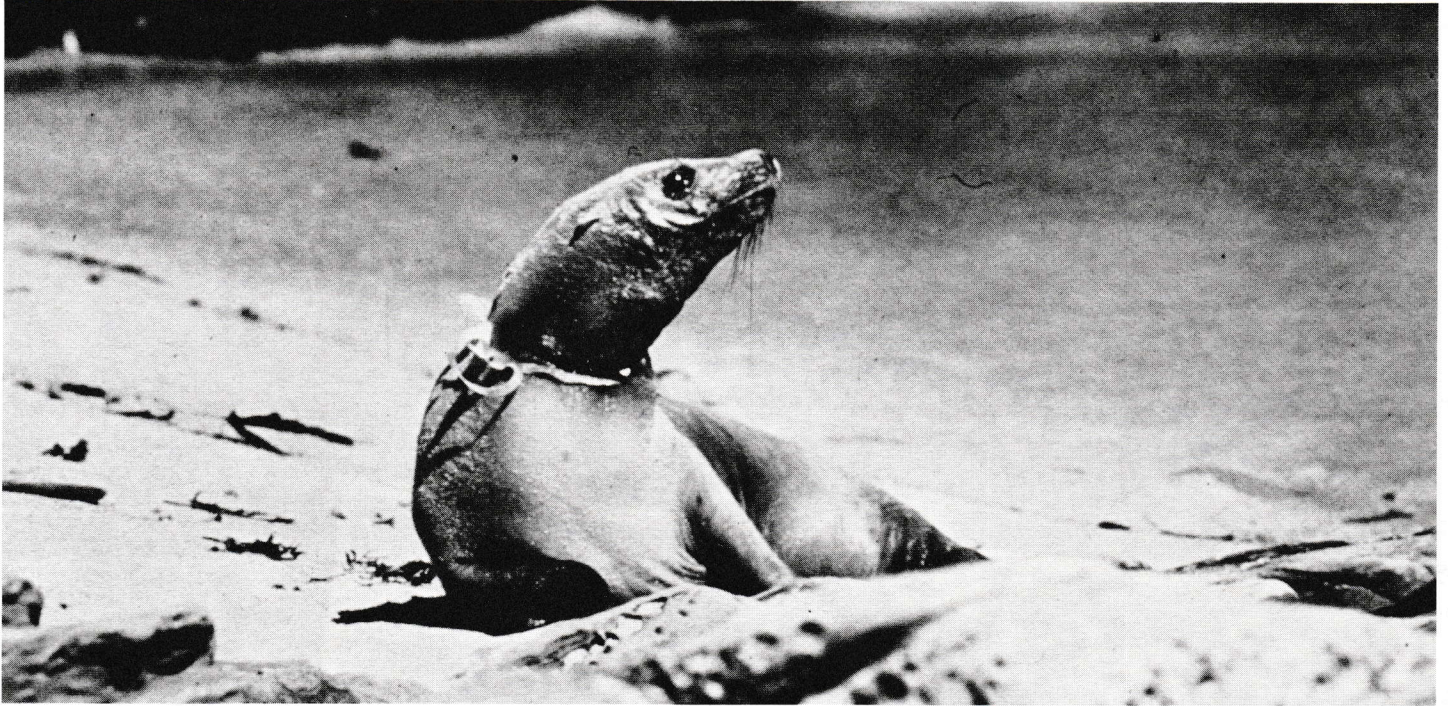


COAST WATCH



**TRASH
CAN
KILL**



The Plastic Peril

By Nancy Davis

The body of a laughing gull lay in the sand. Fishing line was twisted around its spindly legs and feet.

Ornithologist James Parnell picked up the remaining line that hung from the bird's feet and began to reel it in. No sense in leaving the death trap for more birds.

About 25 yards of line later, Parnell saw that he was too late.

The bodies of five more birds were strung together with a twisted mat of nylon line meant to capture fish, not his feathered friends.

