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New Jersey
OUTDOORS

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from the editor

Right In Your Old Backyard

Like many other New Jersey residents, I've been reading about the long gas lines in California with some concern. Can it happen here? Of course it can. And last night our local paper carried the following headline: "Long gas lines may head east."

If it does happen, you'll be better off in New Jersey under similar circumstances because we enjoy some geographic advantages. Unlike California, which is a huge state (it takes a great deal more fuel to get from one place to another), New Jersey is a small, compact state with all recreational areas within three hour's driving time. Many are much less.

New Jersey is blessed with a wealth of excellent beaches for bathing, surfing, and sun bathing. Our bays, inlets, rivers, lakes, and offshore areas offer excellent fishing, both salt water and fresh water. And we have over 250,000 acres of state parks and forests and historic sites spread out over the entire length and breadth of our state, easily accessible from wherever you live. There are all sorts of recreational activities available at these areas: swimming, boating and camping in the summer; ice skating, hiking, and cross-country skiing in the winter, and many more activities all four seasons of the year.

For information and a free brochure that contains a map and facilities charts of these areas write to:

Bureau of Parks
P.O. Box 1420
Trenton, New Jersey 08625

The brochure mentioned above also includes the map locations and facilities charts for the Wildlife Management Areas administered by the Division of Fish, Game and Shellfisheries. These areas are located in all sections of the state and comprise 150,000 acres of hunting, fishing, hiking, and birdwatching habitat. Photographers are welcome, too. For detailed maps and writeups on each of these 56 areas, a revised 120-page guide with maps in three colors will be available this fall. Send a three-dollar check or money order to:

Wildlife Management Guide
Division of Fish, Game and
Shellfisheries
P.O. Box 1809
Trenton, New Jersey 08625

You can also send for the official New Jersey state map which locates all the state recreational areas mentioned in the above paragraphs, and other brochures providing information about other activities in New Jersey. Write to:

Division of Travel and Tourism
P.O. Box 400
Trenton, New Jersey 08625

A most important consideration in these inflationary times is that most of these recreational areas are free (some state parks require entrance and parking fees), and they're right in your old backyard.

IN THIS ISSUE:

Herbs have many uses, both culinary and medicinal. And visiting an herb farm is a sensory delight. Debbie Valente writes about the Wellsweep Herb Farm in the article, *Herb Farming in New Jersey*.

Bass anglers take note. In the article *Hopscotching the Assunpink*, Don Kamienski tells us about fishing the lakes along the Assunpink.

Dr. Joanne Burger, Department of Biology, Livingston College, is back with an article on *Salt Marshes—Havens for Waterbirds*. "An osprey gliding down to skim the water, capturing a fish, and soaring swiftly to its nest nearby is an integral part of the dynamics of a healthy salt marsh," writes Dr. Burger.

On pages 8 and 9, the *New Jersey Record Salt-Water and Fresh-Water Sport Fish* with photos of some record catches.

Author Warren E. Fox (*Little Fishes of the Pine Barrens*) is back with *Little Orchids of the Pine Barrens* in this issue. Author Fox describes several of the 13 orchid species he has found in the Pine Barrens.

As promised, the second half of Pete McLain's article, *More on the Snakes of New Jersey*. This article includes the control, feeding, housing and what to do when bitten by a venomous snake.

A pictorial feature by Ed Powick captures the wild beauty of the *Assunpink Wildlife Management Area*.

Rabies, by wildlife biologist Bruce Hawkinson, discusses the history, characteristics, and treatment of this disease.

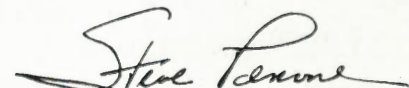
A Bird in the Hand Isn't Necessarily Better by wild turkey project biologist Robert Eriksen updates our information on the New Jersey wild turkey program.

Try it, You'll Like it by Charles Piedl points out the equipment required, how to prepare for, and then, how to bag an under-utilized game animal, the woodchuck.

For you fly tiers—an old friend, Mary S. Kuss, writes about the tying and use of *The Crowe Beetle* for late-summer angling of late-season trout. Follow the author's instructions and try your luck.

Somewhat off the beaten path for *New Jersey Outdoors*, we have an article by Robert S. Fales, titled *The Colorado Potato Beetle in New Jersey*. I'm afraid it's here to stay.

Our Wildlife in New Jersey series, *The Least Tern*, is introduced by the Carol Decker illustration on the inside back cover. The article is written by a frequent contributor, Joan Galli, non-game biologist with the Division of Fish, Game and Shellfisheries.





HERB FARMING IN NEW JERSEY

BY DEBBIE VALENTE

What happened to the Walden dream of the late sixties? It seems that we all know one person or another who tried to make it happen back then and failed—or found that there was no way of becoming completely independent of the trappings of civilization—processed foods, telephone, TV, and automation. Well, we recently saw that the dream is alive and flourishing right in our own backyard at the Wellsweep Herb Farm in Port Murray, New Jersey.

Cyrus and Louise Hyde and their three children, two boys and a girl aged eight, thirteen and fifteen, packed up their bags 12 years ago and left their suburban New Jersey home with the dream of “living off the land.” They tackled an undeveloped four and a quarter acre farm complete with a house, circa 1820, badly in need of remodeling.

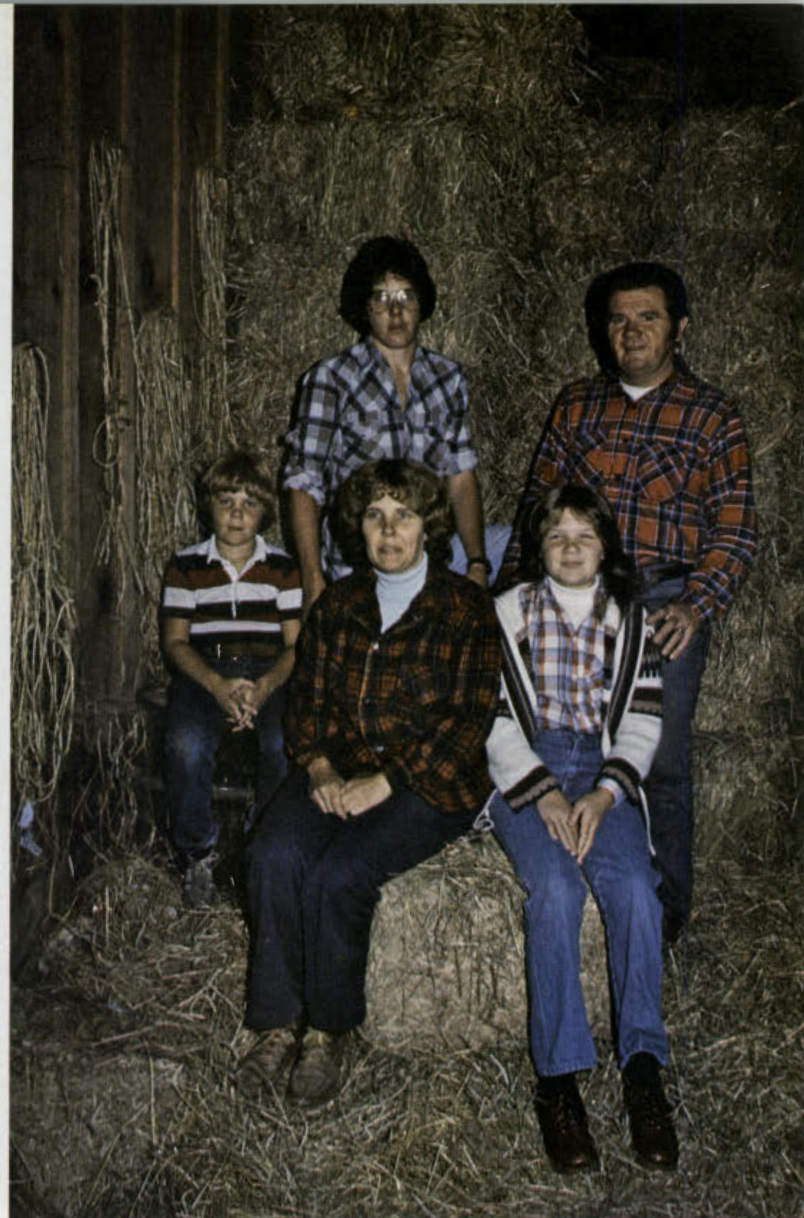
Cyrus’ pioneer fervor probably dates back to his New Jersey Dutch ancestry. His family has been in the country for more than 300 years, from about the time that Peter Stuyvesant was administering the colony of New Amsterdam. In his dining room he proudly displays a

Formal international herb garden

Photos by Harry Grosch



Entrance to Herb Farm



The Hyde Family

pewter knee buckle given to his great-great-grandmother by General George Washington in return for her kindness in providing food and milk for his hungry troops when they were camping near Dey mansion in Totowa during the Revolutionary War.

Cyrus was fascinated by the many uses of herbs introduced to him as a child by his parents. Through perseverance, he and Louise managed to set up a viable business in herb farming and maintain a self-sustaining farm, complete with chickens, pigs, horses, lambs, cows and a family of dogs and cats. (The cat family has also been with the Hydés for 200 years!)



Pewter knee buckle presented to great, great, great grandfather of Cyrus Hyde by George Washington.

Mr. Hyde, a congenial fellow who smiles easily, greeted us at his door clad in blue jeans, his face beet red from long hours in the sun. The first part of the tour consisted of a walk through the formal international herb garden. "I wanted to establish a formal garden to serve as an educational vehicle for the public when they come to visit our farm," he said as he pointed out the lemon verbena and rosemary plants which have been trained into small trees.

Visiting an herb farm is indeed a sensory delight, and we soon learned that part of the experience was gingerly rubbing the different leaves to test the various textures

Continued on page 30

hopscotching the Assunpink

BY DON KAMIENSKI

In 1971, the U.S. Soil Conservation Service and the State of New Jersey joined hands in the development of a project which affects not only the residents of both Mercer and Monmouth counties, but also most of the fishermen throughout the Central Jersey area. The project was the construction of several earthen dams at strategic locations across the Assunpink Creek. The primary purpose for this project was the control of the Assunpink's flood waters, which usually inundated the countryside during the normal spring and fall runoffs.

In addition to achieving its primary goal, the project produced a secondary benefit in that the dams which were constructed helped form a series of lakes and holding ponds which stretch some twelve miles from the Clarksburg watershed area to Mercerville. The objective of this article is to "hopscotch" you along the many bodies of water on the Assunpink Creek.

The headwaters of the Assunpink Creek are actually a series of feeder streams which originate in the Clarksburg-Roosevelt area. In fact, two of these streams make up the initial two lakes of the Assunpink series. Just west of Clarksburg along Route 524 is Stone Tavern Lake. This 52-acre lake is nestled in some of the prettiest countryside in Monmouth County. A gravel access road



PHOTO BY AUTHOR

The author displays a fine bass which was caught at Lake Assunpink on a rubber worm.

leads from Route 524, and the directions to the lake are well marked by signposts. Both bank and boat fishing are permitted here, and most individuals find the 10-12 foot jon boat to be ideal for this size lake.

While outboard motors are not allowed on any of the lakes along the Assunpink, electric trolling motors are permitted, and these are generally used by the fishing fraternity. Located at Stone Tavern Lake are two boat launching areas; these are not surfaced ramps but rather sandy slopes used by individuals trailering their boats. So don't try launching your sixteen-foot bass boat; it just won't work. Fishing in Stone Tavern can be quite interesting for bass, especially in the old creek channel that snakes its way down the middle of the lake. Because of the shallowness of Stone Tavern, it tends to warm up rather quickly, so it would be a good choice for an early spring fishing trip.

Should the fish at Stone Tavern suddenly develop a case of lockjaw and refuse your offering, a quick two-mile trip will bring you to another lake along the Assunpink, namely Rising Sun Lake. Located adjacent to Route 571 between Roosevelt and

Clarksburg, Rising Sun Lake harbors good quantities of both bass and pickerel in its 38 acres of surface water. The New Jersey Division of Fish, Game and Shellfisheries should be complimented for its program of stocking these warm water species in all the lakes along the Assunpink.

At Rising Sun Lake there is a good launching ramp for the car-topper as well as several interesting coves for the bank fisherman to try. Most of the coves are fairly shallow, so lures such as Rapalas, Flatfish, and Mepps Spinners are good choices. The waters around the earthen dam are in the neighborhood of 25 feet deep, so most deep-diving crankbaits and spinner baits prove to be quite effective.

The third lake along the creek, which is aptly named Lake Assunpink, is currently the largest lake in the chain and is easily reached from Route 539 between Hightstown and Allentown. Completed in 1974, this lake covers 225 acres of surface water, and affords the visiting angler varied types of fishing advantages.

The upper end of the lake provides the thin-water type of fishing many individuals pursue. At this end

of the lake, there are patches of lily pads, areas of stick-up trees, and an old creek bed which, while hard to find, is worth looking for with a depth recorder in order to locate the big bass that frequent the area. Because of the numbers of forage fish available in Lake Assunpink, the bass and pickerel are growing to respectable size, with some bass reaching the five-pound level, and pickerel achieving four pounds or better.

The lower end of the lake near the dam affords some fine deep-water fishing. Drifting a minnow at the eight- to ten-foot level is almost guaranteed to produce some type of action.

Between the dam and the launching ramp there is an island which has a water depth of 16 feet on its east side. Located in this hole are several brush piles which have become the home of several nice-size bass and pickerel. Speaking of the launching ramp, the state has constructed a really top-notch ramp on which several boats can be launched simultaneously, and once launched, the fisherman at Lake Assunpink has plenty of room to park his car and boat trailer.

Fishermen are not the only ones

who make use of Lake Assunpink on a weekend. On most weekend afternoons, upwards of a dozen small sailboats can be seen skimming its waters. In fact, Lake Assunpink is an ideal lake on which to learn how to handle that new sailboat, as it is fairly shallow and quite windy—ideal sailing conditions. Also, this lake is just the right length for weekend sailors to develop proper sailing techniques.

Between Lake Assunpink and the next major body of water are a series of smaller dams and holding ponds. While the waters behind these dams are quite small, those below them contain a sizeable population of bass and bluegills which should delight most youngsters. One such holding pond which can be tried is located on the northbound side of Route 130 in Windsor.

The final new lake along the Assunpink Creek is located adjacent to the Mercer County Central Park complex which lies between Mercerville and West Windsor. These recreational facilities are Mercer County's pride. Located at the complex, which covers several hundred acres, are a skating rink, a softball stadium, several soccer

fields and basketball courts—and now a new lake. This lake had a scheduled completion date of June 1979, and already boasts a sizeable population of native fish. Planned for introduction are both bass and pickerel, as well as possibly black crappie, a great schooling fish that affords tasty eating.

This lake features 275 acres of surface water averaging 10 feet deep, and planned facilities include launching ramps, boat liveries, and picnic areas. Fishing from the shoreline, two prime spots to try for native bass are the waters covering Post Road and the break in the shoreline under the high-tension wires.

What the preceding paragraphs describe are the lakes along the Assunpink which can be hopscotched by families in a single day. On the state drawing boards are additional lakes and ponds for the Assunpink that should provide Jersey anglers and boaters with even more recreational waters.

So why not try a little hopscotching of your own on the Assunpink Creek—remember the fun you had playing that game as a kid? □

A Memorial

to a Former Director of DEP's Division of Fish, Game and Shellfisheries

L.G. MacNamara was my boss, my mentor and my friend—and I'll miss him.

