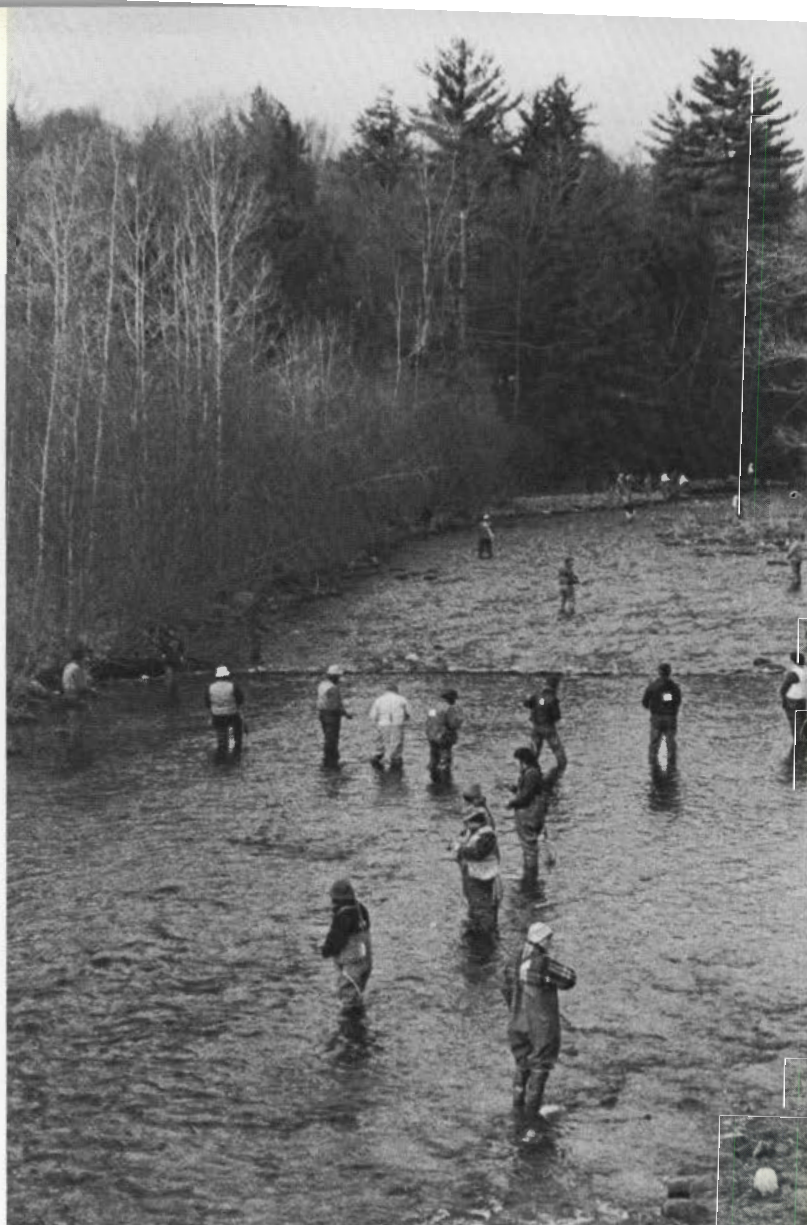
Acknowledgements —

In Delaware: This research was supported by funds from the Department of Natural Resources and Environmental Control of the Delaware State and by Sea Grant funds administered through the College of Marine Studies, University of Delaware. Others helping with this study included J. T. Hance, P. A. Nelsen and R. W. Patton; all are graduate students in the Department of Entomology and Applied Ecology, University of Delaware.

