

July / August 1978

New Jersey

OUTDOORS



State of New Jersey



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from the editor

Do Your Bit in the War on Waste . . .



They say a picture is worth a thousand words. So here it is—a picture on this page is a first for New Jersey Outdoors. And it's not a pretty picture, but it is a picture that is quite common in New Jersey this time of year. Although this picture was not taken this year, this condition still exists in the Pine Barrens area portrayed. So what are you going to do about it? I'll tell you what you can do. Turn to page 17, read Do Your Bit in the War on Waste, and follow the directions.

IN THIS ISSUE

For the New Jersey angler who travels abroad for exotic fishing experiences, Bob Soldwedel's article *The Other Guy's Grass is Always Greener* is an eye opener. Illustrations by Anthony Hillman. Cliff Ross, Division of Water Resources, writes about the *DEP Lake Restoration Program* now in progress.

Two new authors, Tim Dunne and Paul Verbyla, write about the best bass fishing area in New Jersey in *Delaware River Smallmouth*.

Another new author, Joan P. Snyder, writes about the Delaware Water Gap Summer Series, an outdoor concert of American mountain music in *Mountains and Music: A Magical Combination*.

The summer of '76 was not a typical summer at the seashore—remember the dead and dying fish, the brown scum on the beaches, and large areas affected by the "bad water." The authors of *Ocean Fishkill/1976*, marine biologists Bill Figley, Jeff Carlson, Dan Vaughan and Sue Hollings, provide an explanation of the kill.

Still another new author, Park Superintendent William Vibbert, tells us why we should visit *Cheesequake State Park*.

Integrated Pest Management by John Brueck, Environmental Specialist with the Office of Pesticide Control, is about an ecological approach to pest control.

More on our wildlife in New Jersey series—*Little Fishes of the Pine Barrens* by Warren E. Fox, also new to our magazine. This article is introduced by the full color illustration of the Black-Banded Sunfish by Carol Decker, on the inside back cover.

You may never develop a fondness for this type of table fare, but *Eating Weeds and Other Edible Wild Plants* by Irma Chaiten (another new author) will provide you with an alternative to skyrocketing food prices.

If you're interested in catching pickerel and bass in our fresh water lakes and streams, read *Fishing the Floater—Diver Plug* by angler Bruce Litton. But first buy a 1978 fishing license.

Pages 26 and 27 showcase illustrations by first-time contributors Frank Hulick and Christopher Forrest, and photographs by regulars David Bast and David Campione.

The article *Endangered and Threatened Reptiles* by Pete McLain and Jo Ann Frier provides a brief description of the intensive studies of reptiles and amphibians presently in progress in DEP's Division of Fish, Game, and Shellfisheries.

In the March/April 1978 issue, we placed author Joanne Burger in the wrong school at Rutgers University. Dr. Burger is with the Department of Biology, Livingston College. Are we forgiven?

THE OTHER GUY'S GRASS IS ALWAYS GREENER

But He Pays More For Fertilizer

BY ROBERT SOLDWEDEL

ILLUSTRATIONS BY ANTHONY HILLMAN

PHOTOS BY AUTHOR



▲ Your author traveled over 2,000 miles to catch this 6-pound rainbow trout.

▼ Bob Korosec and George Shulack traveled less than 20 miles to take these browns (13 lbs. and 14 lbs.) from Spruce Run Reservoir.



Breathes there an angler with a soul so dead who never to himself hath said "Wow, if I could just spend a day fishing the Yellowstone would I catch trout"; or "The Florida Keys—there's the place to catch fish!" Longingly they stare at the pictures in the outdoor magazines and they despise the cruel fates that have conspired to trap anglers of their caliber in New Jersey. As they cast into an "empty" surf at Sandy Hook how they yearn to be trolling for giant marlin off Australia. Huddled around the TV they watch Curt Gowdy cast for cutthroats in his native Wyoming. How gloomy a future fishing trip to the Delaware River appears compared to that.

To take a line from the song "New York's My Home," let me say that "you better consult with me before you go, because I've been to all those places and I know." You see, for every attractive aspect of a foreign shore there is also a pitfall. These pitfalls seldom receive recognition in outdoor magazines or TV shows, yet any one of them could ruin a vacation. When one clears his head of all illusions and then considers all the hard, cold facts, fishing in Jersey isn't all that bad after all—and it's one heck of a lot cheaper. For instance, let us consider:

Guides and Other Hustlers

Chances are if you are going afar to fish you are going to be saddled, like it or not, with a guide. Many lodges include "guide" services as part of their package, greatly jacking up their rates. The average daily rate for a guide will start at \$50 and skyrocket from there.

In most cases it behooves you to hire a guide, at least for the first two or three days, even if you have an alternative. This is especially true if you want to catch fish. Also, the guide may have the only means of access to many fishing areas and oftentimes will also provide you with the correct fishing tackle with which to tempt your quarry.

Beware of rip-offs on that latter point. A guide I chanced to find myself with in Quebec, "Lucky Pierre" by name, assured me that the only thing a Quebec smallmouth bass would touch was a Mickey Finn streamer, of which he had several—for a price. On my own, several days thereafter, I found the smallmouths to attack anything from artificial worms to zara-spooks. This "hustle" is not unknown on some Jersey shore party boats often appearing in the form of the "No Chum, first-mate diamond jig concession."



You may also find to your misfortune that a guide will regulate your fishing success, not always to your advantage. This is somewhat a standard practice, particularly in areas where the resource is starting to fade. You will have a good first day, fair middle days and your last day (tip day) will be phenomenal.

When you get further away from home you may find communications a problem. On a trip to Costa Rica I found my bait to be attacked by a 100 lb. + sailfish. In my ignorance I kept striking and pulling the bait out of the sail's bill (had I let it lie the sailfish would have taken it in and I would have had him—but I didn't know that then). My guide, meanwhile, was screaming instruc-

tions in Spanish. My grasp of that language would enable me to order cold beer, find the correct rest room, and little else. I did recognize a few words that I once heard in a pool room argument in the Hispanic section of Union City and I believe they related to someone's degree of knowledge, parentage, and portions of the anatomy. I might add that since that time grunts, hand signals, broken English on the guide's part, and broken Spanish on my own, have led to a fine working arrangement. Incidentally, if you are the type who doesn't care to listen to the problems of others, a lack of communications may be a blessing.

Fly Me, I Love People (so do alligators)

One of the first things you will find when traveling far afield is that the local airlines often consider flight schedules to be a mere formality. This can create desperate situations if you are trying to make connections. (Never attempt to get into and out of Miami in the same day; even if your plane is on time, the lines at Custom's inspection will destroy you.)

Possibly the most gruesome aspect of air travel is what may be happening to your baggage. Trying to hand-carry a 7-foot fly rod aboard a crowded plane is one of life's real bummers, but consider the alternative; nowhere is your favorite fishing rod's life in greater jeopardy than in a filled-to-the-brim baggage hold. It is also nail-biting time when you look to see if your baggage got off the place at the same place you did—I've had the misfortune of watching my fishing gear get unloaded at Andros Island while I was bound for Bimini. There is no sadder sight than a fisherman forlornly looking for missing tackle or contemplating a four-piece rod that originally was a two-piece rod.

Welcome to Our Country, Gringo

Mr. Big Spender will find to his surprise that one of the few things money can't buy is the right to fish wherever he wants. Unless you can trace your "roots" directly back to the Hapsburgs or the Duke of York, there are many excellent waters that will not be available to you at any price.

Exclusivity is not restricted to the unfriendly natives of foreign shores. Posting of property is not inherent to New Jersey and in fact is becoming more prevalent even in the remotest corners of the far West. It's really a joy to travel to Montana and then find that all those picturebook trout streams you drive by have only one



Continued on page 30

DEP Lake Restoration Program

by Cliff Ross

Drive along Lakeview Avenue in New Market and you can't miss the outstanding feature of the village — the New Market Pond. It's a shame the way it looks on a hot summer day, covered with weed growth, choked with water lilies, its banks littered with refuse. Fun on the old mill pond these days is all but forgotten. No kids in swimming, nobody casting a line from its banks.

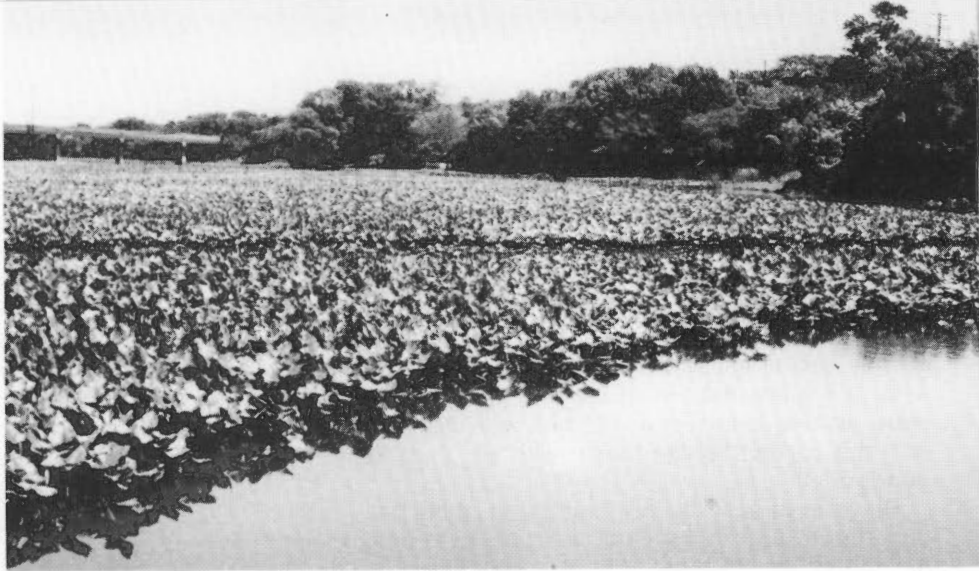
Too bad. For New Market Pond boasts a rich, pre-Revolutionary past, used and enjoyed by generations of New Market people for a couple hundred years and once a great place for a family picnicking, canoeing, swimming and fishing.

Records show the Bound Brook was dammed up to create the mill pond in the early 1700's. And for awhile it was called King's Grant Pond, once owned by Dr. William Mercer who died in 1770.

"I learned to swim in that pond," says Cliff Baird who now sells lawn mowers, lawn fertilizers and seed, chain saws and hardware items at his store at the former mill site. "I remember picnicking as a kid on the banks of this pond. . .in the winter, they'd be out cutting ice on it. And the fishing was good. . .we'd fish for. . .sunnies, catfish, and catch a bass now and then."

There's hope today for some of New Jersey's polluted and eutrophic lakes and ponds through a state-managed Lakes Management program, a plan to make financial help available to restoration-minded lake communities through a grant program funded by the U.S. Environmental Protection Agency.

As it stands, New Jersey has two things going for it in the nationally-funded clean lakes effort—an already evident interest in restoration on the part of some lake communities, and the fact that the State



New Market Pond

CLIFF ROSS

Department of Environmental Protection has been busy surveying lakes and ponds all over the state for the past three years. (See chart on page 5.)

The lakes restoration effort depends on a proof of local interest by the lake population with projects considered on a first-come, first-served basis according to Robert Kotch, DEP Lakes Management administrator.

New Jersey, he said, hopes to be able to apply for some of the \$60 million allocated nationally under the Freshwater Lakes Restoration program to help fund projects.

Feelers from communities wishing to restore a local lake or pond, are a matter of record with DEP. For example:

- Lawrence Township (Mercer County) would like to restore Colonial Lake on the outskirts of Trenton near a municipal playground and tennis courts. A lake accessible to heavy residential development, it shows signs of serious aging.

- Allentown (Monmouth County) would like to deepen the lake by removing the organic muck from the bottom and its rank weed growth and vegetation thus restoring it to its former usefulness.

- The New Market Pond (Middlesex County), choked by vegetation most of the year, has not been lacking in community interest. Back in 1971 Scoutmaster Burt Cutting of Troop 23, organized five Boy Scout troops in the hope they could reclaim the pond by removing 100,000 cubic yards of weeds, cleaning the banks, and getting DEP's Fish, Game and

Shellfisheries Division to stock it. But the project was too big for the Scouts and no lasting achievement is evident.

Piscataway Township's public works director Henry Zanetti is spearheading a drive, hopefully with state help (Green Acres Fund), to make the pond the centerpiece of a new 66-acre township park.

Other lake communities have been active for years in trying to maintain the quality of lake waters. Three years ago the Board of Health in Mount Oliver Township was concerned about the levels of fecal coliform found in water samples taken from Budd Lake, prompting calls for a survey of the lake to determine location of faulty septic systems.

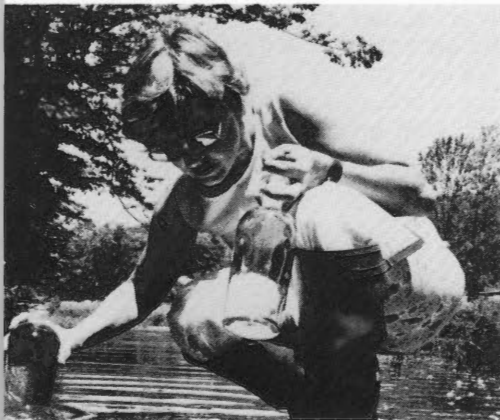
Kotch notes that over the past three years DEP has surveyed approximately 550 lakes and ponds all over the State and collected water quality data for purposes of lake classification. These field surveys have produced files which support the claim that about 38 percent of the lakes and ponds sampled are in various stages of eutrophication—a dirty word to environmentalists meaning a lake that's aging and likely in time to decline into a miry swamp. At any rate, a eutrophic lake is a no-no for everybody—fisherman, boater and swimmer. It's an over-enriched body of water polluted by excessive quantities of phosphate and nitrates or other nutrients.

Frank Takacs, supervisor of DEP's Biological/Technical Unit in the Water Resources Division, quips wryly: "In some cases you'd have to look hard to find the water on some



HARRY GROSCH

Sampler Doris Cone of the Lakes Management program and an aide, Lisa Fleming, a DEP scholarship student, take a sample at Round Valley reservoir. She is using a sampler for taking below-surface samples at various given depths. The state's reservoirs also are included in the sampling surveys which continue this summer.



HARRY GROSCH

Filling a bottle with water from one of North Jersey's many ponds which will be labeled and sent to a laboratory in Trenton for analysis.

of our well sampled lakes."

Some of the lakes have been sampled extensively, ascertaining how fast nutrient materials are entering the lakes and whether they are being used up by the lakes or being eliminated at the lake outlet.

"Our lab results show us the scientific properties of these water samples and tell us whether dissolved oxygen is low, whether it is affecting fish life and whether coliform counts are good or bad and their effect on contact recreation," says Takacs.

In the course of the three-year survey by DEP, cooperating with the federal Eutrophication Lakes survey,

more than 500 lakes and ponds also have been checked for their physical characteristics, for shoreline population density, for septic tank densities and whether wastewater treatment plants are located nearby and, if they are, where they discharge. The geological characteristics of surrounding areas of the lakes have also been studied.

While there's the possibility of better days ahead through the modest federal resources available, no one is expecting miracles. Yet people are interested in clean lakes. They'll have to keep in mind some of the factors weighing in favor of a lake restoration project. These factors are:

- Size of the population residing near the lake which makes use of it for fishing, swimming, boating;
- Whether or not other relatively clean lakes already adequately serve that population;
- Whether the benefits of restoration would accrue primarily to the public at large or be primarily enjoyed by private landowners living around the lake (in which case, the project would have little chance of funding under the program, according to Kotch).

