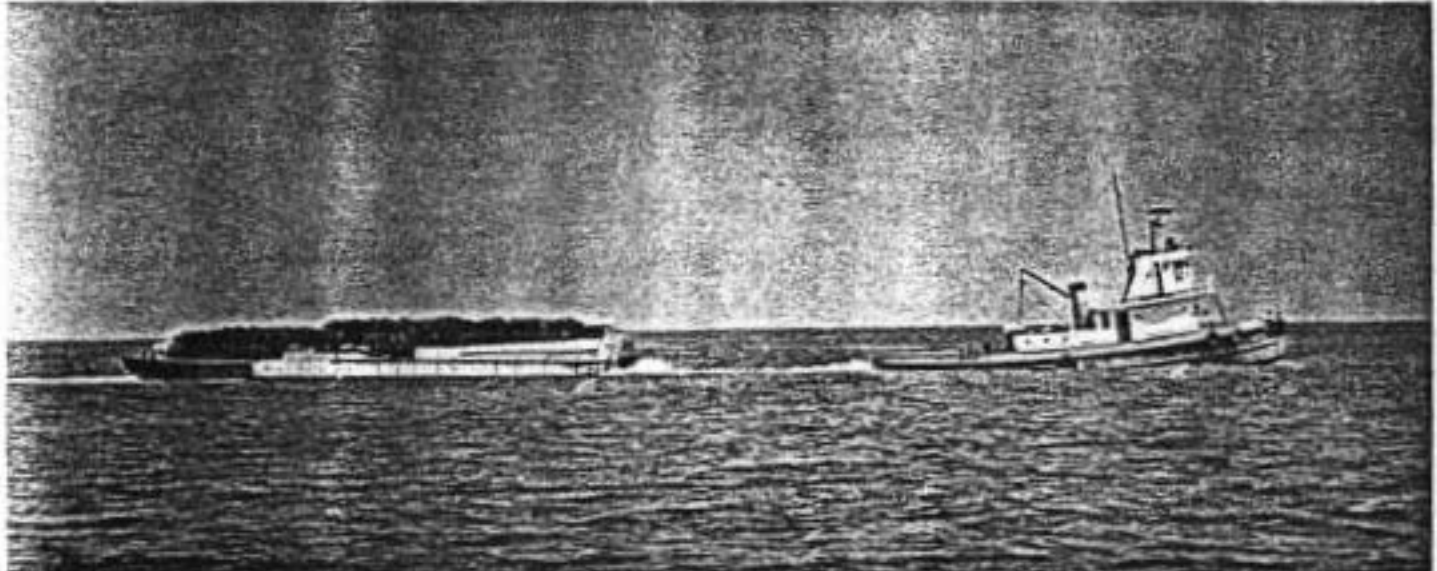
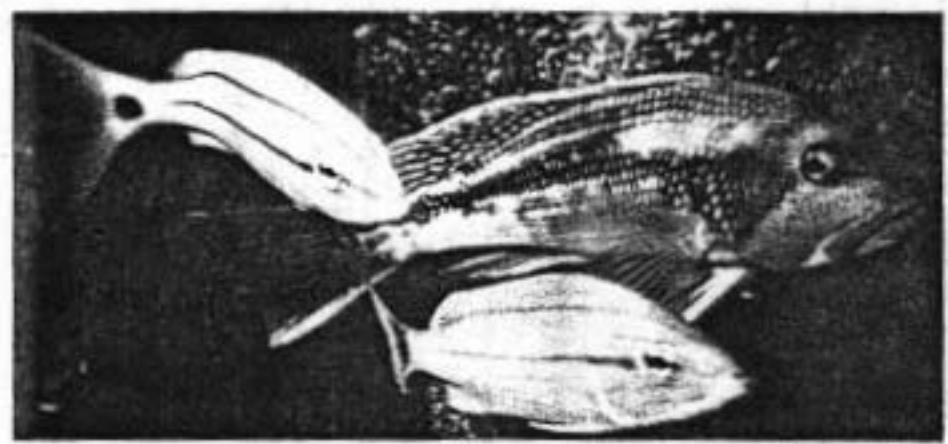


Tires And Fish By David Cupka


What does a discarded tire and a fish have in common? — Both can be found on South Carolina's artificial reefs. Each year South Carolinians wear out approximately three million tires on the state's highways. This amounts to a large solid waste disposal problem. New environmental regulations prohibit the burning of tires so this method of disposal is no longer available. One solution successfully employed by personnel of the Saltwater Sportfish Section of the South Carolina Wildlife and Marine Resources Department is to use some of these tires for building artificial reefs. Such use alleviates part of the disposal problem and also benefits resident and visiting saltwater anglers.

An artificial reef can be defined as an aggregation of material placed into an aquatic environment for the purpose of attracting organisms and providing habitat for them. Materials including concrete pipe, metal ship hulls or rubber tires when placed in the ocean soon become covered with sessile invertebrates such as hydroids and barnacles. These organisms serve as a source of food for "grazer" species of fish which include triggerfish,

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(Tire and Fish Continued)



sheepshead and porgies. The high relief provided by these materials also serves to attract large schools of baitfish. These "grazers" and baitfish are in turn utilized as food by predatory fish such as mackerels, bluefish, amberjacks, barracudas, groupers, cobia and sharks. The reefs also provide food and shelter for blackfish, trout, flounder, and spadefish. At the top of the food chain is the number one predator — the saltwater angler.

Investigations have shown that low-profile reefs attract more of the bottom-dwelling or benthic species of fish (e.g. flounder, sheepshead and blackfish) whereas high-profile reefs are more successful in attracting pelagic species including cobia and mackerel. Thus, certain species of fish can be attracted by regulating the height of the reef above the bottom.

