AFS Policy Statement #26:
By-catch Reduction Devices as a Conservation Measure
(Full Statement)

Issue Definition

Many types of fishing gears, especially those with small mesh, tend to be nonselective in their catch. Thus, large quantities of juvenile fishes, fishes smaller than the legal size limit, and nontargeted species are captured and killed as by-catch in marine fisheries. Much of this by-catch is not marketed or used, and results in considerable waste. Moralities on nontargeted organisms may lead to reduced recruitment biomass, yield, and other ecological impacts on fish stocks. By-catch reduction devices (BRDs) are physical modifications to fishing gear that reduce the catch of nontarget organisms. These devices can alleviate waste and reduce mortality in many fisheries.

Effects on Fisheries

Use of small-mesh nets has been identified as an area of particular concern. Commercial and in some instances recreational fisheries result in an annual loss of millions of pounds of fish, shellfish, and other organisms that are captured, killed, and discarded at sea. Some of this waste is due to the take of animals that have low or little market value, ones that cannot be legally sold, or others such as porpoises, turtles, and birds that are incidentally (accidentally) captured. Shrimp fisheries in waters of the southern United States can cause considerable mortality on finfish and sea turtles populations. The total by-catch of the shrimp fleet in offshore waters of the U.S. Gulf of Mexico was estimated to have been between 300 and 400 million pounds of finfish per year from 1985 to 1989. The annual loss of juvenile red snapper, *Lutjanus campechanus,* in Gulf of Mexico shrimp trawls is estimated at 12.4 million fish. This by-catch accounts for all the allowable harvest of red snapper and may be used as a basis for closure of shrimp fishing in some areas for certain times. In New England, the total weight of by-catch species is estimated to exceed the total weight of shrimp landed. The use of BR can be applied to reduce waste and inadvertent mortality of nontarget species, and thus increase yield and stability in fisheries.

There has been much controversy over the loss of endangered turtles due to accidental entrapment, and turtle excluder devices (TEDs) are presently coming into use in shrimp fisheries off the southeastern U.S. coast and in the Gulf of Mexico. These devices, designed to allow sea turtles and debris to escape from shrimp nets, have proven to be very effective in reducing mortality of sea turtles. They have been voluntarily used by some commercial fishers and are mandatory in certain Exclusive Economic Zone (EEZ) and South Atlantic states' waters. However, regulatory efforts to impose mandatory use of TEDs to protect endangered sea turtles have been controversial and have resulted in resistance to their use within some segments of the commercial fishing industry. If modified and properly developed, TEDs also have potential as a finfish conservation tool because they allow escapement of valuable fishes from shrimp and finfish nets. In the pandalid shrimp fisheries conducted in shrimp nets also promise as BRDs.

Most U.S. fisheries are fully exploited and many are subjected to numerous other adverse environmental stresses. Significant mortalities of juvenile finfish can decrease spawning stock potential and yields available to fisheries and this population stress can also contribute to serious decreases in stock abundance. As an example, recent stock assessment modeling of Atlantic coast weakfish, *Cynoscion regalis, sug*gests that by-catch of weakfish in the south Atlantic shrimp trawl fishery can have a substantial effect on the long-term health of weakfish stock. Other types of fisheries that employ a variety of gear types, such as indiscriminate gill-net fisheries, East and West Coast groundfish fisheries, and MA-Atlantic mackerel fisheries, have been identified as fisheries where by-catch problems need to be addressed.

Further design and development of BRDs should lead to technological improvement that will aid management efforts in addressing juvenile finfish and mortality of nontarget species. Modifications of some of the present fishing gear types, especially those that use small-mesh nets or development of new gears or fishing methods that reduce by-catch could lead to considerable reductions in waste of juvenile finfish and other nontarget species. These savings and stability in commercial and would increase productivity and stability recreational finfisheries that rely on good juvenile recruitment and stock abundance to achieve substantial yields. Since economic and sociological factors greatly dictate the selection of a particular type of fishing gear, the continued development and testing of devices to reduce by-catch need to be pursued in close cooperation with the fishing industry. Such an approach should be a key element in gaining the acceptance of their use on a broad scale by managers and commercial fishers. Therefore, programs that incorporate conservation engineering with education and public information are needed to develop gears that can be accepted by and effectively used by commercial fishers and managers to reduce the magnitude of this problem.

One impediment in the implementation of BRDs in fisheries where they may be most useful is a recent amendment to the Magnuson Fishery Conservation and Management Act of 1976, which would restrict the implementation of BRDs for finfish in southern federal shrimp fisheries until 1994. A number of fisheries agencies are currently encouraging the U.S. Congress to reconsider this portion of the Magnuson Act, which delays implementation of BRDs.

Policy

The policy of the American Fisheries Society in regards to the unnecessary take and waste of marine resources is to:

1. Encourage state and federal agencies to promote the development, use, and implementation of by-catch reduction devices to conserve fish and wildlife.

Using the best available technology, by-catch reduction devices should be implemented in current problem fisheries. Concurrent programs should be designed to develop more effective devices through use.

2. Support the continuation and expansion of conservation engineering programs to reduce by-catch of undersize or nontarget species.

3. Request states and other entities conducting research on turtle, and other excluder devices to develop and support programs to extensively field test all BRD designs that allow for juvenile finfish escapement.

The National Oceanic and Atmospheric Administration agencies (National Marine Fisheries Service, Sea Giant) as well as the U.S. Fish and Wildlife Service should be encouraged to support research on ways to improve the exclusion of juvenile and nontarget species from fishing gear and to promote and distribute this information to industry.

4. Encourage programs, through its membership, publications and by other means, that demonstrate the usefulness of by-catch reduction devices to the commercial fishing industry.

Support efforts to hold national and international conferences in conservation engineering in order to improve technology transfer between researchers and other groups developing by-catch reduction and other fish separator devices.