Applicants for grants have considerable information to research but in many cases, the State can help. Required are:

- A description of the lake's drainage basin and a summary of the lake's historical uses through the present time;
- An inventory of point source domestic and industrial discharges, if any, affecting the lake's water quality;
- How restoration activity could improve the quality of the water;
- How the public is expected to benefit from a project;
- Data on water quality as evidenced by sampling and laboratory evaluation.

Today DEP's Lake Management program is ready to act in behalf of cleaner lakes, answering inquiries by an interested public, most of whom make their approach through their municipal government. "Help for our publicly-owned lakes is a reality," says Kotch mindful of his role in assisting with restoration projects. "We don't predict miracles overnight, but we're trying to educate the public to the condition of some of our lakes and what our program is all about." □

**N.J.D.E.P., DIVISION OF WATER RESOURCES, LAKES MANAGEMENT PROGRAM
LAKE EUTROPHICATION CLASSIFICATION PROGRAM April 1975-December 1977**

	LAKES SAMPLED 75	LAKES SAMPLED 76	LAKES SAMPLED 77	SAMPLED 1 TIME	SAMPLED 2 TIMES	SAMPLED 3 TIMES	TOTAL LAKES	TOTAL SAMPLED	LAKES PRESUMED EUTROPHIC	%LAKES PRESUMED EUTROPHIC
ATLANTIC	18	18	18	1	7	17	35	25	7	28
BERGEN	4	6	5	4	4	1	45	9	2	22
BURLINGTON	39	45	59	27	29	28	114	84	28	33
CAMDEN	20	29	26	3	21	10	49	34	17	50
CAPE MAY	4	7	10	4	2	4	28	10	5	50
CUMBERLAND	14	21	24	3	7	17	33	26	13	50
ESSEX	3	2	6	3	1	2	19	6	6	100
GLOUCESTER	29	27	33	3	9	24	60	36	16	44
HUDSON	0	0	1	1	0	0	6	1	1	100
HUNTERDON	5	6	4	3	2	2	16	7	3	43
MERCER	12	11	14	2	4	10	22	16	12	75
MIDDLESEX	10	14	12	2	2	10	27	14	11	79
MONMOUTH	12	21	19	9	6	11	48	24	13	54
MORRIS	29	44	42	8	22	27	139	58	12	21
OCEAN	24	30	33	8	16	19	56	43	17	40
PASSAIC	13	25	19	10	15	9	95	34	6	18
SALEM	22	20	24	0	7	18	28	25	17	68
SOMERSET	2	4	5	0	4	1	17	5	2	40
SUSSEX	46	62	59	16	19	43	162	78	19	24
WARREN	7	7	9	2	5	5	42	12	4	33
UNION	1	0	2	1	2	0	19	2	1	50
TOTALS	331	399	424	108	184	257	1060	549	212	38.6

DELAWARE RIVER SMALLMOUTH

BY TIM DUNNE AND PAUL VERBYLA

When one mentions bass fishing in New Jersey, the first areas considered are our large reservoirs, upstate lakes, and even our small farm ponds. However, one of New Jersey's finest bass areas is also one of the least utilized—the Delaware River.

The upper reaches of the Delaware provide some of the best Smallmouth Bass fishing in New Jersey. The American Shad is also taken in the spring and early summer while on its spawning run. Some trout are caught, mostly above the New York border, and even an occasional Muskie is taken, thanks to Pennsylvania's successful stocking program. Panfish such as rock bass, redbreast sunfish and fallfish are always abundant and give good accounts of themselves when taken on light tackle.

A canoe is by far the best method to traverse the Delaware, and on any summer weekend hundreds can be seen from Port Jervis, New York, south to the Delaware Water Gap. However, relatively few of these canoers are also fishermen. Most come just to ride down the river and observe the beautiful surroundings. Those who do come to fish are rarely disappointed. We have always found the Smallmouth to be a fierce competitor and a fine table fish. The bronzebacks can be taken from late spring, through the summer months, and into early fall, the best months being June and September.

The key to a good bass fishing trip is finding a spot in the river where the fish will congregate. Unlike their warm water cousin, the Largemouth bass, the Smallmouths like the coolest and most highly oxygenated water. Such water occurs within the rapids and riffles or at the base of falls. An ideal spot is a hole about chest-deep, about 20 or 30 square feet in area within some fast stretches or at the base of a falls. These are areas of slow water within the fast water, where the fish can rest and dash into the current as food passes by.

Once a good hole is located, we have found that the best way to fish the area is to beach or anchor your canoe and then to wade to the edges of the hole. When you locate one of these holes the bass are usually not far behind, so don't give up after just a few casts. Thoroughly cover the whole area before moving on to a new spot.

PHOTOS BY THE AUTHORS



We have found the deadliest bait to be the hellgrammite, the larval stage of the dobson fly. The hellgrammite has a black segmented body, about 2 to 4 inches long, with a pair of pinching jaws on the head. This critter is a fierce predator and its jaws can even inflict some pain to humans. The abdomen has two cerci that should be clipped off since hellgrammites tend to grab on to rocks with cerci and snag your line.

The hellgrammites live naturally in the upper Delaware and are a favorite of Smallmouths and other gamefish. They live under rocks in the fastest water and are usually not available to fish. However, when one is occasionally dislodged you can bet it will be gobbled up in short order. Knowing that the hellgrammite is such an excellent bait, the sport shops charge up to \$2 a dozen. But you can collect your own fairly easily. An old screen nailed to two boards about three feet long will do the job. Go into the rapids of the Delaware (or any cool, clear stream in North Jersey) and hold the screen perpendicular to the current and lift all the boulders directly upstream. The hellgrammites will be caught on the screen and should be placed in a container with some moist leaves. Make sure the container has a tight lid since the hellgrammites are very flat and can escape through very narrow cracks. Don't keep the hellgrammites submerged in water. They can breathe atmospheric oxygen or dissolved oxygen only when in great amounts such as in the rapids of the Delaware. Keep the container in a cool moist place and the hellgrammites will last for weeks.

Ultra-light tackle will provide you with some unforgettable battles, for the Smallmouth is probably, pound for pound, one of the strongest fish around. Spinning outfits with 4-or-6-pound-test monofilament will do the job quite well. Fly fishing can also be productive, using dry flies or bass bugs at dawn or dusk.

A trip of eight to ten miles is plenty for a fishing trip. Ten miles could be covered in a few hours by an experienced canoer, but while fishing you are slowed dramatically. Once you start picking up bass you'll be reluctant to keep on the move. Maps of the Upper Delaware showing access areas, rapids classes, and islands, and giving other information, are available for a small fee from the Delaware River Basin Commission, P. O. Box 7360, West Trenton, New Jersey 08628.

As mentioned before, a canoe is the best way to fish the river and many rentals are available if you don't own your own. Other equipment needed for a good fishing trip includes waders during the cooler months or an old pair of shorts in the summer. A pair of tennis shoes is a must, since much of the river bed is covered with sharp talus, and wading in bare feet is almost impossible. A lunch for a midday stop on an island or the shoreland will also come in handy. Don't forget your camera for shots of the beautiful scenery or perhaps a deer taking a drink, a family of mergansers feeding in the shallows, and, with a little luck, a big stringer of Smallmouth Bass at the end of the day □

New Jersey State Library



DELAWARE RIVER BOAT ACCESS SITES

Miles From Mouth of Bay	Name and Location	Facility
240	Del. Wat. Gap Nat'l. Rec. Area, Milford, Pa.	Launch
239	D.W.G.N.R.A. — Dingman's Ferry, Pa.	Launch
228	Pa. Fish Comm. — 1 mi. above Bushkill, Pa.	Launch
222	D.W.G.N.R.A. — Depew Recreation Site, 1 mi. below Millbrook, N.J.	Cartop
220	D.W.G.N.R.A. — Pahaquarry Access, N.J. 7.5 mi. above Rt. 1-80 Br.	Launch
218	D.W.G.N.R.A. & Pa. Fish Comm., 5 mi. above I-80 Br.	Launch
216	N.J. Div. Parks & Forest, 3 mi. above Rt. 1-80 Br.	Launch
211	D.W.G.N.R.A. — Water Gap, N.J.	Launch
206	Met. Ed. Power Plant, Pa., 0.8 mi. below Portland-Columbia Br.	Launch
199	Doe Hollow Marina, Pa., 0.9 mi. above Belvidere Br.	Launch & Canoe Rental
198	Belvidere, N.J. Br.	Cartop
194	Pa. Power & Light Co. Elec. Station, 4.2 mi. below Belvidere Br	Launch
191	Alpha Cement Plant Lot, Pa., 7.0 mi. above Easton Br.	Cartop
189	Sandt's Eddy Access, Pa., Pa. Fish Comm., 5.5 mi. above Easton Br.	Launch
184	Phillipsburg, N.J. Municipal, Between Bridges	Launch
174	Riegel Paper Co., River Rd., Riegelsville, N.J.	Launch
168	Pa. Fish Comm., Upper Black Eddy, Pa.	Launch
164	Frenchtown, N.J. — Sewage Treatment Plant	Launch
163	N.J. Div. Fish, Game & Shellfisheries, Kingwood Access, Rt. 29, 1.0 mi. below Frenchtown Br.	Cartop
162.5	Tinicum (Bucks Co., Pa.) Park, 1 mi. below Frenchtown Br.	Launch
155	N.J. Div. Parks & Forests, Raven Rock, N.J.	Launch
139	Pa. Fish Comm., Yardley, Pa.	Launch
131	Mercer Co. N.J. Ramp, Lambertson St., Trenton	Launch
128	Bordentown, N.J. Ramp, Municipal permit required	Launch
123	Florence, N.J. Ramp, Municipal permit required	Launch
119	Curtin Marina, E. Pearl St., Burlington, N.J.	Launch
111	Dan's Boat Yd., Delanco, N.J. — M. of Rancocas Cr.	Launch
111	Eble's Marina, Creek Rd., Delanco, N.J. — Rancocas Cr.	Launch
111	Art's Marina — Riverside, N.J. — Rancocas Cr.	Launch
111	Big D Valley Marina, Willingboro, N.J. — Rt. 130 Rancocas Cr.	Launch
95	Merk's Marina, Westville, N.J. — Big Timber Cr.	Launch
95	Joe's Marina, Brooklawn, N.J. — Big Timber Cr.	Launch
95	Halscheid's Ramp, Almonesson Rd., Westville, N.J. — Big Timber Cr.	Launch
91	National Park Marina, National Park, N.J. — Woodbury Cr.	Launch
89	Sweeten's Dock, Mount Royal — Mantua Cr.	Launch
80	Bridgeport Boat Yard — Old Ferry Rd., Bridgeport, N.J. — Raccoon Cr.	Launch
63	Pennsville, N.J., Municipal Ramp	Launch
69	Marlboro Marina, Rt. 49, Salem, N.J.	Launch
45	Div. Fish, Game & Shellfisheries, Stow Cr. Rd., Canton — Mad Horse Cr.	Launch

MOUNTAINS AND MUSIC:

a magical combination

BY JOAN P. SNYDER

Imagine a group of five folk musicians performing against a background of north Jersey's Kittatinny Mountains, an enthusiastic crowd listening from the hillside, all smiles, laughter, and tapping feet. These were the ingredients that made up one of the most successful concerts of last summer's Delaware Water Gap Summer Series, a concert of American Mountain Music.

A 20 minute drive from the Water Gap brought me and a group of friends to that concert at Watergate on a Saturday evening in early July. The path we followed from the parking lot led us to the top of a hill; from there we looked down on a natural amphitheatre that already held a sizable audience.

Sloping gently down from where we stood, the land leveled to hold a wooden bandshell. A short drop led to the bank of a swift stream on one side and a lake's edge on the other. Several children playing a rowdy game of tag occupied the field in between.

The Watergate Recreation Site is one of many attractions for visitors to the Delaware Water Gap National Recreation Area (DWGNRA). Less than a mile down the road is Millbrook, a recreated 19th century village. Another 20 minutes brings the motorist into Peter's Valley Craft Village where woodworkers, blacksmiths, weavers, and other artisans demonstrate their skills. The Old Mine Road, built in the 1660's by Dutch settlers and later used by Washington's troops, follows the river through the Recreation Area.

We followed steps fashioned from old railroad ties down the hill to join an audience that numbered more than 1200 by the night's end. I found myself smiling at the diversity of the crowd as we made our way to an open patch of grass near



JOAN SNYDER

Committee of Correspondence Performing at WaterGate Recreational Site

the front. White haired couples sat in green and white lawn chairs. Other groups in spirited discussion reclined on blankets. Park personnel wandered around, talking with friends in the audience.

According to James McLaughlin, Superintendent of the National Recreation Area, the attendance at the Watergate concerts has risen steadily since their inception in 1971, when an average of 35 people attended each concert. In the summer of 1977, the average was up to 400 people per concert.

It was the idea of Joel Corcos Levy to bring the first concert series to the DWGNRA. At that time, Levy, a painter and former keyboard musician, founded the Artists for Environment. Working with the park service, they arranged the concert series and built the wooden shell that serves as a stage for the performances.

The Committees for Correspondence, as the musicians called themselves, began to play and two dominant sounds emerged from the clamor of minutes before. One was the musical tones of dulcimer, guitar, fiddle, and percussion. The other, the faint laughter and shouting of the children now playing Ring Around the Rosie at the water's edge.

I don't know if the five musicians had expected to be the sole performers that evening. Maybe they did know the complementing of their music by the natural elements would make it the purest mountain music the audience could ever hope to hear.

The fiddle tunes brought to us on the cool evening breeze seemed to be plucked up and carried away by bats and diving barn swallows. Dusk crept over the glacial valley as the early American ballads

brought the crowd together in laughter. Ringing chords of dulcimer accompanied the coming of darkness, as the sky faded from blue to gray, and the green willows on the lake's edge darkened into silhouettes.

The Artists for Environment Foundation was created under Joel Levy's guidance to provide a work-study, fine arts, experience for college students. Artists-in-residence are available for guidance and consultation to senior art students who choose to spend a semester in this natural setting. A pilot program with the Delaware Water Gap National Recreation Area, the Foundation is financed by grants from the National Park Service and the Union of Independent Colleges of Art. The New Jersey Council on the Arts has partially funded the Watergate Concerts since 1973.

Beginning at 7:30 p.m. on Saturday nights from early July to late August, the concerts range in style from baroque to oriental to folk. Admission is free. The Watergate concert site is reached by taking the Millbrook-Flatbrookville exit off of I-80 and traveling 10 miles north on River Road. Information and this summer's schedule can be obtained from the Delaware Water Gap National Recreation Area, Bushkill, Pennsylvania 18324.

The distance between the children and the audience had evaporated in the darkness. Feet tapped, heads bobbed, and couples swayed arm in arm. Soon clusters of people were on their feet, dancing together. We seemed to catch the spirit of the children's gaiety.

The night ended in dance, the audience's joyful tribute to the magical combination of good music and good people, in a pure mountain setting.

