UNC Sea Grant

October, 1984

COASTWATCH

Photo by Joel Arrington

A hunter has his sights set on an overhead flock

Reaping the fall harvest of the coast

The first Americans knew the bounty of the coast. From the sea, they gathered fish and shellfish; from the marshlands and dunes—berries, nuts and other edibles; and from the forests—the meat and skins of wildlife. For our ancestors, fishing, foraging and hunting were matters of survival.

Today it's easier. We gather our meals from the shelves and bins of the supermarket. But there are those who still prefer the taste of wild game, the flavor of mullet roe and the goodness of wild grapes.

This month, *Coastwatch* takes a look at the traditional harvests of the Carolina coast.

Stalking the backwoods for game

Bob Midgett, an avid hunter for most of his 75 years, doesn't need a scrapbook to remember the old days. Pictures of elegant lodges, hordes of hunters, and birds "so thick you couldn't see through them," remain clear in Midgett's mind. His love of the sport was passed on to him from his father, a market hunter during the heyday of waterfowl hunting on North Carolina's coast.

"I started hunting with my daddy," says Midgett. "It was thrilling. It was something that I had in my blood."

And blood and history run thick in eastern North Carolina—almost as thick as the wildlife. Generations of hunters have kept the traditions alive. Over the years, the equipment has changed, but many of the methods and memories remain the same. Many continue to hunt because "It's part of our rural heritage," says John Collins, big game project director with the North Carolina Wildlife Resources Commission. "Most people that were born and raised on a farm are naturally hunters. They're close to nature."

About 160,000 such sportsmen hunt deer, bear, wild turkey, dove, quail, squirrel, rabbit, waterfowl and other game in the state each year. Most of these species have been pursued for centuries, but other prey either migrated or became extinct. Buffalo and elk, for example, used to roam the coastal plains with the Indians, says Ted Dossett of the Conservation Education Division of WRC. Ivory-billed woodpeckers, Carolina parakeets, passenger pigeons and beavers were plentiful as well.

Since that time, hunting on the east coast has gone through many changes. What was once done out of necessity, as with the Indians, is now almost entirely done for recreation.

The coastal Indians were skillful hunters, relying on their talents with the bow and arrow to feed and clothe themselves. Hunting was vital, and resources were abundant. But because there were no limits, some of the species they hunted slowly died out.

The availability of game lessened with the arrival of the white man, says Dossett. Anxious to claim lands, they cleared away the forests—and the natural habitats—for settlement. Also, Indians used wildlife as a means of barter. Furs and meat were traded for steel, guns, glass and other goods.