The action was innocent enough. A sportsman replacing the line on his fishing rod probably tossed the monofilament overboard.

First one gull got caught in the line. Then he dragged it back to the colony where the other birds met a similar fate. They may have thrashed about for awhile, trying to free themselves. But eventually they starved to death.

There are other casualties.

The killer is plastic litter.

Each year, thousands of marine mammals, birds and fish are victims of our plastic society. Curious fur seals play in abandoned

fishing nets, get caught and drown. Birds dive through six-pack rings and strangle themselves. Fish swallow indigestible floating plastic pellets.

The result is almost always the same. The synthetic wonder material built to last a lifetime sucks the breath from marine wildlife.

During World War II, shortages of natural resources created a demand for plastics. By the 1970s, over 20 billion pounds of plastics were produced. Last year, plastic production increased to over 47.9 billion pounds.

But the problem is not how much we produce. It's how much we throw away—into our lakes, rivers and oceans.

Plastic is nonbiodegradable, and some plastics are engineered to last as long as 450 years. That means one six-pack ring has the potential to kill over and over again.

The litterbugs vary.

According to the National Academy of Sciences, merchant ships dump about 6.6 million tons of trash overboard every year. Much of it is plastic.

Careless beachgoers also contribute. In Los Angeles County, Calif., picnickers leave behind about 75 tons of trash on beaches each week. Among the discarded are six-pack

rings, plastic bread and sandwich bags and Styrofoam cups.

Commercial fishermen lose or discard tons of plastic fishing gear every year.

Kathryn O'Hara, marine biologist with the Center for Environmental Education, says hundreds of thousands of tons of plastic debris end up in coastal waters each year.

No one knows for sure how many animals plastics kill, but biologists say that for every animal they observe entangled in a net or strangled with monofilament, there are many more that they don't see.

James Coe, program manager of the National Marine Fisheries Service's marine entanglement research program, has been studying the northern fur seal. He estimates that up to 30,000 fur seals die each year after they become entangled in derelict fishing nets and plastic strapping bands.

Each year researchers assess the fur seal population on Alaska's Pribilof Islands. Among the healthy seals on the beaches are those that have encountered marine debris.

"The damage (to the seals) ranges from something wrapped around their neck to some that are hog-tied," Coe says. "Their flesh may be lacerated, and they have ugly, festering wounds."

Although the result may not be immediate death, the entangled seals may eventually die of infection, exhaustion or starvation. It may take a female seal twice as long to forage for food for her young pups. They also may eventually die.

Coe believes the seals become entangled sometime during the nine months they spend offshore.

During that time, nature plays a cruel trick on the seals.

The same currents that concentrate food in an area of the sea also sweep floating debris there. When the seals gather, they get more than they bargained for, Coe says.

Sea turtles encounter a similar problem. "They eat whatever is in the area where their food is supposed to be," Coe says. That includes plastic bags.

On Long Island, N.Y., a researcher reported 11 dead leatherback turtles washed ashore during a two-week period. All had plastic bags blocking their stomach openings.

At the University of Florida Veterinarian School, Paul Cardeilhac dissects about two dolphins each year that have died after ingesting plastic bags.

Sometimes the mammals regurgitate the bags. Most often, the plastic plugs up the dolphin's digestive tract and it dies, Cardeilhac says.

If the plastic dumped at sea doesn't end up in the stomachs of fish or twisted around the neck of a bird, you'll likely find it washed up on the nation's beaches.