OCEAN FISHKILL/1976

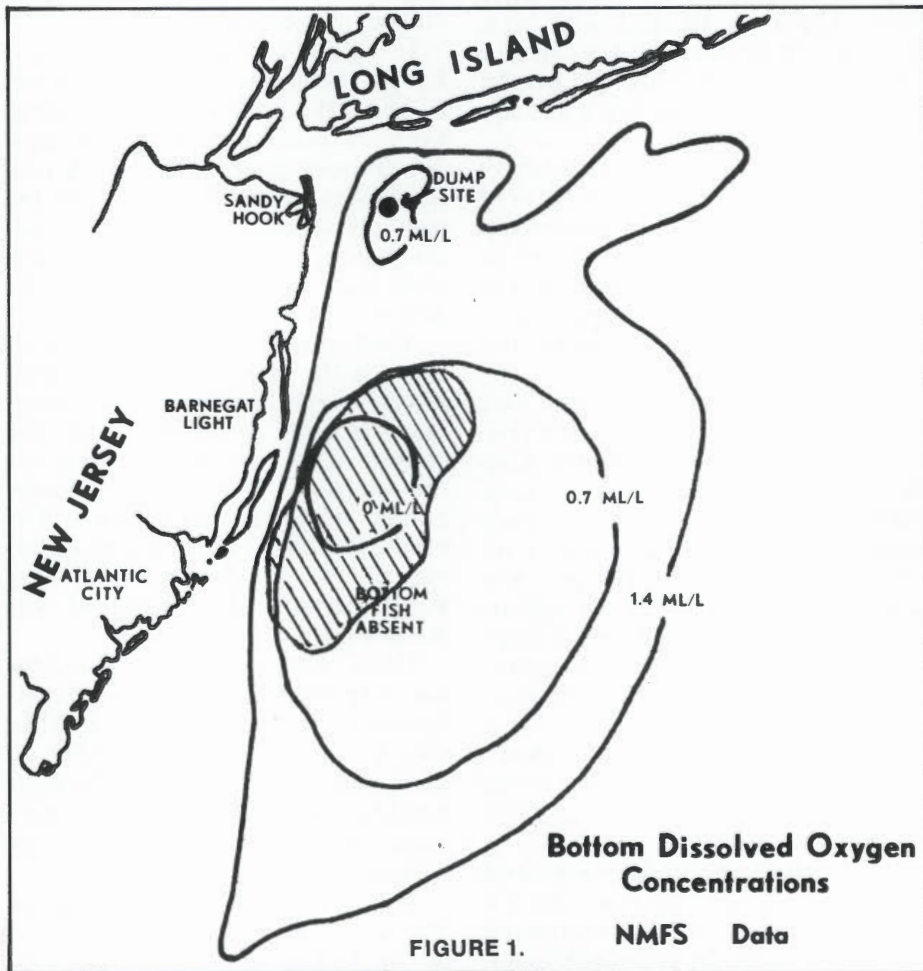
BY
BILL FIGLEY, JEFF CARLSON, DAN VAUGHAN, SUE HOLLINGS



PHOTOS BY THE AUTHORS

If you are an avid marine fisherman, you probably will not forget the summer of 1976—dead and dying fish in the surf and inlets; wrecks devoid of fish, crabs, lobsters, and other marine organisms; disrupted fish migrations; brown scum washing up on beaches; and extensive streaks of red water along the surf.

The first indications of trouble were received from sport divers who found dead and dying fish and shellfish on wrecks located off the northern coast of New Jersey in late June of 1976. The divers noted that the bottom waters were extremely murky and that a dark scum covered the wrecks and bottom. In response, the National Marine Fisheries Services (NMFS) from the Sandy Hook Lab and the Marine Fisheries Section of DEP's Division of Fish, Game and Shellfisheries embarked on sampling programs designed to assess water quality in the reported area. Water samples indicated severely low concentrations of dissolved oxygen in bottom layers. The murky water and bottom scum were found to be the result of a thick bloom of algae that consisted primarily of *Ceratium tripos*. Soon, reports of similar mortalities were being received from many offshore areas as far south as Atlantic City.



More than 3,000 square miles of New Jersey's coastal waters suffered severe depletion of dissolved oxygen near the bottom. During July and August of 1976, bottom-dwelling fish were absent from an area comprising more than 1,100 square miles.

As the seriousness of the problem became more evident, sampling efforts by the NMFS and the Division were expanded to cover a greater portion of the New Jersey coast. These investigations indicated that bottom waters in an area of 3,000 square miles extending from four to about sixty miles offshore and from Sandy Hook to below Atlantic City were either devoid of oxygen (anoxic) or had very low (hypoxic) concentrations of dissolved oxygen (Figure 1). Slow-moving and attached organisms, such as crabs, clams, scallops, starfish, worms, and barnacles, perished in areas where the anoxic conditions persisted. Fortunately, most fish were able to sense the gradually declining oxygen levels and avoided pockets of anoxic water. However, fish species such as eel pout, cunner, and sea bass, which depend upon wrecks and other obstructions for protection, were reluctant to leave such shelters and consequently suffered high mortalities. Through sample trawling, NMFS biologists found that fish were completely absent from more than 1,100 square miles of ocean bottom during August.

The impact of the "bad water" on the State's marine fisheries resources was disastrous. About 69 percent (19 million bushels) of the State's most valuable fishery stock, the surf clam, was destroyed; the potential economic value of this lost resource amounted to more than \$430 million. Losses to lobster industry amounted to more than \$1 million. The inshore trawler fishery lost more than \$5 million. Bluefish avoided the bad water and did not venture into coastal waters off northern New Jersey. Tuna remained well offshore. Bottom species—fluke, sea bass, and ling—had to vacate traditional offshore grounds. Charter and party boats dependent on these species lost future fares from hesitant and disappointed fishermen, had to cancel trips, and were forced to use more fuel to reach the dispersed fish. In all, the State's charter and party fleet lost an estimated \$1.7 million during 1976. In addition, biologists suspect that future stocks may have been damaged because of the disruption of the spawning activities of many species and of the



Division biologist collecting a water sample off Barnegat Light.

mortality of fish eggs and larvae drifting through anoxic waters.

An Explanation of the Kill

The immediate causes of fish and shellfish mortalities were the lack of sufficient concentrations of oxygen in bottom waters and the presence of poisonous hydrogen sulfide gas in anoxic areas. The depletion of dissolved oxygen occurred in the following manner (depicted in Figure 2):

During the late spring, ocean water temperatures vary little from surface to bottom. Oxygen reaches surface waters through diffusion from the air and is also produced by algae during photosynthesis. It is circulated through the water column by diffusion, wave action, and various currents. As the sun warms the surface layers and the colder, heavier

waters sink to the bottom, two layers, one of warm water and one of cold water, are formed. Between the layers is a thin zone called the *thermocline* in which temperature declines rapidly with depth. This condition is especially noticeable while swimming in lakes and ponds—diving underwater, the swimmer will suddenly encounter an abrupt drop in temperature. During 1976, the thermocline extended from 30- to 60-foot depths. Since the bottom layer is significantly heavier than the surface, the two layers resist mixing (like oil and vinegar). The thermocline acts as a barrier to diffusion of oxygen between the surface and bottom. Thus the oxygen supply trapped in the bottom layer must be sufficient to sustain all of the living organisms

Continued on page 12

OCEAN FISHKILL/1976

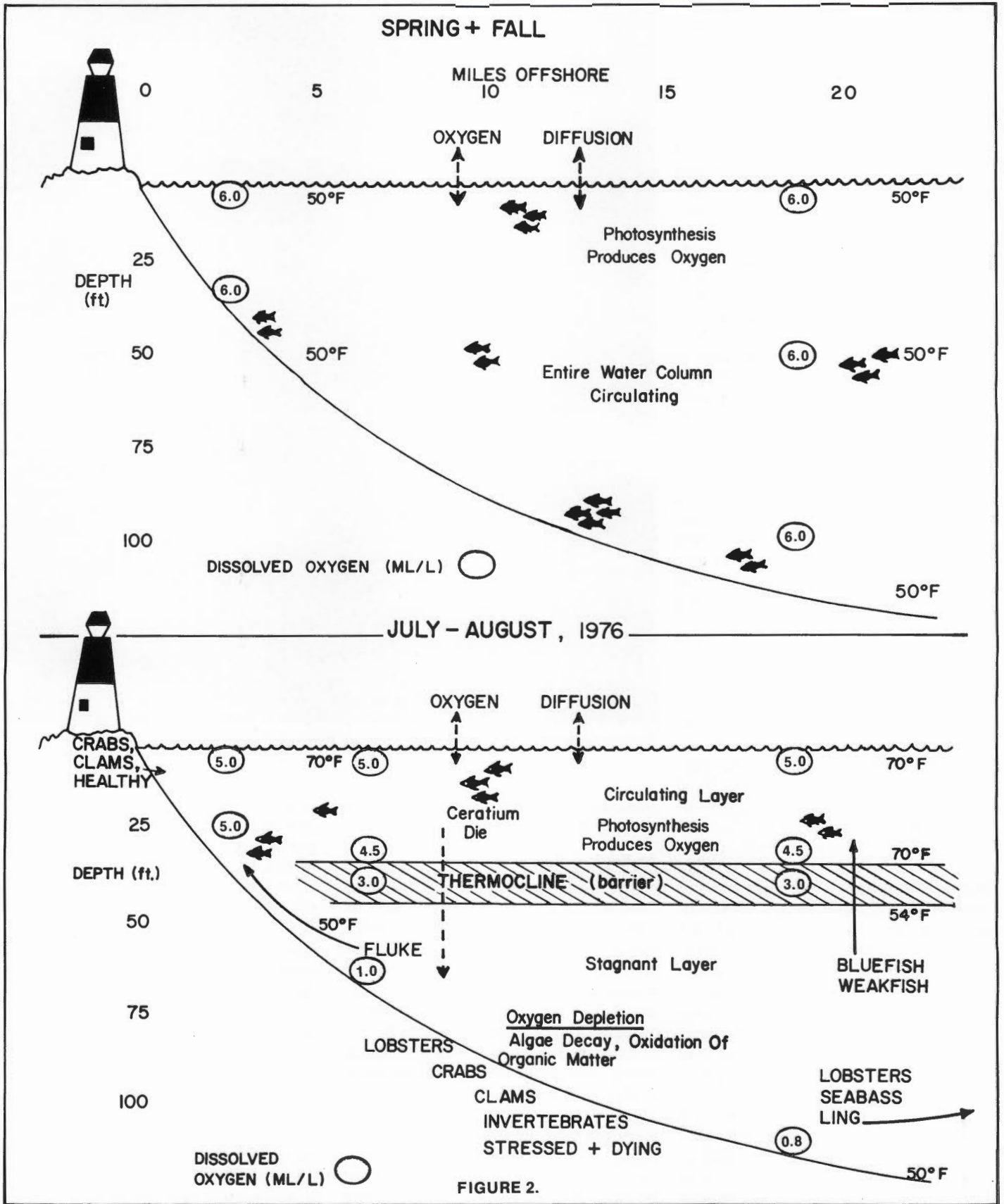


FIGURE 2.

Hypothetical cross-section of ocean depicting the changes in water temperatures and dissolved oxygen concentrations which occur after the formation of a thermocline and the unusual hypoxic condition which led to the fishkill of 1976.

through the summer, and normally it is capable of doing this. During 1976, however, the decay of tremendous quantities of *Ceratium* algae which died and slowly sank to the bottom, and the chemical and bacterial decomposition of other organic matter, placed additional demands on the limited oxygen supply. During July and August of 1976, most of the bottom waters off the coast of New Jersey had dissolved oxygen levels below 1.4 milliliters per liter (ml/l), the concentration below which most fish species begin exhibiting signs of serious stress, and a large area situated off Long Beach Island had absolutely no dissolved oxygen.

Inshore waters less than 60 feet deep were generally not affected because no thermocline was present to trap bottom waters and wave action was able to circulate oxygen throughout the water column. Some species were forced to spend the summer within this narrow band along the shore. At many times during the summer, sportfishermen were able to make large catches (perhaps too large) of fluke in the inlets or just outside the surf.

What caused the anoxic water condition?

The immediate response of sport and commercial fishermen was that the kill was caused by sludge dumping. They believed that the brown and black scum, which covered wrecks and occasionally washed up onto beaches, was raw sewage. In most cases, however, the scum was found to be gelatinous masses of decayed algae.

NMFS biologists believed the anoxic water condition was due in large part to unusual weather conditions. First, surface air temperatures were unusually high during the first six months of 1976 (2°-5° F above normal), resulting in a more rapid warming of surface waters. Second, river runoff began two months earlier in the spring than usual. Third, during February and March, the predominant winds were from the south. Finally, storm activity was very low during the spring and summer. All these factors favored the early formation of a thermocline. Consequently, the oxygen supply below the thermocline was subjected to two additional months of oxygen-using activity by

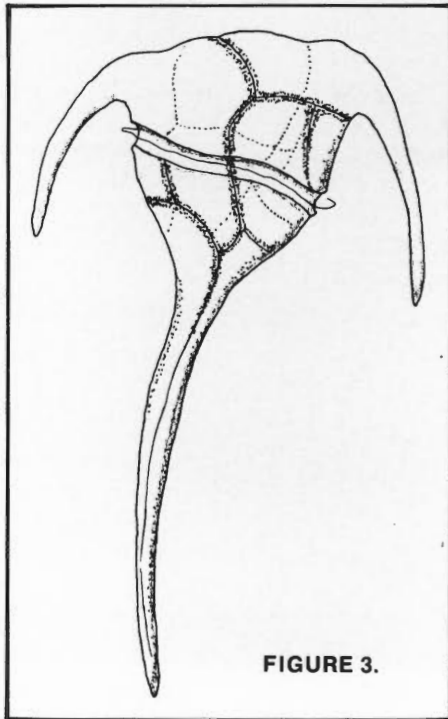


FIGURE 3.

Ceratium tripos is a dinoflagellate algae which experienced a tremendous population bloom during 1976.

marine organisms. By late May, oxygen concentrations were as low as they normally are in July. The combination of early thermocline formation and the decomposition of tremendous quantities of *Ceratium* algae and other organic matter resulted in the eventual exhaustion of oxygen supplies in many areas off the New Jersey coast.

With regard to the fishermen's theory, no one is really certain what role sludge dumping played in the anoxic water condition of 1976. The ocean off New York and New Jersey now receives nutrients (phosphates and nitrates) and organic material from many sources—the dumping of sewage sludge, dredge spoil, and chemical wastes; municipal sewage outfall; river runoff which includes treated and untreated sewage; industrial wastes and farm fertilizers; sewage from pleasure and commercial boats; and more. The nutrients act as fertilizers and may stimulate algae blooms; then, as the algae die and sink to the bottom, their bodies are decomposed by bacteria. Other organic materials in the water are decomposed chemically and by bacteria. The decom-

position process utilizes the oxygen supply that is necessary for all marine organisms commonly associated with clean water.

The Division's Program

The future of New Jersey's economically valuable commercial and recreational marine fisheries and possibly its ocean-based tourist trade is dependent upon the health of the State's coastal waters. At present, no one is certain of the ultimate cause of the anoxic waters of 1976 or if this condition will re-occur in future years.

In an attempt to gather the data needed to identify more specifically the primary factors responsible for this problem, DEP's Division of Fish, Game, and Shellfisheries continued where it left off in 1976 with an intensive ocean sampling program through the summer and fall of 1977. The primary objectives of the sampling cruises were to monitor dissolved oxygen concentrations, temperatures, and nutrient levels of near-shore ocean waters. Fortunately, conditions were improved over those of 1976. No areas were sampled that were completely devoid of oxygen. However, a large area extending from Manasquan to Beach Haven between one-half and twelve miles offshore had dissolved oxygen concentrations between 1 and 2 ml/l during August. These levels are considered critical, but not lethal, to fish and invertebrate life.

Another phase of the study was to investigate the flow of nutrients and organic material from northern inlets into the ocean. Of the four inlets sampled (Barnegat, Manasquan, Navesink and Raritan River), the Raritan River had much greater inputs of nitrogen and carbon compounds.

