Coastwatch

UNC SEA GRANT ▪ AUGUST 1990

Much Ado About Bycatch

Photo by C.R. Edgerton

Bycatch Stirs Controversy

BY KATHY HART

Fishermen call it trash fish; fisheries resource managers, bycatch. But environmentalists and sport fishermen say it's robbery.

Whatever the name, the incidental catch that commercial fishermen net along with their intended catch looms as the issue of the 90s.

Fishermen are right. Sometimes the bycatch is a trashy mixture of jellyfish, hog chokers, tongue fish, spider crabs, sponges and urchins—sea creatures only favored as fare by sea gulls.

But more often than not, mixed in among unwanteds are juvenile and adult spot, croaker, mackerel, flounder, trout and blue crabs. These youngsters represent the potential catch of tomorrow.

And try as they might, commercial fishermen cannot cull their catch fast enough to return many, if any, of these desirables to the water alive.

It is the death of these juvenile finfish and shellfish that has sport fishermen and environmentalists calling commercial fishermen to task.

"We haven't taken a vote on it as a club, but most members are upset by the amount of bycatch," says Bo Nowell, president of the Raleigh Saltwater Sportfishing Club.

"It's an emotional issue," he says. "It's like seeing a recreational fisherman fill up his boat or cooler with more fish than his family can possibly eat or toss his catch on the beach to die. That's obscene.

"Recreational fishermen feel the same way when they see pictures with pounds of bycatch dead. They start to count how many pounds of bycatch there are by how many fishermen there are fishing on a daily basis. They get pretty upset," Nowell says.

But Nowell hastens to add that commercial fishermen and their bycatch aren't entirely to blame for recent declines in fish stocks. He realizes that factors such as water quality, habitat and Mother Nature play roles in the number of fish that swim our waters.

"We're not running around with spears trying to put trawlers out of business," Nowell says.

But nonetheless, Tar Heel commercial fishermen feel that sport anglers, environmentalists and the federal government are making a mountain out of a mole hill of bycatch.

"People simply have a misconception about bycatch," says Clinton Willis, a shrimper and president of the Carteret County Waterman's Association. "We just don't catch as much bycatch as they think. We don't see any problem.

"Besides, any bycatch goes back to the green box (the sound) to feed the crabs and bottom-feeding fish," he says. "It's being utilized."

Jerry Schill, executive director of the N.C. Fisheries Association, agrees. Some of the bycatch, he says, is kept as "legal food fish or bait fish for recreational and commercial fishing."

Willis says he sees no evidence of bycatch affecting finfish populations.

The summers of plentiful shrimp and heavy shrimping are always followed by heavy finfish catches in the fall, he claims. If bycatch were reducing finfish

Shrimp boats docked at St. Simons Island, Ga.

Photo by C.R. Edgerton

populations, then a good shrimp season should be followed by poor catches of fall finfish, he concludes.

But he says that's not the case.

Carroll Yeomans of Vandemere concurs.

After more than 32 years of shrimping, Yeomans says bycatch is cyclical. "Some years, you could hardly work for the bycatch," he says. "The next year you wouldn't catch any."

And Willis and Schill say bycatch shouldn't become a scapegoat for fish and shellfish declines. Factors such as poor water quality and habitat degradation should figure into declines too.

"It's always easier to point a finger at the commercial fishing industry," Schill says.

"A recreational fisherman doesn't catch his normal amount of flounder or speckled trout, and he looks up from his boat and sees a trawler in the distance," he says. "He immediately assumes the problem is that damn trawler or net. He doesn't stop to think about habitat degradation and water quality degradation."

But Schill concedes that bycatch is a problem facing the commercial fishing industry, shrimpers in particular, because the public perceives it as one.

Photo by Jim Strickland

Clinton Willis

"We owe it to the resource and to the health of our own industry to address the problem," Schill says.

Already the bycatch of red snapper by Gulf shrimpers has flamed a debate between commercial and sport fishermen that is heated and volatile.

Fresh from the fight against the use of turtle excluder devices (TEDs), commercial fishermen are leery of government intervention and forced regulations on bycatch.

Willis says watermen can take care of the problem without regulation. When bycatch is thick, fishermen move to another trawling location or cut a hole in the tailbag of their net to release the bycatch.

