The Clam-Kicking Fishery of North Carolina

JAMES F. GUTHRIE and CURTIS W. LEWIS

James F. Guthrie and Curtis W. Lewis are with the Beaufort Laboratory, Southeast Fisheries Center, National Marine Fisheries Service, NOAA, Beaufort, NC 28516. This paper is Contribution No. 81-43B from the SGFC's Beaufort Laboratory.

ABSTRACT—The historical progression of methods and gear in the clam-kicking fishery of North Carolina is described, from the original anchor method to the present fishery in which southern quahog clams, Mercenaria mercenaria *(Linne), are mechanically blown from the bottom by wash from a boat propeller and are retained in a special 12-20 foot wide trawl towed behind a 17-45 foot boat. We trace the history of the fishery and describe the several techniques in sufficient detail to enable the reader to adapt any of them for fishing in other shallow water areas. Focus is on Carteret County, N.C., where the fishery and gear innovations are believed to have originated in about 1940 and which is still the leading clam producing county.*

Introduction

At about the time that fishermen in North Carolina were beginning to convert from sail to small engine power, long-haul fishermen (Guthrie et al., 1973) noticed quahog clams, *Mercenaria mercenaria*, lying exposed in shallow waters where boats pulling the long nets had passed over them. They deduced that the prop wash from their boats was dislodging, or kicking, the clams out of the mud and throwing them on the surface. The fishermen soon realized that the prop wash might be utilized to harvest clams commercially far more efficiently than methods then in use. Clamming at that time was primarily done by hand raking, signing (sighting the excreting hole of an individual clam), or trodding in shallow water on an intertidal shoal (feeling clams in soft bottom with your feet).

The method of harvesting clams by kicking, or using the propeller backwash to extract clams from the substrate, has gone through several stages of development since it was first tried in the early 1940's. In this paper we trace the history of this development and describe the four different techniques that have been used.

Since 1950 the North Carolina clam catch by all methods has varied from a low of 122,000 pounds of meats in 1955 (dockside value $35,000) to a high of 1,541,719 pounds (dockside value $5,554,047) in 1980 (Table 1). Harvesting by kicking is regulated by the North Carolina Division of Marine Fisheries, which sets by proclamation the opening and closing of the season, the months the season will be open, and places where boats are allowed to operate. According to law enforcement personnel, 147 boats were active in Carteret County in 1980. Since kicking does not require an elaborate array of equipment, fishermen consider it a welcome addition to their seasonal fishery repertoire.

Table 1.—Annual catch and value of hard clams landed in Carteret County, N.C., and in all North Carolina counties.

	Carteret County		All counties	
Year	Pounds (10^3)	Value (10^3)	Pounds (10^3)	Value (10^3)
1950	803	150	836	157
1951	760	175	834	192
1952	684	157	724	166
1953	421	109	445	116
1954	206	60	244	72
1955	65	20	122	35
1956	121	42	148	52
1957	217	87	243	98
1958	210	84	278	111
1959	235	94	340	136
1960	334	137	432	173
1961	248	99	490	196
1962	98	39	247	99
1963	168	66	332	130
1964	90	34	225	98
1965	63	28	313	137
1966	70	28	285	110
1967	27	12	287	133
1968	19	10	251	132
1969	31	17	292	154
1970	65	36	336	173
1971	82	46	300	162
1972	77	42	274	163
1973	137	112	379	294
1974	67	70	288	322
1975	77	58	285	226
1976	93	77	306	258
1977	543	816	739	1,069
1978	583	1,543	892	2,449
1979	777	2,272	1,450	4,474
1980	876	3,014	1,542	5,554

Anchor Method

The anchor method is believed to have originated at Harkers Island, N.C., in Carteret County (Fig. 1) about 40 years ago. At first, kicking was done by placing an anchor 25-75 yards (18-25 m) behind the boat, which stopped forward progress but allowed the boat to swing in an arc (Fig. 2). Usually a source of weight was shifted to the stern of the boat to increase the amount of propeller wash directed toward the bottom. Once anchored, the boat was headed into the tide and moved in a half-moon arc, the circumference of the kick being determined by the length of the anchor cable. After the tide swept the turbid water from the kicked areas, the fisherman picked up the exposed clams with a rake. This process was repeated after more cable had been let out to allow the boat to move forward to an unkicked area. Before starting a day's activity a fisherman would try several areas and select the one where clams were most plentiful. The basic method, with its modifications, became popular since it could be done by one fisherman in virtually any small boat, and soon spread through coastal communities. The first person to devise or employ the technique remains unknown, but it soon led to a modification termed the "bedstead."