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opening day trout

- 1** Trout fishermen in a northern N.J. stream
- 2** Billy Byrne shows catch to his dad
- 3** Conservation Officer Glen Hawkswell checks Governor Byrne's fishing license



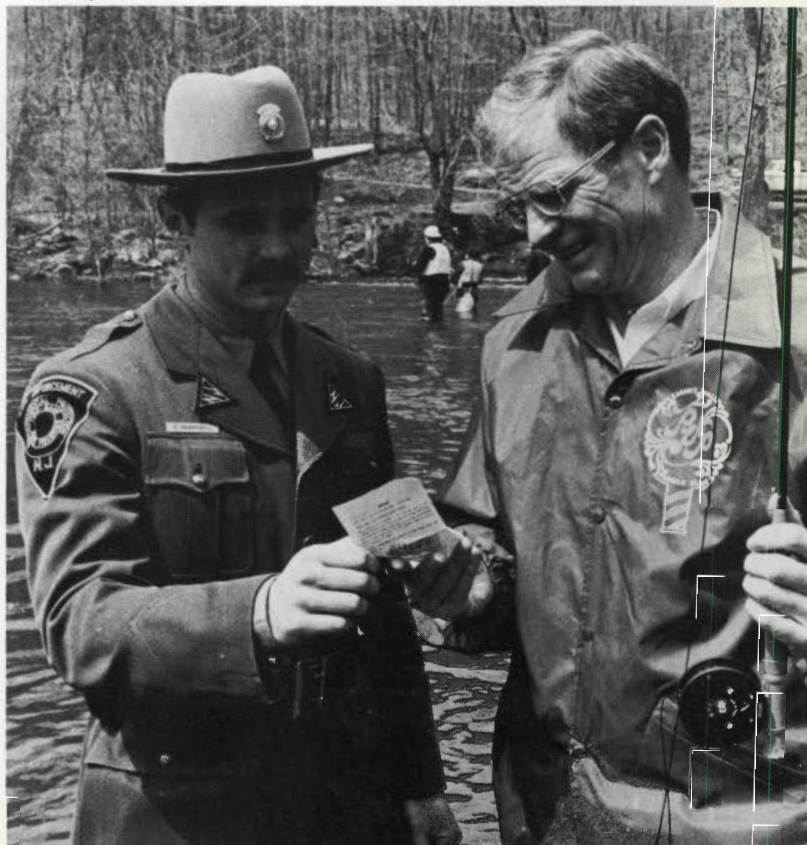
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Photos by Harry Grosch





Harry Grosch



Lagoon developments now encompass over 14 square miles of coastal wetlands in New Jersey.

To New Jersey sportsmen, saltmarshes mean ducks. But, what happens to the waterfowl when draglines and bulldozers turn the lush, green meadows into vast tracts of sand, asphalt and houses?

by William Figley

Already, the demand for recreation and retirement homes at the shore has resulted in the creation of over 14 square miles of lagoon developments on former New Jersey saltmarshes. The largest of these developments, Beach Haven West, comprises over 1,000 acres, has 2,500 homes and 27 miles of interconnected lagoon waterways. During 1973 and 1974, an intensive study concerning the waterfowl populations of this development and the surrounding salt-marsh was undertaken.

HEALTHY HABITAT=VARIETY OF SPECIES

Biologists recognize that a healthy habitat contains a wide variety of species which together are capable of using that

environment to its fullest potential. Over 25 species of ducks, geese and swans can be observed on New Jersey bays and saltmarshes during spring and fall migrations; over a dozen species occur in sizeable numbers throughout the winter.

In Beach Haven West, on the other hand, a single species, the people-loving mallard, dominates the artificial habitat.

This development harbors a winter population of approximately 1,000 ducks of the following species: 950 mallards, 30 white, domestic ducks, 10 black ducks and 10 of assorted species including buffleheads, scaup, canvasbacks and Canada geese.

The mallards use the lagoons during the daylight hours to obtain handouts of food, but fly to nearby marshes at

dusk to roost. The birds return to the lagoons at dawn.

During the nesting season, when the ducks are quarrelsome, the Beach Haven West duck population dwindles to less than half of its winter number. Most of the birds move to less-crowded marshes to nest and raise their young. The ducks remaining in the development nest in every conceivable spot—under boats and docks, in shrubbery and flower gardens—but most prefer tall grass or reed beds in vacant lots or in yards without bulkheads.

BLACK DUCK DECLINE

Formerly, the black duck was the predominant nester on east coast saltmarshes, but its numbers have been steadily declining. Now, about four-fifths of the duck nests found in the marshes surrounding Beach Haven West are

Ducks



 The ducks receive daily handouts of bread, corn and bird seed. Over 1200 mallards were captured and banded in Beach Haven West.

