THE GEAR USED IN THE SEA SCALLOP FISHERY

By WILLIAM F. ROYCE

Aquatic Biologist, Division of Fishery Biology

Fish and Wildlife Service

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For more than a decade the sea scallop fishery of the United States has been conducted by vessels landing principally at the port of New Bedford. Smaller quantities have been landed at New York and Boston and numerous small ports from New Jersey to Maine. In 1942, 7,183,000 pounds of sea scallop meats were landed on the East Coast of the United States and of this quantity, 5,446,000 pounds were landed at New Bedford.

The animal which supports this fishery, the sea scallop or giant scallop (Pecten magellanicus (Gmelin) is a round mollusk with 2 shells which may reach a diameter of 8 inches. It is known to occur on grounds from New Jersey to Labrador and local populations are found along the shore generally in waters of 10 fathom depth or greater. The offshore fishery, which is prosecuted by the larger vessels and which accounts for the bulk of the production, is pursued almost entirely on George's Bank. Most of the fishing is done in 30 to 40 fathoms of water on the parts of the Bank known as the Northern Edge, Southeast Part, and South Channel. The Northern Edge grounds are about 185 miles from New Bedford and are fished principally during the summer months. The closer South Channel area is about 80 miles distant and is fished principally during the winter months.

The bottom where the scallops are found is generally sand or sand and mud mixture. However, it is frequently covered with boulders and extremely rugged gear is required.

The sea scallop, unlike other molluscs, cannot close its shell tightly and thus retain water within. As a result, after it is caught, it dies very quickly and spils unless shucked immediately. All of the vessels fishing the offshore grounds have provisions for shucking the sea scallops as soon as they are caught. The single muscle or meat is the only part of the animal saved and this is shucked out and packed in cloth bags holding about four gallons each. These bags are thoroughly iced down in the hold and brought ashore. After arrival at port, the dealer purchasing the scallops frequently repacks them in consumer size packages for either fresh or frozen shipment.

The vessels used in the New Bedford scallop fishery are necessarily very seaworthy craft. Usually, they are 60 to 70 feet in length, 30 to 70 gross tons, and with 150 to 250 horsepower diesel engines. Many of the vessels go dragging for finny fish during the winter months and change over to scalloping during the summer months. Construction is almost identical to that of a medium size dragger. The only changes necessary for scalloping are the addition of 2 booms for handling the heavy dredges and shucking tanks for shucking and cleaning scallops. The same double drum fishing winch, cables, and forward gallows frames are used.

Figure 1 shows a typical modern dragger rigged for sea scalloping. This vessel, the Catherine and Mary, is 65 feet registered length, 56 gross tons, and is powered with a 180 horsepower engine. Note in the photograph the 2 booms on the forward mast which are rigged especially for handling the dredges. The gallows frames, through which the towing wire passes, are visible on each side opposite the forward mast. The Catherine and Mary changes its rig from dragging to sea scalloping as market conditions require. Figure 2 is a close up of the after deck of another sea scallop vessel. It showsthe winch just aft of the hatch and the two shucking tanks alongside the wheelhouse.

For several years, the Atlantic Fishermen's Union, which mans the scallop draggers used out of all the larger North Atlantic ports, has prescribed that the catch in a single trip shall amount to not more than 150 gallons per man. Most scallop draggers carry a crew of 10 including the captain and the engineer and the catch limit is thus 1,500 gallons. Under the fishing conditions generally found at New Bedford in the summer months, the limit catch is obtained in 5 to 7 days. The Union also prescribed that fishing shall not continue more than 8 days after the first scallops are caught, and this limits the catch to less than 1,500 gallons during the more rigorous months of the winter.

Most of the vessels fishing out of New Bedford use 2 dredges each 11 feet wide. These are towed simultaneously, one from each forward gallows frame and brought up and dumped alternately on deck. Because of the rough bottom, the dredges have been made very sturdy (figure 3). The complete dredge weighs about 1,000 pounds when empty. Some of the smaller draggers with less power have used lighter dredges of 8 to 10 feet in width. Other dredges up to 13 feet wide have been tried but the 11 foot dredge is now fairly standard.

