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Some Recent Examples of Fishing Gear Technology Development or Transfer in New England

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Fishing gear development or technology transfer supported by a variety offunding sources is currently being conducted in New England by universities, state fisheries agencies, or nonprofit fisheries corporations. The funding sources for these efforts have, for the most part, been through the New England Fisheries Development Program, local Sea Grant programs, or the Southern New England Fisheries Development Program. The assumption, as well as the intent, is that benefits derived as a result of the efforts in New England would be directly applicable to many segments of the fishing industry throughout the United States.

Following is a discussion of only a few of the technology transfer or development efforts aimed at providing a diversified harvesting capability for coastal fisheries vessels.

SQUID

The squid resources of the northwest Atlantic are one of the few underutilized stocks that are available to fishermen in the Northeast and at the same time are in strong demand by markets on a worldwide basis. Hence, squid has been a logical choice for emphasis under the New England Fisheries Development Program associated with the harvesting, processing, and marketing of this species.

During the spring and summer of 1974, efforts were made to determine the potential of using light attraction methods at night for harvesting of squid similar to the techniques used in the California squid fishery. The observations made were encouraging as evidenced by the recordings of squid in Figure 1. As a result, during the summer of 1975 and spring of 1976, effots were made to purse seine squid at night using light attraction methods. The purse seining technique was believed to be potentially effective because of the manner in which the squid reacted to light from May to November of 1974. It was demonstrated that the squid could be concentrated in approximately a 200-foot diameter area around a vessel to a depth of 5 fathoms. However, at no time would the concentrated squid come to the surface so that brailing or pumping techniques could be employed.

The purse seining efforts made in 1975 and 1976 proved unsuccessful for unexpected reasons. During 1975, no squid could be found in the areas where they were prevalent in 1974. In 1976, even though the efforts were made in areas where substantial quantities of squid were confirmed, the squid were not attracted to the identical light source as in 1974.

However, the full objective of the New England Fisheries Development Program includes the development of markets as well as processing and harvesting developments. The marketing efforts are providing a strong incentive to produce squid because of the resultant improved price structure. Interest in squid as a viable resource for a directed fishery has multiplied many times over the previous 2 years. Innovative efforts by fishermen from New Jersey to Massachusetts have taken place with such gear as bottom trawls using 64-inch mesh, pelagic pair-trawls, and bottom pair-trawls. The results of the program and the interest in squid by the Southern New England fishing industry is illustrated in Table 1 which compares the spring landings of 1975 with those of 1976.

HERRING

Pelagic pair-trawling for herring was adopted by the New England industry through the efforts of the University of Rhode Island (URI) Sea Grant Program about 5 years ago. Since that time the method has been adopted by vessels from Cape May, N.J., to Boothbay Harbor, Maine, with interest also developing on the possibility of bottom pair-trawling. Funding from the Southern New England Development Program has enabled the URI Marine Advisory Service to successfully introduce this technique to further extend the capability of vessels fishing for herring, mackerel, and other pelagic or semipelagic finfish. The primary purpose for introducing the trawl was to enable pelagic pair-trawling vessels to continue fishing on herring when the herring went to the bottom as their mid-water trawls are not capable of fishing on the bottom effectively. Hence, in these instances, the bottom pair-trawl can change many unproductive nights into productive ones. Since its introduction during the spring of 1976, three pairs of vessels have adopted this additional capability. Interest has also been expressed in trying this method offshore for species such as squid, mackerel, or butterfish.

The trawl is illustrated in Figure 2 and is referred to as a two-bridle Bleaksprutte trawl. It is a modified version of three-bridle Bleaksprutte-trawl which is a symmetrical two-piece trawl with wedge pieces in the sides and utilizes 32-inch stretched mesh size in the face. The trawl is rigged with a 2-inch rubber disc sweep and towed in a similar manner as a mid-water pair-trawl with no floats on the

Figure 1.—Recording of squid from the *Mari - Gale - Barbara*, 13 August 1974, 6 miles south of yellow hills on Martha's Vinyard in 14 fathoms with four 1,000-watt lights on.

Table 1.—Maine and Rhode Island squid landings, average price, and value, April-June 1975 and 1976.

Year	Landings (lb)	Average price (cents/lb)	Value ($)
1975	639,550	14.6	93,845
[1]1976	4,000,000	0.23	920,000

[1]Based on preliminary estimates.