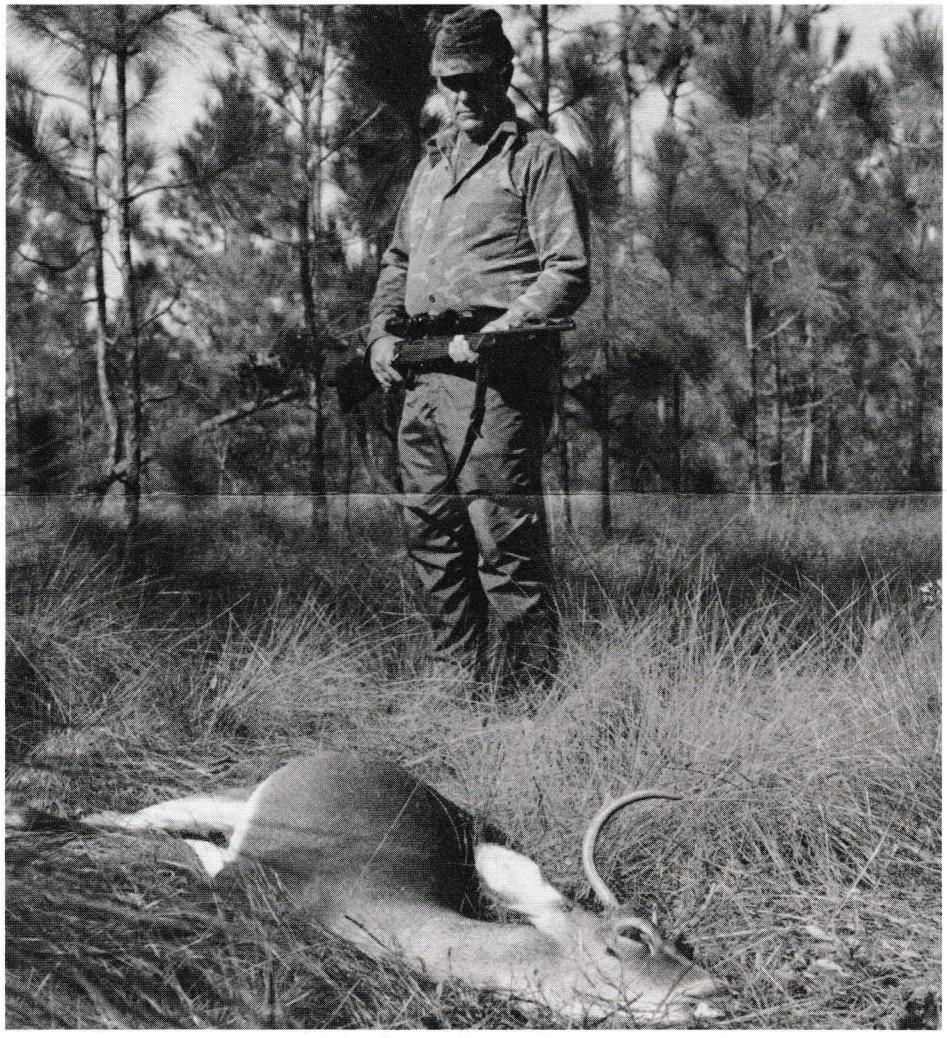
Throughout the 1700s, the bounty of game on the coast continued to fill the pockets of traders and the plates of colonists. For example, 300,000 deerskins were shipped overseas in the 1700s, says Scott Osborne, the deer project director of WRC.

In the 1800s, the ready availability of game, especially deer and waterfowl, prompted market hunting. An absence of laws, bag limits and other shooting regulations allowed hunters to capture and sell all the wild game they could shoot. What started as a lucrative industry, almost ended in disaster, says Collins.

"Big game were reduced in great numbers by market hunting. Until the early 1900s, there were very few deer in this state because of market hunting and poaching. Bear, deer and turkey were all practically wiped out at some time."

Probably the most famous and glamorous market hunting done on North Carolina's coast was for waterfowl during the late 1800s and early 1900s. Even before then, thousands of ducks and geese flocked to Currituck Sound each winter from the North. In

Photo from N.C. Wildlife Commission



Deer are the state's most hunted game

1828, the area became more of a hunter's paradise when Currituck Inlet closed. The fresher sound waters allowed wild celery and other waterfowl foods to grow in the marshy areas, attracting hundreds of thousands of birds. It also attracted hunters, like Midgett's father, who could sell their spoils in Northern markets.

During the heyday, there were no hunting seasons, says Midgett. "When the ducks began to migrate from Canada to North Carolina, that's when the season started."

The geese and ducks were shipped in barrels out of Stumpy Point by train to New York and Baltimore. "I heard my daddy say that the most he ever shipped was 16 sugar barrels of geese," says Midgett. In each barrel, 16 geese were stacked around a stovepipe filled with ice shavings and salt. Each goose was worth about $1.

Jerry Wright of Currituck heard the tales, too, because his grandfather and uncles were also market hunters. He remembers hearing one story in which two gentlemen shot 700 redhead ducks in one afternoon.

Accounts like this spurred wealthy hunters from the North to visit North Carolina's coast. To accommodate them, the natives built stately hunting lodges and started large clubs. Dews Island Hunting Club in Currituck, which opened its doors in 1852, currently is operated by Wright's father. Like other lodges, the club entertained, fed and helped guide the Yankee sportsmen.

In the 1920s and 1930s, increased concern about depletion of waterfowl led to the enactment of several laws, rules and regulations for hunting. The government set seasons and bag limits for waterfowl and other game, and took measures to enforce them.

When the market closed, most market hunters became guides for visiting hunters. Serving as guides is a tradition the Midgetts and Wrights continue.