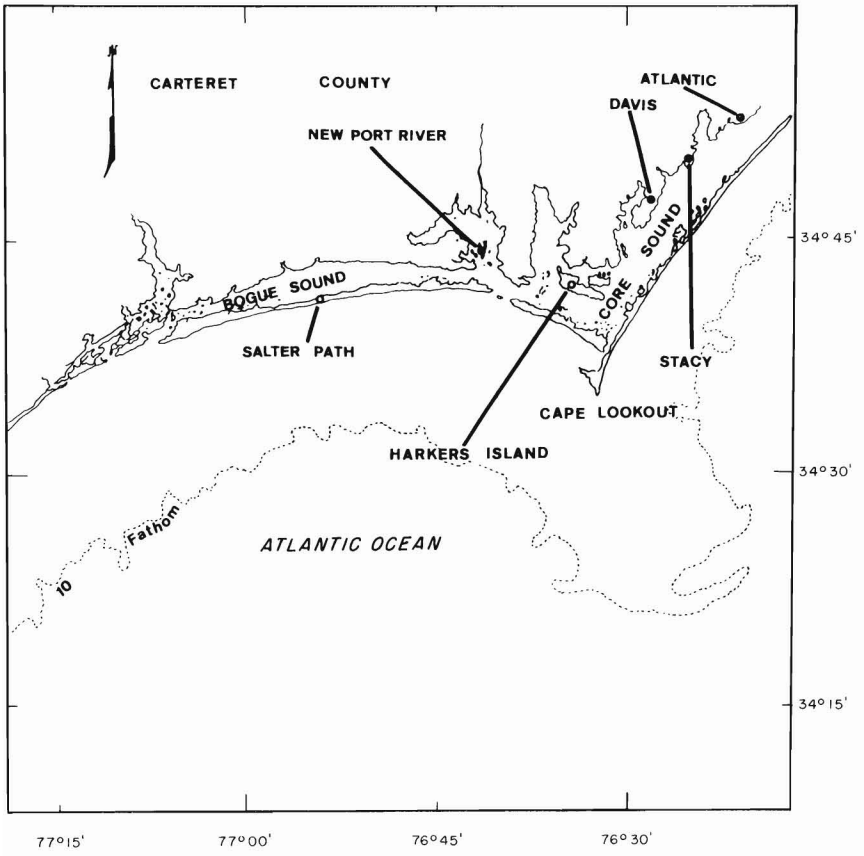

Figure 1.—Areas in coastal North Carolina where harvesting clams by kicking them from the mud with propeller backwash originated.

Bedstead Method

This method is believed to have been developed at Stacy, N.C., during the early to middle 1940's and employed a modification of a gear formerly used to harvest blue crabs, *Callinectes sapidus* (Rathbun). The bedstead, 7 feet wide by 3 feet 4.5 inches high and set on sleds (Fig. 3), weighed, by conservative estimates, at least 150 pounds. The boat pulled the gear behind it in an arc as it swung on the anchor. Clams kicked out by the prop wash were scooped up and collected in the bunt, which was made of heavy twine and had a loose but heavy lead line attached. To retrieve the kicked clams from the bunt, the bedstead was lifted onto the stern, the lead line was brought aboard, and the contents were dumped on the stern, or cockpit, of the boat. This gear was heavy and awkward, but it allowed the fishermen to remain aboard the boat at all times. They were not as dependent upon fair weather or on tide to remove turbid water as they were when using the anchor method, and they could harvest clams in deeper water. Usually at least three people working from the same boat were required (Fig. 4).