During the spring of 1978, sampling operations will continue with special emphasis on monitoring algae and benthic (bottom-dwelling organisms) populations. The benthic survey will provide the data needed to assess the recovery of the resident populations that were decimated by the anoxic water.

Determining the primary factors that led to the anoxic water condition off our coast is only the initial step in safeguarding one of New Jersey's most valuable natural resources. □



Hooks Creek in October

CHEESEQUAKE STATE PARK

BY WILLIAM VIBBERT

Where in New Jersey can you see osprey, red-tailed hawks or marsh hawks soar over green salt meadows, as well as picnic, fish, swim, camp, and play basketball and softball?—Cheesequake State Park located near Matawan. Surprised? One of the most urban and accessible of New Jersey's State parks—true, but also one of the most diverse and interesting. In addition to a wide range of recreational facilities, the variety of plant and animal life that exists at Cheesequake is found nowhere else in the State.

The main summer attractions are the picnic, bathing, and camping areas. There are extensive wooded picnic areas with tables and fireplaces.

The bathing area is located on Hooks Creek Lake which is an excellent "fun fishing" lake. The lake is infested with white perch (use grass shrimp or minnows for bait), sunfish, eels, and several kinds of minnows, as well as an occasional largemouth bass. Many of the picnic tables are located near the lake and a regulation softball field, basketball courts, playgrounds, shelter, concession stand and comfort stations are nearby.

There are two camping areas—the family campsites and Booth Field group campsite. The family area is completely wooded and contains 53 campsites with modern sanitary facilities including hot showers, laundry room, and trailer dumping station. During the summer, an interpretive program is provided every Saturday night. Booth Field with more primitive facilities is used by groups who do not seem to mind walking for water and privy toilets.

There is another side of Cheesequake Park that most summer visitors have not discovered. Cheesequake is located in the "transition" zone between northern and southern vegetation and contains a variety of cover types within a very small area. A walk on one of the trails in the natural area will take the visitor first through a typical pine barrens forest with pitch pine, blackjack oak, and mountain laurel, then across a fresh water swamp with cat-tail, arrow-wood, jewelweed and wildflowers forming a green corridor of lush vegetation. Youth Conservation Corps workers have constructed a boardwalk through the swamp so that the usual muddy feet can be avoided and an occasional black snake or spotted turtle can pass undisturbed beneath your feet. Watch for grouse that find berries and seeds in the swamp vegetation and listen for woodpeckers in the dead trees. Further along, the trail passes through a dense stand of Atlantic white cedar intermixed with magnolias and red maples. The trail then swings upland through a mature hardwood forest with massive American beech, black birch, white oak, red oak, and one of the largest natural stands of white pine in the State. Watch for the many species of songbirds that inhabit this area. The best time to visit is early in the morning when the combined sound of Baltimore orioles, wood thrushes, brown creepers, grosbeaks, goldfinches, blue jays, and mockingbirds will make you forget that New York is only 30 miles away.

Another trail crosses a tidal marsh where a rich variety of wildlife can be seen, particularly from May through September. Bring along a crab-trap as Hooks Creek provides excellent crabbing in late summer. The best crabbing is in September when the male crabs migrate into the tidal creeks to spend the winter in the mud. Frequent birds are American egret, snowy egret, green heron, great blue heron, black crowned night heron, kingfishers, rail, black duck, canvasback (December through March), marsh hawk, red tail hawk,

great horned owl (regular nesters), osprey and an occasional bald eagle. It is possible for a visitor to list 30 species of birds in a single day's visit. Don't forget your binoculars and camera.

A small seine pulled in the tidal creek will produce an interesting array of estuarine creatures such as killifish, grass shrimp, eels, silversides, and menhaden. These are excellent bait for the white perch in Hooks Creek Lake or will make an interesting salt water aquarium. The marsh and tidal creeks are accessible from the beach parking lot and if you're energetic, a canoe can be carried the short distance from the parking lot to Hooks Creek.

The trails are well marked and a map at the trail entrance will help choose the trail that interests you most. Check at the office first and ask what may be of current interest.

Cheesequake is an excellent area to observe wildflowers and is one of the best places in New Jersey to see pink lady's slippers which flower in May to mid June. Trailing arbutus is found along many of the wooded trails and its fragrant blossom is one of the first flowers to bloom in early spring. Wild lily of the valley covers the forest floor in several areas and extensive areas of mountain laurel and sheep laurel turn the forest understory pink in June. Other flowering plants of interest are dogwood and shadbush (or serviceberry) which produce white flowers in early May. There are two native flowering azaleas common in the park — pink azalea or pinkster and white azalea. Much of the understory in the park consists of wild blueberry or huckleberries. These are edible and sweet but the birds will get most of them as soon as they are ripe.

A number of mammals are found in the park. The picnicker will be surprised to see how tame the hundreds of chipmunks seem as they rush through the park searching for nuts and bits of dropped food. Gray squirrels are numerous and create some conflicts with people by stealing food from picnic tables or in one case carrying a package of hotdog rolls up an oak tree. Raccoons are common, but are nocturnal and mostly inhabit the marsh area feeding on fish, mussels, and fiddler crabs and are seldom seen. Skunks are numerous and frequently create interesting situations when they enter the bathhouse looking for scraps of food. Both red and gray foxes are common in the park and whitetail deer are occasionally seen. Muskrats are numerous and can be seen swimming across Hooks Creek Lake in the evening.

Although summer is the busiest time, off season use has increased in recent years. Winter sports are popular and the park contains a sledding hill, and the many nature trails have become popular with cross county skiers. New construction has provided the convenience of heated sanitary facilities with flush toilets which are open all year.

Cheesequake can be reached from the Garden State Parkway (exit 120), Route 9, Route 35, and Route 34 near Matawan. Further information about Cheesequake can be obtained from the Park office. Write to Cheesequake State Park, Matawan, New Jersey 07747 or phone 201-566-2161. □



Bald eagle dries its wings after a rainstorm.



Playground area at recently renovated Sandpit picnic area



Bathing area — typical summer Sunday.



Sledding on hill near lake.

PHOTOS BY AUTHOR

Integrated Pest Management:

*an ecological approach
to pest control*

By: JOHN H. BRUECK

*Environmental Specialist
Office of Pesticide Control*

In the not so distant past about the time of World War II, research demonstrated that several synthetic organic compounds exhibited excellent pesticidal activity. Simultaneously modern agriculture was using, as in the past, intensive cultivation of specialized crops which was causing decreases in natural plant diversity that favored rapid pest development. Hence, the agricultural industry was in need of these spectacular synthetic pest killing substances which would, 1) replace the older less effective plant derived and inorganic pesticides and 2) have optimum application in the fields, pastures, rangelands, forests and even urban environments. As a result these synthetic pesticides were extensively used to control insects, weeds, plant pathogens, rodents and nematodes with much success. However, as years passed it became evident that some of these pesticides as DDT were exhibiting other effects which were not particularly good. Because of their persistence adverse environmental effects such as biological accumulation and biomagnification in food chains were recorded which caused toxicity to non-target organisms such as birds, other animals and even man. Destructive insects developed resistance to these pesticides and beneficial insects were killed because of the broad spectrum toxicity of these pesticides. As more problems arose new pest control strategies and reevaluations of chemical pest control tactics were needed.

Some other various insect control tactics that have been developed briefly described would include insect hormones which can be used to disrupt insect development; insect pheromones which are effective in confusing insect

behavior and mating; biological controls such as parasites, predators and pathogens of destructive insects that naturally occur in the environment which are augmented by importation of other beneficial insects, mass rearing, and release; insect-resistant plant strains which tolerate, repel or discourage insect damage; sterilization and genetic manipulation of destructive insects which disrupts reproduction and development; and cultural control by the use of crop rotation, clean cultivation, and destruction of crop residues left in the field.

Integrating other various pest control tactics as those mentioned above with limited use of pesticides and incorporating information describing insect ecology and the environment is the basic approach toward "Integrated Pest Management" a new strategy for pest control. A more detailed definition may be that integrated pest management is an approach to pest control where all available suitable practices are consolidated into a unified program which keeps pest populations below economically damaging levels which is accomplished at lowest possible economic and environmental costs.

In order to be effective, integrated pest management programs require an interdisciplinary approach that includes agronomists, ecologists, economists, entomologists, plant pathologists, and systems analysts. These specialists must define crop ecosystems and populations contained within. Sampling schemes must be developed to accurately depict pests, their numbers, and beneficial organisms which exist to control these pests. The influences of weather, availability of breeding sites, soil, moisture and other physical elements must be understood as to how they affect the population dynamics in the crop ecosystem. Knowledge of crop plant physiology and pathology must also be known so that it can be determined to what extent an insect pest can feed on and damage the crop. From this information Economic Injury Thresholds are determined that depict what pest population density will cause economic loss to the crop.

Once all this information has been discovered it is processed by a computer to yield a computerized model of the crop plant agroecosystem. Using this model in conjunction with field and weather data from ongoing monitoring programs, it is predicted when or if an insect population will exceed the Economic Injury Threshold of the crop. This prediction indicates when action must be taken to prevent the insect population from reaching the Economic

Injury Threshold and is defined as the Action Threshold. Only when the insect population approaches the Action Threshold need insecticide be applied in limited amounts sufficient to curtail such an insect pest outbreak. This approach manages the pest populations below economically damaging levels at considerable savings and fosters limited, judicious use of pesticides only when absolutely needed. Using this approach it is hoped that problems of insect resistance, destruction of beneficial insects, toxicity to non-target organisms and environmental pollution will be limited. Also this Integrated Pest Management strategy yields much useful information about the agroecosystem and depends on an understanding of ecology and a variety of pest control tactics rather than total reliance on chemical controls sprayed at fixed intervals regardless of need as done in the past.

Applications of Integrated Pest Management in New Jersey include the NJ Gypsy Moth Control Program and the Rutgers Sweet Corn Pest Management Program. The Gypsy Moth Control Program is coordinated by the NJ Department of Agriculture. It is a program in which beneficial insect rearing laboratories have been created to raise beneficial insects for release and establishment outdoors to control the gypsy moth. Also forest pesticide spraying has been integrated into this program when needed to control large gypsy moth outbreaks in certain areas.

The Rutgers Sweet Corn Pest Management Program is a program where careful monitoring and analysis of pest population fluctuations on sweet corn have been used to develop Action Thresholds which indicate when pesticides need to be applied rather than by regular intervals fixed by the calendar. The result of this program is efficient control of the pest populations, using fewer pesticide applications at considerable savings to the farmer. Quoting Dr. Donald Prostak, Pest Management Specialist, from the Rutgers Cooperative Extension Bulletin 422, "in 1973 only 1.9 sprays per season were applied to pest management areas as compared to 4.9 sprays for fields sprayed by the calendar. This results in an approximate savings of \$2,000 per season and a reduction of 500 pounds insecticide per 100 acres."

With the above illustration in mind it is hoped that Integrated Pest Management Programs can be developed for other crops and other pest problems to yield efficient, environmentally sound pest control now and in the future. □



Environmental News

DANIEL J. O'HERN SWORN IN



WITH A STROKE OF THE PEN. . . Daniel J. O'Hern, Commissioner of the state Department of Environmental Protection, signs the oath of office just administered by Associate Justice of the state Supreme Court Alan B. Handler (left) in Governor Byrne's chambers on May 12. O'Hern's daughter, Eileen (right), who held the Bible during the swearing-in, looks on.

New Jersey's new commissioner of Environmental Protection, Daniel J. O'Hern, 48, is a native of Red Bank and prior to his appointment was mayor of that city. O'Hern, who served as a member of the governing body of Red Bank since 1962, first as councilman and since 1969 as mayor, also has been a member of the law firm of Abramoff, Apy and O'Hern. Commissioner O'Hern assumed his duties on May 12.

O'Hern was graduated from Regis High School in New York, and received his bachelor of arts degree from Fordham College in 1951. A lieutenant (j.g.) in the Navy from 1951 to 1954, he served aboard the USS Essex during the Korean War. He was graduated from Harvard Law School in 1957 and served as law clerk to Associate Supreme Court Justice William J. Brennan, Jr. O'Hern was admitted to the Bar in the District of Columbia in 1957. He was admitted to the New Jersey Bar in 1958, and in 1967 was admitted to practice before the U.S. Supreme

Court.

He also served as attorney for the Borough of Little Silver (1975-76) and as Planning Board attorney for the Township of Millstone (1975-78) and the Borough of Sea Bright (1970-78). He was a member of the Executive Board of the New Jersey Conference Mayors.

O'Hern is a member of the Monmouth County Bar Association, the New Jersey State Bar Association, and the American Bar Association. Until this appointment he served as a trustee of the Legal Aid Society of Monmouth County and a member of the Advisory Committee of Professional Ethics appointed by the Supreme Court of New Jersey. He is a past president of the Harvard Law School Association of New Jersey, and past chairman of the Legal Education Committee of the Monmouth Bar Association.

He is married to the former Barbara Ronan of Brookline, Mass., and they reside in Red Bank with their five children. □

NEW JERSEY TAKES EPA TO COURT . . . CITES UNFAIR SMOG CONTROL RULES

On May 2 the state filed a court suit appealing recent rules of the federal Environmental Protection Agency (EPA) on smog control, saying they would fall short of achieving environmental goals and put a disproportionate burden of cleanup costs on the economy of the northeast. Governor Byrne said that the purpose of the suit "is to obtain an equitable smog control strategy which will be fair to New Jersey and our neighboring states in the Northeast."

The suit, prepared by the Attorney General's Office and DEP, was filed in the U.S. Circuit Court of Appeals in Washington, D.C. under the procedural requirements of the Federal Clean Air Act.

A letter from Governor Byrne to EPA Administrator Douglas Costle in April urged a change in the national policy on smog control to account for its transportation over vast areas of the country and said legal action would be taken if the current policy was continued. The suit was instituted when no response was received from Costle.

Byrne said the effect of EPA's present policy would be to require stringent controls on industry and the motoring public in the Northeast while leaving vast areas west of New Jersey uncontrolled. "Despite our efforts to control smog, pollution from these areas upwind of New Jersey will continue to be transported into our state and aggravate our problems," Byrne said. "If the problem is to be solved, all states must do their share."

Note: Smog is formed when unburned hydrocarbons and nitrogenoxides in the atmosphere react in the presence of sunlight. □

STORM BATTERED SHORE GETS EMERGENCY AID

In early spring Governor Byrne approved the distribution of \$1 million in emergency state aid to 21 coastal towns for repairs to beaches damaged by the severe storms which hit the state in February. The municipalities, located in Monmouth, Ocean, Cape May and Atlantic counties will match the grants on a 50-50 basis to cover the estimated \$2.5 million cost for repairs.

The state action was taken when New Jersey's appeal of the Federal Disaster Assistance Administration's ruling declining to

Continued on page 16D

Under spill law

DEP Adopts Additional Hazardous Spill Rules

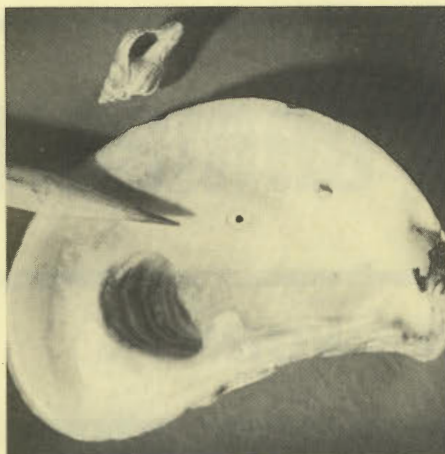
The department adopted regulations requiring major facilities which store oil or hazardous substances to submit plans for spill prevention, containment and cleanup. The rules, which affect facilities with a 400,000-gallon or more storage capacity, were proposed in January to further implement the state's Spill Compensation and Control Law (P.L. 1976, c. 141) enacted last year.