But Schill believes fishermen should work with Sea Grant and the N.C. Division of Marine Fisheries to develop bycatch separation devices and solve the problem on a local level.

"We need to work with the management people—the federal agencies, the state fisheries managers, the bureaucrats—to work out this problem," Schill says. "If we don't work it out adequately, it will go to Washington. We don't need this issue there, and it shouldn't be there.

"Those folks have no idea what goes on out here on the water," he says. "So we need to take the bull by the horns and solve this among ourselves."

Yeomans and Willis think fishermen would be willing to give a finfish separator device a try.

"If someone comes up with a way to get rid of bycatch, I think fishermen would use it as long as it didn't kill the industry by reducing shrimp catch too," Yeomans says.

Sea Grant Test Trawls Reduce Bycatch

BY C. R. EDGERTON

North Carolina Sea Grant is catching up with bycatch.

The fisheries issue of the 1990s is being probed, tested and evaluated by a team of Sea Grant researchers who say they've made big strides toward reducing the number of juvenile finfish caught in shrimp nets.

That's good news for environmentalists and recreational fishermen concerned with reduced fisheries. And it's encouraging to shrimpers who don't look favorably on the time and effort it takes to cull finfish and other marine creatures from their shrimp catch.

The best news of all is that Sea Grant's recent testing of finfish separating devices (FSDs) showed no significant loss in the numbers of shrimp harvested.

"Our results are preliminary, but we're pleased with what we've found out so far," says Jim Murray, Sea Grant's Marine Advisory Service director and principal investigator in the bycatch project.

"We've tested three basic net designs, and in most cases, those nets have shown a significant decrease in finfish without a noticeable loss of shrimp," Murray says. "The results have been good."

Murray emphasizes that Sea Grant's research, which is being funded by the National Marine Fisheries Services and the National Undersea Research Center, is still in its infancy. But, he says, "We know that FSDs work, they reduce bycatch."

And B.J. Copeland, director of UNC Sea Grant, says the project is providing early answers to an issue that's just simmering now, but could boil over soon.

"We recognized the importance of the issue early on. We've done the research and have applied it practically under true-to-life conditions," says Copeland.

Sea Grant's bycatch project began earlier this year when Marine Advisory Service agent Jim Bahen began to interview fishermen up and down the North Carolina coast. He questioned them about possible designs for bycatch-reducing trawls.

When federal fisheries officials began design work on turtle excluder devices (TEDs) a couple of years ago, local fishermen complained that they were left out of the process. "We didn't want that mistake repeated with FSDs," Bahen says.

Several good ideas were garnered from the fishermen. Shortly, three new trawl designs incorporating these ideas were in the works. Assisting was Steve Parrish of S&S Net Shop in Holden's Beach. Parrish is the designer of the Parrish "soft" TED.

After a few kinks were worked out of the original FSD designs, scale models were constructed and transported to the David Taylor Naval Research Center in Bethesda, Md. The nets were lowered into a large tank of circulating water and dye tests were done to determine water flow dynamics.

Using the results from the flume tank tests, Bahen and Parrish made improvements in the net designs and full-scale models were constructed.

In June, FSD designs were installed in standard shrimp trawls and were towed off the coast of St. Simons Island, Ga., aboard the *Georgia Bulldog,* Georgia Sea Grant's research vessel. The *Bulldog* is a fully-rigged 72-foot shrimp trawler.

"We wanted to fish these nets out in the field, right among the fleet," Bahen says. "We felt there was no better way to see if bycatch could be reduced than by actually catching shrimp with our nets."

The key to these experiments, Bahen says, was towing the FSD-equipped nets alongside a standard shrimp trawl that had not been modified for bycatch reduction or TED use.

"We knew if we compared the biomass of the FSD nets with the non-FSD nets, we could come up with a good idea of how the test nets were working," he says.

Three designs were tested.

In one design, a large-square mesh was sewn in an extension that also included a funnel-shaped accelerator.

Another used the same design, but diamond-shaped holes were cut in the extension near the accelerator funnel.

The third was a Parrish TED redesigned to include escape panels for finfish.