Figure 3 shows most of the details of construction. Some things cannot be shown in the drawing and others require some explanation. The holes for the links used in attaching the bag are spaced 4 inches apart around the frame. Single holes and links are used on the top and sides and double holes and links on the bottom. The top bar is sloped forward and downward as indicated in the diagram and the holes for the links are on the <u>front</u> edge of the top bar. The fishermen explain that this construction has been adopted because the dredge occasionally turns over. If this happens, then the links are not worn out and torn off since they are placed on the front of the top bar in a protected position. On the sides and bottom, the holes are placed on the back edge of the bars where the links are adequately protected. The side of the bail is constructed so that the angle of the dredge may be changed to suit bottom conditions. When the bottom is soft, the frame is tipped forward so that the scraper blade tends to ride up over the bottom and prevents the bag from filling up with sand and mud. On harder bottoms, the frame is turned back to allow the dredge to dig in the bottom a little more and insure a better catch.

The bag is constructed, as indicated in the diagram and figures 4 and 5, of steel links and rings on the bottom and part of the top. The rest of the top is a single piece of webbing made of five sixteenths of an inch braided cotton sash cord held together with cord clips or hog links. This piece of webbing is inserted in the top of the net to lighten it and to help insure the dredge landing right side up on the bottom. The meshes are made with the cord clips and sash cord by winding the cord between nails 5 feet apart and forming 6 inch meshes with the cord clips. The technique is similar to that described for the construction of cod ends in the Pacific Coast otter trawl fishery by Carl B. Carlson in the Fishery Market News for May 1945. The diagram of the bag (figure 3) indicates that the mesh part of the top is attached on the front to 33 rings and on the back to 27 rings. This is accomplished by attaching 1 ring to 2 meshes in 11 instances on the front and in 17 instances on the rear. This top section is not made tapered but is simply a square piece of webbing, 44 meshes wide and 10 meshes deep.

The club (figure 5) is attached to the back of the bag to maintain the shape of the bag and to help in dumping it. When the dredge is brought aboard, the chain attached to the club is hooked to the block and the entire bag hoisted in order to dump the catch on deck. The weight of the dredge plus its contents makes it necessary for almost all operations connected with bringing it aboard and resetting to be made with the aid of power.

The list of materials given indicates the requirements for a single dredge. The frame of the dredge may last for several seasons. It is occasionally rebuilt as certain parts wear or are damaged. The bag, however, will require repairs with extra links and rings at the end of each trip and will require complete replacement after about three trips on rough bottom. On smoother bottoms, the fishermen report the bag will last for as much as from six to eight trips. Accordingly, the materials listed for the bag should be increased several times to allow for bag repairing and replacements according to the anticipated use.

Materials List for 11 foot Sea Scallop Dredge

Frame

18 feet	1 3/4 inch round hot rolled mild steel
14 feet	1 1/8 inch round hot rolled mild steel
21 feet	2 1/2 inches x 1/2 inch flat hot rolled mild steel
11 feet	3 1/2 inches x 2 1/2 inches x 5/16 inch angle hot rolled mild steel
5 feet	2 1/2 inches x 3/4 inch flat hot rolled mild steel
11 feet	3 1/2 inches x 3/8 inch flat spring steel
12	1/2 inch by 1 inch rivets
18	3/4 inch by 2 1/2 inches bolts
12	3/8 inch by 3 inches bolts
1	1 inch by 4 inches bolt

Bag

160 pounds	5/16 inch x 3 inches Inside diameter welded steel rings
130 pounds	5/16 inch x 1 1/8 inches open dredge links
10 pounds	5/16 inch cord clips
500 feet	5/16 inch braided cotton sash cord

Club

11 feet	3 inches by 1/4 inch flat hot rolled mild steel bar
11 feet	2 inches by 1/4 inch flat hot rolled mild steel bar
11 feet	2 inches by 2 inches oak
15 feet	3/16 inch chain

"Sep. No. 157"