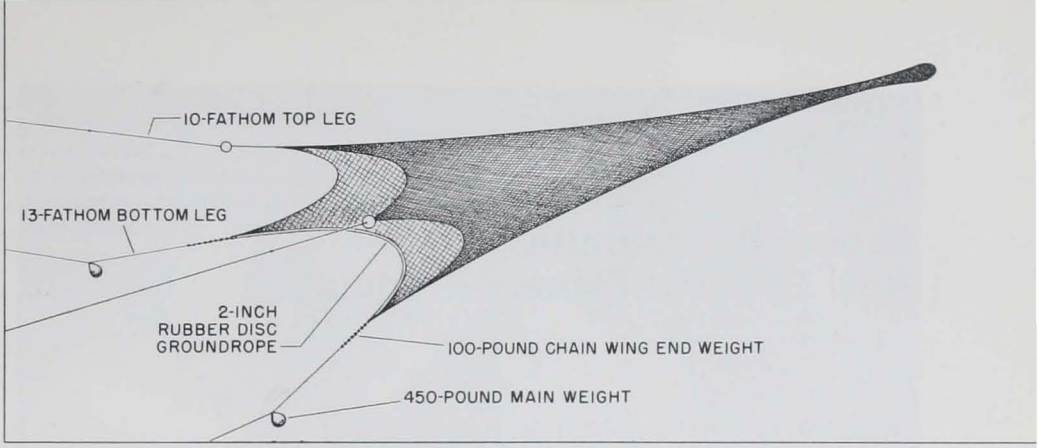

Figure 2.—Two-bridle Bleakspruttetrawl.

headline except for a couple of polyform buoys which assist in the hauling and shooting but provide little, if any, flotation while fishing. With the trawl rigged in this manner, a headline height of between 5 and 7 fathoms could be achieved with two vessels of 350 horsepower each. The trawl introduced was 300 meshes around, of 32 inch in the bellies, and with a top and bottom hanging line length of 180 feet.

The method described above has been successfully used by the coastal vessels in Britain for fishing in extremely rough bottom areas for cod and haddock. Although the trawls used are not quite the same, the technique of bottom pair-trawling has allowed both fleets to extend their capability and effectiveness in becoming more competitive. It is this increase in competitiveness which in some measure will assist the New England fishing industry to harvest a greater percentage of the stocks from America's coastal waters.

HARVESTING TECHNOLOGY

Some of the current efforts on harvesting technology involve joint funding from two programs in conjunction with the industry. An example of such a project currently underway is the underwater video taping of trawl gear being supported by URI and the Southern New England Fisheries Development Program.

Fishermen have had the desire and need to look at their towed gear ever since towed gear was first used. Divers and/or transducers have been used with some success but, unfortunately, it is usually true that fishermen don't dive and divers don't fish.

Hence most, if not all, of the information obtained in the past is either of a "hearsay" nature or an electronic interpretation of a trawl under test which is of course better than no information but still remains incomplete. It is the purpose of this project to enable fishermen from Maine to New Jersey to view their own towed gear and begin to answer some of the questions that continually persist.

There are three primary uses for the information obtained from this project: 1) it allows individual fishing skippers to evaluate their own towed gear as they have it rigged, and lets them make "demonstrated" adjustments to improve the gear's efficiency and productivity, 2) it gives trawl builders and designers the oppportunity to study and evaluate the dynamics of trawl design and rigging on a full scale working basis, and 3) it provides invaluable teaching tools in upgrading the level of knowledge of our existing skippers as well as students in formal fisheries training programs.

The University of Rhode Island has constructed a specially designed 26-foot aluminum boat with a 40-foot mast. An underwater TV camera is mounted on the mast which is then suspended below the boat during operation. The boat can control its position relative to the vessel whose trawl is being videotaped.

The electronics and the operational costs of this project are being funded by the Southern New England Fisheries Development Program while the boat was provided by URI. The fishing industry is supplying the vessels and trawls to be videotaped.

A fourth project of interest involves the conversion of a 36-foot Chatham, Mass., longliner that traditionally fishes for haddock and cod to Danish or Scottish seining for sanddabs. The equipment and gear is currently on order with the fishing demonstration scheduled for the months of March through June of 1977. The vessels fishing from Chatham have been exclusively longliners for many years. During the last few years the fleet has numbered as many as 70 vessels with only about 25 percent of the vessels operating on a profitable basis. Hence, there is a true and serious need for the fleet to diversify with interest in the success or failure of the project being readily evident.

There are numerous other fishing technology projects known generally throughout New England, which are currently underway in the region. These include a safer and more efficient hook-up block being developed by the MIT Sea Grant Program, lobster bait bagging and mussel harvesting projects of the New England Fisheries Development Program, and trawl and trawl door developments at URI. The direction of these developments and their implementation are augmented by the cooperation and informal coordination which exists between all of the agencies, programs, and groups involved in fisheries development. The results of these projects and the cooperation of the various interests have begun to pay off in real dollars for the fishing industry in recent years. This trend should continue in the future and become a key factor in the management and exploitation of our fisheries resources as the United States moves forward under the guidance of the regional management councils.

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