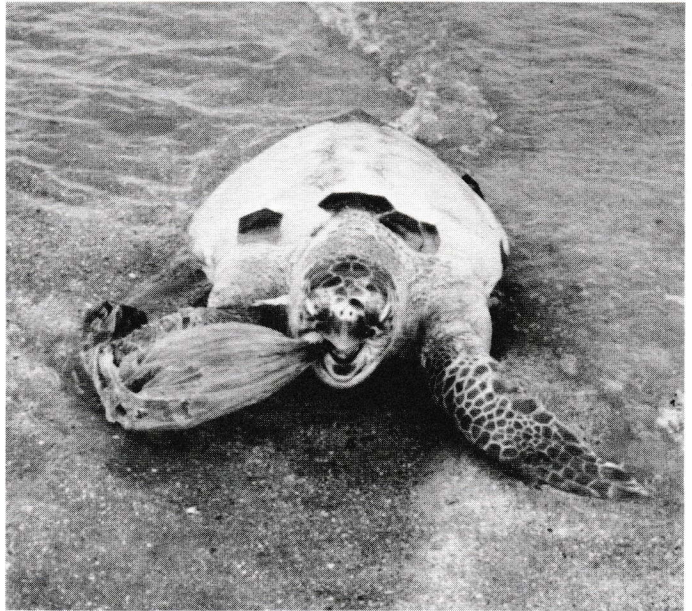
In 1986 the non-profit Center for Environmental Education sponsored a beach cleanup in Texas. About 3,000 volunteers picked up trash on a 122-mile stretch of beach.

O'Hara estimates the volunteers picked up 124 tons of trash. In a survey of just half the participants, she found they picked up 15,580 plastic bags, 10,350 six-pack rings, 5,308 plastic milk jugs and 2,432 plastic egg cartons.

In a survey of litter on North Carolina's Shackleford Banks, a National Marine Fisheries Service researcher found an estimated 11,000 plastic bags, 2,400 six-pack rings, 1,100 plastic packing straps, 1,100 Styrofoam cups and 1,350 pieces of monofilament line.

And our state is not without a horror tale or two.

Parnell has seen gulls with six-pack rings around their heads.



He's concerned for those entangled birds, but he also worries about the entire population. When a nesting bird is entangled, it's possible that its nest failed, he says.

But amid the stories of mangled wildlife, there is an occasional happy ending.

Consider fisherman E.M. Livengood's relationship with a sea gull he's named Georgette.

He and the bird met two years ago on a pier in Nags Head. Georgette's head was poking through the hole of a six-pack ring. One of her legs was stuck in another hole. She couldn't fly, and she could barely walk.

For several days, Livengood fed the gull pieces of shrimp. Finally he caught her in a net and clipped the ring off her.

Now Livengood and Georgette meet regularly on the pier. He takes her pieces of trout from his freezer, and she thanks him by perching on his head.

Poster from the Center for Environmental Education



By Sarah Friday

One person.
One Styrofoam cup.
One ocean.
Nobody will ever know.
Want to bet?

The U.S. Coast Guard estimates recreational boaters generate about 34,000 metric tons of garbage per day.

Add to that millions of tons of daily debris from beachgoers, fishermen and offshore vessels.

The rubbish piles up, snagging, tangling and killing wildlife. But piece by piece it fuels the fire of worldwide efforts to clean up the problem of marine debris.

The efforts range from posters printed to educate the public to massive beach clean-ups in Texas. With all of them, the goal is the same—to save marine mammals.

The campaign has been smoldering for about 10 years. Successes exist, but environmentalists agree only the first rounds of their fight have been completed.

The thrust of their game plan now is education.

“People don’t realize what they’re doing when they throw things overboard,” says environmentalist Jim Murphy of Southern Shores. They don’t correlate plastic bags with turtle food or cigarette filters with hungry birds.

Education can change this.

“I think that once people realize the consequences of their actions, if nothing else, their consciences won’t let them do it,” says Ginny Goblirsch of the Oregon Sea Grant Extension Service. “It’s a matter of changing their habits.”

Pitch in

"My husband is a commercial fisherman," she adds. "Last year he never thought about tossing stuff overboard. But this year he brings it back in."

Thanks to a new project in Oregon, other fishermen are changing their habits, too.

The National Marine Fisheries Service, Oregon Sea Grant and the Port of Newport organized programs to boost public awareness of marine debris. They did not target commercial fishermen, says Goblirsch, but realized that the nets, rope, gear and litter added to the problem.