A small skiff was often carried and secured on the leeward side of the kicking boat. Empty shells and debris culled from the catch were shoveled into the skiff and later dumped inside the kicking arc near the anchor, or in an area not being kicked. If the bunt had a large catch of clams or an excess amount of debris, the catch was dumped directly into the small skiff, because less effort

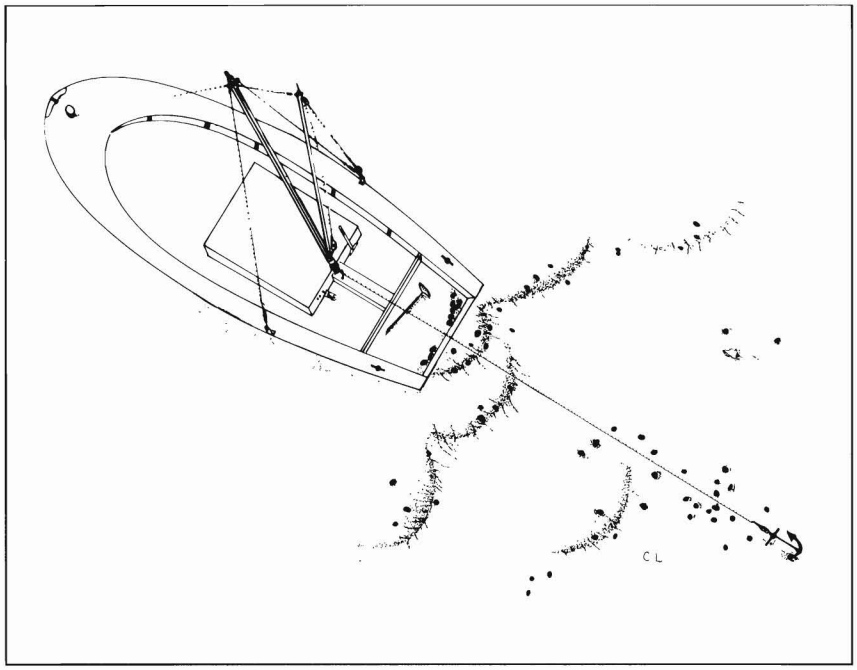

Figure 2.—Diagram of the anchor method for kicking clams.

was required to lift the heavy gear into the low-riding skiff than to lift it into the kicking boat. The bedstead was effective but it proved to be too heavy and cumbersome. It was used for only 1-2 years before it was replaced by the oyster drag.

Figure 3.—The basic bedstead frame, to which a trawl net was attached.

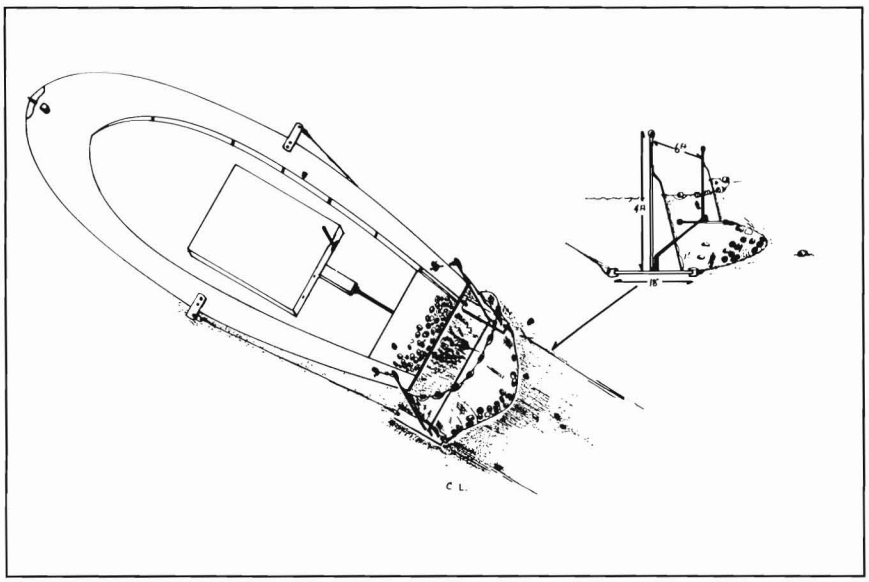

Figure 4.—Diagram of a boat rigged for harvesting clams by the bedstead method.