Photo supplied by the author

and Development

mallards'. Competition from mallards for feeding and nesting sites has apparently contributed to the decline of the black duck.

About three-fourths of the mallard nests in Beach Haven West hatch successfully, while only one-third of the nests in the marsh hatch. Crows, gulls and raccoons destroy most of the marsh nests; the lagoon development, on the other hand, is relatively free of nest predators.

Once the nests hatch, however, the circumstances are reversed. Broods in the marsh suffer slight losses, for the dense marsh vegetation affords them protection from predators. The open waterways and yards of the lagoon development give gulls during the day and more importantly, cats at night every advantage to attack ducklings. A protein-deficient diet of bread, man-

made hazards, such as storm sewers, boats, and wire fences, and children also contribute to duckling mortality. Less than one-fourth of the ducklings hatched in Beach Haven West survive to flying age.

Despite these hazards, about 500 ducklings were fledged in Beach Haven West during 1973.

Perhaps this severe mortality of ducklings is beneficial to the lagoon population. Since the death rate of adult ducks is very low, a large yearly crop of young would probably lead to overpopulation.

During the two-year study, over 1200 mallards were captured and banded in Beach Haven West to determine dispersal and hunting mortality rates. Forty of these banded ducks were bagged and

reported by hunters. All of the recoveries were from the local area, indicating that the lagoon flocks are year-round residents.

During the hunting season, the mallards learned quickly to adjust their daily flights to and from the marsh to avoid legal hunting hours.

The hunting kill of lagoon birds is relatively light and has no real impact on the Beach Haven West population.

Although the creation of lagoon developments has been detrimental to most waterfowl species, the mallard has adapted to and now thrives in these artificial habitats. The developments provide a source of food and refuge for this species. In turn, the ducks provide community residents with an enjoyable and esthetic wildlife resource. □



the shad are coming

Richard Lepes displays shad caught one mile north of Dingman's Ferry.

DELAWARE RIVER SHAD PROGRAM

BY JOE MILLER,

Project Leader, Delaware River Anadromous Fishery Project

Each spring when the shadbush blooms the thoughts of many fishermen turn toward a favorite pastime—fishing for American shad in the Delaware River. Likewise the thoughts of the biologists at the Delaware River Anadromous Fishery Laboratory near Rosemont, New Jersey, are also on shad. The difference is that the biologists are concerned with shad and other anadromous species year round.

Anadromous fish, such as the American shad, striped bass, sturgeon, white perch, and river herring are ocean dwelling fish that migrate to freshwater to spawn. After hatching, the young of these species spend a few months growing in freshwater and then move out to sea.

Federal — State Fish Management Program

The Delaware River Anadromous Fishery Study is part of a Federal-State management cooperative known as the Delaware River Basin Fish and Wildlife Management Cooperative. Composed of repre-

sentatives from the States of Delaware, New Jersey, New York, the Commonwealth of Pennsylvania, the National Marine Fisheries Service, and the U.S. Fish and Wildlife Service, this cooperative was organized in 1972 to provide a unified approach to management of the interstate fishery resources of the Delaware River Basin. The Anadromous Fishery Project serves the Cooperative by providing the needed information and data for planning and implementing fishery resource management.

The Anadromous Fishery Project has been studying the abundance, migratory patterns, and life history of the American shad; and recently has begun investigations to evaluate the impact of suspected problem situations on the anadromous fishery resources of the Delaware River. Emphasis has been placed on studies of American shad because of its value as a sport fish, the large portions of the Basin that it utilizes, and because its perpetuation is dependent on the suitability of the basin environment.

Was Top Atlantic Coast Shad Fishery

Since the turn of the century, the anadromous fish stocks of the Delaware River, particularly American shad have declined drastically. The catches of shad in the Delaware River between 1896 and 1901 were by far the largest made in any river system on the Atlantic Coast. At that time the average annual catch in the Delaware was approximately 14 million pounds and ranged as high as 20 million pounds in good years. During that period shad spawned from freshwater tidal areas above Philadelphia as far upriver as Shavertown, New York, on the East Branch and Deposit, New York, on the West Branch. Spawning was also observed in several of the larger tributaries of the Delaware such as the Maurice River, Cohansey Creek, Salem River, Raccoon Creek, Mantua Creek, and Big Timber Creek.