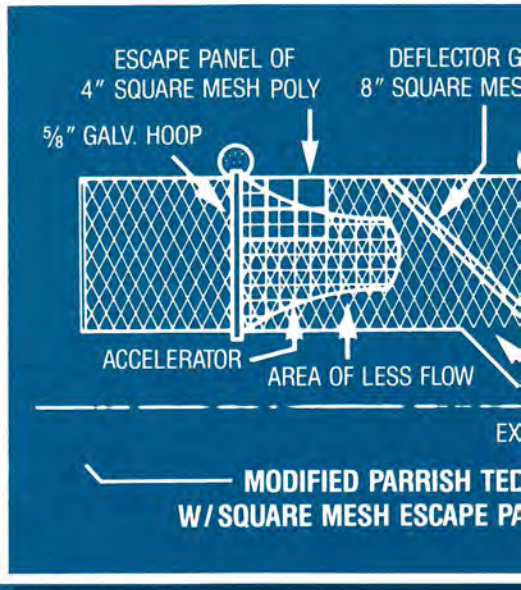
"One thing we discovered in our tests at the David Taylor Research Center was that the accelerator, which was sewn into an extension in the net just before the tailbag, increased water flow to the tailbag while creating calmer water around the outside of the funnel," Bahen says.

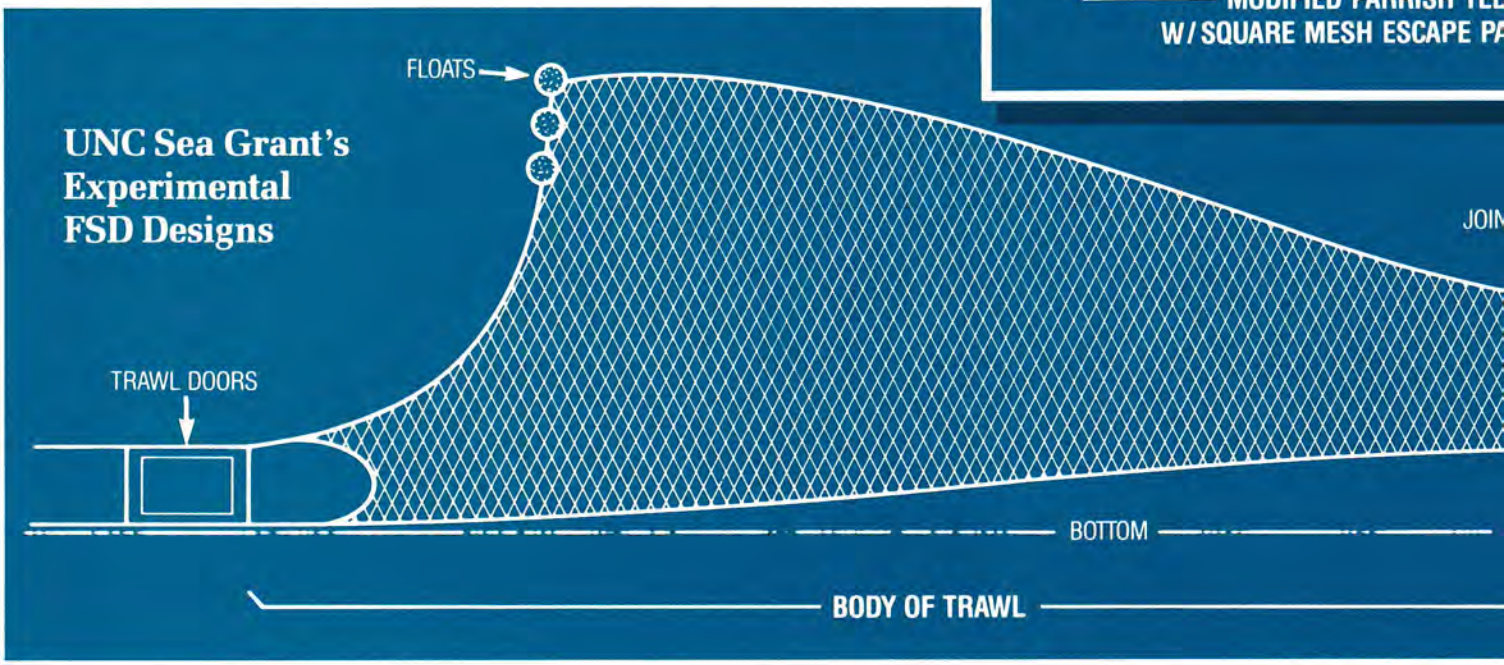
The resulting flow dynamics proved that the weaker and slower-swimming shrimp could be forced into the tailbag by water flowing through the accelerator while the stronger swimming creatures such as finfish could seek the area of quiet or calmer water.