Today, waterfowl such as Canada geese, snow geese, blue geese, tundra swans, wood ducks, mallards, pigeons, pintails and canvasbacks are plentiful on the coast, says Dennis Luszcz, waterfowl project leader with WRC. However, "Duck populations are lower, in general, compared to what was here in the 1900s, because of a loss of habitats—here and in Canada where a lot of the birds are nesting." To help preserve natural areas for waterfowl, WRC manages about 3,000 acres of impoundments.

The history of big game hunting on the coast is a running list of fluctuations in populations.

Deer populations almost were depleted in the 1920s and 1930s, when only about 5,000 to 10,000 roamed the state, says Mike Corcoran, vice president of the N.C. Wildlife Federation. But with new laws and increased management, the deer populations rebounded. Now 300,000 to 400,000 stalk the forest, making them the state's largest harvest. The number of deer grew so rapidly, that the commission extended the season and allowed hunting for doe.

Bears, on the other hand, "are a funny story," says Corcoran. "They need a lot of room to breed." Bears need three different types of territories—foraging, denning and escape. With increased construction, roads, land clearing and development, the bear population has been broken almost in half in North Carolina. They either live in the mountains or along the coast. Fortunately, the bear population is up from its minimum of 30 years ago.

Similar patterns have been seen with small game in North Carolina. Small game are byproducts of farming. But in recent years, changes in agricultural practices such as mowing of ditch banks, land clearing and use of herbicides and pesticides have caused a decline in such species as the gray squirrel, quail and rabbit.

As long as there are economic pressures to build, it will be necessary to preserve satisfactory wildlife habitats, says Dossett. Because hidden in the backwoods of North Carolina's coast are hunting traditions to continue . . . and pictures to add to the scrapbook.

—Sarah Friday

Photo from N.C. Division of Archives and History

Before restrictions, hunters bagged large quantities of waterfowl

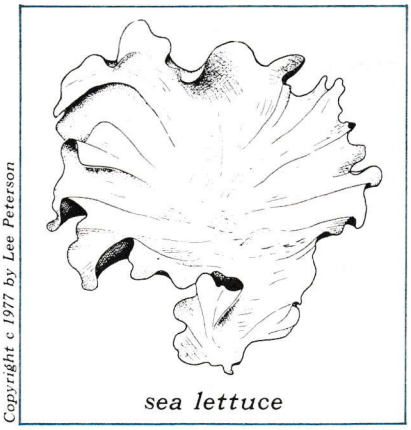
Guide to eating out at the coast

Sit down to a meal gathered from nature—coquina clam chowder, yucca flower fritters, beach peas, steamed periwinkles, cattail pollen bread spread with prickly pear cactus jam, and yaupon tea.

The main ingredients for this menu aren't likely to be found canned or packaged along the aisles of a supermarket. Instead, to obtain the fixings for this meal, you will have to pick, pull, cut and dig your ingredients.

An abundance of plant and animal life is free for the harvest along North Carolina's shorelines, marshes and woodlands. Some items of bounty, such as oysters, persimmons, wild grapes and yaupon, have marked the diets of coastal residents since the Indians. Others have had a more recent discovery.

David Phelps, an anthroplogist at East Carolina University, says the Algonkian Indians, native to northeastern North Carolina, cultivated many of their plant foods—corn, beans, squash, pumpkins, gourds, tobacco and sunflower. But they also supplemented these foodstuffs with wild fruits, nuts, berries and plants. They made flour from ground acorns and puddings from persimmons.