Oyster Drag Method

A modified oyster dredge, converted for use as a clam drag sometime after 1945, probably represented the first automated clam harvester used in coastal North Carolina (Fig. 5). It was reportedly first tried by someone from the community of Davis. The drag was about 4 feet wide and was used to scoop clams off the bottom after they had already been kicked out by the prop wash. It weighed about 100 pounds and had a removable bar on the bottom with teeth 3 inches long. A bag made of metal rings connected together with S-hooks was attached to the frame. The rings on the top were larger than those on the bottom. The heavy clams were thus retained in the bag and worked their way to the cod end, while much of the floating debris passed through the larger top rings.

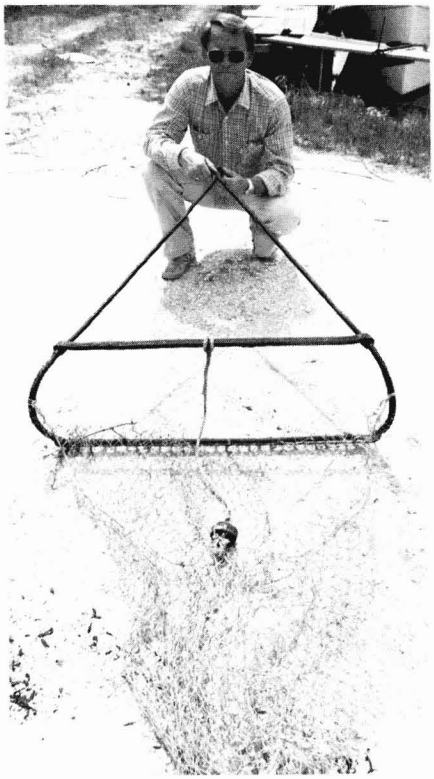

Figure 5.—The oyster drag with bunt attached.

A kicking stake (inset, Fig. 6) was used with this gear, permitting the boat to kick in a complete circle without tripping an anchor. The stake was a 3 inch diameter pipe about 12 feet long. A sleeve about 6 inches long and 3.5 inches in diameter with an eye bolt welded to it was slipped over the stake, resting on a stop placed about 4 feet off the bottom. The stake with the sleeve in place, and a rope sling at the top to help in pulling it up when fishing was done, was driven 4 feet into the bottom with a heavy maul. A cable from the eyebolt on the sleeve passed through a brass ring or single block on the front pull post of the boat and then through another block on a second post mounted on the port side about two-thirds of the way towards the stern. Cable was payed out in 6-8 inch increments each time the boat moved around the stake, allowing the boat to move in an ever-widening circle and cover a new area. Sometimes the stake was moved 10 or 12 times per day, depending on availability of clams.