The rules cover all storage tanks, drums and pipelines both above and below ground, and were developed by a task force made up of industrial, business and environmental representatives.

Major storage facilities will have one year from September 1 to submit their spill prevention and cleanup plans, using the "best practicable technology." During this time, DEP's Office of Hazardous Substance Control will expand its engineering staff to review and evaluate the plans. (Three other sections of the regulations dealing with spill reporting procedures, registration of cleanup companies and DEP's discharge response procedures, have been in effect under interim rules adopted in March 1977.)

DEP's rules are designed to harmonize with existing federal regulations but the federal regulations do not cover the protection of

Continued on page 16D



ATTACK ON OYSTER KILLER

DEP's Division of Fish, Game and Shellfisheries has launched a three-year, federally financed \$220,000 project to increase oyster production in the Delaware Bay by controlling the predator oyster drill—particularly the "Urosalpinx cinerea" species—a marine snail that is very destructive to oysters on the Atlantic coast. Note the size of hole in the oyster shell in relation to the pencil point in the picture: The tiny oyster drill fixes itself to a "baby" oyster as soon as its shell is apparent; it drills a hole in the shell by softening it with an acid and then rasping away the shell with a file-like organ called a radia.

Continued on page 16D

Chemical Plant Agrees to Curb Discharges of Hazardous Wastes

DEP recently signed a consent agreement with Hexcell Corporation of Sayreville (Middlesex County) which requires the company to implement a comprehensive pollution control program to eliminate the discharge of hazardous chemical wastes, including PBBs (Polybrominated Biphenyls). The regulatory action was initiated by DEP's Division of Water Resources and the Program on Cancer and Toxic Substances.

A study conducted in the spring of 1977 by DEP and the federal Environmental Protection Agency (EPA) found residues of PBBs in human hair, fish, plants, soil, and water in the vicinity of the plant located on West Main Street. (PBB, a flame retardant, has been classified as a suspected cancer-causing agent, and continuous exposure to moderate amounts of PBB has been found to have an adverse effect on the liver, kidneys and thyroid of laboratory animals.)

Hexcell Corporation, which voluntarily agreed to stop production of PBBs in March 1977, has agreed to undertake several actions including:

- Implementation of improved housekeeping and spill prevention procedures to eliminate the occasional runoff of contaminated materials into the environment.
- Building of facility to pretreat process wastewater prior to discharge into the municipal sewer system.
- Submit to DEP within 60 days engineering plans for safe removal of contaminated sediment from a small pond adjacent to Hexcell's property.
- Submit monthly progress reports to DEP. □



STUDENTS LEARN ABOUT WILDLIFE AT LIBERTY STATE PARK

Approximately 225 students can speak knowingly about wildlife in the marshland at Liberty State Park as the result of an eight-week pilot program conducted by DEP during April, May and June. The guided field education courses in wildlife awareness for school groups, sixth grade and above, enable the young people to actively explore the marsh resources under the guidance of wildlife professionals from DEP's Division of Fish, Game and Shellfisheries, in cooperation with the Division of Parks and Forestry. The courses included: Man and the Marsh, Mammals and Waterfowl of the Marsh, Marsh Bird Investigation and the Fisheries Resource of the Hudson River. Class size was limited to 25 students; and transportation was provided by the participating schools. The pilot program was designed particularly for urban students in the Jersey City area. (Once the planned environmental center is built and staffed, these courses will be offered year-round and made available to all schools.) Sr. Wildlife Biologist Stephen Toth passes a ribbed mussel shell to a sixth grade student from P.S. #30, Jersey City. (This shellfish, which is found in great numbers in the marsh, plays an important role in the ecosystem.)

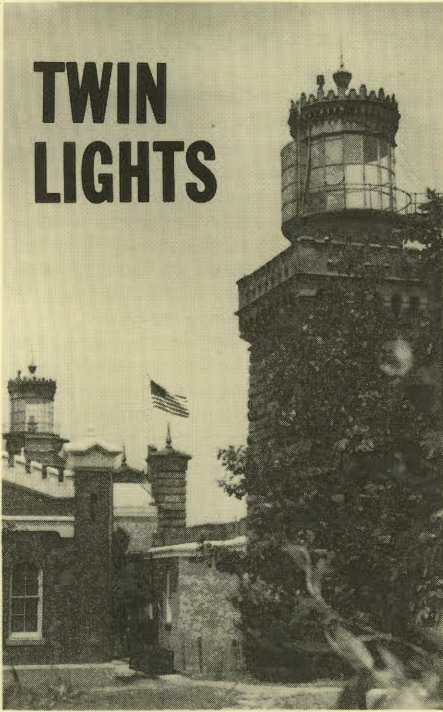
\$740,000 in Grants for Preservation of Historic Sites

DEP Deputy Commissioner Betty Wilson recently approved over \$740,000 in matching grants to 22 state, municipal and private applicants for the preservation of historic New Jersey homes and buildings. The funds are allocated under the state's Annual Preservation Plan and cover the 1978 fiscal year. All properties receiving grants are listed on the State and National Registers of Historic Places.

The grants are funded by the U.S. Department of the Interior, Heritage Conservation and Recreation Service. Recipients will have one year to use the money and complete the projects. The funds can be used for acquisition, restoration or preservation work. Included among the 22 approved projects are the acquisition of the Rutan Log Cabin in Franklin Township (Sussex County), the restoration of the Jersey City Railroad Terminal in Liberty State Park (Hudson County), and the preservation of the Victorian Mansion in Cape May City (Cape May).

Close to \$580,000 was awarded for preservation projects and \$165,000 for statewide preservation planning and surveys. The federal matching grant program is administered in New Jersey by DEP's Office of Historic Preservation. □

TWIN LIGHTS



The history of the Twin Lights site on the headland between the Navesink River and Sandy Hook Bay in Monmouth County is not all nautical, even though its primary use was as a beacon to guide ships past Sandy Hook into New York Harbor. In 1746, cauldrons of whale oil were lit to warn English colonists that French warships were approaching. This was during the French and English War of the Austrian Accession—the colonies of both countries, though far removed from Europe, were considered “fair game” by the protagonists. Later, in the American Revolution, General Washington stationed an outpost here to spy on British fleet movements in New York Harbor, and the beacons signaled the coming of privateers. (England was now the enemy, and France the friend!)

The double lighthouse, the only one of its kind, was originally built as two separate

towers, both octagonal in shape—hence the name, Twin Lights. Erected by the federal government, it began operating in 1828. The first Fresnel lenses used in this country were placed on the twin towers in 1841—the extraordinary improvement in the light made Twin Lights famous—pilots said the lights could be seen 40 miles at sea in clear weather and more than 20 miles out in poor weather. (In 1838, when purchased from France, the two lenses cost almost \$24,000.)

Twin Lights, as it looks today (above), was built in 1862 to replace the earlier station. The two towers, 320 feet apart, 73 feet high and 254 feet above sea level, are connected by a fortress-like brick stone structure. The North tower is octagonal in shape, the South tower is square. In 1898 the first electric arc lamp used in a U.S. lighthouse was installed in the South tower. Guglielmo Marconi in 1899 used the lighthouse to demonstrate his invention, the wireless telegraph. During World War II radar experiments for locating ships were carried on at Twin Lights and it was the success of those experiments that led to the decommissioning of the lighthouse by the federal government. For the last 15 years only a blinkerlight shines as a guide to local boat traffic.

The view from a Twin Lights tower is memorable—the vista includes New York City, Staten Island, Long Island, Ambrose Lighthouse, the Atlantic highlands and the Shrewsbury River. There's an outdoor display of boats and an indoor maritime museum. (An audio-visual display of local maritime history is being prepared.) To reach Twin Lights, located off Route 36 in Highlands, turn immediately before the Highlands bridge and follow the black and white signs to the lighthouse. DEP and the Twin Lights Historical Society cooperate to provide interpreters of the facility from 8 a.m. to 5 p.m. daily during the summer, except for Mondays when Twin Lights is closed. Open weekends in September. Group reservations are available: Call the Cheesecake State Park office—201-566-2161. The state-owned historic site is administered by DEP's Office of Historic Preservation. □

BOATERS BEWARE!

... its the thievin' season

Close to 500 boaters learned the hard way in 1977 that boats are popular with thieves—more than \$640,000 worth of boats, motors and on-board equipment were lost to thieves during the calendar year. More than 80 percent of the reported thefts, accounting for over \$526,000 in stolen property (140 boats, 120 motors, 174 pieces of equipment), took place between May 1 and October 31 when pleasure boating is in season.

The majority of boat thefts are the spur-of-the-moment type and can be prevented if the boat owner will take a few precautionary measures. Captain B. Russell Henry, Chief, DEP's Bureau of Marine Law Enforcement, urges boat owners to use the proverbial “ounce of prevention” to foil thieves by following the recommendations given below:

- Take key out of ignition.
- Keep boats in a well lighted area.
- Chain and padlock small boats to a pier, tree or other solid object.
- Secure all hatches with good, sturdy locks.
- Chain and padlock outboard motors to the hull.
- On larger boats with inboard engines, install a hidden master switch to cut off all electrical supply, or install a hidden shut-off valve to cut off fuel supply, or remove the rotor from the distributor.
- Keep a written record of the hull serial number and the serial number of outboard engines. (Even if a boat is stripped and painted over, it still can be identified by the hull number, and the outboard serial number is usually the only way to identify an engine suspected of being stolen.)
- Keep an inventory of all articles on board, with name and model number, serial number, and description (size, color, weight). In addition, inscribe your social security number on the cover or body of article(s).
- After boating, remove articles that can easily be stolen.
- Check your vessel frequently, making checks at different times of the day and evening.

If, despite all precautions, you are the victim of a boat thief, contact the nearest Marine Police Station. (Much of the information in the listing above will be needed when filing a stolen boat, engine or equipment report). There are eight stations: North Wildwood Station, phone 609-522-0393; Atlantic City, 609-348-4277; Bivalve, 609-785-1330; Monmouth Beach, 609-441-2232, Point Pleasant, 609-443-2260; Ship Bottom, 609-494-6600; Lake Hopatcong, 201-663-3400; and Riverside (in Delran), 609-764-1111. □

BAG LIMIT ON TROUT

A reminder to anglers: The daily bag and possession limit on trout in most New Jersey waters is four. The four-trout limit will be in effect until the close of the season on March 11, 1979. Please consult the Summary of 1978 Fishing Laws for exceptions and further details. □

CLEANER AIR ON WAY FOR N.J./P.A. REGION

New Jersey, Pennsylvania and the federal Environmental Protection Agency (EPA) have come to an agreement regarding the establishment of regional sulphur-in-fuel standards for the metropolitan Philadelphia area. Under the agreement, Pennsylvania has proposed the adoption of more stringent maximum limitations for sulphur content in fuel oil used, sold, delivered and supplied in the counties surrounding Philadelphia. It will maintain stringent standards in the City of Philadelphia. The Pennsylvania Air Quality Board is scheduled to adopt the new regulations on or before August 1 of this year, and will legally implement those regulations on or about October 1.

Governor Byrne said, “This agreement is a tremendous accomplishment for New Jersey and should insure good air quality for our

Continued on page 16D

PRECIOUS WATER

We're all familiar with the saying, “Water, water, everywhere... but not a drop to drink,” yet we take it for granted that this precious liquid will always be there at the turn of a tap. To make sure that there will be enough water in the northeastern part of the state should there be a recurrence of the drought of the 1960's, and to protect and conserve the groundwater resource upon which southern New Jersey depends, DEP's Division of Water Resources last year embarked on the development of a Statewide Water Supply Master Plan. A series of public meetings have been held throughout the state over the past several months to acquaint New Jerseyans with the Master Plan program, and special review committees have been formed. A brochure explaining the master plan and its program of public involvement is available from DEP, Division of Water Resources, Statewide Water Supply Master Plan, P.O. Box 2809, Trenton 08625. □



News Capsules

DIAL 609-292-8272 TO GET BEACH AND FISHING 'INFO'

Anyone interested in New Jersey beach/ocean conditions or where the fish are biting can obtain the information by calling 609-292-8272 from 4 p.m. Thursdays through Sundays. The new 24-hour message service inaugurated by DEP in response to citizen requests, will be in effect through Labor Day weekend. □

SPRUCE RUN SWIM AREA OPEN BUT CAMPGROUNDS ARE CLOSED

The campgrounds at Spruce Run State Park (Hunterdon County) are closed because of construction of day-use facilities for boating, picnicking and parking. This development is expected to be completed by the spring of 1979 and will increase the area's day-use accommodation by 2,000.

The bathing beach at Spruce Run is not affected by the construction. The beach is open and lifeguards are on duty. □

LIBERTY PARK FERRY TO ELLIS ISLAND IN OPERATION

Regular ferry service—Battery Park to Ellis Island to Liberty State Park and Liberty Park to Ellis Island to Battery Park—began on April 30 and will continue until October 29. The boats operate daily from 9:30 a.m. to 5 p.m. The first boat from Liberty Park leaves daily at 10:30 a.m.; the last ferry to return to Liberty Park arrives at 4:15 p.m. The ferry service was first implemented last May (1977) through the combined efforts of DEP, Circle Line Cruises and the National Park Service. □

HUNT-WESSON TOLD TO TREAT DISCHARGES

DEP recently ordered Hunt-Wesson Foods Company in Bridgeton (Cumberland County) to submit plans for treatment of their processing wastes which are being discharged onto a field in Fairfield Township. The plant, located at the intersection of Grove and Eagle Streets, is discharging vegetable wastewater through a spray disposal system. DEP is requiring wastewater treatment to prevent contamination of the groundwater. Hunt-Wesson was given 60 days to submit treatment plans for approval by DEP and the Delaware River Basin Commission. □

RESOURCE RECOVERY EXPLAINED

Staff members of DEP's Solid Waste Administration are available to local environmental, civic, business and service organizations to explain current resource recovery technology and its advantages. Interested groups and organizations should write to DEP, Solid Waste Administration, 32 East Hanover Street, Trenton 08625. □

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CLEANER AIR

residents without placing an undue economic burden on South Jersey industries. . . I am pleased that this situation has been resolved with the cooperation of Pennsylvania and federal officials. I hope this will lead to further recognition by the federal government of the importance of developing national and regional solutions to air quality problems."

(The agreement is the result of action taken by Governor Byrne and DEP in October 1977. A letter of intent to file a Clean Air Act lawsuit compelling the enforcement of air pollution rules in Philadelphia unless Pennsylvania and the EPA agreed to restructure standards throughout the region was sent to EPA, the Pennsylvania Department of Environmental Resources, the City of Philadelphia and 74 commercial establishments in the Philadelphia area.) □

DEP ORDERS LANDFILL TO MEET STANDARDS

In mid May, the department notified Ward Sand and Materials, Inc. of Philadelphia, owners of a Pennsauken sanitary landfill, to comply with state regulations within two months or face closing. Beatrice S. Tylutki, director of DEP's Solid Waste Administration, said the engineering plans filed by the company "show an intentional noncompliance." She listed 14 specific reasons for rejecting the design application.