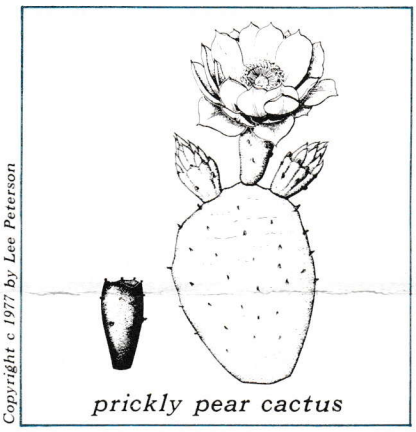
sea lettuce

The Pilgrims subsisted their first winter in America on the starchy tubers of the groundnut, which grows wild on stream banks along the East Coast. The Indians taught the Pilgrims to eat this tuber. And those who know its goodness still seek the groundnut today, using it like a potato. Maxine Claar, a wild foods expert, says the Indians saved many settlers' lives by teaching them which North American plants were edible. The Indians not only provided information that allowed the settlers to supplement their meals during those first lean years of adjustment to a new land, but taught them the hazards of many poisonous plants.

groundnut

While many wild foods are abundant today, only a few adventurous folks bother to sample their goodness. But Claar and her family often forage for their meals when they visit the coast. She says wild foods are often richer in vitamins than their cultivated counterparts.

From the surf, the Claars gather coquina clams or mole crabs for broth or chowder. Along the surf and sound edge, Claar collects sea lettuce that has washed ashore to make another coastal chowder. "I take it home, wash it in fresh water and dry it in a slow oven or outside on a hot day," she says. "Then it becomes dry and crispy. I add it to a milk-based chowder along with butter and wild onions. It makes an excellent chowder."

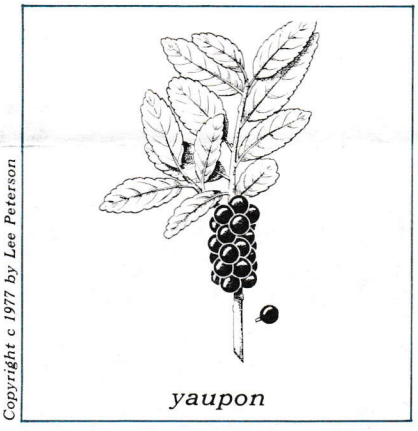


prickly pear cactus

And while the dunes appear barren, they too offer edibles for the forager, says Mark Joyner, the aquariums specialist for the N.C. Office of Marine Affairs. The succulent leaves of the sea rocket, which has a mild mustard flavor, can be steamed or added raw to salads, Joyner says. The trailing wild bean, available from early September to mid-October, should be picked when it's small and cooked like green beans, Claar says. And the beach pea, which resembles the garden variety, should be chosen when it's tender and bright green for preparation like its domestic relative.

For a more versatile dune plant, seek out the yucca, more properly called the Spanish bayonet. The sweet, white cluster of flowers can be added raw to salads or dipped in an egg batter and fried as fritters, Joyner says. Or foragers can wait until fall when the yucca produces a purplish fruit that can be split, seeded, buttered and baked.

And if you can beat the raccoons and rabbits to the ground cherries, you can stir their sweet red fruit into jams, jellies, toppings or pies. But Joyner warns that unripened, green berries are poisonous.



yaupon

Other fruits and berries, abundant behind the dunes, make tempting morsels for the sweet tooth. Persimmons and cranberries have been stirred into confections for centuries. Wild grapes, such as fox grapes and pigeon grapes, can be squeezed into juices or seeded for pies and jams. And the fruit of prickly pear cactus, stripped of its bristles, can be eaten raw or cooked into jam.

From the marsh, Claar gathers two wild foods flavored with tradition—marsh periwinkle snails and glasswort. During the days of Charles Dickens, the European species of the periwinkle were roasted and sold on the streets of London and in small restaurants called "winkle shops."

Today, Claar wades through the marsh to pick a similar species, the southern white periwinkle, from the blades of the salt marsh cord grass. She steams the gastropods and

serves them as hors d'oeuvres. The meat should be picked out with a bent safety pin or nutpick and dipped into melted butter or cocktail sauce, she says.

From the marsh edge, Claar chooses the tender, jointed stems of the glasswort for pickles or as a condiment for a salad. Glasswort was a very popular herb among the early colonists, especially Martha Washington.

The wax myrtle, or bayberry shrub, was another coastal plant popular during colonial times. The berries from this shrub were boiled in water to remove their waxy covering for aromatic candles. And the bayberry leaves, as well as leaves from another shrub called the red bay, seasoned stews, soups and chowders, Claar says. And coastal residents today swear by the red bay and bayberry's abilities to ward off insects and fleas.