Shad was so abundant and the catches so great that farmers lined up at dockside to fill their wagons with fish to be preserved and stored for later use.

The most popular and efficient methods of taking shad in these early days was with gill nets and haul seines. Gill nets were fished in the Bay and in the tidal portion of the river. Haul seines were principally used in long pools in the freshwater section of the river. Shad "clubs" or "fisheries" were formed because it was necessary for several fishermen to cooperate to clear the large seining areas of rocks and stumps and to pull in the seines. The catches were divided among the fishermen in the club or sold locally. While shad fisheries were once abundant along the river, today, the only one that remains is the Lewis Fishery at Lambertville, New Jersey.

After the large catches of shad near the turn of the century, the catches began to drop off and reached a low point during the years 1948-1954 when only a few thousand pounds of shad were taken commercially and very few fish were even seen in the River. However, biologists are optimistic that the corner has been turned because shad runs are definitely on the increase again. But because the commercial fishing effort is now very low, the true extent of the increases are not known.

Shad Decline Caused By Pollution

The causes for the rapid declines in shad production and the slow recovery are a result of many factors and problems which now exist in the Delaware River Basin.

Of course, the main cause is the widespread pollution of the lower River and upper Bay by municipal and industrial wastes.

The wastes lower the level of dissolved oxygen in the water. Studies have shown that to stay healthy

Photos by Harry Grosch



Numbers of adult American shad taken in gill nets during the spring spawning period are used to establish indices of abundance from year to year. Joe Miller gently removes shad from net.

Juvenile American shad spend 5-6 months in the nursery areas of the Delaware River prior to returning to the ocean.



shad need water with a dissolved oxygen level of five or more parts per million. But the levels in the River between Torresdale and Marcus Hook fall to zero or near zero during late spring, summer, and early fall.

Pollution Throws Three Strikes At Shad

One could say that the pollution zone throws three consecutive strikes at the shad. First, if the dissolved oxygen levels fall too early, then part of the spawning run is cut off before they can get through to the cleaner waters above Trenton. Accounts have been given of these late-comers dying as they futilely attempt to penetrate the pollution, but it is believed that many search for another place to spawn. Second, for those fish that do successfully ascend the river, complete their spawning, and then begin the return journey to the ocean in June and July the pollution block is set in so tight that there is no chance for survival. And finally, third, the young shad begin moving downriver in September and October. Those that try to move through the pollution block before high flows and cooler weather have combined to improve dissolved oxygen conditions perish.

The adult shad that successfully navigate the pollution zone and ascend into the uppermost reaches of the river find themselves in another ballgame; and again they come out on the losing side. Pepacton and Cannonsville Reservoirs on the East and West Branches of the Delaware River were constructed during the 1950's and 1960's to supply water to New York City. Frequent and rapid changes in stream-flow releases from these reservoirs cause extreme temperature variations for forty or more miles downstream. As a result, a stretch of river that would make perfect smallmouth bass habitat is changed in a few hours into a coldwater trout stream. The shad are very sensitive to changes in temperature. A drop of

only a few degrees difference in water temperature will cause adult shad to cease spawning and young shad begin to move downstream instinctively since it appears to them that cold weather has arrived. A drop of several degrees in water temperature has been shown to slow or stop the development of eggs and larval shad or to result in deformed fry.

Fine, so the adult shad have arrived early enough to get through the lower river before the pollution barrier has set in. And because they didn't go too far up river to be affected by the reservoir releases, they have successfully spawned and produced healthy young shad. And these young shad have resisted their instinctive urge to move out to sea until the water quality in the pollution zone has improved enough to permit passage. Now they are home safe. Right? Wrong.