Some of the reasons listed were: the fill cover material is shown to have a thickness of six inches rather than the minimum one foot required by law. A system for interception, collection and disposal of leachate was not provided. A methane gas control system was not provided. Also, plans submitted by Ward Sand in 1971 showed the size of the landfill to be nine acres, while the 1978 plans are for 80 acres. The facility was expanded without the necessary authorization from DEP, Tylutki said. In addition to submitting revised engineering plans, the company is required to submit a reasonable schedule for the preparation of an environmental impact statement. □

SITING ENERGY FACILITIES IN THE COASTAL ZONE

A DEP report which frames the issues facing coastal energy planners is available from the department's Office of Coastal Zone Management (OCZM), P.O. Box 1889, Trenton 08625. The issues addressed in the report include nuclear power, Outer Continental Shelf (OCS) oil and gas exploration and development, deepwater ports, liquified natural gas, and the more general issues of energy conservation and the siting of energy facilities. The report, "Energy Facility Siting Issues in New Jersey's Coastal Zone," includes an overview of how energy is used and produced today in New Jersey. □

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

Continued from page 16A

STORM BATTERED SHORE

designate that part of the state a federal disaster area had been denied. Byrne said, "Since the federal government has once again declined to assist us in repairing our storm damage, we are moving ahead immediately with our own relief programs."

The decision to apply for federal disaster assistance and the decision to use the emergency funds were based on detailed engineering reports of the coastal damage by DEP's Division of Marine Services, which administers shore protection programs. The approved projects include beachfill and beach restoration, sand fencing, seawall and bulkhead repairs, and dune restoration. □

Continued from page 16B

DEP ADOPTS

groundwater or the prevention of spills of hazardous substances other than oil. The state rules are designed to fill these gaps. Federal regulations also do not require storage facilities to submit spill containment and cleanup plans prior to a discharge.

DEP's standards require secondary containment measures such as dikes and lagoons which must be lined with an "impermeable material" (one which does not permit passage of a substance through it) to prevent discharge into underground water supplies. Facility owners also must take steps to find out if their present operation is leaking into groundwater supplies and notify DEP if such a condition exists.

Copies of regulations may be obtained from Karl Birns, DEP, Office of Hazardous Substance Control, Division of Water Resources, P.O. Box 2809, Trenton 08625. □

Continued from page 16B

OYSTER KILLER

Once it bores through the shell it feeds on the soft parts, killing the oyster.

The oyster industry now relies on the production of seed oysters in the upper Delaware Bay for its planting of oysters on leased grounds. The much more abundant natural seed oyster set in the lower bay is destroyed almost yearly by the oyster drills. For this reason the first area to be tackled under a demonstration project will be the lower bay on about 35 acres in Maurice River Cove. Shellfisheries experts estimate that effective protection of as few as 200 to 300 acres of the dense natural seed beds in this area could result in the doubling of the entire Delaware Bay oyster production. (Current production averages about 300,000 bushels of market-size oysters per year.)

Under the project, a hydraulic dredge will be constructed and installed on a boat. A huge suction head will remove all material from the oyster bottom of the lower bay and drills will be separated from shells, oysters, etc. and destroyed; the other materials will be returned to the oyster bottom in order to maintain its stability. The project, funded by the National Marine Fisheries Service, will be carried out by DEP under the direction of Dr. Harold Haskins, Chairman, Department of Oyster Culture at Cook College, Rutgers University. □

Do Your Bit in the War against Waste!

Send to legislatures—state & fed. government, newspaper folk—other media, container mfrs., bottlers—keep going through 1978

Send a used 12-ounce beer or soft drink can to show your support for mandatory beverage container deposit legislation. While a return to returnables involves both bottles and cans, the Clearinghouse realizes that sending a bottle is not practical. Send cans only, and do not flatten. Follow these simple directions.

1. Tear off the label along the perforation.
2. Fill out your name and return address, sign the note to the President, legislators, other media, etc.
3. Make sure that the can is clean and dry.
4. Cover all openings of the can with masking tape.
5. Attach one end of the label to the can.
6. To complete your Throwaway wind the label around the can and fasten at the seam. Be sure the label is secure to the can or else your can may not make it.
7. Put 24¢ postage on the can.

THE NATIONAL CLEARINGHOUSE ON DEPOSIT LEGISLATION THANKS YOU! For further information, write:
Diane MacEachern, Environmental Action Foundation, 724 Dupont Building, Washington, D.C. 20036

Dear _____

This beverage container is only one of **70 billion** that contribute to the trashing of America annually. Throwaways also represent wasted energy. Deposit laws could save **81,000 barrels of oil per day**.

As an alternative to waste, I support a national deposit on all beer and soft drink bottles and cans. Please work to adopt deposit legislation. Let's **really** help keep America beautiful.

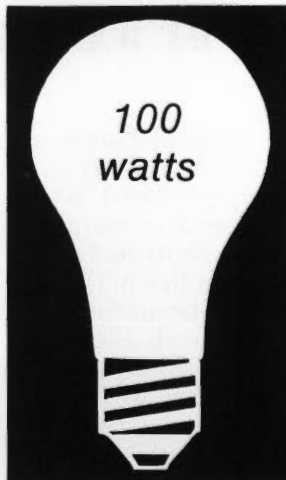


Sincerely,

From: _____

**24¢ postage
1st class**

To: _____



THE ENERGY USED TO MAKE THIS THROWAWAY REPRESENTS ENOUGH POWER TO KEEP ONE 100-WATT LIGHT BULB BURNING FOR 20 HOURS.

LAST YEAR, AMERICANS USED 70 BILLION OF THESE THROWAWAYS.



1. Secure this end of label to can with tape.
2. Wrap label around can, secure label at seam with tape.



MUD SUNFISH *Acantharchus fomotis*

PHOTOS BY AUTHOR

Wildlife in New Jersey / **LITTLE SUNFISHES OF THE PINE BARRENS**

BY WARREN E. FOX

The first of four little sunfishes is found in the Pine's sluggish streams, mostly in floodplain ponds and bayous. The Mud Sunfish (*Acantharchus pomatis*) is more bass-like in body form and its head is more massive than other sunnies in proportion to its body. It grows to about five inches and prefers to live in the outer layers of sphagnum beds where it is beautifully hidden and can dart out to grab a passing lunch. Since beds of sphagnum and grasses like himblewill always accumulate sediment along their edges that weighs them down, it appears the fish is hiding in mud but it isn't really. Hence its common name that should really be "Sphagnumfish."

When it is found in sphagnum its coloration will be longitudinal lines of brown mottling on a green background. One band covers the dorsal area, arching above the lateral line from the eye to the transparent tail. Other lines are below the lateral line, partial, distorted, dip towards the belly, and extend to the tail.

When the fish is found in the open, over a gravel bottom, the green fades and becomes a pinkish fawn color but the brown mottling continues. The mouth is relatively large and easily handles small fish, crayfish, and worms, as well as insects. A Mud Sunfish has no trouble swallowing a Darter at one gulp.

The "ear" spot is sort of halfmoon-shaped and follows the upper curve of the operculum. The eyes are large and very black, set well forward for frontal vision.

The three related sunfishes of the Pine Barrens are the Blackbanded (*Enneacanthus chaetodon*), Banded

BLACKBANDED SUNFISH



(*E. obesus*), and the Bluespotted Sunfish (*E. gloriosus*).

Their habitats overlap, as they are all carnivores feeding on the same organisms but in slightly differing niches. They hybridize in the wild, making identification very difficult. A specimen caught today will have the markings of *E. obesus* but tomorrow will exhibit those of *E. gloriosus*. *E. chaetodon* exhibits spotting characteristics of the others. This presents an intriguing similarity to Darwin's Finches but — he was lucky, the birds didn't change colors!

The Bluespotted Sunfish is *the* Mr. Milktoast of the Pine's waters and the largest of the genus, attaining 3-1/2 inches. It is very retiring and secretive. It hides in the submerged grasses of the stream's edge or in tangles of exposed tree roots laden with algae. Ever watchful of what passes by, it darts out, snatches its prey, and right back to its lair. Fortunately, these grasses harbor ample quantities of organisms to keep it fairly well fed.

Coloration depends upon mood, stress, and background, varying from a very dark blue-green to a very pale olive-green. At times it may show a few faint transverse bars, confusing its identity with the Banded Sunfish, but they soon fade. Males have something of a point to the hinder lobe of the soft dorsal and anal fins. Dominant virile males will also have some blood-red splashes of color in the eye's ring.

If close inspection is possible, the "ear" of the gill cover has a quite sharp point. The spot on this ear is not as dark as that of most sunfishes and the forward part of the spot is pearly-iridescent.

Spotting is much more prominent when the fish is in the dark phase. Then spots will be a greenish-blue and arranged in parallel rows laterally, arching in the dorsal area. When the fish is in the light phase, spotting will be pale green to brassy in color. There are no spots in the forward portion of the spinous dorsal. For the size of the fish, the head is smaller than in other sunfishes and overall, appears "petite."

This species makes its nest in vegetation, mostly algae-covered roots and grasses. It does guard the nest and protect it from other fishes but does not gather up straying young. They swim about within the nest area

BLUESPOTTED SUNFISH — Male — *Enneacanthus gloriosus*



and about the parent until ready to take up life on their own, usually at about two weeks of age, then disappear into the vegetation.

For beauty of form, grace, and delicate color this species is the winner.

The bulldog of the genus is the Banded Sunfish. It too, hides in vegetation, but forages from one stand to another, picking up an exposed worm from the bottom along the way or snatching an insect from the surface. Anything that moves is food. It is smaller than the Bluespotted and larger than the Blackbanded, averaging less than three inches.

The spot on its "ear" is larger than the eye and more prominent. Seven transverse bars on the body are always present although they do vary greatly in their color and intensity. Two more bars on the head are variable and incomplete.

The head is larger in proportion to the body in this species than in the other two and the colors are more brilliant. Spots are blue, green, and brassy, all distributed over the body and not in noticeable rows. Spots are well distributed throughout the dorsal, tail, and anal fins.

This species is more territorially inclined than the others of the genus and never misses a chance to assert itself. To ward those off of its own kind (and other than predators) it does not attack violently, but will nudge the intruder's body by sliding up to it with much body wagging and push it away with its tail, sort of like doing the "Bump"!

The Blackbanded Sunfish is the most intriguing of three species in the *Enneacanthus* genus. Less than 2-1/4 inches long, it is native to waters of Pine Barrens areas in New Jersey, Maryland, and Virginia. One authority extends that to the streams of the Atlantic Seaboard to Florida but I cannot vouch for that. In 1897 it was transplanted to Germany, where fish fanciers cultivated it in their peat-bog waters; they have shipped them by the thousands, worldwide, as an exotic tropical fish ever since. Needless to say that in heated aquariums with purified city water and packaged foods the Sunfish are soon dead.

The general coloration of the Blackbanded is a golden-straw background with several vertical brown

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BANDED SUNFISH — Adult Male — light phase *Enneacanthus ebesus*



LITTLE SUNFISHES

bands that are really irregular mottling. There is a partial band midway in the dorsal area and short or disconnected bands over the head and tail base. Markings differ from one side to the other and also from one individual to the next, like fingerprints.

Also prominent in the fishes are the black first two spines of the dorsal fin followed by an orange third spine. In the ventral fins these colors are reversed. The first spine is orange and the second is black, while the edge of the webbing between the two is white. The fins otherwise are transparent, with considerable spotting that varies with the available light from pearly white to pale blue, pale green, and brassy. In most sunfishes there is a prominent dark spot on the "ear" of the gill cover but in this species it is brass-colored with a slash of gold that blends into the body color.

The Blackbanded Sunfish is very sedate. It will remain in one position for long periods of time with all fins erect in a very majestic mien. Its stance is maintained by constant movement of the transparent pectoral fins. When it wishes to move about in search of insect prey, it does so very slowly, with little apparent effort like a sailing ship with all sails set. To escape a predator, or to effect a capture, it can move with lightning speed.

The Blackbanded inhabits the sluggish edges of streams and eddies where there is good exchange of water without the turbulence of the mainstream, in the open over sandy bottom that matches its own straw-colored base but always near enough to vegetation into which it can dart for protection. It is a prey species of the Pickerel. The Blackbanded feeds on insects under lily pads and searches the fringes of Fontinalis and filamentous grasses such as the Slender Spike Rush for the larvae of the Caddisfly, amphipods, segmented worms and of course fish fry are always acceptable.

They spend the winter in hibernation, seeking thick clumps of gelatinous, filamentous blue-green algae in which they encase themselves, seemingly immune to predation and freezing. Where algae are absent, they are found wedged between tightly settled tree leaves apparently requiring little oxygen until spring.

While most other sunfishes dig nests into sandy bottoms to spawn and raise their young, the *Enneacanthus* genus form nests in vegetation laden with considerable algae, where the eggs and young rest on plant filaments, completely surrounded by gently circulating water which the parent supplies with waving fins.

The male builds the nest, entices a gravid female to it, and after the spawning play drives her away, because at this point she is hungry and would eat the eggs were it not for his protection. After a short rest, the male will entice another female to spawn and probably a third. Thereafter, he settles down to a sedate life of simply guarding the eggs and larvae until they become too active for him to control.

He attempts to keep the larvae together by snatching up those who wander off and returning them to the nest. But there comes a time when they become so active that he becomes exasperated in capturing them and gets so many in his mouth that he has to swallow to make more room. Unfortunately, this becomes a population-control mechanism and the most vigorous and wary larvae dart out of range and are strictly on their own.

When the young have just hatched, they are tiny, transparent, glass-like slivers that can only be detected by their brilliant blue eye. They either remain motionless or move with lightning speed, feed on zooplankters, and come to rest upon vegetable filaments. They are so small I've never been able to detect actual spring hatching time. They do not all hatch at once; some are moving by the sixth day and all have dispersed by the sixteenth day.

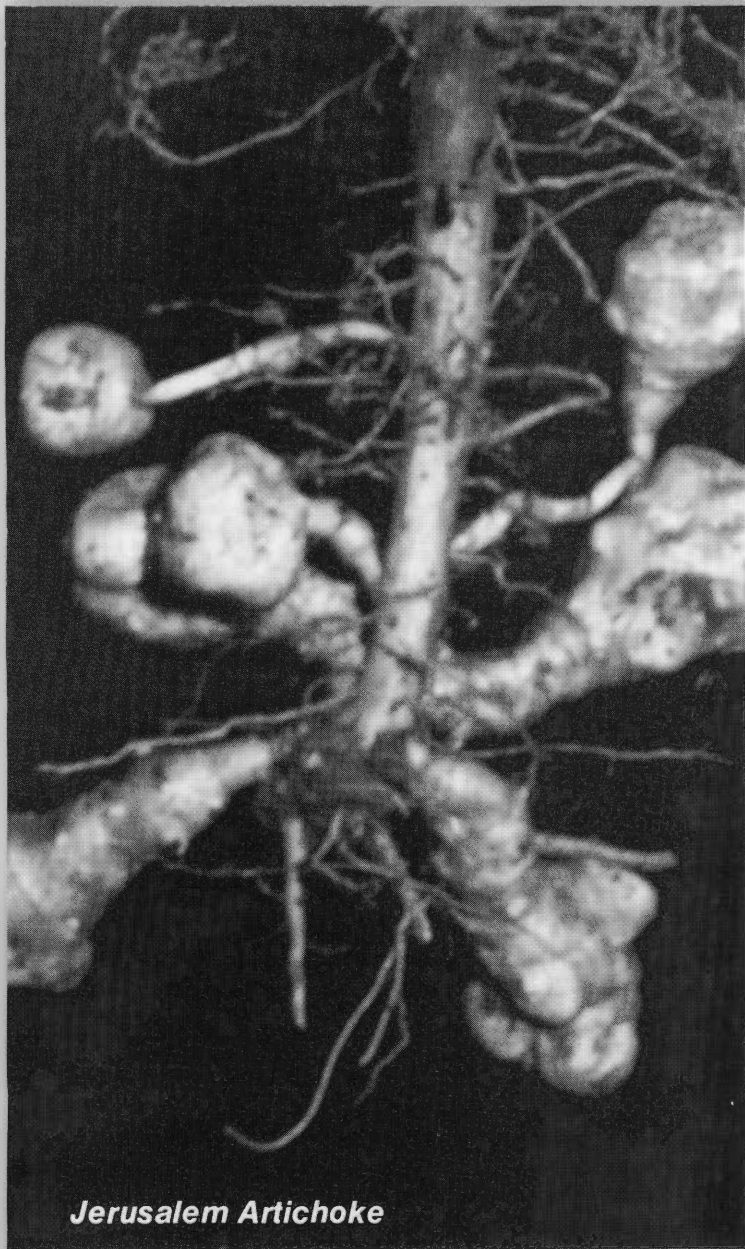
Environmental factors of water quality and temperature suitable for spawning usually occur about May 23, and another spawning occurs in mid-August with higher temperatures, a three-day hatching period, and rather indifferent care of the nest by the parent. This is probably caused by there being maximum populations of predatory insects, larvae, and juvenile fishes at this season so that the parental care instinct is quickly frustrated.