When it comes to quenching a thirst, drink a glass of iced yaupon tea and sumac lemonade. Yaupon tree roots were steeped to make a black tea that the Algonkian Indians used as a ceremonial purgative. But the colonists found the leaves made a milder brew void of such nauseating effects. Yaupon tea has enjoyed extensive use by coastal residents since colonial days, and many folks drink it today.

The red berries of the summac (not to be confused with ivory-white berries of poison summac) can be crushed and soaked in cold water to make a pink lemonade. But Joyner says the berries should be picked before winter, when heavy rains wash away the tannic acid that flavors them.

Along swampy freshwater areas of coastal North Carolina, Joyner says you can find the most versatile plant in North America—the cattail. In the winter, the cattail's starchy tubers can be used like potatoes. In the spring the young shoots can be peeled and eaten raw or cooked. The immature flower spikes can be boiled and eaten like corn on the cob. Or you can wait until the spikes have matured and produced a bright yellow pollen that can be harvested and used for flour. When the spike explodes in the late summer, the white fluff can be gathered for use like goose down. Joyner says many of the life jackets used in World War II were filled with cattail fluff.

Before eating any wild plant, berry, nut or fruit, Claar and Joyner stress that it should be positively identified. Many plants are edible, but others are poisonous. Use a good field guide, such as *A Field Guide to Edible Wild Plants of North and Central America* by Lee Peterson, Claar says.

And don't collect your edibles from roadsides, Joyner warns. Roadsides are frequently sprayed with weed killers. And the pollutants from automobiles can contaminate nearby vegetation, he says.

Claar asks that foragers "do not overstrip any area of its vegetation. Pick only what you need."

To learn more about foraging coastal areas, contact the N.C. Marine Resources Centers at Ft. Fisher (919/458-8257), Bogue Banks (919/247-4003), Roanoke Island (919/473-3493), or the N.C. Maritime Museum in Beaufort (919/728-7317). The education specialists at the centers and museum plan foraging expeditions during the spring, summer and fall.

—Kathy Hart

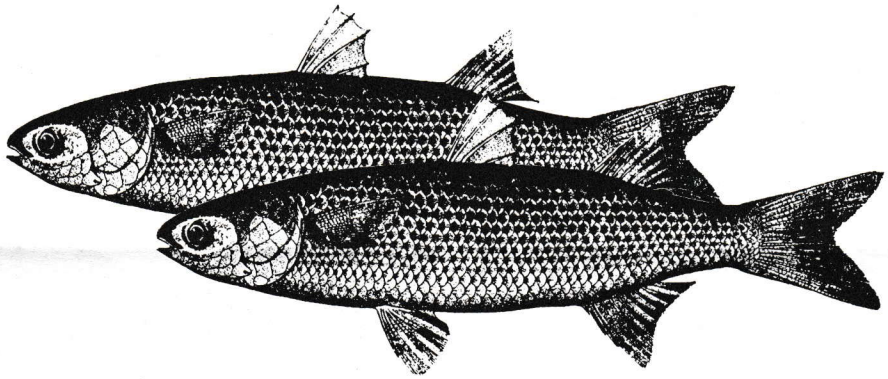
Mullet runs: a signal in the wind

A hard northeaster' blows across the waters of Pamlico Sound.The air cools, the water temperature drops, and the mullet start to run.

Natives call the winds a mullet blow. In the old days, the fall northeasters were a signal to fishermen—they loaded nets into boats and flocked to the beaches to harvest one of the state's most important cash crops.

But those times are gone. Each year, fewer fishermen watch for that change in the wind, the drop of the thermometer and the black ripple of a school of mullet cutting through the water. On restaurant menus, the mullet has gone out of style. In its place, the flounder, the shrimp and the scallop command a higher price and greater demand.

The state's mullet-fishing tradition isn't lost. Some still watch for the signs of a mullet run, and many more claim mullet is the best fish you'll ever taste. Norwood Frost, a 41-year-old fisherman, has been catching mullet since he was old enough to walk. He's from



Salter Path, a beach town that some claim originally was settled by mullet fishermen. That wouldn't surprise Frost. He says Salter Path is the "paradise of the world." The mullet fishing is pretty good, too, he adds.