Along the river there are a number of potential hazards. Notable among these are the many major industrial, municipal and power generating facilities that use tremendous volumes of water for various purposes. Their use is so great that their combined withdrawal capacity is greater than the river's flow at Trenton for many months of the year. Many of these plants return the water to the river at increased temperatures of 10-20° Fahrenheit. These facilities threaten the young shad with impingement on their intake screens and/or entrapment in heated thermal plumes.

The intake screens are necessary to keep debris such as logs, leaves, etc., from entering the plant and causing damage. The velocities of the water passing through many of the screens is too great for nearby fish to swim against and they become impinged. In some cases screen wash systems flush fish and debris back into the river, but even so, only a few of the hardiest fish survive.

As water temperatures drop with coming winter, fish seek areas of warmer water. To the juvenile shad and other fishes the thermal plumes from heated effluents afford such havens; however, decreasing river temperatures, coupled with the inability of the fish to adjust to sudden changes or to tolerate the lower natural temperatures of the river, cause their death. Remember, shad normally spend their winters far to the south where temperatures are much higher.

Tending to increase the problem is the fact that the thermal plume is frequently close to the intake, thus promoting impingement.

Exactly how other factors of design, as well as the operation and location of these and other facilities affect the mortality of juvenile shad is not known.

Year-Around Research Effort

Biologists at the Delaware River Anadromous Fishery Laboratory are studying the "problems" of pollution, reservoir releases, and impingement, and determining the effects of these problems on the anadromous fishery resource. Field work goes on year around; from the warm spring evenings, through the hot summer nights, into the frosty fall mornings, and the icy winter days. The information resulting from these efforts will be utilized in the planning and implementation of fishery management programs; which in turn will provide for consideration of the fishery resource in the scheme of Basin development.

During April, May and June field crews will fish gill nets at established stations along the river to capture adult shad. Each shad will be tagged and the information from returned tags will be used to determine abundance and movement. In the future, biologists hope to use electronic fish counters to get an accurate count of spawning fish ascending the River. But, for the present, abundance is estimated, from year-to-year, based on the number of shad caught per hour the nets are fished. For information on the movements of shad in the Delaware Basin and out in ocean, the biologists rely on sportsmen and commercial fisherman who return tags from the shad they catch along with the date and location of catch. Most tags are returned from locations within the Basin, but several have been returned from Chesapeake Bay and the Atlantic Coast.

One adventuresome shad tagged at Lambertville, New Jersey, was caught 126 days later in the Bay of Fundy, Nova Scotia. That's a distance of over 750 miles.

Nature has imposed many hazards on the shad which must migrate out to sea as small fish, spend three-to-five years maturing, and then return to freshwater to spawn. The chances of surviving are slim. Of 100,000-200,000 eggs spawned by a pair of shad, only two or three need to return to maintain the size of the run. But man has further stacked the odds against the shad by damaging its freshwater and tidal environment.



Hundreds of adult shad are tagged each year in an effort to learn their movement patterns; the return of these tags is vitally important to the success of the study.

Somehow the Delaware River shad runs have survived, albeit barely. What the future holds for the American shad and other anadromous species depends on how well the biologists do their job, and on how strong a stand sportsmen and other concerned segments of the public are willing to take to see that pollution and other problems are minimized. □