Letters, signs and the media urged people to "Show Care for Wildlife, Keep Plastic on Board."

And last year, NMFS gave the Port of Newport a \$97,000 grant for a model refuse disposal project. With education, an incinerator and adequate refuse facilities at the port, the town hopes to demonstrate what fishermen, boaters and merchant ship crews can do voluntarily to reduce the amount of debris going into the ocean.

The problems are different in Texas. Tourists and the Gulf Stream currents produce tons of debris on Texas beaches daily. The currents catch the ocean's garbage and, with strong winds, carry it to shore.

To combat the problem, forces have joined in Texas.

An "Adopt the Beach" program allows businesses, organizations or individuals to claim a section of the beach and clean it at least three times a year.

And beach patrols in certain areas notify, and often fine, litterbugs.

One of the most successful campaigns has been "Texas Coastal Cleanup," sponsored by the Center for Environmental Education, (see story, page 2).

Charlie Moss, a Texas Sea Grant county extension agent, assisted in the cleanup. Now it's his job to identify the offshore point sources of debris. Freighters, ocean liners, oil rigs and platforms are among the culprits.

Currently, no laws prohibit anyone from dumping trash beyond the 200-mile international water line, Moss says.

But the United States is expected to ratify its part of an international provision prohibiting ocean dumping of plastics.

To become law, Annex V of the MARPOL treaty must be ratified by nations representing 50 percent of the world's gross tonnage of debris. So far, 26 nations—or 44 percent—have ratified it. The United States (4 percent) and Soviet Union (5.8 percent) could make the difference.

In addition, seven bills regarding the disposal of plastics and marine debris in U.S. waters are pending in Congress. And numerous state legislatures and research organiza-

tions are taking a closer look at the issue.

In North Carolina, the law keeps some people from trashing the beaches. Anyone caught littering on land or up to 3 miles offshore faces a fine or imprisonment.

A grass roots effort brews in the state to remedy the litter problem.

For four years, Bill Pinkstone and other members of the N.C. Beach Buggy Association have collected trash three times a year along the Cape Hatteras National Seashore.

"Operation Beach Respect" drew nearly 3,000 volunteers in a recent pickup, says Pinkstone, director of the BBA. "We believe that it is working, that people are more conscious of it now."

"We've been lucky that individual groups have had the time to pick up litter," says Lundie Spence, Sea Grant's marine education specialist.

But Spence cautions that not enough are aware of the problem. "A litter-free beach means that everyone on the beach 'picks it back'—takes it home," she says.

That's exactly why Jessie Bush of Nags Head joined the fight.

Bush, who describes herself as an environmentally concerned citizen, had been reading about wildlife entanglement in her magazines. She knew she lived in a popular tourist area and believed education might heighten awareness of marine debris and its effects on wildlife.

So she wrote letters, picked up trash, talked to people, wrote more letters and made calls.

Progress was slow, but one thing led to another.

In March, with the help of a local artist and the Dare County Board of Commissioners, an illustrated poster was published. It pleads, "Help Save Our Wildlife, Plastic Litter Kills."

Bush and her helpers distributed the posters in fish houses, restaurants, businesses, marinas, piers and homes.

"Reception has been remarkable," says artist Che Greenlee. "Since this is an emotional issue, this is something people can relate to."

Articles, radio announcements and speeches at local clubs brought the issue home. And already, plans are in the works for a 70-piece slide show at the N.C. Aquarium on Roanoke Island, public service announcements and another poster.

And Bush wants to involve state government in regulation and legislation of marine debris.

"Somehow the message has to get through," Bush says.

One person.

One goal.

One ocean.

SANDSIFTER

BRUCE SMITH

By Sarah Friday

Bruce Smith isn't gifted with extra-sensory perception.

And he doesn't have a degree in sociology.

But the New York native can tell you more about East Coast beachgoers than anyone—without ever seeing them.