"So, we located the larger mesh and the diamond-shaped holes in the portion of the net where we felt the fish would congregate, in the dead-water section," Bahen says.

Those innovations proved favorable in the field tests, says Roger Rulifson, an East Carolina University fish biologist.

The nets (the FSDs and the standard trawls) were tested in 90-minute trawls





for five days. Nets towed on the port side of the *Bulldog* were fishing harder than the starboard net, Rulifson says.

"And that made some difference in our data," he says. "So many things can make a difference."

When the square-mesh net was towed on the starboard side, researchers saw a 25 to 85 percent reduction in bycatch. "But when the net was towed on the port side, there was no significant difference. Because the port side net was fishing harder on the bottom, we still feel the square-mesh FSD was working well," Rulifson says.

When the diamond-mesh separator was rigged on the starboard side, researchers saw a 37 to 51 percent reduction in total biomass, with no significant loss of shrimp. In subsequent tows, a metal hoop, attached at the opening of the accelerator, was removed. The hoopless net did not reduce bycatch when used on both the port and starboard sides of the boat.

Photo by C.R. Edgerton

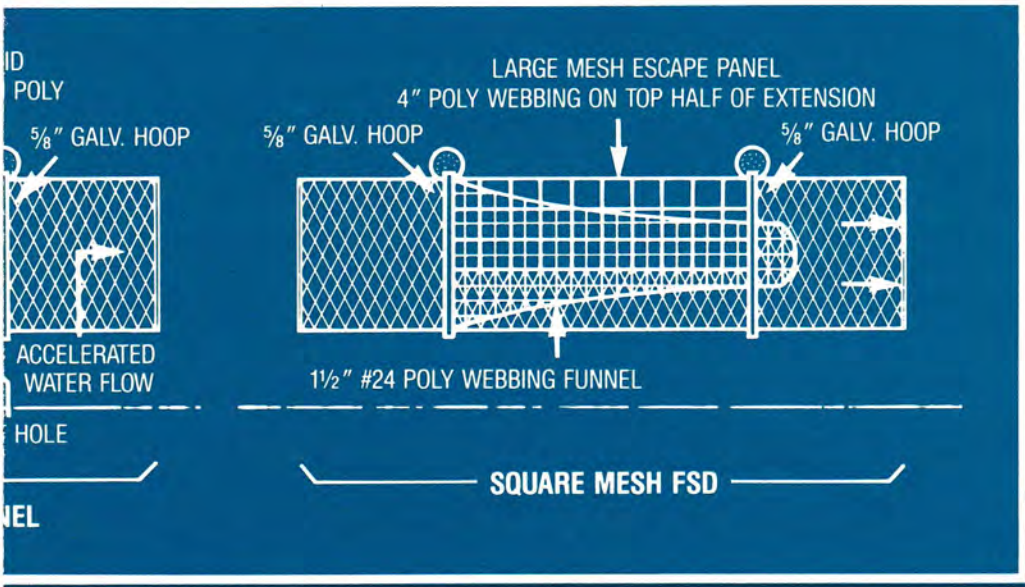
Bahen (left) and Parrish adjust a video camera in the cod end section of the diamond-mesh FSD aboard the *Bulldog*.