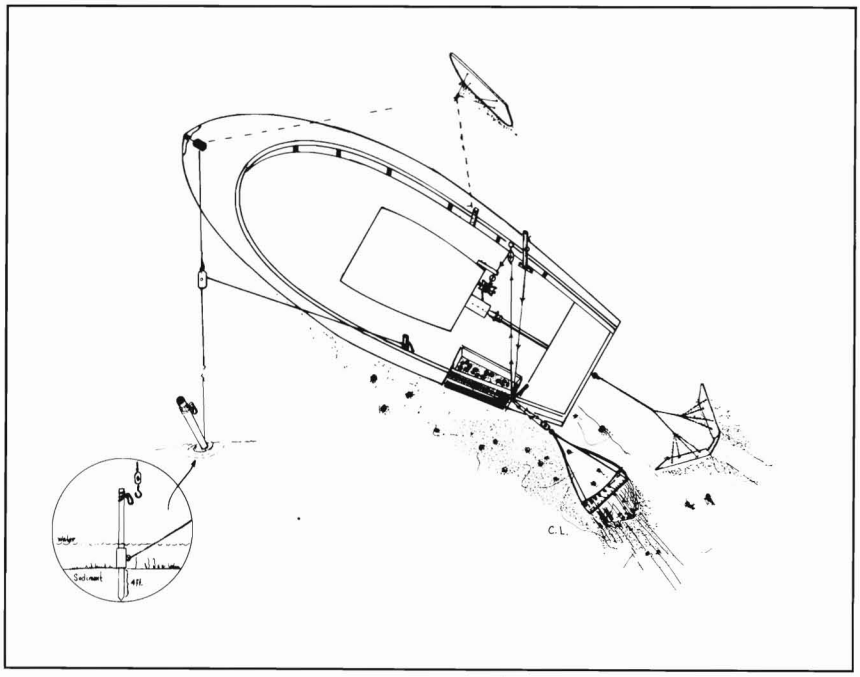

Figure 6.—Diagram of a boat rigged for harvesting clams by the oyster drag method.

The drag was transported, carried, and fished on the port side of the boat just a little aft of the stern. A towing cable was secured to a high post located on the starboard side. It ran across the boat, around a turn post located aft of the culling tray on the port side, through a single block on the tip end of the drag, back to another single block on the high post, and then through a single block located aft of the engine housing that lined up the cable on the drum spool (Fig. 6). The turn post, 2 or 3 feet high, also was used to turn the drag toward the rollers, which were mounted at the edge of the deck in front of the culling tray. The drag was pulled to the boat so that its teeth barely touched the side of the boat, and the catch was rolled onto the culling tray. Usually two or more men fished together.

The boat was slowed by two trawl boards used like sea anchors directly aft of the boat. These boards were 6 feet × 2.5 feet, with the inside ends tied together at the top and bottom by ropes 2 or 3 feet long (Fig. 6). The boards were secured to the stern pull post by either a single bridled line or by a line from each board. In bad weather a single trawl board was used off the starboard side to keep the boat from getting too close or too far away from the kicking stake. This board was secured at the front pull post and held at a set distance off the starboard side by a line running from the board to a mid pull post. The oyster drag was an extremely efficient gear, and on some days 10,000 pounds of clams were harvested by a single boat. It was used until the development of the clam trawl.

Clam Trawl

The first clam trawl reportedly was tried at Atlantic, N.C., in 1968. It has not been changed appreciably, except for some minor modifications to allow escapement of debris over the top of the net. The major advantages of this gear are simplicity and maneuverability (Fig. 7, 8). The trawl boards are attached

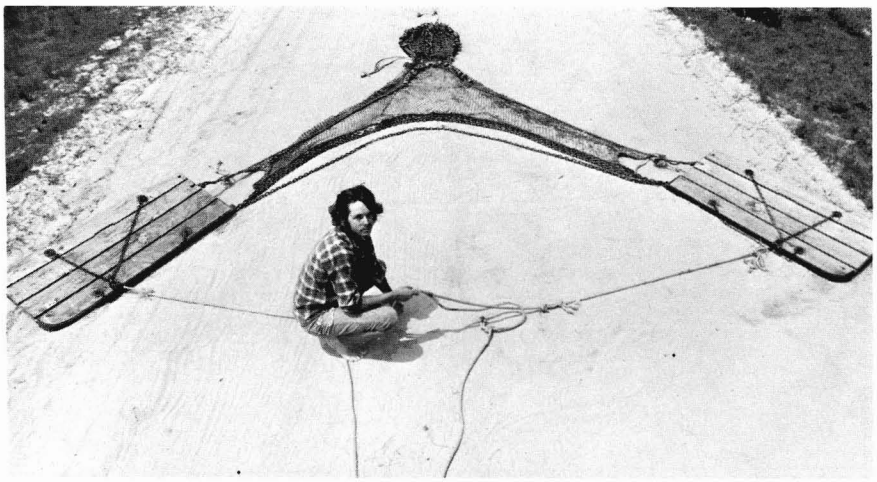

Figure 7.—The clam trawl, with boards attached.

directly to the net, the gear is fished about 15 feet behind the boat, and the boat is not attached to a stake or anchor. A single towing line that runs from the winch through a block on the lower mast is bridled to the trawl boards (Fig. 9). A lazy line around the cod end runs through a block high on the mast, enabling the whole net to be lifted out of the water for dumping the catch.