DELAWARE RIVER BOAT ACCESS SITES

Name	Location	Facilities	Charge
<u>SUSSEX COUNTY</u>			
Del. Water Gap Nat'l. Recreation Area Milford Beach	Milford, Pa.	Launch	Free
Howard Angle Riverview Tavern	N. J. above Dingman's Ferry Bridge Dingman's Ferry, Pa.	Launch & Rent Launch & Rent	Charge Charge
<u>WARREN COUNTY</u>			
D.W.G.N.R.A. — Camp Depew	0.5 mi. above Calno School — Pahaquarry Twp.	Cartop Only	Free
D.W.G.N.R.A. — Pahaquarry Access	1.4 mi. below Calno School — Pahaquarry Twp.	Cartop Only	Free
D.W.G.N.R.A. & Pa. Fish Comm. Smithfield Beach	3.0 mi. above Shawnee on Delaware, Pa.	Launch	Free
Copper Mine Inn	7 mi. above Water Gap	Launch & Rent	Charge
N. J. Div. of Parks & Forests Worthington Tract	4.5 mi. above Water Gap	Launch	Free
D.P. & F. Worthington Tract	3.5 mi. above Water Gap	Cartop Only	Free
D.W.G.N.R.A. — Kittatinny Point Gray's Service Sta.	Water Gap — N. J. Delaware, N. J.	Launch Rent	Free Charge
Al's Fixit Shop	Rt. 46, Ramseyburg	Rent	Charge
Riverside Trailer Pk.	Belvidere	Launch	Charge
Belvidere Bridge	Belvidere	Launch	Free
S. S. Diana	Hutchison	Launch	Charge
Pa. Fish Comm.	Rt. 611, Martins Cr., Pa.	Launch	Free
Phillipsburg Municipal	Hampton St.	Launch	Free
Riegel Paper Co.	Riegelsville	Launch	Free
<u>HUNTERDON COUNTY</u>			
Pa. Fish Comm.	Upper Black Eddy, Pa.	Launch	Free
Frenchtown	Sewage Treatment Plant	Launch	Free
Tinicum Park Bucks Co., Pa.	1 mi. S. of Frenchtown Bridge	Launch	Free
Div. of Parks & Forests Bull's Isl. Recr. Area	Raven Rock, N. J.	Launch	Free
<u>MERCER COUNTY</u>			
Pa. Fish Comm.	Yardley, Pa.	Launch	Free
Mercer Co. Ramp	Lamberton St., Trenton	Launch	Free
<u>BURLINGTON COUNTY</u>			
Bordentown Municipal	Bordentown	Launch	Charge for Permit
Curtin-Hope Marina	Burlington	Launch	Charge
Dan's Boat Yard	Delanco	Launch	Charge
<u>CAMDEN COUNTY</u>			
Joe's Marina	Creek Rd.—Bellmawr	Launch	Charge
<u>GLOUCESTER COUNTY</u>			
Halscheid's Ramp	Almonesson Rd., Westville	Launch	Charge
National Park Marina	National Park, N. J.	Launch	Charge
Sweeten's Dock	Mantua Cr., Mount Royal	Launch	Charge
Mullen's Dock	Rt. 130, Bridgeport	Launch	Charge
Bridgeport Boat Yard	Rt. 322, Bridgeport	Launch	Charge
Oldman's Cr. Marina	Rt. 130, Nortonville	Launch	Charge
<u>SALEM COUNTY</u>			
Marina	Pennsville	Launch	Charge
Salem (Several ramps)	Salem River and Cove	Launch	Charge
Alpha Marina	Hancocks Bridge, N. J.	Launch	Charge
Div. of Fish, Game and Shellfisheries Mad Horse Cr. Wildlife Mgt. Area	Stow Neck Rd., Canton	Launch	Free

LIVE FISH FOR YOUR ANGLING PLEASURE



CHARLES O. HAYFORD
STATE FISH HATCHERY
HACKETTSTOWN N. J.



Open house

PHOTOS BY HARRY GROSCH



Free samples of fish food being handed out by Tom Hoby, Hatchery Worker



Chuck Byrnes, Hatchery Disease Bio-specialist, shows Karen Jaeger of Oak Ridge quality of hatchery trout



For a nickel, Ron Barnickle and Gerry Herring receive trout feed from dispenser



Steve Perrone of Moorestown feeding hatchery trout



Small ponds and streams often hold surprisingly large fish such as this nice pickerel taken from a small pond (Author's mother).

getting started in freshwater fishing

(Continued from page 4)

four or five minutes. If you still have not fooled a fish, give the nightwalker a slight twitch of the line and move it along the bottom a few inches. Keep doing this until the bait is directly below you, then reel it in and cast to another place and follow the same technique again. When the bait is at rest, be sure that the bail on the spinning reel is left open so the fish can run with the bait without resistance. Give the fish about thirty seconds to get the bait completely in his mouth; then set the hook—hard! If you plan to release your catch, do not wait too long for the fish to mouth the bait or it might swallow the hook which will eventually kill it. Should the fish swallow the hook and you still want to release it, do not try to remove the hook as this will most certainly be fatal. Cut the line as close to the fish's mouth as possible and gently return it to the water. The hook will soon rust away and the fish will stand a reasonable chance of survival. Since hooks are

fairly cheap, do not worry about wasting money following this procedure. Be a true sportsman and keep only the fish you need.