Frost looks for the mullet to run around the first of September. But his crew is alone on the beachfront. "We're the only crew left now," he says. "Back yonder, there used to be seven or eight crews. The older guys have died out and the younger ones won't mess with mullet."

Billy Smith, a 55-year-old fisherman from Atlantic, has been catching mullet for over 35 years. He says commercial fishermen have lost interest in mullet because there's no financial incentive. "Back then, mullet was worth as much as flounder. Now, you get $1 a pound for flounder and 10 cents a pound for mullet . . . if you're lucky."

Smith isn't likely to sell his nets, though. "It's something I was brought up doing," he says.

Frost and Smith are among the faithful who cling to the tradition of mullet fishing—a tradition that began

Continued on next page

with the first settlers. By the 1800s, mullet was one of the main cash crops for the Outer Banks, says Judie Spitsbergen, curator of education at the N.C. Maritime Museum in Beaufort. "Mullet was infinitely important as a source of food. And eventually with the market in other states, it was an important commercial crop," says Spitsbergen.

Outer Banks fishermen were especially known for mullet fishing. During the fall runs, they set up temporary camps made of small thatched huts near the beach. Lookouts kept watch on the waters for the dark mass that indicated a large school.

With one end of a seine on the beach, part of the crew would row into the surf, positioning the other end of the net in front of the approaching fish. As the mullet filled the net, the boat slowly circled toward shore. After making the catch, the Bankers would clean, salt and pack the mullet in barrels for shipment to inland markets.

Over a hundred years later, the method of fishing for mullet hasn't changed. And even the technology has improved only slightly. "We used to row out with the net until outboards came out, and then we got lazy," says Frost. For muscle power to pull in the thousands of pounds of mullet, his crew uses two tractors.

Traditionally, the mullet fishery was confined to beach seine operations. During the heyday of the shore fishery, folks eagerly bought oceanfront property. This prime real estate provided plenty of shorefront for pulling in the nets, says Spitsbergen.

But the beach fishery has seen hard times in recent years. Fishermen like Frost at Salter Path are finding that cottages and condominiums are limiting their access to the oceanfront. Now, most mullet fishermen gill net for the fish in the sounds and inlets.

Two species of mullet inhabit North Carolina waters: the striped or jumping mullet and the white mullet. The two usually are marketed as the same species, and their differences are nearly indistinguishable even to fishermen.

As far as Tate Faircloth is concerned, there's only one kind of mullet—the "pop-eye mullet." That's what he calls jumping mullet because of their "great big old eyes."

Faircloth is a Wrightsville Beach fisherman who has been catching mullet for over 30 years. He fishes the causeway where regular "mullet stands" along the shore provide areas cleared of debris. "You can't throw one of those big nets just anywhere," says Faircloth.

Fishing for mullet is a lot of work and even more waiting, says Faircloth. "I've set out many a time and never seen a mullet in the water. This time of year, you might see them at any time, but you're liable to sit there all day long. Then you'll see them coming down the water. They stay real close to the hill (shore). Ten or 15 will be jumping at a time. That lets you know you got a good bunch of fish coming to you. The water will be solid black and it could be as many as 10,000 pounds."

Last year Faircloth hit a big school. With about 3,000 pounds in the net and no one to hold up the cork line, the jumping mullet lived up to their name. Faircloth estimates about a thousand pounds of fish leaped over the line.

The ones that stay in the net are reward enough for Faircloth. "I enjoy my mullet fishing," he says. "And I've caught a many a thousand pounds. I really enjoy seeing them come down the water and putting a net around them."

Chances are mullet fishermen like Faircloth, Frost and Smith will continue to fish for mullet even though there's no great demand for it at the fish market. Well, there's no great demand unless you're talking to a native. "There are hordes of people who can't wait for fall because they love the taste of mullet," says Spitsbergen.

The fishermen scoff at those who say mullet has a "fishy" flavor. How else should it taste, they say.