Here was a man whose appearance and mannerisms sometimes belied his outstanding abilities. His countenance and stature brought to mind a pro-football lineman. This rugged appearance coupled with his casual dress and unpretentious bearing misled many an audience. For when "Mac" arose to speak, another side of the man showed itself. Although soft-spoken, he was most articulate. His presentations on wildlife conservation were models of clarity and understandable logic.

As an administrator, "Mac" expected performance from his staff and could be counted on to express his concern with mediocrity or errors of omission. Yet, he had great patience with inexperienced and untried employees. "Mac" himself was imbued with the work ethic almost to a fault. He was a continual inspiration to his staff with his tenacity of purpose and emphasis on achieving objectives.

"Mac" will probably be best remembered for his

vision and innovativeness. During his tenure as Director of the Division of Fish and Game he launched a number of highly successful programs. They included a strong land acquisition effort, unusual waterfowl development on tidal marshes, and effective deer management and animal damage control programs.

"Mac" was ever-conscious of the constituency of the Division of Fish, Game, and Shellfisheries and many sportsmen accompanied "Mac," as his guests, during periodic visits to such areas as Tuckahoe, Colliers Mills and the game farms and hatcheries.

Long before he retired, "Mac" had achieved the epitome of success for a professional man—the respect and admiration of his colleagues throughout the country. I, for one, am grateful to have had the opportunity to serve my apprenticeship under him and be known as one of "MacNamara's Boys."

Vic Schmidt,

Deputy Director (Retired) U.S. Fish and Wildlife Service



PHOTOS BY THE AUTHOR.

Sunset in a New Jersey salt marsh in July. The wind whistles softly through the grass as the pink rays brush the tips and shimmer across the water.

SALT MARSHES

havens for waterbirds

BY JOANNA BURGER

The fog lifts gently, grudgingly, revealing an endless expanse of snow and ice, broken only by leafless bushes. Beneath the snow the salt marsh silently slumbers, awaiting spring. Salt marshes extend the length of the Atlantic coast, interrupted only by channels, inlets and roads. Thousands of acres of land are covered with salt marsh grass, low bushes, and reeds. Guarded from the sea by barrier beach islands, salt marshes themselves protect mainland areas from storms, wind, and the unceasing tides. To many, these areas appear barren, wasteful, and even ugly. To some, salt marshes represent only future building lots and marinas. But salt marshes harbor hundreds of birds: some nesting, some feeding, and some merely

stopping over on their long trek north. For some species displaced from beach areas, salt marshes are the last remaining safe nesting area.

In February and early March the snow and ice gradually melt, exposing patches of *Spartina* grass forced down by the weight of the snow. Brant brazenly march over the marsh, grazing on the grass, creating bare spots which fill with water. Foraging in flocks of only a few to hundreds, they literally mow the marsh. They will remain through April, preparing for the flight to arctic breeding grounds.

In mid-March Herring Gulls hover above the marsh, and land in groups to court and display. Even in the snow, they select territories and build nests.



Herring Gull chicks are almost ready to fly by early July when the grass is still relatively short. Author holds a 35-day-old chick.



Herring Gulls nest in salt marshes, building large nests to be used by the chicks until they are 50 or 60 days old.

Recent newcomers to New Jersey, they have usurped the nesting areas of more traditional marsh-nesting species such as Laughing Gulls and Common Terns. In only 30 years of nesting in New Jersey, they have formed more than 30 colonies, and the number of nesting pairs are doubling every three or four years. The gulls will wait until mid-April before they lay eggs, and so spend the cold, frosty days in March fighting for territories, and feeding offshore or on garbage dumps. A dark-bodied one-year-old picks up a clam in the shallow water surrounding the salt marsh, rises in the air, and drops it several times on the mud. Undaunted, the gull flies over the marsh and drops it in the soft mud exposed by the Brant. Still it does not open. The gull glides over the marsh until it hovers above grey, sun-baked boards, all that remains of a rowboat stranded there by a high tide many years ago. Adjusting for wind, it drops the clam once more. At last it cracks open and the gull feasts amid hundreds of bleached clam shells, attesting to the many gulls that have used this site over the years. Only by trial and error, and by watching other gulls, do the young learn where to drop clams, from how high, and how to adjust for the wind.

In the grey-yellow grass Clapper Rails are visible, slinking silently in search of food. Soon they will build nests along the creeks and channels. The nests are built high to protect the eggs from the everpresent tides; even so, high tides sometimes wash the eggs out of the nest, leaving them scattered for up to 30 feet. Rails, however, will retrieve their eggs, placing them back in the nest; sometimes they even "retrieve" the larger eggs of Laughing Gulls nesting nearby. Although their eggs get wet in such high tides, they will

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Oystercatcher about to settle on a nest in Spartina grass.

NEW JERSEY RECORD

March 1979
New Jersey Division of
Fish, Game, & Shellfisheries
P.O. Box 1809
Trenton, NJ 08625

SALT-WATER SPORT FISH

| SPECIES | ANGLER | YEAR | LB. | OZ. | WHERE CAUGHT |
|---------------------|---------------------|------|-----|-----|--------------------|
| Albacore | Walter Citimm | 1961 | 69 | 1 | Hudson Canyon |
| American shad | Rodger G. West | 1967 | 7 | 0 | Great Bay |
| Atlantic bonito | Frank G. Lykes, Jr. | 1945 | 13 | 8 | Off Sandy Hook |
| Atlantic cod | Joseph Chesla | 1967 | 81 | 0 | Off Brielle |
| Atlantic mackerel | John Lucadema | 1978 | 3 | 6 | Off Barnegat Inlet |
| Bigeye tuna | Dennis M. Seehaus | 1978 | 299 | 0 | Hudson Canyon |
| Black drum | Herschel Layton | 1944 | 92 | 0 | Delaware Bay |
| Blackfish | R.N. Sheafer | 1954 | 21 | 6 | Off Cape May |
| Bluefin tuna | Joseph Casale | 1973 | 796 | 0 | Off Long Branch |
| Bluefish | William Di Santo | 1971 | 23 | 14 | Off Cape May |
| Blue marlin | Joseph Teti, Jr. | 1964 | 620 | 0 | Off Atlantic City |
| Blue shark | Bill Tybor | 1978 | 241 | 0 | Off Brielle |
| Broadbill swordfish | Edmund Levitt | 1964 | 530 | 0 | Wilmington Canyon |
| Cobia | Eli P. Hitchner | 1972 | 45 | 2 | Delaware Bay |
| Dolphin | W. Scott Smith, Jr. | 1974 | 63 | 3 | Baltimore Canyon |
| Fluke | Walter B. Lubin | 1953 | 19 | 12 | Off Cape May |
| Little tuna | Richard C. Mitchel | 1975 | 17 | 11 | Off Manasquan |
| Pollack | Philip Barlow | 1964 | 43 | 0 | Off Brielle |
| Porgy | Victor F. Rone | 1976 | 5 | 14 | Delaware Bay |
| Red drum | Bud K. Whitley | 1978 | 51 | 9 | Delaware Bay |
| Sea bass | C.N. Davis III | 1973 | 6 | 4 | Delaware Bay |
| Shortfin mako | Robert J. Kline | 1977 | 362 | 0 | Barnegat Ridge |
| Spotted seatrout | Bert Harper | 1974 | 11 | 2 | Holgate, surf |
| Striped bass | Donald Zboyan | 1970 | 68 | 0 | Off Sandy Hook |
| Tarpon | Jack Hoagland | 1972 | 42 | 8 | Shrewsbury Rocks |
| Thresher shark | Robert Ohlott | 1977 | 247 | 0 | Off Point Pleasant |
| Tiger shark | Jacob Garey, Jr. | 1977 | 791 | 0 | Off Brielle |
| Wahoo | Charles Dooner | 1976 | 114 | 0 | Off Atlantic City |
| Weakfish | A. Weisbecker, Jr. | 1952 | 17 | 8 | Mullica River |
| White marlin | Merrill P. Arden | 1968 | 123 | 0 | Ambrose Light |
| Winter flounder | Frank Coleman | 1968 | 3 | 2 | Great Egg Harbor |
| Yellowfin tuna | David L. Wheatley | 1978 | 228 | 4 | Wilmington Canyon |

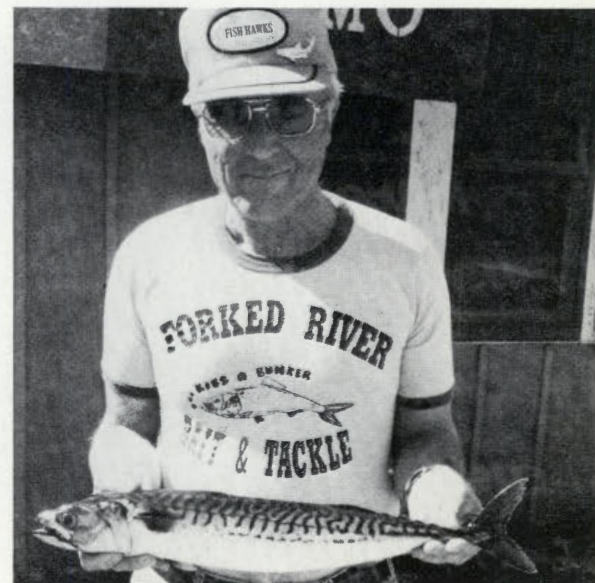


AMERICAN SHAD

J. Edward Whitman—1978—9 lbs. 4 oz.—Delaware River

FRESH-WATER SPORT FISH

| SPECIES | ANGLER | YEAR | LB. | OZ. | WHERE CAUGHT |
|-----------------|--------------------|------|-----|-----|------------------------|
| Atlantic salmon | John A. Mount | 1951 | 8 | 0 | New Wawayanda Lake |
| American shad | J. Edward Whitman | 1978 | 9 | 4 | Delaware River |
| Bluegill | Mike Ayers | 1974 | 2 | 1 | Farm Pond, Sussex |
| Black crappie | William Hanna | 1961 | 3 | 6 | Alloway Lake |
| Brook Trout | George J. Hornung | 1956 | 6 | 8 | Lake Hopatcong |
| Brown bullhead | Robert Dorf | 1966 | 22 | 15 | Spring Lake |
| Brown trout | Howard Devore | 1964 | 16 | 11 | Greenwood Lake |
| Carp | John A. Pisa | 1971 | 41 | 2 | Delaware River |
| Chain pickerel | Frank McGovern | 1957 | 9 | 3 | Lower Aetna Lake |
| Channel catfish | William Otten | 1918 | 28 | 0 | Greenwood Lake |
| Largemouth bass | Logan B. Whitesell | 1960 | 10 | 12 | Mount Kemble Lake |
| Muskellunge | Walter M. Journey | 1977 | 27 | 8 | Delaware River |
| Northern pike | Herb Hepler | 1977 | 30 | 2 | Spruce Run Reservoir |
| Rainbow trout | Richard Ruis, Sr. | 1970 | 8 | 6 | Round Valley Reservoir |
| Rock bass | Harold Webb | 1968 | 1 | 2 | Lake Hopatcong |
| Smallmouth bass | Earl H. Trumpore | 1957 | 6 | 4 | Delaware River |
| Striped bass | Elwood W. Bernat | 1978 | 27 | 12 | Union Lake |
| Walleye | Stanley Norman | 1934 | 12 | 13 | Delaware River |
| White catfish | Lewis Lomerson | 1976 | 10 | 5 | Raritan River |
| White perch | Robert Huber | 1950 | 2 | 8 | Lake Hopatcong |



ATLANTIC MACKEREL

John Lucadema—1978—3 lbs. 6 oz.—Off Barnegat Inlet



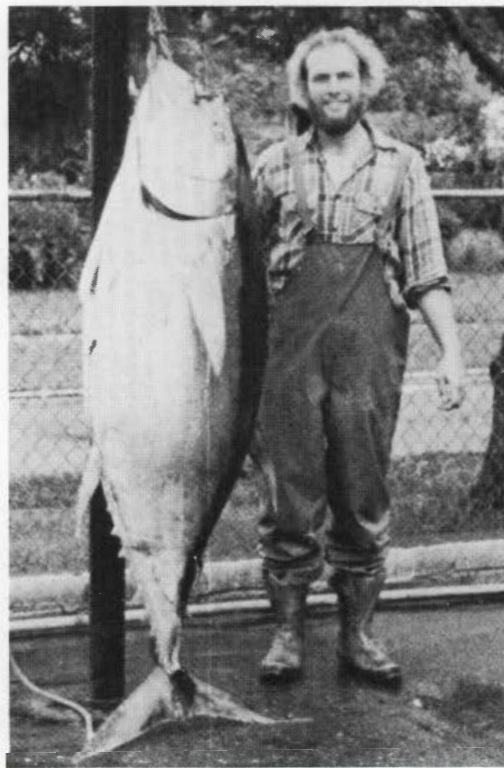
BLUE SHARK
Bill Tybor—1978—241 lbs. 0 oz.—Off Brielle



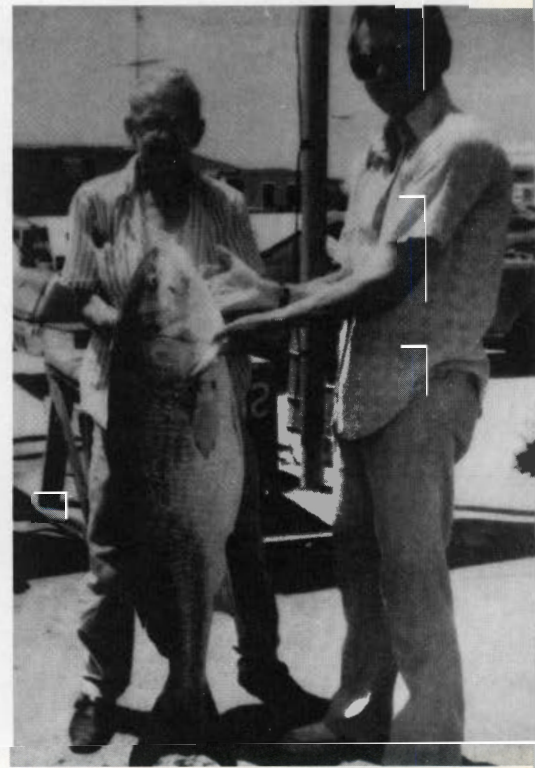
YELLOWFIN TUNA
David L. Wheatley—1978—228 lbs. 4 oz.—Wilmington Canyon



STRIPED BASS
Elwood W. Bernat—1978—27 lbs. 12 oz.—Union Lake



BIGEYE TUNA
Dennis M. Seehaus—1978—299 lbs. 0 oz.—Hudson Canyon



RED DRUM
Bud K. Whitley—1978—51 lbs. 9 oz.—Delaware Bay

LITTLE ORCHIDS OF THE PINE BARRENS

BY WARREN E. FOX

The most widely distributed and best-known of our native orchids is the Pink Lady's-slipper, or Moccasin Flower, *Cypripedium acaule*. It is found in damp pine woods or oak-pine-maple mixes, along streams and the edges of swamps and bogs where the soil is sandy, rich in humus, very acid, and always moist but never soggy. Among the pines the soil surface may seem to be dry, covered with a layer of needles, but just below the surface it is moist enough to support a few species of mosses. The level of moisture and the parentage of the humus is critical to the existence of a species of soil fungus whose hyphae attack the fleshy, fibrous roots of the orchid, which are unable to extract sufficient nutrients from the soil on their own. After attacking the plant's roots the fungus becomes an agent of the plant, serving as its absorptive system.