As I mentioned before, just about the only two fish found in New Jersey which are not really susceptible to nightwalkers are pickerel and crappies. If you plan to pursue either of these fine fish, I would recommend substituting nightwalkers with baitfish. The smaller baitfish work best for crappie while pickerel prefer the larger variety. Baitfish also work well on bass, trout and most panfish. Be sure to use very small baitfish for trout and panfish.

The best way to hook baitfish is through the lips, being sure not to pierce the brain. Some anglers prefer to hook baitfish in the back, just behind the dorsal fin. If you use this method, be sure not to pierce the spine. Fish baitfish essentially the same way I described for nightwalkers, except that in water over eight feet deep



Author's wife, Linda, caught these trout from the small creek in the background using spinning tackle and live bait on her first fishing trip (A nameless feeder creek to a beaver pond near Sparta, N.J.).

you will find it necessary to use two small split shot in order to bring the bait to the bottom. In water less than eight feet deep, split shot is not needed.

The techniques thus far described are simple to apply and may be used on both contained waters (lakes, reservoirs, ponds, etc.) and moving waters (rivers, streams, brooks, etc.). However, fishing moving water requires taking current into consideration. The bait must be drifted naturally and yet kept near the bottom. Keep these two factors in mind, and you will catch fish in moving water.

Many fishermen, in fact most experts, recommend fishing upstream with live or artificial baits. They contend that game fish such as trout and smallmouth bass usually face upstream. Thus, according to the experts, an angler wading upstream is less likely to spook the fish above him than an angler wading downstream would be likely to scare fish below him. This is essentially true; nevertheless, I prefer to fish downstream. My reasons are practical ones. Upstream angling normally requires wading in the water and fairly long casts. Most (but not all) of the rivers and streams in New Jersey are quite small, have brushy banks and

low tree lines making it impossible to make long casts, or at least very difficult. In downstream angling the fisherman can fish from the banks or very quietly wade to a fixed position and drift his bait downstream very naturally. This is a relatively easy method to apply, and the beginner does not have to worry about long casts. Moreover, the angler can cover a tremendous amount of water without doing much wading. I often drift my bait up to 100 yards. In short, for most small rivers and streams such as those found in New Jersey, a downstream approach is the most effective. This is especially true when fishing with live bait. Again weights and bobbers are *usually* unnecessary. However, the bait must drift along the bottom, and when the water current is very fast, you may find it necessary to pinch on a couple of split shot. When the water current is too slow to drift a bait, a very small bobber may be used to carry the bait downstream. The bait does not look very natural when fished in this manner, but nevertheless this method often proves very effective.

During recent years, the experts have disproved the contentions that fish could only be caught along the shorelines of contained waters and that areas toward the middle of a body of water are barren. Their sophisticated equipment has enabled them to locate the hidden lairs and migration routes hundreds of yards from the nearest bank. They have also learned that only a small percentage of a given body of water is inhabited by fish worth fishing for. If you are not fishing in the right place, you are simply wasting your time. Locating fish by finding the hidden lairs and migration routes is usually referred to as structure fishing. It is expensive to purchase the necessary equipment to pursue this type of fishing properly, and it requires a considerably long time to learn. Nevertheless, once mastered it is extremely productive.

What does this mean to the beginner who does not want to spend a lot of money and who just does not have the time to learn structure fishing? The answer is so obvious it is usually overlooked. Fish the smaller lakes and ponds. Also fish rivers, streams and brooks. Here the fish are restricted to smaller areas, and although they still depend on structure, concentrations of fish are much easier to locate without expensive equipment. Moreover, you would be surprised at the lunker fish which have been caught from these smaller waters.

In the May/June 1974 issue of *New Jersey Outdoors* I had an article published entitled, "Fishing the Hidden Waters" which discussed how to locate the more inconspicuous of the smaller waters and their virtues. Allow me to repeat a little of what was said.