Natives eat their mullet fried or barbecued over charcoal. And they eagerly await the full moon in October when the largest roe mullet are said to be found. They like their roe fried, baked, salted or scrambled in with their eggs. Smith says some folks like mullet roe so much that they'll keep salted roe in their pocket all day for an occasional nibble.

Spitsbergen says coastal residents keep one secret about mullet well-guarded. There's nothing they like better than mullet pluck, she says. Pluck? It's the gizzard and liver from the fish, of course. "Some people say you have to have a bite of fish and alternate with a bite of pluck to know pure heaven," she says.

For more information on cooking mullet and roe, contact Sea Grant's seafood specialist Sam Thomas or Sea Grant's seafood agent Joyce Taylor at the NCSU Seafood Laboratory in Morehead City at 919/726-7341.

—Nancy Davis

Photo by Suzanne R. Hill

Netting a run of mullet near Atlantic Beach

THE BACK PAGE

"The Back Page" is an update on Sea Grant activities — on research, marine education and advisory services. It's also a good place to find out about meetings, workshops and new publications. For more information on any of the projects described, contact the Sea Grant offices in Raleigh (919/737-2454). For copies of publications, write UNC Sea Grant, NCSU, Box 8605, Raleigh, N.C. 27695-8605.

At seafood restaurants, few people stop to think of what it takes to get fresh fish on their platters. From the hook to the cook, there are many steps involved, and all of them are important.

Gary Van Housen, UNC Sea Grant's new regional marine specialist in Bogue Banks, will be working to ensure product quality from North Carolina's fisheries. He'll be advising fishermen, processors, restaurant owners and others, of ways to improve their handling of fresh fish. Van Housen will also develop marketing strategies for various fish found off North Carolina's coast.

Van Housen comes to Sea Grant from the National Marine Fisheries Service in New York, where he was a fisheries product inspector. As inspector, he administered a seafood quality program under the NMFS Grade A certification program and examined seafood for export.

He holds a bachelor's degree in biology from Houghton College in Houghton College, N.Y., and did his graduate work in fisheries biology at the Virginia Institute of Marine Science in Gloucester Point. As a student, Van Housen received two academic scholarships and a Sea Grant award for his master's thesis research.

Van Housen says he sees his work with Sea Grant as a challenge because "North Carolina is a transition zone. You have the northern and southern fisheries during different times of the year." For example, in the winter, northern species such as sea trout and flounder are plentiful, and in the summer, fishermen find southern species such as pompano and king mackerel.

Also, the state "has a huge estuarine system. This is one of the most productive ecosystems. This equates to more seafood and more seafood products."

For more information about seafood marketing, contact Van Housen at the N.C. Marine Resources Center on Bogue Banks, P.O. Box 896, Atlantic Beach, N.C. 28512. Or call 919-247-4007.

Hurricane Diana is history. But the damage she left behind is still causing headaches for southeastern coastal residents. Spencer Rogers, UNC Sea Grant's coastal engineering specialist at Ft. Fisher, is surveying the damage to see how property owners can prevent problems the next time a hurricane blows North Carolina's way.

"New construction and general construction practices fared very well," Rogers says. "The most common cause of major structural damage was the failure of a porch roof or overhang. When the porch roof blew off it often damaged the main roof and allowed water inside the building."

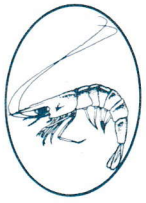
Rogers estimates that while many structural repairs were not costly, the accompanying water damage often increased financial losses considerably. Rogers says that future damage may be prevented by carefully connecting the porch posts supports to the roof and the foundation.

Despite damage estimates of more than $70 million, Rogers says Diana was a relatively mild hurricane. The storm surge, a wall of water driven onshore by a hurricane, was minimal, and the hurricane's highest winds were directed offshore. These factors combined to reduce damage to buildings, homes, beaches and dunes.

But he cautions, coastal residents may not be so lucky next time. That's why Rogers is offering technical assistance in storm-resistant construction methods to builders, designers and homeowners making repairs or planning new construction. For help, call Rogers at 919/458-5780.

UNC Sea Grant is seeking accurate wind speed reports recorded during Hurricane Diana at shoreline areas in New Hanover and Brunswick counties. Spencer Rogers will use the information to gauge how well coastal homes and buildings stood up to Diana's fury.