This orchid is cultivated by skilled horticulturists in the wildflower trade who have developed the expertise to duplicate natural soil conditions to maintain the fungi. For the average flower lover and gardener, however, it is a hopeless project and the orchid is best left to mother nature unless a developer's bulldozer is about to do its thing.

Pink Lady's-slipper usually displays two ovate-lanceolate, fuzzy, six-inch leaves, opposite each other, nestled deep in the surface litter. From the center of these leaves, in late May or early June, a single flower will arise on a stem usually about eight inches tall, sometimes having a tiny extra leaf.



Grass Pink

Photos by Author



Pink Lady's-Slipper



Yellow Crested Orchid



White Fringed Orchid

The flower is rather large for the size of the plant. Sepal and petals are greenish, flushed with brown and a bit of pink. The large pouch is pink with rose veining and sometimes a flush of purple. Rarely, a white specimen may be found.

The pouch is actually an insect-trap mechanism that provides for cross-fertilization. A small slit in the bulbous portion limits entrance to a small, powerful bee who may then feed on the attracting nectar. To leave, the bee must crawl out another opening at the top of the pouch that is partially blocked by the column. The insect first contacts the stigma centered on the column and then, during his scrabbling to get free, contacts the anthers on either side of the column and gets dusted with pollen. The next blossom the insect visits is fertilized when the pollen from the first is brushed onto its stigma.

Orchid flowers should not be picked because then seed will not be produced and that rhizome will not produce another flower. A new rhizome may branch from the old one and produce eventually a flowering bud, but that takes years.

The *Arethusa*, *Arethusa bulbosa*, is the rarest, most brilliant, and most easily destroyed orchid in the Pine Barrens. It is native to the acid bogs, growing in sphagnum hummocks that have developed around the bases of fire-damaged pines and cedars, its tiny bulbs held by the sphagnum only a few inches above the anaerobic, acidic muck of the bog. In late May, *Arethusa* bears a single rose-pink flower on a slender stalk. Often called the "Dragon's-mouth" because of its similarity to that imaginary beast's fiery oral cavity, this orchid's tongue is crested with flaming yellow hairs, with purple markings on either side of the lip for fangs, the pink dorsal petals forming the fiery snout and the rearing sepals appearing as outstretched, bloody forelegs poised for attack. After the flower fades, a single grasslike leaf appears that continues until frost, gathering the energy for seed formation and next year's blossom.

Three years ago I witnessed the elimination of this species from the only bog in which I knew it to exist. A young man, who only identified himself as a science teacher, hopped from hummock to hummock, gather-

ing every blossom in sight. He didn't know that picking the blossom also removed the bulb, which is invariably uprooted because of the loose anchorage of the threadlike roots in the spongy sphagnum. Furthermore, his hopping from clump to clump depressed the orchid-bearing stratum into the bog's muck, where the plants are quickly smothered. He, and the two ladies with him, raved over the beauty of the blossoms and how much they loved them, but love like this the plant can do well without. There has not been even one blossom in the last two seasons.

When exploring bogs, a person should wear boots and step only where others have previously trampled or upon exposed tree roots, bare sandy patches, or in the muck where little plant life can exist. True, it may be rough going—but isn't it worth it?

The Rose Pogonia, or Snake-mouth, *Pogonia ophioglossoides*, shares much the same habitat but is a rooted plant and more tolerant of wet feet. It likes some humus intermingled with the sphagnum, giving it a more substantial tenure, and therefore is more successful. This orchid is similar to the *Arethusa*, though smaller and not as brilliant, with pastel pink colors. It blooms from late June through July.

A bog orchid of different form is inappropriately named the Grass Pink, *Calopogon pulchellus*. It has a single stem with a single, broad, grasslike leaf rising from a well rooted bulb. The stem bears multiple flowers, which bloom one at a time as they develop on the elongating stem, from late June through July. The blossom is bright rose-pink in color and is different from those of the first two species in that the column stands tall and slightly arched, with only a little petal formation at each side at its tip. The column has a tuft of red-tipped yellow hairs, termed a "crest," that is usually found on the pendant lower lip of other species.

If a Grass Pink blossom has been open for a time and has not been fertilized, the column folds downward, bringing the crest in contact with the lip, then rises to its former position, apparently effecting self-fertilization in the process. This species produces seed capsules in greater numbers and more reliably than other orchids, possibly because of this self-fertilization mechanism.

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Arethusa or Dragon's-mouth



Rose Pogonia or Snake-mouth

more on the snakes



of new jersey

Northern Pine Snake

PETE MCLAIN

BY PETE MCLAIN

The study of snakes, including their identification and habits, is included in "Herpetology"—the science of reptiles and amphibians. Reptiles and amphibians are among the vertebrate animals (those having a backbone) and they are classified just below the birds and mammals. Snakes are cold-blooded, gathering

their body heat from the surrounding environment. Many people, however, do not know the basic difference between reptiles and amphibians.

The reptiles are clad in scales, shields, or plates and their toes, when present, bear some form of claw. Young reptiles are miniatures

of the parents in general appearance, but not always in color or pattern. The reptiles include the crocodylians, turtles, lizards, and snakes.

The amphibians have a moist, glandular skin and they do not possess any form of claw on their toes. The young pass through a

larval stage (which is usually aquatic) before they change into the adult. The amphibians include the salamanders, newts, frogs, and toads.

The Division of Fish, Game and Shellfisheries, through the Endangered and Nongame Species Project, has actively been studying snakes in New Jersey to learn more about their status. Research has already indicated that the timber rattlesnake population is low enough to qualify it for the State Endangered Species list. The corn and pine snakes are presently threatened. Other species of snakes may also be on the decline.

There are people who would like to see every snake disappear from New Jersey. However, we must remember that the snake has been a part of the environment since long before man settled the state. It doesn't seem reasonable to see a species of wildlife, which is beneficial to both man and the environment, pass into extinction because of habitat contamination and destruction or apathy.

Many people feel that snakes do

have a place in New Jersey and that a basic understanding and knowledge of our various snake species—their populations, habits, and habitats—will make the public more aware of the value of the snake both esthetically and as a natural control for rats, mice, and insects. There are citizens who couldn't care less about snakes, but many other inquisitive nature students might like to learn more about New Jersey's snakes.

HOW TO CONTROL SNAKES

There are many hundreds more nonvenomous snakes than there are venomous ones and these harmless snakes frequently come into contact with man. During the fall months when snakes are seeking winter hibernating quarters they may be attracted to basements, stone walls, and rock gardens. The best prevention is to make certain that all cracks and crevices in the house and outbuilding foundations are tight. Also, by removing rock piles, brush piles and trash and keeping the grass and weeds cut low you remove cover attractive to snakes. Finally, any food or cover that attracts rodents should

be removed as rodents are the primary food of many snakes.

If you see a snake on your property or while hiking, the best action is to avoid the snake unless you are familiar with snake identification and handling. Here in New Jersey it is *illegal* to possess most snakes and they should be left in the wild and not kept as pets.

KEEPING SNAKES IN CAPTIVITY

Only three species of snakes may be possessed without a permit in New Jersey—the boa constrictor, the garter snake, and the ribbon snake; all others require a permit. The Division of Fish, Game and Shellfisheries (P.O. Box 1809, Trenton, New Jersey, 08625) should be contacted for information on obtaining the proper authorization before the snake is acquired. Generally, permits are not issued for venomous snakes.

Knowledge of the proper care and feeding of the snake intended to be kept in captivity must be demon-

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Timber Rattlesnake

LEONARD LEE RUE III





ASSUNPINK

By Ed Powick

PHOTOS BY AUTHOR

Would you like to find an area in New Jersey that has lakes, woodlands, country lanes and almost no people? Where you can fish, boat, hike, sail, horseback ride, birdwatch and photograph nature in peaceful, unspoiled surroundings. Then you must discover Assunpink Wildlife Management Area in Central New Jersey. It is almost 5,000 acres of land purchased with Green Acres Funds to provide flood protection for the Assunpink Creek Drainage. It has created a fish and wildlife habitat in an area that is untainted by large concentrations of people. It is not easily accessible from a major highway and you would not accidentally stumble onto it. In fact good directions are essential since it is surrounded by rolling farmlands where directions are hard to come by. This isolation adds to its charm and accounts for some of its desirability.

About 80 per cent of Assunpink is located east of the New Jersey Turnpike and in this section are three lakes: Assunpink Lake, Stone Tavern Lake and Rising Sun Lake. For directions to these areas and detailed information about these lakes, read

Hopscotching the Assunpink on pages 4 and 5.

Assunpink Lake covers 225 acres and is the largest of the three. All three lakes provide areas for parking and boat launching. A fisheries management program is in operation directed toward a warm-water fishery based on largemouth bass. All of the lakes contain largemouth bass, blue gill, pumpkinseed sunfish and brown bullhead. Chain pickerel are present in limited numbers and an occasional "native" brook trout is taken. Grass shrimp, minnows, and worms are popular with the fish but must be brought from home as there are no bait stores close by. Do not let the unavailability of a boat stop you; the few people I saw fishing were all doing it from the banks. I found the dam easily accessible at Assunpink Lake and Rising Sun Lake. It provides a gradual rock slope, an ideal spot from which to cast. A fishing license is required for all—except those under 14—to fish in New Jersey fresh water. Licenses may be obtained at any county or municipal clerk and hunting and fishing stores.

As illustrated in the photographs, Assunpink is one of the best birdwatching areas in the state. □

Assunpink Wildlife Management Area Scenes





Yellow-rumped Warbler



Female Belted Kingfisher

Swamp Sparrow



Common Yellow Throat



White-Crowned Sparrow





LEONARD LEE RUE III

by Bruce Hawkinson

Rabies has been around for a long time. Early scholars such as Aristotle discussed it in their writings. In America the first case was documented in 1753 in Virginia. Major rabies epidemics in wildlife have been recognized for over the past 100 years. In the United States today, the only state which is rabies-free is Hawaii. California and Minnesota have reported the most cases.

Because of pet vaccination programs, the incidence of rabies in domestic animals is declining. Conversely, the incidence of rabies recorded in wildlife has been increasing, not necessarily because of rabies being worse, but because there are more people around to notice it.

Rabies can affect any warm-blooded animal, however those wildlife species which appear to be the most susceptible are skunks, foxes, and bats. Cattle

seem to contract the disease more often than any other domestic animals. The two orders of mammals most likely to harbor the disease in nature are Carnivora (flesh-eaters) and Chiroptera (bats).

Rabies is a *zoonoses*, a disease that can affect both humans and animals. *Sylvatic* rabies refers to that form found in wild animals. Rabies is caused by a virus which affects the central nervous system and the brain. This virus will spread into the saliva of the mouth, where it will be transmitted when the rabid animal bites a victim breaking the skin. Rabies can also be transmitted by the consumption of the rabid animal by a carnivore, through excrement, by breathing of contaminated air (primarily in caves), and through nursing of offspring.

Rabies victims show either of two distinct complexes of symptoms, the so-called "furious" and "dumb" forms. The "furious" form causes restlessness and irritability, and the affected animal will snap at any moving object. In the "dumb" form, the symptoms include paralysis, with an inability to close the jaws, and a loss of weight. In either form, the animal may die in as little time as one week. If a person contracts the disease, treatment consists of 14 to 21 vaccine injections through the stomach wall.

The rabies virus has been kept alive for centuries for two reasons: The "furious" form causes the affected animal to go crazy and snap at anything it sees, thus increasing the possibility that it will transmit the disease to another animal; also, animals sometimes may carry the disease without being severely affected by it. If overpopulation occurs, a flareup of the disease will occur where it was formerly dormant.

In general, the spread of rabies is dependent upon the availability of susceptible hosts; therefore, the greater the number of animals in a given area, the better chance of a rabies outbreak. Trapping by man can lower wildlife densities in certain areas thus preventing epidemics of rabies.

Human rabies is most common in males under 20 years of age. It takes from one week to a month for the symptoms to occur depending on the severity of the attack and its proximity to the brain. After symptoms occur, the illness will last about four days before death. If treatment begins as soon as possible after the attack and up to 13 days afterwards, it should be successful.

In New Jersey, the vast majority of rabies cases in man are contracted from bats. One out of every ten bats examined after they have attacked pets or people is proven rabid, but the incidence in all bats in nature is much lower—2%.

To prevent rabies various measures are used, including vaccination of pets and trapping of wild animals. People should not keep wild animals as pets as they may have contracted the disease. Anyone bitten by any animal showing irrational and unpredictable behavior should capture the animal and contact the New Jersey Department of Health. It should be emphasized that the actual incidence of rabies in New Jersey is presently very low (around 20 cases a year) and human deaths are rare. □



Environmental News



HANCOCK HOUSE HAS NEW 'OLD' LOOK. This state-owned historic house museum has undergone extensive rehabilitation over the past several years and the final phase, the addition of a kitchen area on the first floor, will soon be completed. The 2-1/2-story house, built in 1734 by Judge William Hancock, took its place in history in the early hours of March 21, 1778 when 20 Quaker patriots were murdered in their beds by British troops for having sent cattle to Washington's starving army at Valley Forge. (Hancock House was used as a barracks for local men during the Revolutionary War.) The historic site, which had been closed during the restoration process, was reopened to the public last year on the 200th anniversary of the tragedy.

Hancock House is considered one of the finest examples of South Jersey style Flemish bond decorative brick architecture (glazed bricks laid in patterns). The restoration project, funded in part by federal preservation grants and part by the state, included strengthening the structure, repointing the brick, returning dormers and windows to their original design, interior painting, and installing heating/air conditioning/climate control to protect the valuable antiques. DEP's Office of Historic Preservation oversaw the rehabilitation and the Division of Parks and Forestry administers the site.

A visit to Hancock House will be enjoyable for the whole family. Instead of a museum-like atmosphere with display cases of unrelated artifacts, visitors are treated to a "homey" environment. The rooms have been designed to represent actual living conditions in an 18th century house and simplicity of the every day life of a Quaker family in that era. Located in Lower Alloways Creek Township at Hancock's Bridge (near Salem) in Salem County, Hancock House is open Wednesday through Friday, 9 a.m.—12 p.m., 1 p.m.—6 p.m.; Saturday, 10 a.m.—12 p.m., 1 p.m.—6 p.m.; and Sunday, 1 p.m.—6 p.m.

DEP EXPANDS PROGRAM TO LOCATE, IDENTIFY AND MONITOR TOXICS

New Jersey's efforts in searching out and identifying old abandoned chemical dumps and other sources of toxic substances received a major boost in mid-April in the form of a \$450,000 grant from the U.S. Environmental Protection Agency (EPA). The grant was awarded to DEP under the federal Toxic Substance Control Act, as amended, which provides \$3 million in demonstration grants to be distributed among the 50 states. New Jersey's

grant is the second largest single amount received by a state.

The grant will be used in conjunction with DEP's existing toxic substances program. Approximately two-thirds of the funds will be used to establish a specially trained four-person Investigation and Integration Unit to go out into the field and track down landfill sites that might pose a hazard to public health

Continued on page 16 D

HEARINGS HELD IN JUNE ON MOVING AND STORING RADIOACTIVE MATERIALS

Three public hearings were held by DEP in mid-June on proposed regulations controlling the transportation and storage of radioactive materials. The sessions were chaired by Dr. Max Weiss, head of the State Radiation Commission. When adopted, the regulations will enforce transportation requirements of the N.J. Radiation Protection Act.

George Tyler, director of DEP's Division of Environmental Quality, said the regulations will give the state control over transportation of certain types of radioactive materials of over 20 curies* and during related storage. This will permit state and local authorities to reroute certain shipments to avoid populated areas and deal more quickly with accidents involving radioactive materials during transit. The regulations also will enforce the legislative requirement that radioactive material shipments of specific type or quantity be registered.