Smith cleans beaches for a living.

As the owner of Sandsifter, a beach maintenance operation based in Sea Cliff, N.Y., he's traveled from New Orleans to Portsmouth, Maine, in search of debris.

On the way he's found plenty of trash—plastic bags, light bulbs, candy wrappers, beer cans. You name it.

But he's also discovered that what he finds in the sand often tells a story and that it's easy to identify the cast of characters.

Smith sees North Carolina beachgoers as frequent smokers and soda drinkers.

In Florida, industry plays a larger part.

New Yorkers are picnickers, he says. Plenty of plastic forks, spoons, knives, plates, beer cans, empty soda bottles and Styrofoam cups give it away.

"Everybody there loves the beach," Smith says. But trash is just "one of those things nobody thinks about."

On any given summer day at Jones Park Beach on Long Island, tourists create 4,000 cubic yards of debris. That's the most in the world.

But Smith is the first to admit that the problem on the coast is worse than a few discarded fast food bags.

Oil sludge and ocean dumping leave tons of grease and gunk lying on the beaches. Eight and a half million pounds per year to be exact.

Tighter oil sludge restrictions in New York have cleaned up that problem, he says. But no laws prohibit dumping offshore.

Photo by Scott Taylor



Soda cans and trash pile up on Shackleford Banks

In his five years of business, Smith has seen debris take its toll on wildlife. He's found the decomposed carcasses of fish, sharks and seagulls. But the most striking changes he's seen were in the New York area. Where he once saw one dead gull a month in the harbor, now he sees one almost daily.

Florida faces the same problems.

Sludge, tourists, industrialization and shipping pile debris higher and higher, making the Sunshine State's beaches the dirtiest on the East Coast according to Smith.

"It's not that people in Florida are dirtier than New Yorkers; it's just that the prevailing weather patterns make it more of a problem," he adds.

Debris from the mainland collects in the canals and waterways and rushes to the ocean. Then, the Gulf Stream currents and winds from the east push the floating waste mixed with seaweed back onshore.

Smith attributes most of Florida's problem not to tourists, but to freighters offshore.

Food, boxes and trash often break loose from the ships or are thrown overboard. In one story Smith heard, 300 tons of frozen chickens slid into the sea.

In North Carolina, Smith has seen plenty of plastic plates, spoons and jugs—the kind orange drink comes in at the quick-stop shops.

But one of the biggest contributors to litter in North and South Carolina is cigarette butts. He's found so many in his harvester-like sandsifter that he's renamed the beaches "The World's Largest Ashtray."

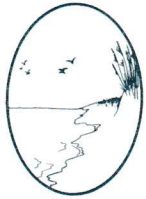
"The biggest problem I see in North Carolina is the beaches tend to be rather narrow," he says. This creates two problems for beach cleaning.

The density of people and trash increases when the beach isn't very wide. And since the beaches are small, the sand tends to compact and is hard to sift.

Still, Smith ranks North Carolina's beaches as some of the cleanest he's seen on the East Coast.

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.



When lightning meets sand on North Carolina's beaches, a striking phenomenon takes place. Heat from the lightning fuses elements in the sand to form glass-like tubes called fulgurites.

"As lightning strikes the sand, the electricity runs to the groundwater," explains Lundie Spence, Sea Grant's marine education specialist. "The heat from the electricity actually melts the silica, which is one of the major components of sand in North Carolina's beaches."

Most sand in North Carolina is composed of two minerals—quartzite and feldspar. Quartzite contains the element silica, which is used to make glass.

Fulgurites are rare in the state, Spence says. But specimens can be found. They vary in size and are usually finger-like with smooth interiors and rough, sandy exteriors.

You can find fulgurites on high dunes after a rain. Spence suggests searching the dunes of Bear Island and Nags Head Woods.

The rain washes away loose sand, uncovering the fulgurites.

If you find one, dig it out carefully, Spence says. All fulgurites are collector's items, but larger specimens are more valuable.