If you watched or had wind speed equipment that recorded velocities during Diana's peak winds, please contact Rogers at 458-5780.



Lights. Camera. Action. The set isn't in Hollywood and stars aren't Richard Gere or Sally Field. Instead, this film's topic is aquaculture, and its stars are fish farmers in Japan, Europe and the United States.

Jim Larison, the director of communications for the Oregon State University Sea Grant Program, filmed and produced the 56-minute documentary, "Farmers of the Sea."

The film traces aquaculture's beginning, examines its more recent successes in Japan, and looks at its competitive edge over wild fisheries in Europe. The documentary questions the future of aquaculture in the United States and shows its potential for helping the people of developing nations feed themselves. Some of the aquaculture research sponsored by Sea Grant is featured in the film. For teachers or museums who would like to rent or purchase a 16 mm or video copy of the film, write Sea Grant Communications, AdS 418, Oregon State University, Corvallis, OR 97331.

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Jim Bahen, the UNC Sea Grant marine advisory agent at Ft. Fisher, is testing a hypothesis. He thinks that if the webbing of a gill net is dyed dark colors, it may catch more fish than the typical white webbed net. He believes that the darker webbing may blend better with the water and delay the net's detection by fish.

Bahen has dyed half of a 100-yard gill net dark green and the other half dark blue to test his theory. Keep an eye on the Back Page for his results.

Tyre Lanier, a UNC Sea Grant researcher in the NCSU Food Science Department, is the 1984 recipient of the Earl P. McFee Award. Lanier was cited for his work in surimi research and "for excellence in the field of fishery technology."

Surimi, a minced fish product, can be used in restructured seafood products. For the consumer, Lanier's research may mean a fish product high in food value but low in cost.

The award was presented at the 29th Atlantic Fisheries Technological Conference in Wilmington in August.

Wayne Wescott, UNC Sea Grant's marine advisory agent on Roanoke Island, and Frank Thomas, project director for UNC Sea Grant's work at the NCSU Seafood Laboratory in Morehead City, were two of 11 recipients awarded Outstanding Extension Awards by North Carolina State University.

Wescott was rewarded for his efforts in establishing a more productive and lucrative soft-shell crab industry in coastal North Carolina. And Thomas received his commendation for his contributions toward developing a seafood processing industry in the state.

On the coast, some farmers do their harvesting underwater. They grow clams, oysters and other shellfish for food and profit. Shellfish farming, or aquaculture, can be productive in North Carolina. But before cultivating your first crop, know the rules governing shellfishing.

North Carolina law requires that anyone using state submerged bottomlands for aquaculture must obtain a lease from the N.C. Division of Marine Fisheries. Other laws protect natural shellfish beds, public trust rights and riparian rights and prohibit use of polluted waters.

For more information on shellfish aquaculture laws, write UNC Sea Grant for a new publication, *Shellfishing, North Carolina's Aquaculture Regulations*. Written by Walter Clark, Sea Grant's coastal law specialist, the book explains shellfishing regulations and provides checklists for lease, license and permit requirements for harvesting different species of shellfish.

To receive a copy of this booklet, ask for publication UNC-SG-84-06. The cost is $1.

Joye Stephenson will replace Elaine Murray as UNC Sea Grant Director B.J. Copeland's administrative secretary. Murray left after six years at Sea Grant to join a new firm in Apex. Stephenson comes from the NCSU Civil Engineering Department. She's been with the university for 11 years.

Coastwatch is published monthly except July and December by the University of North Carolina Sea Grant College Program, 105 1911 Building, Box 8605, North Carolina State University, Raleigh, NC 27695-8605. Vol. 11, No. 9, October, 1984. Dr. B.J. Copeland director. Kathy Hart, editor. Nancy Davis and Sarah Friday staff writers. Second-class postage paid at Raleigh, NC 27611.

COASTWATCH

105 1911 Building
Box 8605
North Carolina State University
Raleigh, NC 27695-8605

Second-class postage paid
at Raleigh, NC 27611
(ISSN 0161-8369)