It has been estimated that in 1975 there were 2.2 million such shipments nationally and 5.6 million shipments are expected in 1985. These shipments, which are now mostly radiopharmaceuticals, will eventually include spent fuel from nuclear generating plants.

Administration and enforcement of the regulations, once adopted, will be carried out by the Bureau of Radiation Protection within the Division of Environmental Quality.

*A curie is a unit quantity of any radioactive nuclide in which exactly 3.7×10^{10} disintegrations occur per second. □

DEP INVESTIGATING FORMER RADIUM PROCESSING SITES

Former radium processing facilities in New Jersey are being investigated by DEP's Bureau of Radiation Protection in cooperation with the U.S. Environmental Protection Agency (EPA). The purpose of the investigations, begun in the spring, is to determine the extent and scope of possible residual radiation contamination at all former facilities of this type. The first full scale radiation survey got underway this past May in Orange (Essex County) at the site occupied, between 1917 and 1929, by the U.S. Radium Corporation, once a large radium refining company.

Four other states—Colorado, Illinois, New York and Pennsylvania—were identified by EPA as having had radium processing plants within their borders at some time during the mid 1900's. Similar investigations are being carried out in those states. □

SCHIFFMAN HEADS WATER RESOURCES



ARNOLD SCHIFFMAN, 39, of Trenton, became director of DEP's Division of Water Resources in late May. His professional career in water resource matters spans 15 years. From 1967 until his appointment to the DEP post Schiffman was with the Maryland Water Resources Administration where, as program director, he was responsible for many of the planning and management programs developed by that state with special emphasis on groundwater management, permits, enforcement, planning and hazardous waste management. Earlier, Schiffman worked for the state of California.

Schiffman received his B.S. degree in geology/engineering from City College of New York and his master's degree in marine geology from the University of Southern California. □

NEW LAWS RELEASE FUNDS FOR OPEN SPACE PROJECTS

Three measures signed into law by Governor Byrne on March 27 made more than \$50 million in Green Acres money available for state and local recreation/conservation projects including land acquisitions park development and neighborhood enhancement. All will be administered by DEP.

Chapter 60, P.L. 1979 appropriates \$46 million from the 1974 Green Acres fund—\$5 million to be used for the purchase of land in New Jersey Pine Barrens; \$1 million for land surveys, appraisals and other program requirements; \$20 million for local assistance grants for acquiring parkland; and, \$20 million for local program grants for developing parks.

Chapter 55, P.L. 1979 appropriates \$4 million from the 1974 Green Acres fund to go along with \$2 million previously authorized for the acquisition of Pigeon Swamp in South Brunswick (Middlesex County). Eventually, this ecologically unique area which has an underground aquifer (water supply) will become a state park and protected wildlife refuge.

Chapter 56, P.L. 1979, the "Aid for Environmental Concerns Act," is designed to financially assist municipal/county environmental agencies in urban- or rural-aid areas to carry out projects to enhance neighborhoods. State

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PINELANDS UPDATE

Exemptions

The interim Pinelands Development Review Board, which is responsible for making decisions on exemptions from the temporary suspension of development and construction permits until the state planning commission takes over the function, has met weekly since March 2. As of May 21, 201 applications for exemptions had been approved (including 1,941 dwellings) and 21 denied (including 6,243 dwellings—one a 4,500 unit complex).

Pinelands Planning Commission

Written standards for developing the Pinelands are being formulated by the 15-member Pinelands Planning Commission, which has been meeting on an average of once a week since March 30. The commission's goal is to devise a comprehensive land use plan that will strike a balance between the environment and the economy—sensible development of Pinelands areas that can support it and preservation of those areas that are ecologically sensitive and can't.

Legal action

On May 8 the state Supreme Court heard arguments by the New Jersey Builders Association and the state Attorney General relative to the constitutionality of Governor Byrne's action imposing the temporary ban on state permits relating to development and construction in the Pinelands. (No decision had yet been rendered as NJO went to press.)

Legislation

The state Senate on May 21 passed the administration's Pinelands Preservation Act by a vote of 33-2. The measure was then sent to the state Assembly for its consideration and vote. □

Clean water dividend

ANOTHER 7,200 ACRES OPENED TO SHELLFISHING

There are glad tidings for growers, harvesters and eaters of clams, oysters and mussels this year—the annual reclassification of shellfish harvesting waters carried out by DEP's Division of Water Resources in the spring showed a net gain of 7,261 acres of approved shellfish waters, the largest gain of upgraded waters in recent years. Within New Jersey's three-mile Atlantic ocean jurisdiction, there are now 153,265 acres open to shellfish harvesting—an area that stretches from Sandy Hook to Cape May. (Shellfish harvesting areas are classified as approved or condemned in accordance with the federal Food and Drug Administration clean water requirements.)

Assistant commissioner Paul Arbesman noted that the increase in approved shellfish waters is due, in part, to the construction of new sewage treatment facilities which have eliminated many dischargers of wastewater. Arbesman said, "DEP is working to reduce bay and ocean pollution through the upgrading of municipal systems."

Charts delineating the areas as approved or condemned for shellfish harvesting are available from DEP, Division of Water Resources, P.O. Box CN-029, Trenton 08625 and through shellfish licensing agents. □



SEAN M. REILLY, SR., 36, of Toms River, is DEP's Pinelands Coordinator. His responsibilities include heading the Pinelands field office in Toms River where advice and help is offered to people applying for exemptions to the temporary ban on state permits related to development or construction in the Pinelands. Reilly is DEP's liaison with the recently established Pinelands Planning Commission and directs the staff which makes recommendations for exemption to that body for its consideration. He participated in the development of the Pinelands Review Committee Plan for the Pine Barrens which, along with the provisions of the 1978 National Parks and Recreation Act, formed the basis for the Governor's executive order setting up the new commission. Reilly also coordinates the efforts which involve the input from governmental agencies, citizen, industrial and environmental groups. He chairs public meetings and seminars. Reilly joined DEP in August 1977 following five years as executive director of the South Branch Watershed Association.



HOWARD WOLF, of Trenton, was appointed special assistant in charge of DEP's Pinelands acquisition program on May 3. Wolf, a state government career employee who has been actively involved with the Green Acres program since its inception, will direct the Pinelands real estate function of DEP and will coordinate supporting activities of the state Department of Transportation and the Attorney General's Office. Before assuming his new post, Wolf had served as deputy director of the Green Acres Administration.

NEW U.S. PARK PROGRAM WILL GIVE WELCOME ASSIST TO HARD-PRESSED CITIES

Four counties and 21 municipalities* in New Jersey have been declared eligible to compete for funds in a federal grant program directly aimed at reviving and rebuilding critically needed parks and other recreation facilities in certain financially hard-pressed communities. This program, the first of its kind on a countrywide basis, will be administered on the national level by the U.S. Department of the Interior under terms of the Urban Parks and Recreation Recovery Act of 1978. DEP's Green Acres Administration will follow through on the state level for New Jersey.

The law provides for grants covering 70 percent of approved projects. In addition, federal sources will provide a dollar-for-dollar match to state contributions to the local share of a project, up to 15 percent of the total cost, bringing the federal share to a maximum of 85 percent. This provision makes it possible for a park rehabilitation project in New Jersey to be completed at no cost to the community, as the matching portion of a Green Acres grant would be paid by federal sources instead of the municipality/county.

For example, an approved project carrying the price tag of \$100,000 could be financed by a combination of 70 percent federal grant (\$70,000), a state Green Acres grant to cover half of the remaining cost (\$15,000) and an additional 15 percent federal grant to match the state contribution (\$15,000).

DEP Deputy Commissioner Betty Wilson, who is a director of the National Association of State Outdoor Recreation Liaison Officers and helped draft regulations for the new program, explained that merely being on the eligible list does not automatically mean that a city or county will get a federal grant. The grants will be awarded nationally on a competitive basis, with overall need and innovative planning the major considerations in the selection of recipients. (An informational meeting to explain the application process was held in Trenton in May for officials from eligible counties and municipalities.)

The federal law authorizes \$150 million each for fiscal years 1979 through 1982, and \$125 million for fiscal 1983. President Carter has requested \$37.5 million for the last quarter of fiscal 1979 and full funding for fiscal 1980. No allocations are made for specific states.

**Eligible counties:* Camden, Essex, Hudson and Passaic. *Eligible cities:* Asbury Park, Atlantic City, Bayonne, Bloomfield, Bridgeton, Camden, East Orange, Elizabeth, Irvington, Jersey City, Long Branch, Millville, Newark, New Brunswick, Passaic, Paterson, Perth Amboy, Plainfield, Trenton, Union City and Vineland. □

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609-292-7172**



BARRIER-FREE AWARD WINNER. The attractive, functional, energy-efficient park support building and shelter (above) at Black Brook Recreation Area, a Green Acres project in Hanover Township (Morris County), recently took first runner-up honors in the 11th annual Award of Merit contest, a national competition sponsored by *Park Maintenance* magazine. The multipurpose building (maintenance/workshop, snack bar, office, restrooms) is barrier free, there are no steps, doors are extra wide and toilet stalls are oversize to accommodate wheelchairs. The building and shelter were designed by Ballou-Levy-Fellgraff, Architects and Planners, affiliated with Kinsey Associates of Livingston.

A \$309,500 Green Acres matching grant, covering 50 percent of the cost for developing Black Brook park was approved by DEP in December 1975 with the remaining 50 percent of the cost to be provided by the township. Other park facilities completed and in use include lighted tennis courts, a baseball field, tot lot, jogging/walking/biking trails, horseshoe courts, and sitting areas. The 18-acre park site, located at the corner of Sunset and Manchester drives along Black Brook Drive, is within bicycle and walking distance of most of its area residents. □

ATSION LAKE, NEWEST SWIM AND PICNIC AREA NOW OPEN

There's been an addition to the family of publicly owned recreation facilities. Atsion Lake Recreation Area in Wharton State Forest (Burlington County) opened on Memorial Day weekend as New Jersey's newest public day-use bathing and picnicking spot. The 36-acre Pinelands site, located off Route 206 midway between Red Lion and Hammonton, has a capacity for 2,000 persons and parking for 300 vehicles. The complex is designed to accommodate the handicapped, with ramps to all locations. The bathhouse and administrative office includes showers, changing area, sanitary facilities, first aid station, life-guard office and locker area. The park, which is open from 8 a.m. to dusk, is administered by DEP's Division of Parks and Forestry. Admission and parking fees are \$1 weekdays* and \$3 on weekends and holidays.** The \$2.1 million construction cost was met with a 50-percent grant through the federal land and Water Conservation Fund and a like percentage from state Green Acres funds.

**Remember, admission and parking are free on TUESDAYS at all state parks and forests.*

***Children under 12, senior citizens who are New Jersey residents age 65 or over, and totally disabled persons are admitted to all state parks and forests free of charge. Convenient Senior Citizen passes and Disabled Person passes are available. Applications may be obtained at any park/forest office, or from the Division of Parks and Forestry, Box 1420, Trenton 08625. □*

BOATERS, TAKE NOTE!

Buying a boat is a large investment and running a boat is no nickel and dime affair either, so it makes sense to take reasonable precautions to protect your boat and equipment from thieves. Captain B. Russell Henry, chief of DEP's Bureau of Marine Law Enforcement, in a warning to boaters emphasized that 80 percent of the thefts occur between May 1 and October 31 and most are the spur-of-the-moment type and preventable.

Captain Henry urges boaters to take the following security measures: Take key out of ignition; keep boats in well lighted areas; chain or padlock small boats to a pier, tree or other solid object; on larger boats with in-board 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; check your boat frequently, making checks at different times of the day and evening; and keep a written record of the hull serial number and the serial number of outboard motors (even if a boat is stripped and painted over, it can still be identified by the hull number, and the outboard serial number is usually the only way to identify an engine suspected of being stolen).

If you are the victim of a boat thief, contact the nearest Marine Police Station: North Wildwood Station (609-522-0393), Atlantic City (609-348-4277), Bivalve (609-785-1330), Point Pleasant (201-899-5050), Ship Bottom (609-494-6600), Lake Hopatcong (201-663-3400), Riverside, in Delran (609-764-1111) and Monmouth Beach (201-229-6000). □

News Capsules

IN CASE OF A BOATING EMERGENCY, CALL . . .

The Marine Police have two stations along the Atlantic coast operating on an around-the-clock basis to respond to emergencies. They are the Atlantic City station (phone: 609-348-4277) and the Monmouth Beach station (201-229-6000).

There are thousands of boaters around today who thank the swift, efficient actions of the New Jersey Marine Police and/or the U.S. Coast Guard (USCG) for helping them, their passengers and their vessels avert disaster at sea. The federal and state units have concurrent jurisdictions over the same waters and cooperate in search and rescue operations as needed. Generally, the Marine Police take care of search and rescue missions in state waters (rivers and bays) and the USCG handles such operations in the ocean.

Safety equipment: Boaters, for your safety and that of your passengers, be aware that certain equipment is required by law on motorboats operating in New Jersey waters. For people, Personal Flotation Devices—one "wearable" (life jacket) for each person on board in sizes suitable for adults and children and, if your boat is 16 feet or over, one "throwable" (cushion or ring buoy) as well. Boat equipment—Engine flame arrester and air-scoop vents (outboard motors excepted), fire extinguisher and horn. The number pattern is to be painted on the boat; and the boat registration and operator license should be carried on the person. And, remember, it's against the law to pollute the water—discharging of oil is prohibited. □

Weekly reports begin

OCEAN AND BEACH CONDITIONS

The first 1979 advisory in DEP's annual program of providing weekly ocean and beach condition reports was issued on May 24. Regular monitoring and sampling of the near-shore and off-shore water quality will be conducted throughout the summer. Please report any ocean or beach problems to the 24-hour DEP hotline at 609-292-7172. □

HISTORIC SITE RULES

Proposed regulations for receiving and processing nominations of sites for inclusion in the New Jersey Register of Historic Places were brought to the public for comment at a hearing held by DEP in Trenton at the end of May. The proposed rules also set criteria for DEP review of any public undertaking which would encroach upon any area, site, structure or object which is included in the Register. The testimony taken at the hearing and the written statements received by the department's office of Historic Preservation by the June 1 deadline are under review.

SEWERAGE LOANS REPAYED, MONEY AGAIN AT WORK

More than \$6 million has been repaid to the state by municipalities and sewerage authorities who borrowed money through the 1969 Water Conservation Fund for planning and design of wastewater facilities. The repayment of the loans made the funds (\$6,000,574) once again available for use in clean water projects.

An appropriation bill signed into law by Governor Byrne on March 21 provides for the distribution of \$5,238,574 of the repaid loan money as the eight percent state match for 27 local sewerage treatment projects. The law, Chapter 45, P.L. 1979, also appropriates \$200,000 for the design and engineering of a dam monitoring system for the Spruce Run/Round Valley Reservoir Complex (Hunterdon County) and \$562,000 to upgrade the sewerage treatment plant at Ancora State Hospital (Camden County). □

GOOD-BYE AEROSOLS

The final step in a federal program to phase out the manufacture/use of nonessential products packaged in aerosol spray containers using chlorofluorocarbons as the propellant was taken on April 15 when a ban on interstate shipments of virtually all such products became effective. Fluorocarbon* propellants, once used to pressurize more than a billion containers of various consumer products each year (deodorants, hair sprays, household cleaners, paint sprays, insecticides, etc.), have largely disappeared from store shelves in recent years following a 1976 National Academy of Sciences report saying the unrestricted depletion of the ozone layer—the earth's protective shield in the stratosphere—would increase the planet's exposure to the sun's ultraviolet radiation and therefore could increase the incidence of skin cancer in humans, alter crop yields and change climates.