This sunfish will never become plentiful because the water it inhabits is acid and tea-colored. The coloration reduces the penetration of sunlight and thereby the production of planktonic species upon which the larval young are dependent for food. This condition also severely restricts the ability of acid stream waters to purify themselves, if polluted, because sunlight is the key to photosynthesis and oxygen production that supports microbial consumption of the pollutants.

The acidic nature of the water on which all these sunfishes depend is caused by the types of perennial vegetation that grow, die, and decay to produce humic acids throughout the watershed. Tremendous quantities of such nutrients enter the ecosystem and, because of their acidic nature, decay very slowly; so slowly that some trees are found almost intact in the bottom muds hundreds of years after falling. By the same organic biochemical interaction (or lack of it) such nutrients are locked up in sediments, keeping the water beautifully clear and defying determination of true nutrient levels by chemical tests. The species of vegetation found near these waters have the ability to extract the nutrients they need in spite of their "locked-up" condition and would do less well, even die, if grown in neutral situations.

All of the indigenous species of the little fishes of the Pine Barrens are very susceptible to the slightest change in water quality, and to them any alteration, even slight pollution, means extinction.

We would do well to be more conscious of such elements of our natural heritage, and to conserve them so our children may enjoy them also. Dollars are of fleeting value while resources become ever more valuable. □



Jerusalem Artichoke

Edible Tubers

Are you tired of paying high prices for fresh fruits and vegetables? Tired of breaking your back planting, weeding, and fertilizing your vegetable garden? There are other alternatives.

Learn to eat and enjoy the weeds that grow in your or a friend's backyard or take off to the woods, fields, swamps, vacant lots, or fringes of parking lots and begin foraging for edible wild plants. I have been doing this for several years and have discovered new foods, all free for the eating, plus a whole new way of life. Foraging and eating the so-called weeds has given me an exciting, satisfying hobby, in more ways than one, and added a new dimension to my life. *Where* and *how* do I fit this activity into my rather urban existence?

First of all, I have converted my backyard into a weed emporium. I have stopped mowing the grass and let

eating weeds and other edible wild plants

by
Irma Chaiten
photos by
David Chaiten

nature take its course. Many wildlings have voluntarily arrived — dock, *Rumex crispus*; lamb's quarters, *Cenopodium album*; sheep sorrel, *Rumex acetosella*; and yellow wood sorrel, *Oxalis stricta*. Others like Japanese knotweed, milkweed, bee balm, and smooth sumac I have dug up in waste places or gotten as seedlings from my foraging friends.

It is true that my neighbors disdain me and have enclosed my entire yard with a stockade fence, at their expense, to hide and inhibit the invasions of my wildlings into their manicured lawns. Occasionally I peek through the cracks in the fence and see them dutifully discarding dandelion greens, purslane, chicory, and other nutritious and delectable edibles. 'Tis a pity that they are unaware that all these plants can be substituted for fresh salad greens or cooked like spinach or as-

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eating weeds and other edible wild plants

paragus. Although I have not converted any of my neighbors we have reconciled our differences because when my supply of wild greens is waning I offer to weed their vegetable gardens to replenish my salads.

HOW TO BECOME A FORAGER

If you decide to eat the weeds and become a forager, I have some advice and words of caution to suggest.

1. Don't try to learn it all at once, go slowly. Begin with some easy weeds like chickweed, dandelion, purslane, and some berried shrubs like sumac, elderberry, and rose hips.
2. If you are unsure of identification dig up the entire weed, roots and all, put it into a plastic bag and bring it to your local County Agent, or the Rutgers Extension Service. Make sure they give you both the common and scientific name of the plant. You must become aware of the scien-

tic names, even if they seem unpronounceable, because there are tremendous discrepancies with common names.

3. Take a course on Edible Wild Plants at any of the New Jersey Environmental Centers. They exist in Morris, Essex, Union, Somerset, Hunterdon, and Monmouth Counties. Here you will meet foraging friends and your instructor will be a person "in the know." If you don't mind traveling, take a course at the New York Botanical Garden with Gary Lincoff, the guru of Central Park. He offers walks and workshops on urban edibles and can be contacted at 212-873-2147.
4. Become acquainted with the numerous books on the subject. We are fortunate to have an author like Euell Gibbons who wrote so many noteworthy and informative books on edibles. Now Roger Tory Peterson and his son Lee have written, *A FIELD GUIDE TO EDIBLE WILD PLANTS OF EASTERN AND CENTRAL NORTH AMERICA*, and with this excellent source I predict that foraging will gain even more momentum and become a way of life as it was with our ancestors.
5. Avoid excessive eating of the wildlings in the beginning, unless you have a cast-iron stomach. As with any new foods, moderation is the best policy. Remember that many people have food allergies to domestic strawberries, tomatoes, nuts, etc., and may react similarly to wild foods.

Sumac fruits



Rose Hips



6. **DON'T** attempt to eat any *wild mushrooms*. If they really are a challenge and a temptation to you I suggest you join or contact the New Jersey Mycological Association. This is a group of knowledgeable people who study and identify wild mushrooms and know which ones are edible or poisonous. Contact the president, Robert Peabody, 180 Mountain Avenue, Hackettstown, N.J.
7. **DON'T** eat any plant that vaguely resembles Queen Anne's Lace or wild carrot, *Daucus carota*. This plant belongs to the Parsley . . . *Umbelliferae* family and although it is not poisonous there are many poisonous members that resemble wild carrot. Two such plants are poison hemlock, *Conium maculatum*; and poison water hemlock, *Cicuta maculata*. Plants like poison ivy and poison water will give you a rash, but eating these so-called "hemlock" plants will kill you. So keep away from this group.
NOTE: Our native evergreen Eastern Hemlock Tree, *Tsuga canadensis* is perfectly harmless and a tea can be made from its needles which is very rich in Vitamin C.
8. **DO NOT PICK RARE OR ENDANGERED PLANTS**. Pick what is common and abundant, weeds preferred. Some helpful publications on the subject are:
RARE AND ENDANGERED VASCULAR PLANTS OF NEW JERSEY, by David Fairbrothers and Mary Hough, New Jersey State Museum, Trenton.
PROTECT NEW JERSEY PLANTS, a free leaflet from Department of Environmental Protection, Bureau of Parks, Trenton.
 Many of our native wildflowers and ferns can be purchased from Mincemoyer Nursery, Route 526, County Line Road, Jackson, N.J. 08527.

SOME SUMMER EDIBLES

In the summer the fields and roadsides abound with numerous wild edible plants. I have selected 10 very common and abundant plants which I think you might easily be able to locate.

DAY LILY, *Hemerocallis fulva* or *flava*. Showy orange or yellow, 6-petaled, unspotted flowers which open only for one day. Leaves long and straplike. Grows abundantly along roadsides or in gardens.

Edible Parts: Unopened flower buds boiled like string beans. Mature flowers fried in batter and wilted ones added to soups and stews. Tubers (all year), cooked like potatoes.

MILKWEED, *Asclepias syriaca*. A stout plant, 3-5 feet tall with thick, fleshy, opposite leaves. Clusters of tiny pale pink to purplish flowers like inverted umbrellas. Seed pods are pointed and warty. Entire plant exudes a milky juice. Grows in dry areas.

Edible Parts: Unopened flower buds cooked like broccoli in two changes of water. Young seed pods cooked like okra.

STINGING NETTLE, *Urtica dioica*. Erect, straight plants, 2-4 feet tall with heart-shaped, toothed leaves, and small greenish flowers. Entire plant covered with stinging hairs, so gather only with gloves.

Edible Parts: If you touch this plant it can give you a rash, but if you cook the young shoots or leaves the stinging principle disappears. Pale green top leaves can be boiled and added to soups or made into "nettle porridge." Hot poultices of mashed leaves used for rheumatism.

WOOD SORREL, *Oxalis stricta*. A delicate, low-growing plant with cloverlike or shamrock leaves in groups of three. Bears a small five-petaled yellow flower and tiny erect seed pods. Grows abundantly in waste places and gardens.

Edible Parts: Leaves and stems have a nice sour flavor. Can be eaten raw as a trail nibble or added to a salad. Boil leaves for a lemonade-like drink and add sweetening.

CAUTION: Do not use in large quantities; contains oxalic acid like spinach and could inhibit absorption of calcium.

SUMACS, SMOOTH and STAGHORN, *Rhus glabra* and *typh-*

Continued on page 32

Elderberry fruits



Wood Sorrel



Day Lily



Fishing the Floater-Diver Plug

by Bruce Litton

I braced for the strike as a sudden, V-shaped wake appeared behind my floating Rapala. A good-sized pickerel smashed the minnow imitator with authority.

I have experienced many such episodes while fishing the class of plugs I call floater-divers; these are the minnow imitators—Rebels, Rapalas, and Redfins, among others.

Such plugs are primarily used to fish shallow depths of one to four feet. All gamefish will strike them, salt and fresh water, but in this article we will be concerned with their use in the fresh water lakes and streams of New Jersey.

There are a few things you should look for in terms of a quality lure. First of all, make sure the "hook hangers" on the plug are not simply screwed into the body—they will pull out easily. They should be attached to one continuous wire inside the plug's body. The hooks should be attached to the hangers by a split ring. The best diving lips are those which are molded into the lure's body; they are stronger and won't break off as easily. If you happen to buy a plug that runs off to a side, straighten the eye loop with a pair of pliers. This is called "tuning."

In terms of durability, the smooth finished Redfin plug is, in my opinion, the best. The finish won't come off as easily with constant use and accidental contact with plastic worms, which often causes other finishes to become sticky. The hooks are nickel plated, preventing rust, and the lip is molded right into the lure's body. A well-built and durable plug.

There are factors to consider in buying plugs other than durability, however. Different brands of floater-divers are made with different materials. Rapalas are made with balsa, Rebels with plastic, and Redfins with highly buoyant plastic. These materials give different actions, which are utilized at different times.

Rapalas and other balsa plugs will

rise to the surface faster and have a tighter wiggle than the plastic variety. It is a good type of lure for fast retrieves and a fast, surface popping action.

The Redfin and similar plugs have characteristics similar to the balsa plug. They can be effectively retrieved at a quick pace, but my favorite retrieve is a slow one accompanied by a hard jerking of the rod tip. This bait will run deeper than balsa plugs.

The Rebel and many other plastic floater-divers are best suited for slow retrieves. After being pulled under the surface, this plug rises slowly.



PHOTO BY AUTHOR

It is very effective as a surface lure when twitched slowly across the surface. Stop-and-go retrieves can be very productive with this lure. Let it rise completely to the surface every time you stop the retrieve. At times, a hard jerking of the rod coupled with a moderate speed of retrieve will pay off.

To determine what retrieve (action and speed) I will employ, I first look at the water temperature. If the temperature is very low (40's), if I use a floater-diver at all it will be a Rebel type since it can be retrieved at bare minimum speeds. When a snap swivel is added for weight, the plug

will suspend and can be retrieved extremely slowly. A floater-diver rigged this way comes in handy for shallow pickerel ponds.

As the water temperature climbs, I have a wider range of speeds and actions at my disposal. When the temperature of the water climbs to 60 degrees or higher, it makes the most sense to experiment with your retrieve until it fits the mood of the fish—in which case he should hit!

Another factor to consider concerning speed and action is the species of fish you're after. For instance, I find myself using balsa plugs most often for pickerel when the water is 60 degrees or higher, because of the pickerel's pugnacious behavior. The balsa plug gives a faster speed and action, which tends to turn the pickerel on. For bass, I usually prefer Rebels. For small-mouth bass, plugs in the 1½ to 2½-inch class usually work best. Stick with two to five-inch plugs for the rowdy pickerel. Go with a two- to four-inch plug for largemouth bass in most instances. Remember that you can get away with a larger plug and heavier line in murky water.

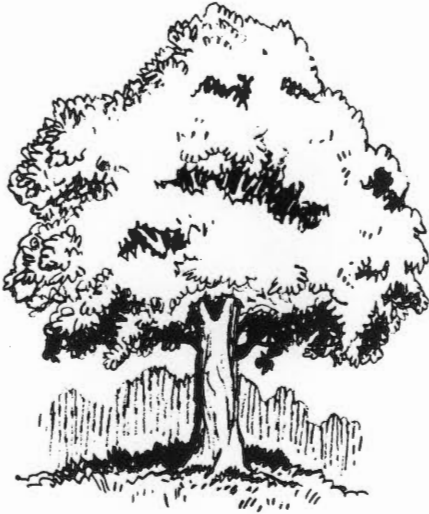
The mood of the fish is also important. Is the fish in a feeding, neutral, or turned-off mood? If he is on a feeding rampage he will take a large plug and this will be to your advantage because you can throw longer casts and a larger plug is easier to control. Consequently, you will catch more fish.

Most of the time the fish will not be feeding and will be in more of a "neutral" mood. In this case, small lures in the 2½ to 3½-inch class are my favorites.

I personally don't think too much of colors. However, if the fish are preying upon a certain forage, try to match the plug's color closely to it. A general guideline to colors is: Bright days and/or clear water, use bright lures. Dark days and/or dark water, use dark lures. In muddy water try flashy colors.

When action, speed, size, and color are correctly blended together you will have a fish-catching combination.

The floater-diver, used correctly and in the right situations, is a valuable lure in your tackle box. □



TREES 1, TIMBER 0

A study commissioned by the industry-related American Forest Institute shows that Americans prefer to have forest trees preserved rather than cut for timber. The study, undertaken to measure attitudes toward forest-related recreation vs. development, especially towards wilderness, was conducted in September, 1977 by the Opinion Research Corporation, Princeton, NJ. Two thousand members of the general public were surveyed, while 100 Washington, D.C. "thought leaders" were polled. The results: of the 2,000 citizens surveyed, 62 percent preferred the preservation of trees; only 28 percent indicated support for increased timber sales. Within the ranks of the 100 thought leaders, the vote was much closer — 38 percent supported preserving trees while 36 percent favored increased timber sales. The remaining segments of both groups either had "no opinion," supported "both," or were critical of the manner in which the question was phrased. Concerning wilderness, only seven percent of those surveyed thought there is "too much" while 32 percent indicated there is "too little." Since support for more development was lacking on the part of the general public, the pollsters advised the American Forest Institute to aim its "persuasive efforts" at the Washington thought leaders, since they perceive the issue "more rationally and with greater expertise."