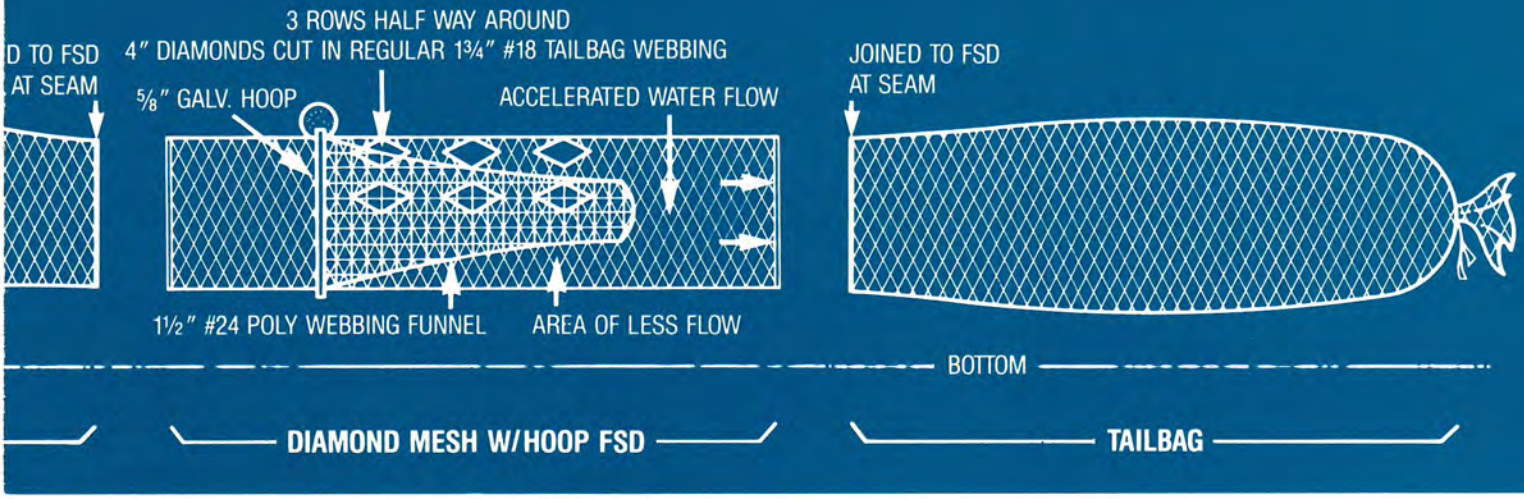
"This tells us that the diamond-mesh separator worked well, but only when the hoop was left sewn in," Rulifson says.

When a modified diamond-mesh separator was used with a TED, bycatch was reduced 35 to 65 percent. "But shrimp loss was anywhere from nine to 55 percent," Rulifson says. "This is unacceptable.

"I should stress that these are preliminary results, that these numbers come from the first week of two weeks of testing," he says. "We were working the bugs out of our gear and modifying it as we went along."

But Bahen says the team was looking at more than just a reduction in





bycatch poundage. "We were also trying to see which kinds of fish were staying in the nets," he says. "And the size of the fish was important too. We not only saw a reduction in biomass, but the smaller fish were finding their way out of the nets."

That's good news, says netmaker Parrish. "We want to be able to keep the marketable fish and let the smaller ones out," he says. "Sure, we could make the holes (in the separator) bigger and let out most of the fish, but that's not what we're trying to do."

The challenge, Parrish says, is to adapt the principles used in the FSDs to nets that must include TEDs. "The smaller fishermen, the ones who tow for shorter periods of time, will use these FSD designs," he says. "Now, we need to make it work for fishermen who are doing longer tows and who must use TEDs."

Bahen says another week of testing during the fall shrimping season should give researchers a better handle on the new FSD designs.

Until then, the data collected from the June field tests will be analyzed more closely.

"I don't know if FSDs will ever become part of the commercial fishing industry," Bahen says. "But when and if it does, we'll have the information fishermen will need to effectively run these nets. Right now, we're getting ahead of the game."

Photo by C.R. Edgerton

Steve Parrish makes repairs to a model FSD at the David Taylor Research Center.

Bycatch Catching Lots of Attention

BY C. R. EDGERTON

Governmental agencies on the state and national levels are planning bycatch strategies. These efforts could make the reduction of bycatch the most talked about fisheries issue since turtles.

The National Marine Fisheries Service, the federal agency charged with regulating the country's fishing waters, is proposing an innovative plan for dealing with bycatch. A steering committee, made up of representatives from government, industry and academia, is in the works.

"NMFS officials say this committee will attempt to look at the overall bycatch picture, and not just innovations in gear," says Sea Grant's Marine Advisory Service Director Jim Murray.

The steering committee will set up a subcommittee that will monitor technical innovations and ideas dealing with bycatch, Murray says.