*Fluorocarbon is the simplified term for Chlorofluorocarbon, the chemical name for gases composed of chlorine, fluorine and carbon. It is actually the chlorine that has been found to reduce the earth's protective umbrella of ozone in the upper atmosphere.

COMPOST EXPERIMENT

The Camden County Park Commission has undertaken a "controlled experiment" to grow grass in resistant areas using compost, the by-product of sewage sludge as fertilizer. About 90 tons of compost was plowed into the ground along the north and south sides of the Cooper River in Pennsauken and Collingswood during May in the hope that it would modify the soil enough to allow a hardy growth of grass. The compost was obtained free from the Camden County Municipal Utilities Authority, whose composting plant has been in operation since the summer of 1978. □

continued from page 16B

OPEN SPACE PROJECTS

grants covering up to 80 percent of the cost (not to exceed \$10,000 per year, per project) will be available for such visible projects as artwork in public places, fountains, neighborhood sitting places and recreation areas, and street-scaping. The legislature included a \$100,000 appropriation to fund the program in its fiscal year 1979 budget. □



WE'VE COME A LONG WAY

Abraham Lincoln was President of the United States and the Civil War was being fought when the Geological Survey was established as a unit in New Jersey government in 1864. Webster's Dictionary defines "geological survey" as a systematic examination of an area to determine the character, relations, distribution and origin or mode of formation of its rock masses and mineral resources,"—but from the beginning the unit has undertaken investigations in many fields relative to the natural resources of the state. Over the years as New Jersey grew in population and industry so did the need for more specialized types of data and mapping with the result that the Bureau of Geology and Topography came into being with the Geological Survey becoming a part of that bureau. Dr. Kemble Widmer, state geologist (center, above), has been chief of the bureau since 1958. Helping Widmer cut the "115th Anniversary of the New Jersey Geological Survey" cake are Ms. Carol Lucey, supervising geologist, and Dr. George Halasi-Kun, state topographic engineer. □

continued from page 16A

DEP EXPANDS PROGRAM

and the environment; investigate potentially hazardous situations involving production, use, discharge or disposal of toxic substances; attempt to resolve such problems; and to coordinate monitoring, field activities and problem solving within DEP and among other related agencies. The unit is to follow up on pollution abatement programs to determine their effectiveness.

The remaining funds will be used to expand the existing air monitoring program to include a wide range analysis of airborne organic compounds which are suspected cancer-causing agents. This analysis will locate areas in need of additional study and monitoring. One important feature of the program is the determination of air contamination produced by chemical or landfill fires. □

A bird in the hand isn't necessarily better

Robert Eriksen

In the early 1940's the future of the wild turkey in the United States was in doubt. These woodland birds had disappeared from much of their ancestral range, especially in the northeast. Populations were small, even where the birds still remained.

Turkey habitat, once destroyed by man's activities was expanding due to farmland abandonment and better conservation awareness. The problem was how to get turkeys back into areas from which they had disappeared. Repeated attempts to re-establish the birds using game farm stock had failed. Experts felt that the wild turkey would soon be lost as a game species.

Since those days, unbelievable advances have been made. Only 20 states supported wild turkey populations in 1940. Populations were declining in some of the states where the birds remained. Today wild turkeys are found in 45 states. The estimated nationwide population is well over a million birds.

The credit for this increase in wild turkey populations goes to game managers and wildlife biologists who developed and used live-trapping techniques. In various areas of the country, cannon nets, drop nets and drugged bait are used to capture wild turkey. Live-trapped turkeys are moved to unoccupied habitat and the transferred birds establish new populations quickly. Results of the trap and transfer technique have been nothing less than phenomenal.

Since 1955, wild turkeys have been re-established in New York, Vermont, New Hampshire, Connecticut and Massachusetts by trap and transfer. Successful reintroduc-



Wild Turkey Tom

IRENE VANDERMOLEN C/O LEONARD RUE ENTERPRISES

tion has also occurred in Ohio, Indiana, Illinois, Iowa and many other states. Wild turkeys have even been established beyond their former range in California, Oregon, Washington, Montana, Wyoming, North Dakota, Minnesota and even Hawaii. Birds transferred from Vermont and New York to New Jersey and Maine are also doing well.

A recent survey by Wayne Bailey of the National Wild Turkey Federation yielded some interesting results. Over the years 33 states have released some 133,000 *game* farm turkeys. Nearly every release failed to establish a lasting population. Turkeys of game origin now occupy 685 square miles of land in the United States.

The study showed that the same states have live-trapped and transferred about 26,000 wild birds. True wild turkeys and their descendants now occupy over 300,000 square miles of habitat.

The obvious conclusion of this and many other studies is that game farm turkeys are inferior to wild stock genetically, behaviorally, and in their ability to establish self-

sustaining populations. Game farm birds are undesirable from aesthetic and management standpoints. Their release into the wild should be prohibited by law; in many states (including New Jersey), game farm bird releases are prohibited.

Unfortunately, many people do not realize that innate differences exist between wild and game farm turkeys. To help increase wild turkey populations, they purchase a dozen pen-raised birds and release them. Nothing could possibly hurt our growing turkey population more than the introduction of game farm turkeys.

New Jersey's wild turkey population is now over 200 birds. Live-trapping and transfer of turkeys from the flock in Sussex County has already begun. Wild turkeys have been released at two sites in Warren County. Over the next decade transfers of turkeys to suitable range will continue. Reestablishing wild turkeys throughout the state will take time, but the results will be worth the wait.

A bird in the hand isn't necessarily better—especially if that bird is a game farm wild turkey! □

*try
it
you'll
like
it*

BY CHARLES PIEDL



Author with Chuck

PHOTOS PROVIDED BY AUTHOR

"Well, I suppose it's all right I guess, but what good is it? You can't use a rifle in Jersey!"

"Whadaya mean!" I replied in mock indignation. "That shows how much you know!"

The occasion was my showing to a friend of a newly acquired second hand rifle. It was a Marlin #57 cal. 22 magnum fitted with a Bushnell 4-power scope. Although this model has been out of production for several years, this one was in mint condition. While perhaps not the best rifle-scope combination, this one, having been fitted with a braided leather sling, plus the case, was a bargain too good to pass up.

"To begin with," I continued, "no dyed-in-the-wool sportsman can own too many firearms!" My conscience and I had long ago fought out the battle over what was practical and what would be nice to have, and I won. Well, almost.

"Furthermore," I pointed out, "ground hogs may be hunted with a rifle."

"Ground hogs?"

"Yes, you know, woodchucks!" I replied.

"Aw, c'mon! Nobody hunts ground hogs in Jersey."

The foregoing conversation, which occurred some time ago, serves to underscore the fact that the ground hog is a little-utilized game animal. (The New Jersey woodchuck season in 1979—March 24 to September 29.)

In talking with various individuals, so often you hear laments like, "there's no place to hunt," "I went out a couple of times and only got a rabbit," or "a license costs ten bucks, it ain't worth it," and so on.

There are almost unlimited possibilities in New Jersey for the serious-minded sportsperson (there is a growing number of gals that enjoy getting outdoors with their guy), and the woodchuck is just one of them. Many farmers will grant permission to rid their land of this fellow—but don't wait for opening day, do some preseason scouting.

With regard to not bagging your limit on rabbits, bear in mind even ol' brer fox doesn't depend solely on rabbits, and he's a pro. But the real bargain is the ten-dollar license. If you divide the license fee by the hours of recreation it provides, well I think you'll get the idea.

In addition to the aforementioned current license,

you'll need a woodchuck rifle permit, and prior to obtaining the permit, you'll need to complete a Rifle Safety Course. This information can be obtained from your district Conservation Officer.

The selection of equipment, of course, is largely a matter of personal choice. Woodchuckin' in New Jersey, especially in the southern half of our state, where I do mine, is quite unlike that of neighboring Pennsylvania, where one can find open rolling vistas of pasture and meadow where three-and even four-hundred-yard shots can be found. The rifle permit is not valid in the counties of Atlantic, Cape May, Cumberland, Gloucester, and Salem, which leaves us with Camden, Burlington, and Ocean counties.

Because of the many densely populated areas, even though there are many rural areas in these counties, I hesitate to blast away on someone's back forty with such calibers as the .222 or 6mm Rem. Although these high-speed bullets break up well on impact with minimal danger or ricochet, their noise level might be irritating to residents. The 22 cal. long rifle hollow-point has little muzzle blast, but clean kills on chucks require head shots, and the long rifle leaves much to be desired beyond 60 or 70 yards. In addition the .22LR is quite prone to ricochet due to its low velocity. This is why my choice is the cal. 22 WMR. From a bench rest I can consistently group a three-inch bull at one hundred yards. The velocity at 100 yards is 30 percent greater than the 22LR. The ricochet incidence with the 46-grain hollow-point is minimal, and the noise level is low. As to what type of rifle to use, here again it's a question of preference. Leading manufacturers have models available in both bolt and lever actions. The next piece of equipment needed is the scope. It is truly said by those who know, "buy the best you can afford." The very minimum should be a 6x. A 4x with its wider field of vision is adequate for deer hunting, but for chuck-sized game, a 6x will give better results. There is a vast array of variable scopes on the market today, 2x-7x, 3x-9x, but you'll find a 6x is well within the .22WMR's capabilities of 125 yards or so.

Binoculars are essential. You'll discover this your first trip afield. They will confirm a suspicious-looking dark form to be a stump, an upturned clump of earth, or a chuck. Again, there's no substitute for quality.

These are the three main ingredients, but of course there are a few accessories that will make your trip more pleasant. I carry a small folding stool which I attach to an army pistol belt when walking. I also have a canteen of water on the belt, which serves not only for drinking, but for rinsing my pocket knife and fingers after dressing a chuck. I've also affixed an army combat pack to the belt. It's compact in size, measuring approximately 10" x 10" x 6", and will accommodate a couple of sandwiches, ammunition, camera, film, and insect repellent.

This is not intended to be the final authority for chuck hunters, but to give the reader some food for thought. Secure your license and permit, take your scoped rifle down to the range and get zeroed in, get your gear together, and start visiting farmers. After all, you want your ten dollars worth, don't you?

Tools for the Job



Left to Right: 6mm Rem., 222 Rem., .22 WMR. and .22 LR



Now That You Got Your Chuck. . .

It is important to field dress your chuck immediately to prevent spoilage, especially in warm weather. A cheesecloth bag will provide aeration as well as insect protection. Keep it out of direct sunlight, and try to finish cleaning and get it in refrigeration within 4 or 5 hours—sooner if it's a hot day. When dressing the chuck be sure to trim off as much body fat as possible, and be sure to remove the small yellowish kernels from under the front legs to prevent a gamey taste. Cut up, salt, roll in flour and brown in hot fat. Then place in pressure cooker with a half inch of water in the bottom. Cook for 70 minutes at 15 lbs. of pressure. The meat will fall from the bones. You can serve as is, or mix with your favorite noodle casserole. □

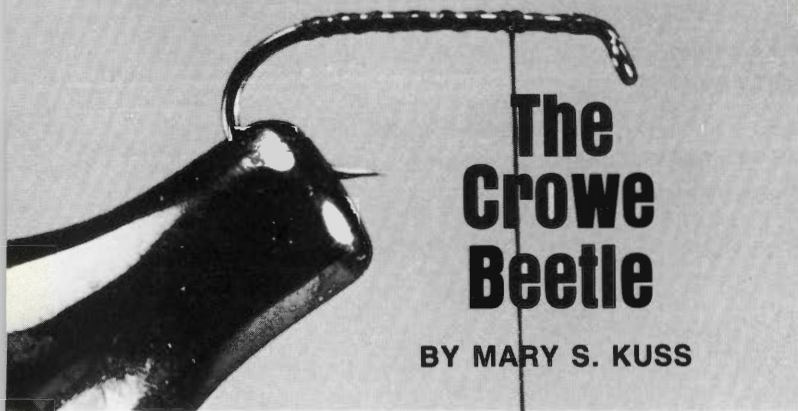


FIG. 1

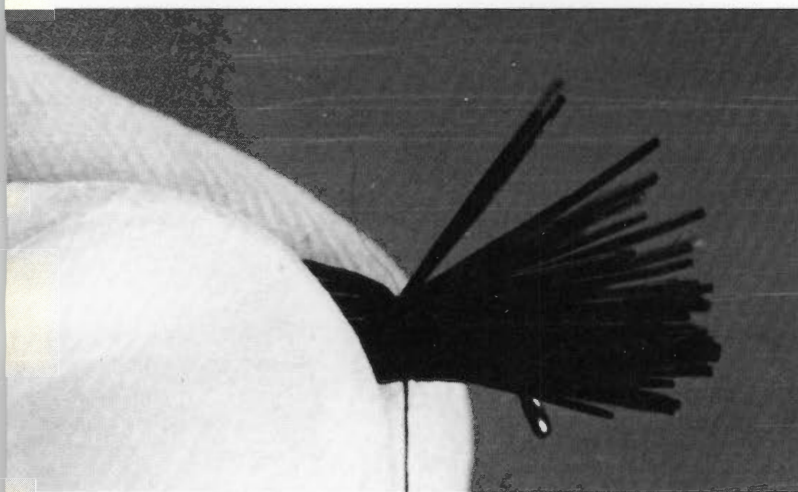


FIG. 2

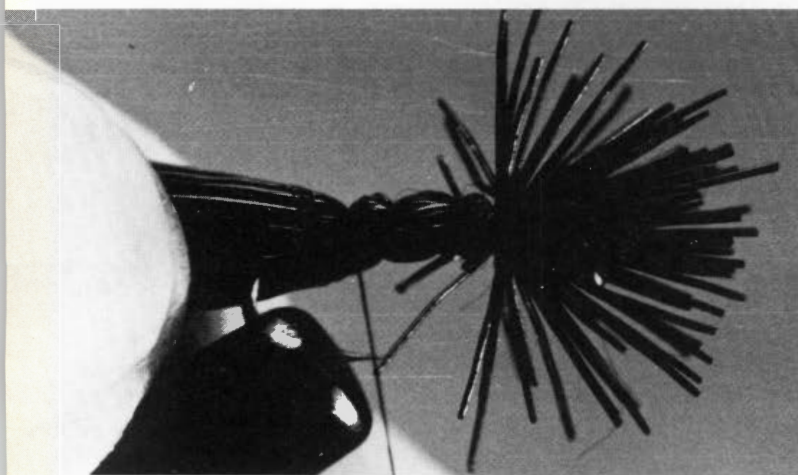


FIG. 3

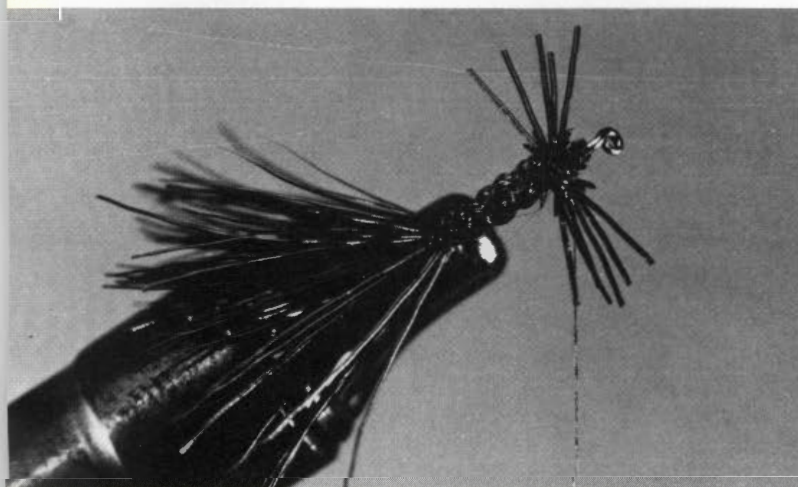


FIG. 4

For the dedicated fly fisherman who continues to go astream throughout the summer and fall, fly patterns imitating terrestrial insects play a central role in late-season strategy. Gone are the gullible, freshly stocked trout of spring. The number of hatching aquatic insects is diminished, while populations of terrestrial insects are peaking. Many of these land-based insects find their way into the stream. They are of numerous types, shapes, sizes and colors, ranging from large grasshoppers and moths to almost microscopic ants and leafhoppers. All are grist for the trout's mill. Especially through the middle of the day, many fish will hold along the stream banks under overhanging vegetation enjoying shady relief from the heat and waiting for tasty terrestrial morsels to drop into the water or be carried to them by the current.