To make room for new publications, Sea Grant is having a sale. In the coming months, we'll feature some of our popular booklets at reduced prices.

If you're a birdwatcher, you may want to order a series of books about colonial waterbirds. *Atlas of Colonial Waterbirds of North Carolina Estuaries* (UNC-SG-78-10) has been reduced from \$7 to \$5. And its 1983 supplement (UNC-SG-84-07) has been marked down from \$2 to \$1.

Management of Colonial Waterbirds: Summary Proceedings of a Workshop (UNC-SG-80-06) is reduced from \$2 to \$1.

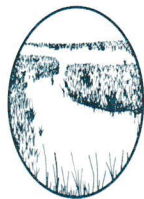
To order, send a check to Sea Grant for the sale prices. Please specify the publication number.

Sea Grant is sponsoring a national technical conference on surimi, a minced fish product used in restructured seafoods.

Until recently most surimi was made from Alaska pollock. But Sea Grant researcher Tyre Lanier has proved that fatty fish, such as menhaden, are also acceptable in making surimi.

The conference, to be held in Raleigh Dec. 8 and 9, will examine the use of fatty fish in surimi. It will attract industry leaders and international experts in surimi research.

Write Sea Grant for more information on the conference.



Things are anything but dreary around the Great Dismal Swamp these days. The U.S. Fish and Wildlife Service recently unveiled a \$6.4 million plan for managing the huge refuge on the North Carolina-Virginia border.

The plan calls for protecting and preserving the wildlife and history that have been a part of this 106,000-acre refuge for more than 200 years.

In the late 1700s, George Washington attempted to drain the swamp and use the land for farming and logging.

And before the Civil War, the area was a refuge for as many as 1,000 runaway slaves.

From the 1920s to the 1940s, logging operations continued in the Dismal Swamp. Then in 1973, the Union

Camp Corp. turned over the land to the U.S. Department of the Interior.

Now, wildlife officials hope to bring back bald eagles and red-cockaded woodpeckers, restock the streams and maintain the populations of bears, bobcats, deer and more than 200 species of birds.

Plans also include forest regeneration and four new visitor centers.



The New Bern High School coastal biology class has published another best seller. Last year, we told you about *The Influence of Man's Existence*, a book about

the impact of man on the Trent and Neuse rivers. *Coastwatch* readers were so interested that the class received orders from all over the state and a few from as far away as Texas and Indiana.

This year 42 students worked together to produce *A Walk on the Wild Side: Croatan National Forest*. "Wilderness for wilderness' sake, for preservation, for wildlife and for man, that's what the Croatan National Forest is," the students write. "There is an unknown world on the east coast of North Carolina waiting to be discovered, with pathways of adventure to meet a wide variety of interests."

This 127-page book explores the wilderness of Croatan National Forest.

For a copy of the book, write New Bern Senior High School, in care of Coastal Biology, 2000 Clarendon Boulevard, New Bern, N.C. 28560. Enclose a check for \$7.50 made out to the New Bern Senior High School Coastal Biology Class.

Proceeds from sales will go for scholarships for the students.

Shellfish farming is one of coastal North Carolina's most productive aquaculture industries. Residents buy or lease submerged lands to grow clams, scallops or oysters.

Whether you're planting your first crop or your fifteenth, it's important to

Continued on next page

know the laws that regulate the cultivation and harvest of shellfish.

The booklet *Shellfishing—North Carolina's Aquaculture Regulations* outlines these rules and explains the requirements for meeting them. Written by Walter Clark, Sea Grant's coastal law specialist, the publication also provides a lease, license and permit requirement checklist for different species of shellfish.

For a copy, write Sea Grant and ask for UNC-SG-84-06. The cost is \$1.

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Coastwatch is a free newsletter. If you'd like to be added to the mailing list, fill out this form and send it to Sea Grant, Box 8605, NCSU, Raleigh, N.C. 27695-8605.

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