Tires to be used on the artificial reefs are first baled by means of a hydraulic baling machine. This machine compresses 10 tires into a stack eighteen inches high held together by steel bands. The bale is then cut to allow entrapped air to escape so that the bale will sink. The next step in the process depends on the method of disposal to be used. If the bales, which weigh 200 pounds apiece, are to be dumped onto a reef site without being anchored or strung together, then a piece of polypropylene line is tied through the tires in each bale. The polypropylene line is not affected by saltwater when the steel bands corrode through in approximately three months. When this occurs, the tires (still held together by the polypropylene line) fan out. This provides more habitat and protective spaces for fish and increases the amount of food available by exposing more surface area for the attachment of sessile invertebrates. In addition, the two outermost tires in the bale assume a horizontal position and become sanded in to serve as anchors for the unit.

Other baled tire units, not held together by polypropylene rope, are strung on stainless steel cable in groups of twenty and attached to concrete culverts. These units are then loaded on barges and taken to the reef sites. Once the proper location has been reached, the culvert anchors and tire units are rolled off the barge.

A third method of disposal is that of placing tire units in surplus ship hulls.

These units are attached to the hulls by means of stainless steel cable. If the fuel tanks and engines are still in the hull, these are cleaned to remove all oil and grease before the boat is sunk. This is the most convenient and productive way of disposing of tires, since the hull does not have to be brought back to port and itself becomes an important component of the reef.

Before a new reef is constructed, several possible sites are chosen by means of SCUBA surveys. Prerequisites for a potential area include: 1) proximity to a safe inlet or harbor so that the reef is accessible to the small boat fishermen within a safe distance of shore, 2) location in a previously unproductive area so that no conflicts will occur with existing fisheries, 3) an adequate depth so that sunken material will not produce a hazard to navigation, and 4) a current regime such that sanding in of the reef will not occur.

Many people are involved and quite a few businesses participate in the Artificial Reef Program of the South Carolina Wildlife and Marine Resources Department. R. M. "Buck" Morris has devoted a lot of time and effort working on the artificial reefs in the Beaufort area while Herbert Forester has helped to make the reefs in the vicinity of Murrells Inlet a reality. Local businesses which have generously provided services include Wholesale Tire Co., Westvaco, Tidewater Concrete Products Co., Ininger Transport, Thurston Motor Lines, Old Dominion Freight, L. A. Chitwood Co., Southeastern Freight Lines, Bunch Leasing, George A. Rheaman Co., Hickling Motors, Santee Cement, Packet Motor Express, Johnson Motor Lines and McLean Trucking Company.

Surplus ship hulls to be used in the program are obtained from the U.S. government. The baled units and ship hulls are transported to the reef site by a marine contractor who is awarded a contract on the basis of a low bid.

In the Beaufort area, the Beaufort Technical Center provides a boat and crew to take a portion of the tires to the two reefs located in this area. All of these services make the reef program a community type project which is benefiting South Carolinians. Without the generous assistance of these persons and organizations, the reef program would

(over)



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not be nearly as successful as it is.

Funds to purchase buoys, cable, and a baling machine as well as to pay for the towing contracts have come from two primary sources. In 1967 the South Carolina General Appropriations Act made available the sum of \$30,000 for the construction of "offshore fishing drops" along the South Carolina coast. These funds have been available every year since then. Also a grant of \$40,000 was received from the Coastal Plains Regional Commission for the construction of artificial reefs during the present fiscal year.

A logical question is whether the ar-

tificial reefs located off the South Carolina coast are successful. The answer is partially provided by the results of a study conducted on the Murrells Inlet Artificial Reef by personnel of the National Marine Fisheries Service. In 1971, during the period from June through September, anglers fishing on the artificial reef landed approximately 19,000 fish. The predominant species represented in this catch were black sea bass, grunts, porgies, jacks, mackerels and flounders. Small boat fishermen spent more than seven thousand hours fishing on the reef during this four-month period. Flounder and

amberjack caught on the reef were significantly larger than those caught on nearby natural rocky bottom areas. The presence of large fish on the reefs was also shown by Eddie Reed, a sport fisherman from Orangeburg, who caught a new state record summer trout this past year while fishing on one of the artificial reefs in the Beaufort area.

The Murrells Inlet reef increased fishing opportunities and provided high catch rates for small boat fishermen. It attracted a significant number of new anglers (16 per cent of those fishing the reef) to the area. Also, almost 90 per cent of the total private boat angling population surveyed fished on the reef at least once on a fishing trip out of Murrells Inlet. In addition, 20 per cent of the boats fishing the Murrells Inlet reef were from out of state. All of this adds up to increased economic benefits to the local communities.

Thus, no doubt exists that South Carolina's artificial reefs are successful from many points of view. They are helping to solve part of a solid waste disposal problem as well as providing increased fishing opportunities. The reefs also provide economic benefits to the people of South Carolina and recreational benefits to resident and visiting saltwater anglers.

Despite their obvious success, a need exists to expand our existing reefs so that they will be able to withstand increased fishing pressure. In addition to the expansion of existing reefs, plans are underway to begin the construction of new reefs.

In South Carolina, participation in saltwater angling is growing and the artificial reef is an important tool used by fisheries managers to help satisfy the resulting increased demands on our saltwater sportfishing resources. ***

(Bridge Fishing Continued)

"I'd say that on the average the bridge fisherman loses three out of every four fish that a man in a boat could land with little trouble," said Sorensen, a veteran bridge fisherman.

Despite these hazards Sorensen said that, except for January and February when the fishing is slow, the Broad River Bridge averages 15 to 25 anglers all day every day. And this is just one of many popular fishing bridges in coastal South Carolina. The fact is that many anglers

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