It has been the experience of your author that such fish are rarely selective to a specific insect. They are usually feeding opportunistically on whatever chance brings their way. A large bushy dry fly, however, is not likely to be effective in this situation. Remember that the late-season fish has seen a parade of such flies go by, and perhaps had an unpleasant experience or two with them. If the fish is keying on anything, it is probably a low-floating food item that doesn't look too out of place with the naturals upon which he has been feeding lately.

Based on the theory that selective feeding is the exception rather than the rule, your author relies heavily on a single terrestrial pattern—the Crowe Beetle. Although the angler must be prepared to change to another pattern if a steadily rising fish refuses his offering repeatedly, the Crowe Beetle is a good pattern to start off with, and a good "searching" pattern, to be used when fishing the water rather than working to a specific rising fish.

The Crowe Beetle is relatively simple to tie; its construction requires only tying thread, hook, lacquer, and deer body hair. Its only major drawback is its lack of durability. The deer hair is easily shredded by a trout's teeth. This would be a major fault if an expensive, purchased fly, but is easily forgiven if you tie your own, especially considering its ease of construction and the inexpensive materials needed.

The standard color for the Crowe Beetle is black, but grey, tan, brown, yellow, green and white have all been

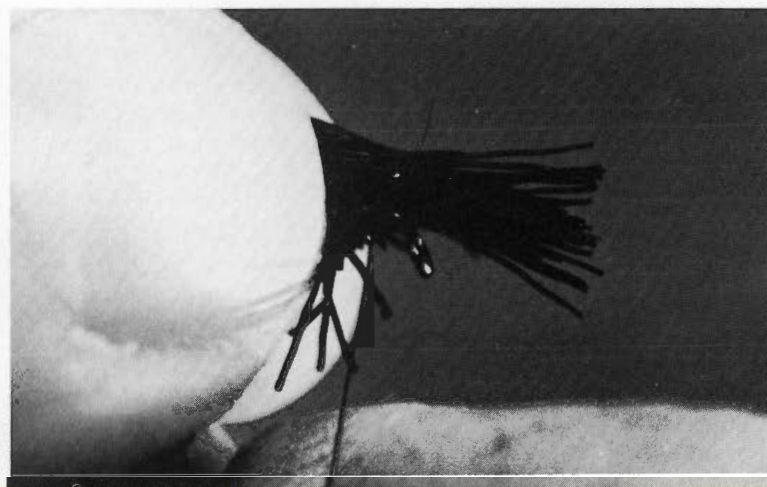


FIG. 5

used successfully. The usual size range is #12 through #20. This fly should be fished on a long leader (12 ft. minimum) and with tippets of 5X or smaller, as befits the conditions of low, clear water and cautious fish that are likely to be encountered in the late season. Runs and current tongues along overhung stream banks are the most productive locations. The angler should work his way upstream, casting from the bank if possible, or wading very slowly and stealthily to avoid alarming the fish. Careful stalking will permit a closer approach to a rising fish or a promising spot, allowing the use of a shorter cast. A shorter cast, in turn, makes for easier line control, helps keep the fly from dragging, and facilitates setting the hook.

Crowe Beetles are also good panfish flies, in lakes and ponds as well as in streams and rivers. Tactics for panfish in moving waters are similar to those for trout, except that panfish generally hold in deep pools and slower water than that preferred by trout. In ponds and lakes, as in streams, banks with overhanging vegetation are prime locations. Also try fishing around lily pads and stumps. On larger lakes, fish the shorelines toward which the wind is blowing, since that is where floating insects will accumulate. Fish often gather in such areas to feed, and their attention is focused on the surface. In still water, cast the fly to a likely location and allow it to sit for a while. Next, give it a couple of slight twitches. Now move the fly a few feet, very slowly, and repeat the sequence. Keep the fly on the water as long as patience will allow before picking up for another cast. Remember, a fish can't take your fly while it's in the air. Good luck!

TYING THE CROWE BEETLE

Materials required:

Hook: Regular dry fly, Mustad #94840 or equivalent, sizes 12-20

Thread: 6/0 Pre-waxed nylon, color to match body material

Body, legs and head: Hollow deer body hair, black or any color desired

Procedure:

(Note: Instructions are for a size 12 fly. Dimensions will vary according to hook size. Amount of deer hair used will depend on hook size, coarseness of the hair, and

the technique and preferences of the tyer.)

Step 1: Place hook in vise, attach thread at head position, wind back to tail then forward to shoulder. Apply lacquer to shank. (Fig. 1)

Step 2: Select a clump of deer hair about 3/16 inch in diameter. Hold the clump of hair by the tips and remove underfur and very short hairs by stroking the hair butts with the fingertips or an old toothbrush. Trim hair tips off to facilitate handling.

Step 3: Tie in the clump of hair at the shoulder position, allowing about 1/4 to 3/8 inch of hair butts to extend forward over the hook eye (Fig. 2). Make several tight turns of thread at this point to secure the hair firmly to the hook shank. Don't tighten too quickly, or the thread may cut through the hair.

Step 4: Now hold the long section of the hair to the rear of the fly and make even turns of thread toward the hook bend, bringing the hair to the hook shank (Fig. 3). At the tail position, make several tight turns of thread, then wind forward again, returning the thread to the shoulder position.

Step 5: Pull the short butts of hair back and take some turns of thread in front of them to make them stand out at right angles to the hook shank. Trim away all but a few hairs on each side of the hook to suggest legs (Fig. 4).

Step 6: Next, pull the long section of hair forward over the top of the fly and bind it down in front of the legs (Fig. 5). After the hair is well secured, take a few turns of thread ahead of the tie-down point. Cut the excess hair off even with the point at which the hook shank meets the eye.

Step 7: Finally, finish your Crowe Beetle by tying off the thread with a whip finish or half-hitches. Lacquer the head and all exposed thread. Give the back of the fly a light coating of lacquer, vinyl cement, or thinned rubber cement to increase durability.

(Fig. 6).

The tying procedure may be modified in a number of ways, one of the most useful of which is to trim away *all* of the short hair at the shoulder in step 5 and form the legs by cutting 3 or 4 hairs at the tail position on each side of the body and pulling them forward. This is done after the whip finish but before final lacquering of the head and shellback. □



FIG. 6 (SIDE VIEW)

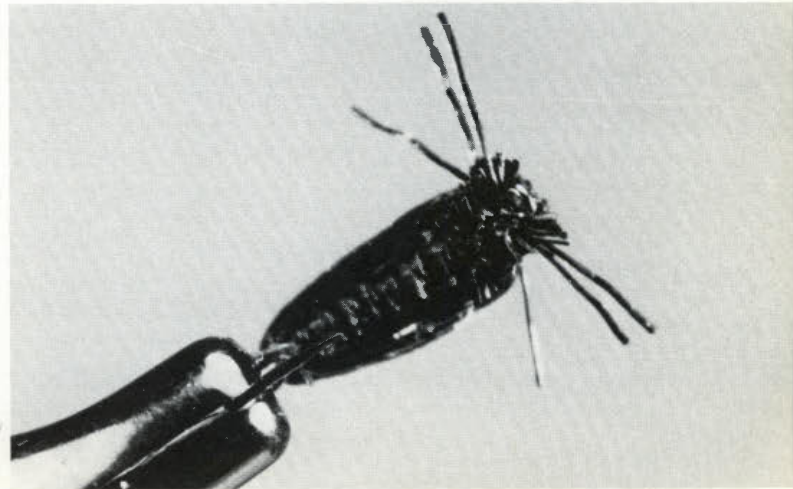


FIG. 6 (BOTTOM VIEW)

The Colorado Potato Beetle (in New Jersey)

ROBERT R. FALES

Associate Science Writer, Schering Corporation

When I first saw the fat, red grubs munching on the vegetation in my back yard, I was puzzled. According to my copy of *The Gardener's Bug Book*, they were the larvae of the Colorado potato beetle; but what were they doing in central New Jersey—and miles from the nearest potato patch, at that? Closer inspection of the plant that they were so merrily defoliating revealed it to be *Solanum dulcamara*, a species of nightshade. Well, that made sense; the commercial potato, upon which the beetle wreaks such economic havoc, is *Solanum tuberosum*, a “domesticated” member of the nightshade family. A little library research provided the information on how this once obscure insect came to be a resident of the Garden State and an international pest.

In 1820, American engineer and wilderness explorer Stephan Harriman Long set out to find the headwaters of the Red River, unaware that he would make a discovery of much greater importance to future generations. During his travels, Long encountered on the high plateaus at the foot of the Rocky Mountains populations of pretty white-and-black and yellow-and-black striped beetles that fed on a sparse and scrubby weed called sand bur or buffalo bur (later named *Solanum rostratum*). When the buffalo bur beetle, as it was then called, was formally described in 1824, neither it nor its food source was particularly abundant. The beetle was named *Leptinotarsa decimlineata* and quickly forgotten.

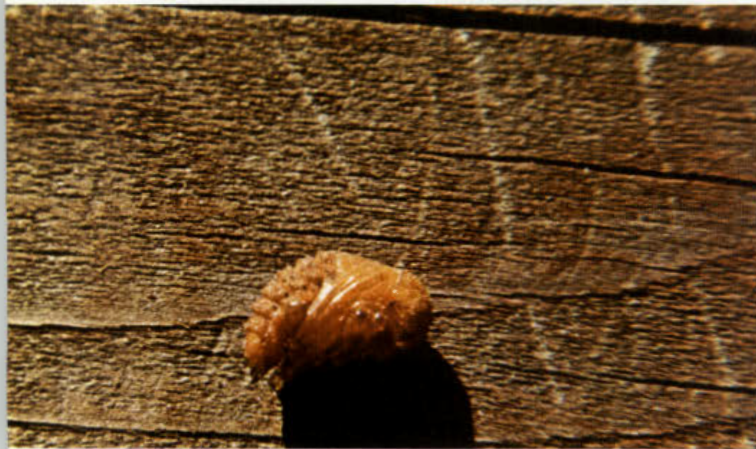
In the 1850s, there occurred a westward migration of large numbers of pioneer settlers; one of the crops that accompanied them was the potato. Large tracts of land were devoted to growing the plants, and clusters of potato fields could be used to mark “the way West” as well as any rutted wagon trail. Eventually, the settlers approached the Rocky Mountains and the austere domain of the buffalo bur beetle. Being a strong flier, the beetle had probably been foraging for years outside of the restricted habitat of its only food source, but always unsuccessfully. When it finally encountered potatoes, however, the beetle found the new nightshade to be at least as tasty as its traditional fare and much more plentiful. It emigrated! Beetle numbers in the potato fields grew rapidly in response to the acres of undisputed available nourishment; the beetle's range expanded. The



A cluster of eggs on the underside of a nightshade leaf.



A larva lunches on *Solanum dulcamara*.



A pupa unearthed from its underground resting place.



An adult Colorado potato beetle stalks an unsuspecting leaf.

potato bug, as it became known, was a recognized pest in Nebraska by 1859. It appeared in Illinois in 1864 and in Ohio in 1869. By 1874, New Jersey and the rest of the mid-Atlantic states were part of its new home. The beetle had moved eastward at a rate of 85 miles a year over a living bridge of potatoes. From field to field it had migrated, frequently destroying entire crops by stripping leaves and stems from the haulm (above-ground part) of the plants, thus preventing the development of the subterranean tubers. The beetle spread northward into Canada and southward into Texas and northern Mexico. It even traversed the ocean and was identified in the Gironde region of France in 1922. It has been a source of irritation to European farmers ever since.

The success of the Colorado potato beetle is largely due to its ability to live outdoors anywhere that potatoes or other suitable nightshades can grow, and to the absence of an effective predator or parasite. During the inhospitable months, be they hot or cold, the adult beetle can survive by hibernating 12 inches or more underground. When the weather turns fair, the adults emerge and fly about in search of food. On the undersides of leaves, the females lay clusters of yellow or orange-yellow eggs that hatch in four to

seven days. The red, humpbacked grubs feed voraciously for two to three weeks until they are approximately half an inch long, then they burrow into the ground to pupate (transform from larvae into adults). Ten to 15 days later, the new adults emerge from the pupal skin. At first, they are the color of egg yolks and almost as soft. After several hours, they harden; their convex backs are scored by ten longitudinal black stripes and their thoraxes and abdomens become bright orange or crimson shields tattooed with inky spots. They make their way to the surface to continue the meal that was interrupted a fortnight earlier—and to breed. In our area, two new generations can be produced easily during the summer, and the adults that appear in September form the nucleus of next year's population. Because of the large numbers of eggs produced and the rapid succession of generations, one vernal female may have thousands of autumnal descendents. Although at least 30 different species of insects alone attack the Colorado potato beetle in one way or another, no biological agent has proved capable of controlling its numbers. Unfortunately, the use of insecticides remains the most effective large-scale measure against this agricultural pest. □

ANNOUNCING the publication of a book on the VERTEBRATES OF NEW JERSEY.

VERTEBRATES OF NEW JERSEY, Edmund W. Stiles, Department of Zoology, Rutgers University.

This paperback volume treats all the vertebrates of New Jersey except the marine fishes. Freshwater fishes, amphibians, reptiles, birds, and mammals are treated in annotated checklists, and keys for identification are provided for all groups except the birds. The volume also includes information on the derivations of scientific names, techniques for specimen preparation, a taxonomy of living vertebrates of the world to the family level, and an extensive bibliography on vertebrate evolution and natural history.

This "no frills" reference volume will be very valuable for anyone interested in the serious study of New Jersey vertebrates. It is a workbook for professionals in this field—not a handsome book for adorning bookshelves.

Please Order From: Dr. Edmund W. Stiles, 158 Runyon Avenue, Somerset, N.J. 08873.

Price: \$6.90, N.J. tax .35, postage and handling .75, total cost \$8.00.

The Department of Environmental Protection is offering a 3' x 4' environmental map of New Jersey printed on semi-transparent paper.

The map describes the habitat requirements of 23 of the state's most important marine fish and shellfish species. Depicted are many of the spawning, wintering and summering grounds, migration routes, range limits and shellfish beds of the described species.

In addition to biological information, the map delineates major wildlife areas, CAFRA boundaries, tide heads, oil lease grounds and depth contours.

This is an excellent reference map and ideal for environmental education and classroom instruction. It is not, however, a fishing guide or map for anglers.

This map, entitled Fisheries Map, is available by writing to:

Map and Publication Sales
Bureau of Geology and Topography
P.O. Box 1390
Trenton, N.J. 08625

The cost is \$3.00 per copy. Checks payable to: Treasurer, State of New Jersey.