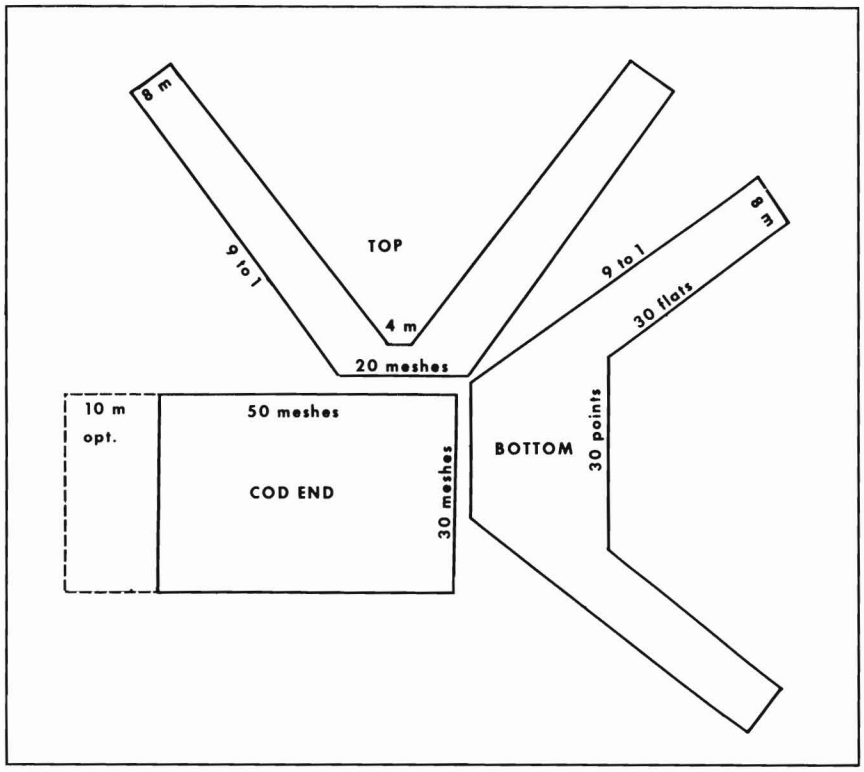

Figure 8.—Schematic diagrams of clam trawl, showing measurements.

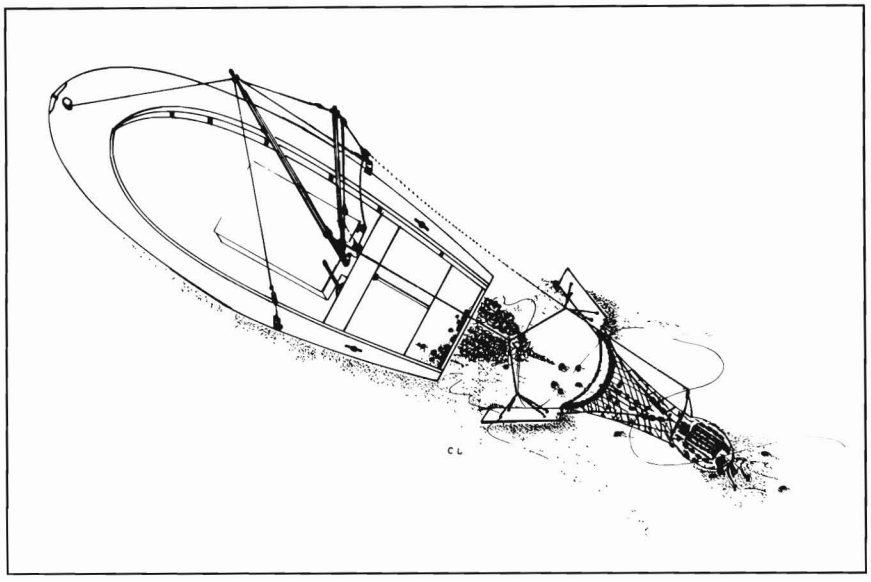

Figure 9.—Diagram of a boat rigged for harvesting clams with the clam trawl.