Very few New Jersey anglers realize that there are many small, relatively hidden waters open to the public which are almost unfished or lightly fished, and which are often more productive than the larger and more well known streams, ponds and lakes. You have to spend some time locating them, but when you find one of these small, hidden hotspots, you will have a tremendous feeling of satisfaction and enjoy some darn good fishing. If you are fishing a stream, try exploring it above and below its more popular stretches. If the going gets hard because of the briars or swamp land, all the better; do not let it discourage you. Ride the back roads and look for small ponds and lakes. If you see a small path going off in the woods, follow it; the exercise will do you good. It will probably lead to a dead end, but on the other hand it could lead to a fine pond or stream loaded with hungry fish. Of course, always ask permission when going on private property.

One of the main rules to remember is that fishing pressure decreases as the terrain becomes harder to fish. Less fishing pressure does not always mean more fish per square foot of water (though it often does), but if there are fish present they will almost always be more willing to bite than in the heavily fished areas. Remember, fish not subjected to heavy fishing pressure are less

educated and easier to get into the creel.

The whole idea is to think in reverse, go where few other fishermen venture, be persistent and enjoy the exploring as well as the fishing. "Fishing the Hidden Waters" goes into this subject in more detail and it would be well for the beginner to go back and read it.

I would be quite dishonest if I stated that I never use artificial lures, never use a fly rod or bait casting tackle, and never fish the larger waters. There have been times when the fish would not give my live bait a second glance, but would viciously attack a spoon, plug, spinner or fly. In addition, some of my most successful fishing trips have been on large lakes. It is important to remember that no fishing method will take fish all of the time under all circumstances; and the serious angler must become versatile as he gains experience. However, the intent of this article has been to point the beginner and weekend fisherman in the right direction to successful freshwater fishing, keeping in mind that learning the basics of any pursuit is essential to success.

Some of the experts may disagree with me, but my experience has shown that in freshwater angling, the basics can best be learned with spinning equipment and live bait fished on the smaller waters. Once this approach has been mastered, you may want to move on to artificial lures, fly fishing, bait casting, and perhaps big water structure fishing—or you may want to remain an ol' worm dunker, content with simple angling techniques and stringers filled with fish. □

STUDY SHOWS RETURNABLES CREATE JOBS, INCOME

An economic analysis of the impact of a return to returnable bottles for soft drinks and malt beverages in Maryland shows a significant upswing in both jobs and income.

The study, compiled by the Maryland Governor's Council of Economic Advisers, shows the possibility of a net increase of 1,500 jobs in Maryland and an increase of \$18.5 million in personal income, generating about \$1.1 million in state income and sales taxes. Local jurisdictions would also gain about \$400,000.

With a mandatory returnable bottle law, the study showed that Maryland taxpayers also—

- would save a significant portion of the \$7 million they now spend for litter pick-up and solid waste disposal costs to subsidize a throwaway system.

- While the analysis cautioned that there would be some job dislocations in the beverage container manufacturing industry, industries involved in the distribution and retailing of soft drinks and beer would have substantially higher employment levels.
- The optimistic Maryland report was followed by receipt of a press release from the less-than-impressed Beverage Can Makers. Despite the Maryland report and the economic success of bottle bills in Oregon and elsewhere, the industry press release attacked the "inflationary effects of forced deposit legislation."
- "We've got our hands full trying to hold the line without the headaches a forced deposit law would create," one beverage can spokesman reported.

CONSERVATION NEWS NATIONAL WILDLIFE FEDERATION

Backyard Wildlife

A list of selected references for creating and improving wildlife habitat in your own backyard has been prepared by the Endangered and Nongame Species Project of the Division of Fish, Game and Shellfisheries. For a free copy, send a stamped, self-addressed envelope to:

Backyard Wildlife
Endangered and Nongame Species Project
Division of Fish, Game and Shellfisheries
P.O. Box 1809 Trenton, N.J. 08625



R. Jenkins
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Ron Jenkins

New Jersey State Library *Great Horned Owl*

Bubo virginianus

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