Least tern on nest

PHOTOS BY AUTHOR

THE LEAST TERN

JOAN GALLI

Nongame Biologist

The smallest tern in North America, the least tern is one of New Jersey's most graceful and elegant summer residents. It also is one of the state's most beleaguered and rapidly disappearing birds.

Only nine inches in length, the least tern has earned the name "sea swallow" because of its quick, darting flight, tapered body, and forked tail. Its white belly and throat, pearly gray back and wings, and yellow legs—features shared by others of its family—create the subtly, yet elegant appearance characteristic of all terns. The small size, black-tipped yellow bill, and black cap with a white forehead patch distinguish the least tern from the common, royal, gull-billed,

Forster's and black terns which also occur seasonally along the New Jersey shore. The shrill "yik-yik" call of the least tern is a sure sign to all bird enthusiasts that summer is coming.

Least terns are seasonal residents here. Arriving in mid-May from their wintering grounds in Central and South America, they come, like the tourists, to summer at the "Jersey shore." However the birds, unlike the humans who descend on our beaches during the summer, do not spend their time enjoying the good life and loafing in the sun. On the contrary, they are actively involved in the demanding task of raising a family—defending a nesting territory, feeding the young, and trying to withstand the adverse effects of weather, winds, tides, and predators.

The nests, called "scrapes," are merely hollowed-out impressions in the sand. Two to four cream-colored, speckled eggs are laid in the nests which are preferentially located on the open beach in shell strewn, gravelly sand. The terns prefer to nest where there is no vegetation, although they need sparse grassy areas nearby where they can take their chicks for safety and shade in the period between hatching and fledging (flying stage).

Species such as the least tern which depend on bare sand for nesting, occupy a precarious niche. In many areas, beach erosion has considerably reduced the amount of natural sand above the high tide. To some

extent, this natural loss has been offset by man's creation of artificial nest areas on dredge spoil sites. The least tern is adaptable, and can quickly locate a newly created nest area. However, bare sand is a temporary condition. Because of the growth of dune grass and other vegetation on the beach fronts, sand nesters are frequently forced to move every few years to unfamiliar and perhaps unsafe locations.

Another disruptive force for nesting least terns is the weather, which is never kind to ground nesters. During severe summer storms, least terns are subject to blowing sands and flood tides which often force the adults to abandon eggs and young to preserve their own lives. Least terns are, however, well adapted to survive these natural adverse conditions. Persistent renesters, they almost always have some success despite storms, and predation by owls, gulls, night herons, peregrine falcons, dogs, cats, and rats. What they cannot tolerate and adapt to is human activity and interference at their nest sites.

During the mid-1800's, least tern bred abundantly along the New Jersey shore. However, the period 1880-1890 saw the virtual extermination of the tern owing to collection of the adults for the millinery trade. With the passage of protective legislation in the early 1900's, the terns made a slow comeback. By 1930, least terns were once again common, although nowhere did they occur in their former abundance.

Recent review of the status of the least tern in New Jersey indicates that the long-term population trends are again seriously downward. In 1974, only 16 colonies with a total of just 410 nesting pairs were located in New Jersey. Production in all but two of the colonies was reported as poor to zero. The warning flag was up and concern over the status of the least tern prompted personnel from the New Jersey Division of Fish, Game and Shellfisheries' Endangered and Nongame Species Project to undertake a research project designed to determine the present population of least terns along the coast and the factors limiting successful nesting. A more comprehensive air and ground survey involving division personnel, state conservation organizations, and concerned individuals revealed 24 colonies of 694 pairs in 1976. In 1977, 26 colonies with at least 940 pairs were reported by the surveyors. The increase in number of nesting colonies found is a misleading indication of the population trend. It reflected more-careful searching on the part of the surveyors, not increasing numbers of terns. Closer analysis of the data revealed that traditional nesting sites were disappearing at the rate of nearly 10% annually. The terns' reproductive success—the number of young birds which annually spread their wings and fly south at the end of the breeding season—was found to be low.

Once again, the cause of the least tern's decline appeared to be human disturbance. Three colony sites



Least tern eggs camouflaged by shells and sand.

surveyed in 1978 may well disappear in the next few seasons as housing developments are planned on the exact spots where the terns have struggled to raise their own families. One site is slated for casino development. Many colonies are on temporary dredge spoil sites which are gradually being covered by unacceptable vegetation. All the colonies are under pressure from people who carelessly use the beaches for picnics, dog walking, and as freeways for motorized vehicles without any thought for the impact of their activities on the beaches' wildlife. Bathers, boaters, and beachcombers roam through the colonies crushing the well-camouflaged eggs. Because they scare the adults off the nests, these human intruders become unconscious predators as the unprotected young then fall victim to scavenging gulls and to the scorching sun. Flooding is also a serious hazard to tern colonies. In 1978 an estimated 1800 adult birds produced only 380 young. The flood tides of July 4th destroyed many nests.

In December 1976, the seriousness of the situation revealed by the years of study prompted the Atlantic Audubon Society to propose the least tern for endangered species designation in New Jersey. In September 1977, the New Jersey Endangered and Nongame Species Advisory Council, acting on information provided by state biologists, unanimously approved the recommendation. In March 1979 the least tern was declared an endangered species in New Jersey. Such a designation has made the state's program to survey, monitor, and protect the least tern eligible for two-thirds matching funds under the federal Endangered Species Act of 1973. Such funding, it is hoped, will provide the necessary manpower to implement the management alternatives needed to reverse the decline in the least tern populations. Through a long-term program of habitat surveillance, protection, and public education, the elegant and graceful least tern may yet successfully coexist with the summer tourists on New Jersey's warm and sunny beaches. □

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SALT MARSHES

hatch anyway. The grass over the nest has been bent by the rails to form a roof, providing a screen both from the searing sun and from hungry predators such as Crows and Herring Gulls, which often course over the grass in search of eggs left uncovered. Unlike gulls, rails nest solitarily, spaced out over the marsh, as do sparrows, Willets, Oystercatchers, and ducks.

By May the marsh is teeming with nesting species. Laughing Gulls have arrived in the thousands to nest in the *Spartina alterniflora* areas. This grass species grows in the low areas of the marsh which daily are inundated by the tides. The gulls select the higher areas, however, and construct large, platform nests for their three eggs. In years of very high tides, they move into the higher *Spartina patens*, or even into the grass beneath bushes. Their chicks hatch by early June, and are difficult to find in the grass, now grown tall. The grass seems to stretch unendingly in all directions swaying silently in the breeze, giving no hint that the beach only a mile or two away is covered with blankets, bikinis, beer bottles, and bathers.

Salt marshes attract myriads of spring shorebirds bound for farther north to breed on the tundra. Their silver and white bodies sparkle in the sun as hundreds probe for food amid the shallow water in tide-covered marsh. Low tide finds the flocks feeding amid the algae-covered mudflats bordering the marsh. Only the Willets and Oystercatchers feed alone, indicative of their intention to stay behind in solitary pairs, spaced over the marsh.



Salt marsh islands nestled behind the barrier beaches that are crowded by people.



Common Terns flying above a colony disturbed by people wandering about.

Common Terns and Black Skimmers also come to the salt marsh, nesting on the windrow of grass strewn there by winter storm tides. They nest in colonies of a few to several hundred pairs. Many islands they select are low, and subject to flooding by storms and high tides. They have been forced from the high, dry, sandy beaches by people, and from some of the high salt-marsh islands by Herring Gulls. Considerably smaller than Herring Gulls, they cannot displace the gulls that arrive on their breeding colonies two months before them. Further, they cannot defend their eggs from Herring Gulls, and some colonies are completely destroyed by the gulls. A survey of 56 miles of coastline in Ocean County showed that few unused islands are available for further use by terns. If forced off their present colonies, it is unclear where they will go. Although all salt marshes may look alike to us, they obviously are not alike as far as the terns are concerned.

At the end of the tern colony a larger nest, the Oystercatcher's, guards the colony—but guards it for its own purposes. For many tern eggs have been slit and eaten by the Oystercatcher. Their noisy chatter is a common sound in the marsh. As one pair flies up from its territory, a bird from an adjacent territory takes up the flight, calling continuously.

Nestled within the salt hay, a Willet nest shelters three eggs and one gangly chick only an hour or two old. Barely able to balance atop its long legs, its feet seem as large as its head. The chick's awkwardness is deceptive though, for it darts quickly away through the grass, and freezes against the marsh upon hearing the staccato, repetitive call of its circling parent. Unlike the chicks of gulls, terns, skimmers, and herons, those of Willets and Oystercatchers can feed themselves upon hatching. The brood thus leaves the nest when all have hatched, and wanders about in search of food. When disturbed by people or other predators, the chicks scatter and freeze, to be called together by their parents when all is safe. All species have evolved protection against predators: Colonial species rely on their ability to chase predators away



Many New Jersey heronries are located in bushes.

by mobbing them in groups, and solitary species rely on camouflage. Hen ducks, for example, sit silently on their nests until you are very close—so close that I've caught them with my hands. Upon departing, female ducks usually cover the eggs with down, making them even harder to see.

Old hunting shacks and docks are scattered about the marshes, their rustic old beams blending in, providing balance and contrast. But they also provide nesting sites for Barn Owls, Tree Swallows, and Barn Swallows. Living in such a cabin for several summers, I grew fond of the patter of tiny Barn Owl feet in the loft above, and the chatter of young Barn Swallows nesting below the floor only inches above the tidewaters below. Myriads of salt marsh insects provide a constant food source for these young swallows. Old phone poles and shacks also provide nesting sites for Ospreys, an endangered species in New Jersey, but one that is increasing thanks to the efforts of our conservation personnel. An Osprey gliding down to skim the water, capturing a fish, and soaring swiftly to its nest nearby is an integral part of the dynamics of a healthy salt marsh. Though few in number, they add to the complexity, and thus the stability and health of the marsh.

Tucked in the higher areas of the marsh, bushes and reeds provide nesting sites for colonies of herons, egrets and ibises. Again these species have often been displaced from nesting thickets on the barrier beaches, and find refuge in the marshes. Some arrive as early as late March, but nesting usually begins in early May. Chicks hatch in June, and soon climb about in the bushes when disturbed. If they wander

far, they get lost, and many die because of the curiosity of people wandering unknowingly through their colonies.

The sweltering heat of July is endured by most species as it is the last few days of their vigil over their young. The annoying greenhead flies and mosquitoes must be ignored. Sometimes a faint breeze brushes the grass, relieving the heat, removing the flies, reminiscent of the cool, rainy winds of earlier days, reminding one of the cold chill that will set in soon enough. But before winter comes the salt marsh will assume colors of reds and yellows. Even the saltwort, *Salicornia*, which used to be pickled and canned by the early settlers, will turn a bright red. The midsummer marsh once again teems with shorebirds, this time bound for the warm shores of southern beaches and marshes. Still later ducks and geese will come in droves, to winter, or go still farther south. Even in winter the grey marsh harbors hundreds of Brant, slowly munching their way across the marsh, leaving it clipped short. The old hunting shacks that dot the marsh now seem their age—old, deserted, and grey. But I still remember the marsh as the sun rises in July, casting a pink glow over the expanse of swaying grass, revealing the hundreds of birds still free to use the marsh. Not a wasteland at all, but a haven for waterbirds throughout the year.

The author wishes to acknowledge the many hours spent wandering about salt marshes with F. Lesser and M. Gochfeld, in fruitful discussions and pleasant discoveries. G. Costa and E. O'Malley graciously provided their shack and Clam Island, where I have lived amid a salt marsh. □

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more on snakes

strated before a permit will be issued. A brief introduction to snake care follows.

HOUSING

The keeping of reptiles and amphibians is known as the *vivarium* hobby. Generally, it involves keeping reptiles and amphibians in glass tanks and wooden, fiberglass, or metal cages. These holding facilities can take many shapes and sizes and be specially designed to accommodate the habits and requirements of the various reptiles to be kept.

As a general rule, most reptiles and amphibians should be kept in an environment which best represents their natural habitat. Most reptiles require dry surroundings. It is a good idea to provide a substrate which is dry at one end and moist at the other and to make certain that an adequate level of relative humidity (10-25%) is provided.

Some snake fanciers prefer a dry vivarium, which is constructed by

first filling the bottom of a glass tank with an inch of dry pebbles to facilitate drainage. Next, about a half an inch of charcoal is added, followed by an inch or two of sandy loam. Some small plants may be rooted in the soil and bark. Stones or other hiding areas should be provided.

However, one of the simplest snake facilities is the plain glass aquarium. Obviously, the aquarium should be of a size to accommodate the snake—a boa would obviously need a larger aquarium than would a small garter snake. Utilizing the proper size glass aquarium, several sheets of newspaper cut to the exact size of the bottom can be added to absorb moisture. This is quick and easy to keep clean by replacing when necessary. A water dish should be provided which is large and heavy enough not to be overturned. Sheets of bark, stones, tree limbs, or a cardboard box with holes provide hiding and climbing facilities for the snake.

Snakes must have access to clean drinking water at all times. They should also have a rough surface such as a piece of bark or a tree limb

to help them during their shedding process. *Every* snake cage should have a wire top which is secured with a padlock.

Maintaining the proper temperature is important when keeping snakes. Most of our native species can be kept at a year-round temperature ranging from 75 to 85 degrees Fahrenheit. During the hot summer the reptiles should be kept in a cool place and out of the sun's rays. In the winter, an electric light bulb and a shade or reflector may be required to maintain a healthful temperature.

FEEDING

Feeding snakes in captivity can be a tricky business. For example, the green snake feeds only on certain insects; this highly specialized diet may be impossible to obtain and most green snakes starve in captivity shortly after being purchased.

However, most snakes are carnivorous or insectivorous. The larger snakes and also many other smaller varieties feed primarily on warm-blooded animals. These snakes can exist on laboratory rats

Eastern Milk Snake



and mice which may be purchased in pet shops and laboratories. Unfortunately, these rodents can be expensive and it is frequently difficult to get snakes to eat in captivity.

The common garter snake, ribbon snake, and others will feed on salamanders, earthworms, frogs, newts, and even small fish. The different species of snakes have varied feeding preferences and some experimentation may be required to find an acceptable food. It is better to acquire an adult snake rather than a young one, as juvenile snakes are especially difficult to feed and raise.

Snakes living in the 75- to 85-degree range can be fed once a week. Remember never to feed a snake prior to hibernation as the food may lay in the snake's stomach, decompose and poison the snake. The best feeding time is just after the snake sheds.

The snake when properly cared for tends to be a healthy animal free from most ailments. Probably the most common problem with snakes in captivity is bacterial and fungal infections. One is a mouth canker or "rot" which attacks the gums and mouth tissue and even the bones in extreme cases; this appears as a cheesy substance and is usually fatal. Various mites are known to attack captive snakes, transmitting blood disease that may kill them. Always carefully inspect a newly acquired snake for signs of infection or disease before allowing the snake to come into contact with others in your collection.

Finally, avoid handling snakes any more than necessary unless they are extremely tame and relaxed. There is a special knack to handling snakes whereby the snake is held loosely allowing the coils to move freely. Sometimes you may have to permit the snake to crawl slowly from one hand to the other almost like you are climbing a rope hand over hand. Some snakes, such as the constrictors and climbers, will wrap around your arm as if holding onto a tree limb.

SNAKE BITES

The old adage "play with a snake and you get bit" is generally true, and all experts agree that the way to prevent a snake bite is to leave a snake alone. Almost all snake bites

occur because of amateurs handling snakes, or because of someone's failure to take the proper precautions while in the field.