The typical clam trawl designed for a 21 foot boat is 10 to 12 feet long and is hung on 0.5 inch polydacron rope with 72-84 strand braided nylon twine. Twine size in the trawl body varies from 42-84 strand nylon (rolled or braided). Mesh size varies from 1.25 inch bar in the bottom to 3 inch bar in the body. The same twine and mesh size are used in the larger trawls. The net usually is pulled with one or two 2-5/16 inch tickler chains 12 inches ahead of three chains attached to the bottom of the net as a lead line. The three chains (0.5 inch dia.) are hooked together by a series of S-hooks attached directly to the net (Fig. 10). A 25-mesh square in the bottom and top of the cod end of the net is usually cut out and replaced by 1.25 inch diameter metal rings also held together by S-hooks.

The trawl board for the 10-12 foot trawl is 5 feet × 2 feet and is typically slung one-third (Fig. 11) (i.e., when the bridle links are pulled tight they form a diamond on the lower one-third of the board, though individual boards vary in setting). Trawl board and net size vary with the size of the kicking boat and depths of the water fished. Boards for a 20 foot clam trawl may be up to 9 feet × 3.5 feet. Kicking is generally restricted to depths less than 10 feet. Fishermen generally try to position the propeller about 12-15 inches above the bottom for most efficient operation. Boats with drafts up to 7 feet can clam in water up to 10 feet, while boats built with a tunnel for the propeller shaft can clam at depths of 1 to 2 feet. Weight can be added to the stern or shifted around on the boat to achieve the optimum propeller angle and depth above the bottom.

To help make a boat more efficient in varying water depths, a winged rudder was introduced by some fishermen in 1976 (Fig. 12). Essentially, it is simply a rudder to which two iron deflectors have been welded at an angle of about 30°. The deflectors extend about 18 inches on either side of the rudder and bend downward at an angle of about 20° 9 or 10 inches from the center post. Water

Figure 10.—Heavy anchor chain attached to lead line of a clam trawl.

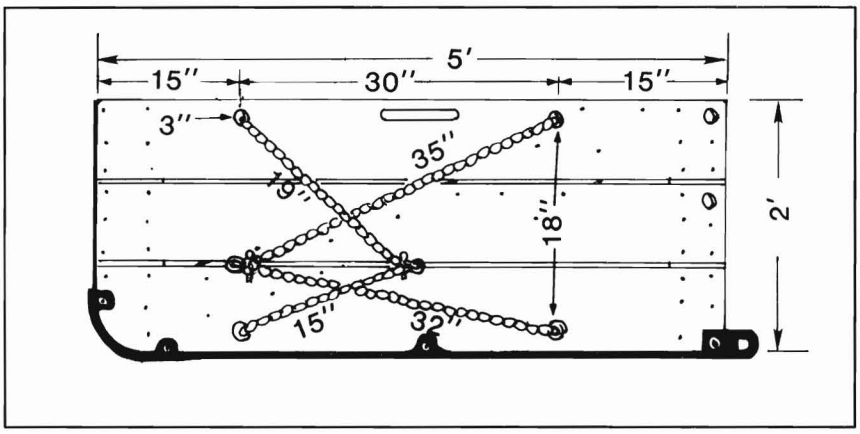

Figure 11.—Diagram showing how trawl board for clam trawl is rigged.

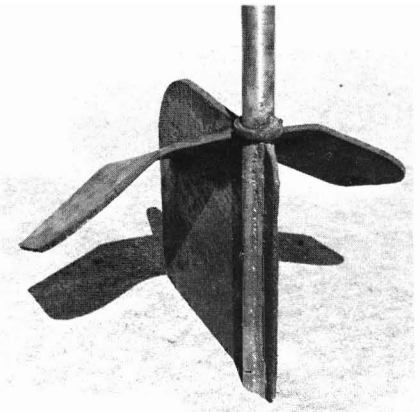

Figure 12.—The winged rudder, used to deflect propeller backwash to the bottom.

from the prop wash is deflected downward and compensates for the propeller not being the optimum angle or distance off the bottom.

Acknowledgments

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