Reprinted from *Conservation News*
National Wildlife Federation

***You've been
reading about
and looking at
pictures of . . .
NEW JERSEY
OUTDOORS***

- the seashore, beaches, boating, bathing
- the Kittatinny Mountains, hiking, camping, skiing, and natural areas
- over 250,000 acres of state parks, forests, and historic sites
- over 145,000 acres of wildlife management areas
- fishing, hunting, birdwatching, and the Pine Barrens

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landscapes
and
wildlife
in
new jersey

Canada Geese
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CHRISTOPHER P. FORREST



Raccoon
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*Quiet
Morning
Photographed
By
DAVID
BAST*



*Cedar
Swamp
in
Red
Lion
Photographed
By
DAVID
CAMPIONE*



PHOTOS BY PETE McLAIN

Andrew Odum watches Sigmund Leszczynski of Herpetological Associates catch a 14-year-old rattlesnake (estimated) with 13 rattles. The snake was taken in Bass River Twp. as part of the Division of Fish and Game's Endangered Species Program.

ENDANGERED AND THREATENED REPTILES

By Pete McLain and Jo Ann Frier

The Department of Environmental Protection's Division of Fish, Game and Shellfisheries Endangered and Nongame Species Project is presently studying the threatened snakes and endangered turtle in New Jersey to determine their critical habitat and to develop a management program which will ensure that the timber rattlesnake, the pine snake, the corn snake, and the bog turtle will continue to be part of the environment in our state.

During the past several years, populations of these snakes appear to have been reduced in numbers. Indiscriminate killing of rattlesnakes and illegal collecting of pine and corn snakes are some of the factors con-

tributing to the reduction of snake populations. However, the loss of critical habitat is probably the chief cause of the snake decline.

In the spring of 1977 the National Audubon Society made a \$1,500 grant available to the Division's Endangered Species Project to study the timber rattlesnake, the corn and pine snakes and the bog turtle in New Jersey. This donation was used to match federal aid monies to the Endangered Species Project and a total of \$4,500 is now allocated to studying these reptiles.

The Endangered and Nongame Species Project was fortunate in being able to contract with Robert



Robert Zappolarti and Andy Odum prepare to catch a timber rattlesnake in South Jersey as part of their research.

Zappolarti, President of Herpetological Associates, to serve as the research leader in studying the bog turtle, timber rattlesnake, corn snake, and the pine snake during 1977-78. Robert Zappolarti has authored an excellent book on reptiles and amphibians and has devoted most of his life to studying these secretive creatures in New Jersey.

The Division of Fish, Game and Shellfisheries is responsible for all the wildlife resources in the state and through its Endangered and Nongame Program is determined to protect and manage the nongame as well as the game resources for all the citizens of the state.

By gathering scientific information on the reptiles and amphibians the Division is able to develop regulations and programs and determine critical habitats. In addition, recent studies have shown that reptiles and amphibians are excellent indicators of the quality of wildlife and human habitats. Where a healthy population of reptiles and amphibians exists it is generally true that good water quality and proper land use exists. When populations of reptiles and amphibians begin to decline or disappear the quality of the habitat has begun to deteriorate.

One of the major thrusts of the present research on the endangered turtles and snakes is to determine their present status in New Jersey and to plot locations and



Andrew Odum, Robert Zappolarti and Ernst Hofmann place a rattlesnake in a pinning box while they prepare to mark the snake for future identification. All snakes are released at the location where they are caught.



Andy Odum and Robert Zappolarti showing a timber rattlesnake in a pinning box.

populations. Through the data gathered by Herpetological Associates, it will be possible to provide better protection to the reptiles and amphibians and also to evaluate environmental impact and direct land-use programs related to this resource. Also, the Division is presently stepping up its nongame enforcement and permit program to prohibit illegal collection and possession of reptiles and amphibians in New Jersey.

The New Jersey Division of Fish, Game and Shellfisheries is one of the first fish-and-game agencies to undertake intensive studies of reptiles and amphibians. Presently several other states are considering nongame programs similar to the one operating in New Jersey.

In addition, DEP's Division of Fish, Game and Shellfisheries is the first state agency to receive a grant to study nongame wildlife species from the prestigious National Audubon Society. □

Continued from page 3

THE OTHER GUY'S GRASS

fault to mar their beauty — a sign directing you to keep out. Since you know that real civilization hasn't been established west of Fort Smith, Arkansas, you can imagine what the punishment for trespassing probably is. It's still better than Europe, though — I hear they still prescribe "drawing and quartering" for poachers there!

Exclusion may also appear in the form of limited access. When you're down along the Carolina coast during the "off tourist season" (which is also the prime fishing season) and you are looking for an inexpensive "head boat" to take you out for a day's fishing, you will soon realize how spoiled you are. New Jersey's sport fishing facilities are second to none and a lot better than most.

We Will All Go Together When We Go

One of the biggest reasons that we have for getting out of Jersey is to enjoy fishing away from the crowds. Unfortunately, thanks to the affluent society we live in, our fellow Jerseyans are going along with us and we are all meeting on the Snake River in Wyoming on the same day along with two doctors from Chicago; a vanload of hippies from Los Angeles; and an insurance salesman and his wife, six kids, and a Labrador retriever. The "Lab" really enjoys jumping in the river after your lure.

I met a Montana Fish and Game Department biologist who told me there were days when portions of the Yellowstone reminded him of the Big Flatbrook back in his "native" New Jersey.

The surge in the numbers of fishing tourists has created fisheries management problems even in Alaska. These waters cannot sustain a trophy-fishing resource worth paying \$2,000 a week for if too many people come and take too many fish. It takes a long time to replace an eight-pound rainbow trout — something like 5 or 6 years — and who wants to spend \$2,000 to catch small trout? This lesson was learned too late in many portions of Canada, and now if you want exceptional fishing worth the price and your time you have to fly to it. Alaska and Canada have, of necessity, imposed restrictive regulations in many areas to preserve a fishery truly worth the price. You will find this graphically illustrated if you try to bring too many walleye fillets back from Canada. It would be easier to smuggle narcotics.

Don't Feed the Animals

The urban New Jersey angler when traveling afar may well experience "cultural shock" when confronted with the forest primeval and its inhabitants. The thought occurred to me, while I was beating a hasty retreat from an Alaskan brown bear, that as far as that moment in time was concerned, I was no different from a Neanderthal running from a sabretooth tiger. The only difference would be the type of fabric the bear would bite through when he started gnawing on my leg. For anyone spoon-fed a steady diet of Walt Disney, Gentle Ben, and Grizzly Adams, the revelation that a wild animal may not want to be petted and in fact may kill you, will come as a rude awakening. (Fortunately for me the bear was so stuffed with salmon that he didn't follow through on his charge.)



Moose also are quite cranky, especially in and around the West's National Parks. Wherever hunting is prohibited, you'd better keep one eye peeled for the bigger beasts because they do not fear man or respect him as the planet's dominant species. It's a joy to see wildlife up close, but not *that* close.

The majority of problems are posed by the lower forms of wildlife. In the western states rattlesnakes are everywhere, lurking to nail the unwary and ruin his trip. In tropical waters it seems as though every fish you catch either bites, stabs, is poisonous, or a combination of all three. And while New Jersey has its share of unfriendly insects, the foreign ones seem to be bigger, take bigger bites, and carry exotic diseases.

If It Should Rain, Then Let It

No single factor has ruined more fishing vacations than the weather. In Jersey, if you're at home in Bergen County you know pretty much what the weather will be off the Jersey coast. Even if you get surprised by an unpredicted thunderstorm it's no big loss.



Contrast this with the dilemma of the poor slob who plops down a thousand bucks for a week of bonefishing in the Bahamas and finds the wind blowing a full gale when he arrives and for six days thereafter. This is not a rare occurrence in the Bahamas.

Or you can go to the Rockies for the fabulous spring trout fishing and find the rivers flooded or go out there for the fantastic fall fishing and find yourself trapped in a Budget-Rent-A-Car in six feet of snow.

The problem is that your time and money are already invested and what the weather does after that is up to the whim of the gods.

You Should Have Been Here Last Week

Well, if we all caught fish every time we went fishing there wouldn't be much of a challenge, would there? I get enough challenges fishing in Jersey; when I pay and travel I'd like some odds in my favor for a change. The places I've been skunked in read like a list of the Meccas of the fishing world. Travel halfway 'round the world and come up empty!? Any reputable lodge will warn you in its brochure that this possibility exists, but you prefer either not to read that part or not believe it. Better believe it! Being in exotic, remote, famous places does not guarantee success. The fates will conspire against you.

The theory that "if anything can go wrong, it will" still holds, may be even more so for the vacationing fisherman, since you are at the mercy of your guide, the elements, and the fish, and you probably brought the wrong equipment. Captain Ahab's crew had Isaiah the prophet to warn them of Moby Dick and I have presumed to fill Isaiah's role for you. Mind you this is only a prophecy, not a curse; you may still catch fish (but I doubt it).

Time and Money

Two major investments are necessary to fish out of state—time and money. Theoretically the further out you go, the greater the investment and the better the fishing. Well, the theory holds pretty true for *half* of that



statement. Unless you are extremely wealthy, and if you are you should be down at Pez Maya catching 10-pound bonefish right now instead of reading this, you are probably in short supply of both commodities and should have your priorities in order before the investment is made.

The reason to go afar to fish should not be based on the poundage of fish to be caught. You cannot beat the Jersey coast on a cost-per-pound basis anywhere. There is no better fishing for bluefish, fluke, weakfish, etc., anywhere, and no more economical place for the Jersey angler. One can actually make money on a day's catch off a Jersey shore party boat. As for freshwater anyone living in a lake community with an active fishing association or having access to such is not going to find any better lake fishing anywhere for the price. The catch rate of the dedicated angler fishing the even most heavily utilized New Jersey public lakes will compare favorably with what can be found elsewhere. If you put the time and effort in on New Jersey's trout-stocked waters that you would traveling west, there is no doubt in my mind that you could show a better trout-caught-per-dollar/time-spent relationship. Don't travel strictly to find superior fishing, for it will be like searching for the Golden Fleece and you might well find yourself golden fleeced in the process.

. . . and Energy

President Carter may have found a way to keep the Jersey angler in New Jersey. Even his severest critics know that we can't go on for long in our current energy-wasting groove. If it comes down to a choice between a week's fishing in and around West Yellowstone and a year's fishing in New Jersey I would find it hard to believe that anyone who truly enjoys fishing would choose the former.

Get While the Gettin's Good

If you have the time and money to go, then go on get out of here while there still is some energy left, but read this article over again to prepare yourself and be ready to repent tomorrow.

I've personally experienced everything I've written here and a lot more, including earthquakes, shark attacks, Montezuma's revenge, and marooning, yet there still are a few places I'd return to. These were the places where I was treated as family—places that were so totally different from New Jersey that they seemed worlds apart and places that have not become commercialized tourist-fishermen traps (and these abound). There's a camp on the Pacific Coast of Costa Rica that I've returned to time and time again, even though I've had fishless days there, because it fills my requirements so admirably. *This* is the reason to go—to experience what you've never seen, not to catch more and bigger fish. If what you want to do is just catch fish, stay home—you'll come out ahead in the long run.

And for the long run you had better accept the fact, as I have, that as long as you live and work in New Jersey this is where you're going to do most of your fishing, so it behooves you to work towards improving fishing in your backyard, instead of looking down your nose at it. **Comprende?** □

eating weeds and other edible wild plants

ina. A treelike shrub with feather-compound leaves, leaflets paired and toothed along the margins. Conspicuous, erect, thick bunches of red berrylike fruits grow in spikes. Abundant along roadsides and open places. **NOTE:** Poison sumac grows **ONLY** in swampy places and has whitish berries.

Edible Parts: Clusters of red fruits used to make a cold drink, "sumacade." Crush berries lightly, add cold water, strain, and sweeten to taste.

ELDERBERRY, *Sambucus canadensis*. A shrub with large coarsely toothed, compound leaves, flat-topped clusters of small white flowers and purple-black fruits. Roadside ditches and meadows.

Edible Parts: Fresh flowers dipped and fried in batter. Ripe berries cooked in pies, sauces, jellies, fruit juice or wine. **CAUTION:** Do *Not* Eat **UNCOOKED** berries—can cause digestive upset; and don't make whistles out of dried stems.

ROSES, *Rosa*, many species. Shrubs with thorny stems and compound serrated leaves. Flowers white, pink, rose, with five petals. The fruits resemble tiny, shiny red berries and are called *hips*. They cling to plants all winter.

Edible Parts: Fresh petals used in salads, on sandwiches, and in jams. The hips can be eaten raw, cooked like fresh fruit, or boiled to a syrup. A handful of rose hips provides as much Vitamin C as 60 oranges. **CAUTION:** Do not use hips from sprayed garden roses; use the wild ones.

BEE BALM, Oswego Tea, *Monarda didyma*. Plant 2-3 feet tall, with bright scarlet flowers in a solitary terminal cluster. Bees and hummingbirds attracted to it. Grows in wet places in upland areas, not easy to find. Well worth buying seeds and planting in the garden in partial shade.

Edible Parts: Aromatic leaves have a strong mint flavor. The Indians taught colonists how to steep the fresh and dried leaves to make a tea which was considered little inferior to true tea.

JAPANESE KNOTWEED, *Polygonum cuspidatum*. Large perennial plants which resemble shrubs with woody bamboo-like stems with enlarged or swollen nodes. Leaves are large and alternate on stem with decorative small white flowers in showy clusters.

Edible Parts: This plant was introduced as a garden plant and is now widely naturalized along roadsides. It is not edible in the summer, but should be identified at that time and location remembered for springtime. Young shoots in April resemble asparagus and can be cooked as a vegetable, or cut across and eaten raw in a vinaigrette sauce. It is related to rhubarb and can be cooked with sugar and eaten as green rhubarb; a very versatile plant.

JERUSALEM ARTICHOKE, *Helianthus tuberosus*. A 6-to10-foot yellow sunflower with broad rough leaves and stems. Flowers are smaller and don't produce as many edible seeds as those of common sunflower. Roots are large and tuberous.

Edible Parts: Tubers, 3-5 inches, can be sliced and eaten

raw like carrots, or cooked and used as a potato substitute. Tubers are low in starch and high in insulin, good for a diabetic diet. Flowers bloom in September; dig tubers in fall or during the winter.

SOME ADDITIONAL TIPS

Just remember recognizing and identifying the wild plants is only part of the job. Knowing what to do with them after gathering is the secret. Experimentation and research in the innumerable books on the subject is the answer (see bibliography). Also don't forget the forager's credo, "use without using up." If you are harvesting plants with roots and all, never take more than 10 percent of a healthy stand and never forage from other people's property without permission.

In conclusion, I must admit that I find the hunting and gathering of wildlings more exciting and rewarding than the actual cooking and feasting. Despite Euell Gibbons' ecstatic descriptions, I find my pampered taste buds have trouble adjusting to some of the unpalatable wild flavors. However, I never have to worry about getting lost in the woods and starving to death!

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FRONT COVER

Salt Water Anglers with Hammerhead Shark — Photographed by Al Nunes-Vais

INSIDE BACK COVER

Black-Banded Sunfish — Illustration by Carol Decker (See article on page 18)

BACK COVER

Field Trip — Photographed by Robert K. Berry



Carol Decker ©