Contrary to Western movies and greatly exaggerated stories, snakes do not seek out man. The scene of a snake crawling toward cowboys sitting around a campfire with murder in its heart and the hero killing it with a quickdraw shot from his .45 pistol is nothing but pure foolishness. Every snake would rather retreat than fight and given half a chance it will do just that.

In the United States a high percentage of snake bites occur during the handling of snakes kept in captivity. Despite the great publicity on the deadliness of venomous snake bites the records over the years indicate that 98 percent of envenomated victims recover.

Snake venom is yellowish in color and is secreted from glands on either side of the snake's upper jaw. It is injected through two hollow fangs. The amount of venom depends on the species and size of the snake, on how recently it has given an envenomating bite, and on whether the bite is offensive or defensive. Even a day-old rattlesnake contains sufficient venom to make a man ill.

Various snakes have different types of venom. The venom of New Jersey's venomous snakes is hemotoxic, affecting the bloodstream by destroying red corpuscles, preventing clotting, and digesting the tissue. There are also species, such as the coral snake, whose venom attacks the central nervous system; none of these species occurs in New Jersey.

The symptoms of a pit viper bite are an intense, burning pain and discoloration at the bite area, followed by swelling. Sometimes the puncture marks of the fangs may not be clearly visible and there may not be much bleeding. Actually, more bleeding is frequently caused by the bite of a large nonvenomous snake which rakes the skin with a series of sharp teeth.

About 90 percent of snake bites occur below the knee and occasionally on the hands and arms. A snake can strike 1/2 to 2/3 of its total length, so staying well away from a

venomous snake is the best defense should you encounter one.

Whenever the topic of venomous snakes is discussed, someone will ask, "What should you do for a snakebite victim?" The first answer is to immediately seek medical help from a qualified doctor, who has the knowledge and equipment to handle the situation. The well-meaning local "expert" may cause serious injury to the person he is trying to treat. However, if you are more than 30 minutes from a doctor or hospital the following treatment is effective in slowing down the reaction until you can get the patient to professional help.

First, make absolutely certain that the snake inflicting the bite was a venomous snake; otherwise, the treatment may be more damaging than the bite. Next, make certain that the patient is kept calm and do not administer alcohol; both excitement and alcohol cause the blood, lymph, and venom to circulate faster.

Next, apply a constriction band between the bite and the heart. This band should be loose enough to allow the insertion of a finger between band and skin.

The next step should be taken with great care. Use a sterilized razor blade or sharp knife and make a longitudinal incision about 1/8 to 1/4 inch long and about 1/4 inch deep at the site of the bite. Do not make multiple cuts or an "X", and do not make incisions on toes or fingers as such cuts may cause permanent damage.

Next, apply suction, preferably with the suction bulb of a snakebite kit, or as a last resort, with the mouth. Continue suction for 20 or 30 minutes. If suction is not applied within the first 20 or 30 minutes, it will be of little value in removing the venom.

Antivenin should be used only under a doctor's supervision as it requires intravenous administration by saline drip and may cause a severe allergic reaction. While traveling in snake country (in New Jersey that means the Pine Barrens and the northwest counties), you should carry a snake bite kit, available at reputable drug stores. It should again be emphasized that a snake bite victim should be taken to a doctor or hospital immediately and that

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HERB FARMING

and scents. My first test was one of the 85 varieties of scented geraniums: ooh-la-la, strawberry—more aromatic than the real thing!

Herbs are still used in dyes. Indigo, mater, and broom are sources of the three primary colors: blue, red, and yellow. And henna is still sold commercially as a hair dye—just as in the days of Cleopatra.

For the second leg of the tour, Cyrus showed the farm animals to

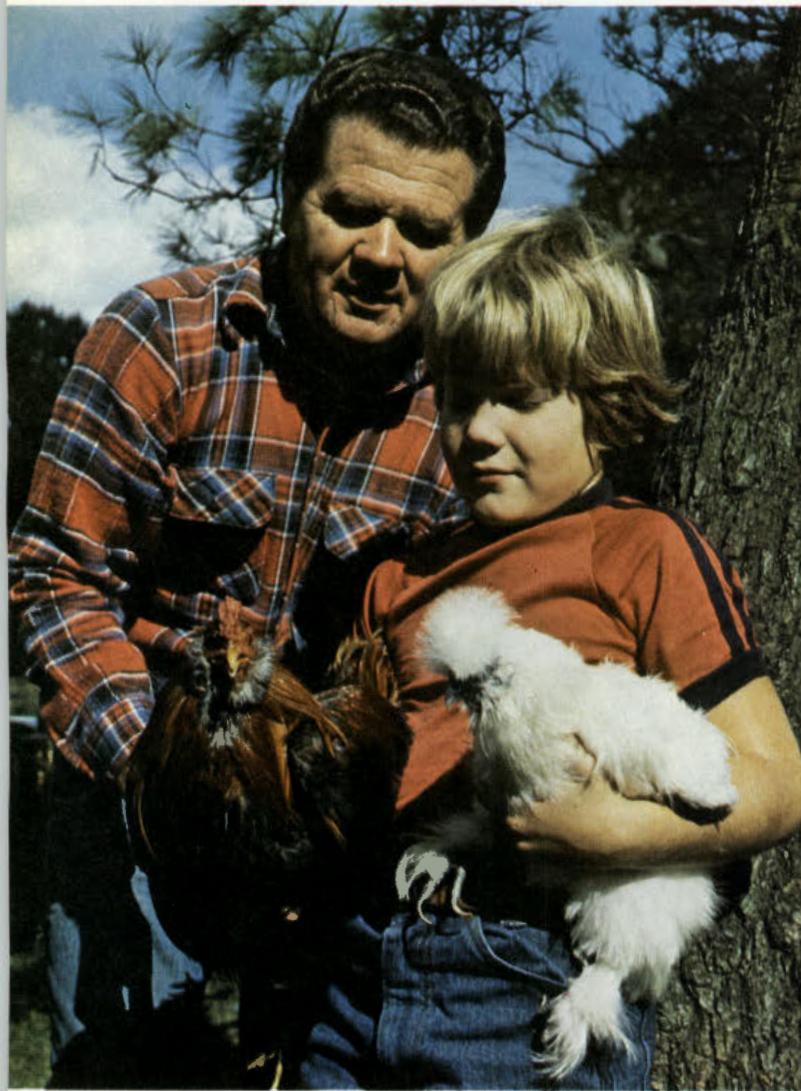
us—or maybe he was showing us to the farm animals. Nevertheless, they all seemed to greet us with varying degrees of disdain or good-natured curiosity. “We’ll slaughter the young pigs in the fall,” he said, as the oinkers grinned up at us from their muddy pen—oblivious to their keeper’s plans. Cyrus and his sons also breed fancy show chickens. His older son won a prize at a local fair last year for his silky white Bantam, a mass of proud white fluff. Presently they are breeding a chicken raised by the Chilean Indians, the Aracomma Bantam. Their dream bird will have no tails, rumps or tufts.

Inside the Hyde’s big red traditional barn, climbing to the top of

the dark staircase, our senses of sight and hearing were muted. The heady smell of herbs saturated the air in the high ceilinged barn. Cyrus switched on a single naked light-bulb. To our delight the entire network of rafters was covered with drying herbs and flowers. The variety of textures and colors was astonishing—from the velvety pink cockscomb flowers to the gray spikes of lamb’s-ear.

“This took a lot of hard work,” Cyrus quietly commented as he surveyed the ceiling bedecked with small parcels of plants hanging from white baker’s string. “We use no chemicals or dyes in our plants.”

The crucial point in drying herbs is deciding when to pick them and



Cyrus and son, Mark, with prize winning silky bantam.



Holly Hyde in herb drying shed



Cyrus picks flowers for drying

then finding a dark, dry place to hang them. The Hydes sell the plants individually or in basket arrangements.

Reluctantly we clambered down the stairs after Mr. Hyde and followed him along the hand-set brick path to the house. Inside we were given a glimpse of the family history and character through artifacts saved by Mr. Hyde, including the George Washington knee buckle. Other curios included a medicine server shaped like an Aladdin's lamp, 175-year-old Hitchcock chairs, and a caldron last used at a family anniversary party 75 years ago!

Seeing how much the family heritage has influenced Cyrus, we asked him if he thought his children would some day take over the farm. "They've expressed an interest in it," he replied with a pleased glimmer in his eye.

The Wellsweep Herb Farm is open for business Monday through Saturday 9:30 to 5:00, May through

September. After Labor Day, it is best to call ahead: (201) 852-5390 between 9:00 a.m. and 5:00 p.m.

The largest selection of herb plants is available around May 15th. (A shipping catalog is available for 35¢.)

The herb garden is in full foliage during July and August. The Hydes usually have two open houses each year—one in June and one in September. At that time they present lecture tours through the herb garden and drying shed. Local craftspeople also come to show their wares.

Eyes lit up with enthusiasm, Cyrus told us about his discovery that the soil on his farm seems to produce variegated effects in the coloring of many of his plants' leaves—from the common plantago to peppermint geranium to thyme—and about how he is nurturing those strains to produce more attractive plants. He has also successfully experimented with crossing the traditional purple-leaf basil with the miniature green-leaf basil to produce a hybrid miniature purple-leaf basil plant.

Cyrus was also keen on telling us about the many uses of the herbs for both culinary and medicinal purposes. "We use the petals (not the hips) of this rose to make a rose petal jam," he explained. Many of the herbs, especially the thirty or so mints that the Hyde family cultivates, are used for teas. Salvia, tansy, and fennel have been an age-old remedy for upset stomachs. Senna, a tall fern-like plant, is an organic laxative. Catnip, the favorite high of the feline set, has a relaxing effect on us human folks when brewed as a tea. Combined with fennel, it's said to cure colic.

The deadly nightshade plant, belladonna, is still used today as an antihistamine to keep patients from choking. Horsetail grass serves as a natural emery board.

Herbs have their place in history too, according to our guide: "The drink that Christ refused on the cross was a mixture of wormwood

and gall, the opium poppy." It's been said that some of the men working on the construction of the Panama Canal who escaped the malaria epidemic wore necklaces fashioned out of pennyroyal. An innovative customer at a herb farm recently said that he was buying the plants to protect his pool-party guests from the onslaught of Jersey mosquitoes by providing each of them with a pennyroyal boutonniere.

Myrtle and rue have their place in traditional European folklore. The custom says that a myrtle plant should be planted when a Polish baby girl is born, and rue for a Lithuanian baby. On the girl's wedding day a wreath made out of the plant should be worn for good luck.

The most popular herbs in Cyrus Hyde's garden are the cooking herbs romanticized in Simon and Garfunkel's remake of the old canticle, "Scarborough Fair": parsley, sage, rosemary, and thyme. Cyrus also suggests that you'll be hooked once you've tasted lovage, a hardy celery, in potato salad. Savory is great in bean dishes, oregano in tomato salads, and woodruff, a ground cover, makes a fine German May wine.

Herb Garden Tours are available to groups of 12 or more people; there is a charge of \$1.50 per person and reservations are necessary. Given during the growing season (May-October), the tour is a guided lecture walk through the herb garden and dried flower shed. An herb punch is also served.

Club Lectures are available upon request from October through February. The program is about the history and uses of herbs and dried flowers. Growing conditions, recipes, garden design, etc., are also covered in this informative lecture.

How to get there: From route 46 or route 78 take route 31 to route 57 eastbound. Follow route 57 to the first blinker light and turn left onto Port Murray Road. Go through the small town of Port Murray and bear left onto Mt. Bethel Road. Wellsweep Herb Farm is one mile down the road on the left. □

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LITTLE ORCHIDS

Of the 13 orchid species I've found in various environments within the Pine Barrens, nine occurred in the bogs. Here the White Fringed Orchid, *Habenaria blephariglottis*, provides the best display with its tall spikes carrying heads of 50 or more pure white blossoms having fringed lips, each a tiny masterpiece of nature's exquisite art.

This species is dependent upon a specific mosquito and a tiny metallic blue-green wasp for fertilization. I've noticed that in seasons requiring considerable spraying for mosquito problems, the plants produce very few, if any, seeds.

Like the *Arethusa*, the White Fringed Orchid is limited to a narrow stratum of the sphagnum growths with its crown about six inches above the muck base, set rather deeply in the sphagnum to support the tall spike. The roots are fleshy and rather sparse, with quite a few mycelia-like hairs about them, probably indicating another fungus relationship.

As bogs become drier in the ecological process termed "suc-

cession," this orchid persists longer than the others, but disappears when the area becomes a meadow. Its growth cycle is too long to survive mowing and its light requirements preclude its survival in deep shade or in full sunlight.

A closely related species, much smaller in size and yellow-orange in color, is the Yellow Crested Orchid, *Habenaria cristata*. It is often found near the white fringed species but at a slightly higher elevation. It requires moist, rich humus covered with a sphagnum layer, and moderate shade during the heat of the day. It often is found along roadways hiding in coarse grasses that the mowing machines can't reach because of the treeline. Such accessibility is unfortunate, making it so easy for botanists to collect specimens that there are more *cristatas* in herbaria than in the wild. Photographers, too, can be unkind monsters, trampling the vegetation about the specimen they've selected, tearing out shrubs and protective cover in order to have a clear view and good light, then leaving the plant exposed to the rigors of civilization. Little wonder that it is an endangered species.

At the southern tip of New Jersey, in a bog within a typical Pitch Pine-Oak-

Maple-Magnolia woodland, grows the northernmost stand of the White Rein or Snowy Orchid, *Habenaria nivea*. It is snowy white and found among sedge grasses in full sun. The many florets form a dense, cone-shaped head, striking in its symmetry. While the former two species of *Habenaria* have fringed, pendant lips, this flower's lip is uncut and stands uppermost. Its other five petals form its lower hemisphere. The spur of this flower extends backward and horizontally across the stem, whereas those of the others hang vertically.

This bog has had drainage ditches dug and is nearing the successional stage at which, since it is managed and mowed, it will continue as a meadow. The large crayfish population here has to dig increasingly deeper for water to keep their gills wet. Their excavations bring to the surface large amounts of a gray-white clay which is buffering the acidic quality of the bog. The survival of the few orchids left depends on the judgment of the management. Mosquito relief or the treasure of beautiful flowers—another of the difficult conservation choices that challenge highway engineers, land-use planners, and nature lovers alike. □

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more on snakes

first aid treatment and use of cutting are only for the strictest of emergencies.

It should also be pointed out that during the past ten years, with millions of New Jersey residents hiking, picnicking, camping and wandering our woodlands and fields, there has not been a single case of a snake bite causing illness or death.

Again, the way to prevent snake bites is through common sense and care in areas where venomous snakes occur. Always look where you are walking and don't place your hands in holes, or under logs or

rocks without first looking. Wearing protective knee-high leather boots is a good practice. For further safety, don't handle dead snakes, stay on established paths and trails, and don't wander around after dark. During the hot summer months most snakes are inactive during the day, but come out at night to feed.

Finally, if a friend or acquaintance has a captive venomous snake make certain that he is experienced before you visit or inspect his snakes. Professional herpetologists and scientists never "free handle" venomous snakes. They know that they should be treated with respect and always kept in locked cages which are clearly labeled "Venomous Snakes."

SUGGESTED READING

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FRONT COVER

Sand Dunes at Island Beach State Park—Photographed by Patrick Sarver (See editorial.)

INSIDE BACK COVER

Least Tern—Illustration by Carol Decker (See article on page 24.)

BACK COVER

Charm of a Daisy Field—Photographed by Paul E. Taylor.



Carol Decker ♀
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