"In addition to our own work with finfish separator devices (FSDs), there's work being done in Florida, some in Georgia and other places," he says. "Up to this point, there hasn't been a good system to get all this together. That's what the National Marine Fisheries Service wants to do."

The steering committee will also attempt to organize a conference that will feature bycatch-reducing gear from around the world. "This will show that bycatch is not just an American problem, that other countries have been dealing with it for years." Murray says.

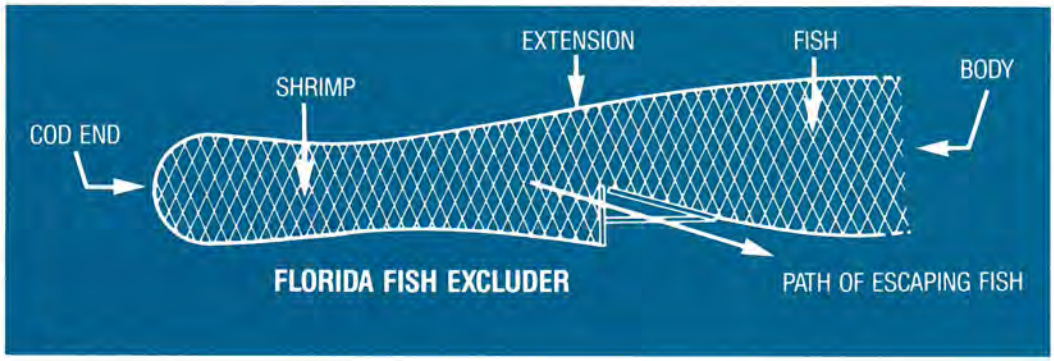
On the state level, the N.C. Division of Marine Fisheries is testing experimental bycatch-reducing gear, including a new net addition known as the Florida Fish Excluder. This device uses a simple bar grid sewn into the bottom of a standard shrimp trawl to allow an escape path for finfish.

"We've been able to see about 30 percent reduction in bycatch using the Florida separator," says DMF fisheries expert Katy West. "On the other hand, we've not had much success with skylight designs." (Skylight designs incorporate larger-sized mesh or holes in the top of the net.)

One major holdback in DMF's efforts to test bycatch-reducing gear is a lack of funding. "Our project has been approved, but the funds haven't come in yet. So we're doing some testing on our own," West says.

DMF's experiments have focused on the inshore shrimp trawl fishery and the offshore flynet fishery. They will also test FSDs in trawls equipped with Parrish, Morrison and Anthony Weedless TEDs.

"The division's position is that we really don't know how much of a problem bycatch really is," West says. "But we know it definitely wouldn't hurt to try to reduce it. We don't advocate a ban on trawling, but we do support modifications in gear to try to reduce bycatch."



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, Box 8605, NCSU, Raleigh, N.C. 27695-8605.

Is it worth 39 seconds of your day to save the life of an endangered sea turtle or a wood duck?

That's what your annual participation in the Big Sweep averages—mere seconds a day.

Join thousands of others across the state on Sept. 22 in cleaning North Carolina's beaches, lakes and rivers.

From 9 a.m. to 1 p.m., volunteers will pick up trash and record what's collected on data cards. The tallies will be used in compiling national statistics on waterway litter.

Taking that time to volunteer means a lot to wildlife who are in a tug of war with floating waterway debris and litter along the shore.

The cleanup also puts trash—and the sources of it—in the spotlight. It's a real exercise in public education. Last year, volunteers collected 81.5 tons of cans, plastic, paper, glass and other trash at 96 coastal and inland sites.

Choose a waterway location near your home or make plans to collect trash at your favorite beach. Wherever you choose to go, you'll help beautify our waters and save wildlife.

A hat, gloves, sunscreen and a good attitude are all you need to bring. We'll supply trash bags and data cards.

Volunteer today to be a Big Sweeper. It's good clean fun.

For cleanup locations, call the Telecom USA Big Sweep hotline between 8 a.m. and 5 p.m. The number is 1-800-27-SWEEP.

Or call Sea Grant at 919/737-2454 for the name and number of the regional coordinator in your area.

Big Sweep '90 is coordinated by UNC Sea Grant, N.C. Division of Coastal Management, N.C. Division of Water Resources, N.C. Division of Parks and Recreation, N.C. Aquariums, N.C. Wildlife Resources Commission, N.C. 4-H Program, Keep North Carolina Clean and Beautiful, Keep America Beautiful, Duke Power Co., Western North Carolina Development Association, WRAL-TV in Raleigh and WGHPiedmont in Greensboro.

Volunteers in North Carolina are making sweeping statements with colorful Big Sweep '90 T-shirts.

The design shows hands pitching in to sweep our shores free of litter. The white, all-cotton T-shirt is washed in warm, Southeast shades of rose, gold and teal.

T-shirt sales support the Big Sweep.

Show your support for Big Sweep and get an eye-catching bargain in return. Shirts are $8 and are available in small, medium, large and extra-large.

To order, send $8 plus $1 for postage and handling per shirt to Sea Grant, Box 8605, NCSU, Raleigh, N.C. 27695-8605. Postage and handling will be waived on orders of more than 10 shirts.

For more information, call Sea Grant at 919/737-2454.

Add a little marine science to your high school class. Send for Sea Grant's latest marine education curriculum guide, *S.E.A. Lab: Science Experiments and Activities for High School Students in Chemistry, Biology and Physics.*

The 208-page illustrated book is chock full of marine experiments and activities high school teachers can use in the classroom.

S.E.A. Lab is divided into three sections—chemistry, biology and physics. And within each section, activities are grouped around central themes.

For example, four activities in the chemistry section focus on density dynamics in the estuary. In the biology section, one group of lessons features experiments on animal adaptations in the ocean. And in physics, students can learn more about light in the sea.

The activities were developed by teachers and marine science graduate students.

The project was coordinated and field tested by Lundie Spence, Sea Grant's marine education specialist; Dirk Frankenberg of UNC's Marine Science Curriculum; and Jo Wallace, formerly with the UNC Center for Math and Science Education. And it was funded by The Dreyfus Foundation, UNC Sea Grant, the UNC Center for Marine and Science Education, and the UNC Marine Science Curriculum.

The book is illustrated with line drawings that are suitable for photocopying. And an answer key is provided for all activity questions.

If you would like to add a little marine flavor to your lesson plans, write Sea Grant for a copy of *S.E.A. Lab.* Ask for UNC-SG-90-01. It costs $10 plus $2 for postage and handling.

One day a year is not enough time to deal with shoreline litter.

The Big Sweep is producing its first educational publication, *Ripples*, which is aimed at children ages 9 to 11.

The illustrated booklet of 16 activities focuses on the problems created by litter

in our ocean and inland waterways. It includes puzzles on paper and active games for groups.

For example, "Be A Sport, Trash Sort" is an active relay that teaches children how to sort recyclables.

"Wildlife Tug of War" teaches children the dangers posed to animals when they become entangled in six-pack rings.

If you're a teacher or the leader of a scout, 4-H or church group and would like to use the booklet, let us know.

Write to Sea Grant, Box 8605, NCSU, Raleigh, N.C. 27695-8605, and ask for UNC-SG-90-02.

Printing of the Big Sweep educational book was funded through the N.C. Wildlife Resources Commission and the N.C. Wildlife Federation. Copies are free. But please enclose $1 per booklet for postage and handling.

It's 5 o'clock.

You're leaving the beach.

Do you know where your trash is?

Have you left picnic debris, old foam coolers, broken toys and cigarette butts scattered on the shore around you? Then consider this.

Your litter can supply many a fast-food meal for hungry seabirds. They often mistake floating plastic and other trash for dead fish or fish eggs. They swoop down in a feeding frenzy and often swallow before they taste. Then it's too late.

Ingested plastic may block digestion. Or if enough plastic is eaten, the bird may eventually die of malnutrition. The plastic takes up room in the stomach and tricks the bird into thinking it's full. Sometimes it just stops eating altogether.

More than 14 billion pounds of litter accumulates in the ocean each year. Don't make more trouble for wildlife by leaving your trash on the beach or tossing it overboard!

Volunteer for Big Sweep '90

Fill out the form below, and return it to the Sea Grant, Box 8605, NCSU, Raleigh, N.C. 27695.

Name_____

Address _____

City, State, Zip _____

Telephone number _____

Area you want to clean_____

Number of people in your group _____

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