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By William F. Royce*

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The animal which supports this fishery, the sea or giant scallop (Pecten magellanicus Gmelin) is a mollusk with two shallow, disc-shaped shells which may reach a diameter of 8 inches. It is known to occur on grounds from New Jersey to Labrador, and local populations are found along the shore generally, in waters of 10-fathom depth or greater. The offshore fishery, which is prosecuted by the larger vessels and which accounts for the bulk of the production, is pursued almost entirely on Georges Bank. Most of the fishing is done in 30 to 40 fathoms of water on the parts of the Bank known as the Northern Edge, Southeast Part, and South Channel. The Northern Edge grounds are about 185 miles from New Bedford and are fished principally during the summer months. The closer South Channel area is about 80 miles distant and is fished principally during the winter months.

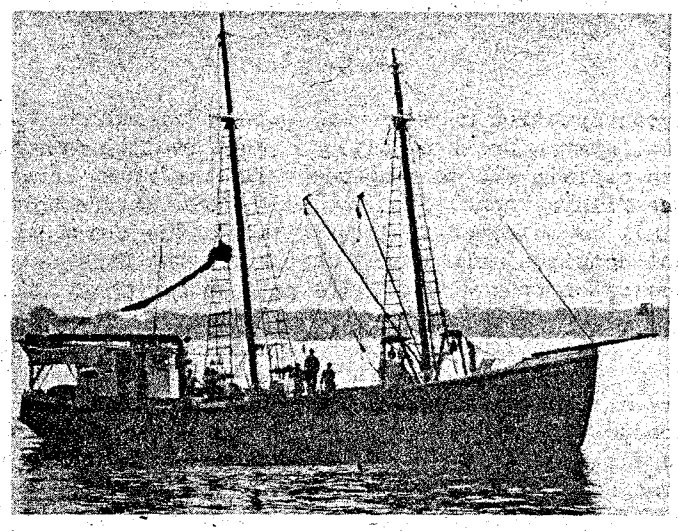

FIGURE 1

The bottom where the scallops are found is usually sand or sand and mud mixture. However, much of it is covered with boulders. Extremely rugged gear is required.

The sea scallop, unlike other mollusks, cannot close its shell tightly and thus retain water within. As a result, after it is caught, it dies very quickly and spoils unless shucked immediately. On all of the vessels fishing the offshore grounds, the sea scallops are shucked as soon as they are caught. The single muscle or meat is the only part of the animal saved, and this is shucked out and packed in cloth bags holding about 4 gallons each. These bags are thoroughly iced down in the hold. After arrival at port, the dealer purchasing the scallops frequently repacks them in consumer-size packages for either fresh or frozen shipment.

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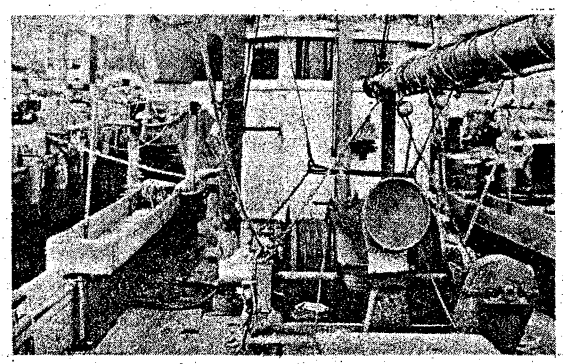

FIGURE 2

For several years, the fishermen's union, which mans the scallop draggers operated from all the larger North Atlantic ports, has prescribed that the catch in a single trip shall amount to not more than 150 gallons per man. This limitation was adopted partly as a conservation measure and partly to insure a shorter trip and the landing of scallops in fresh condition. Most scallop draggers carry a crew of 10, including the captain and the engineer; thus the catch limit is usually 1,500 gallons. Under the fishing conditions usually found at New Bedford in the summer months, the limit is obtained in 5 to 7 days. The union also prescribed that fishing shall not continue more than 8 days after the first scallops are caught, and this limits the catch to less than 1,500 gallons during the more rigorous months of the winter.

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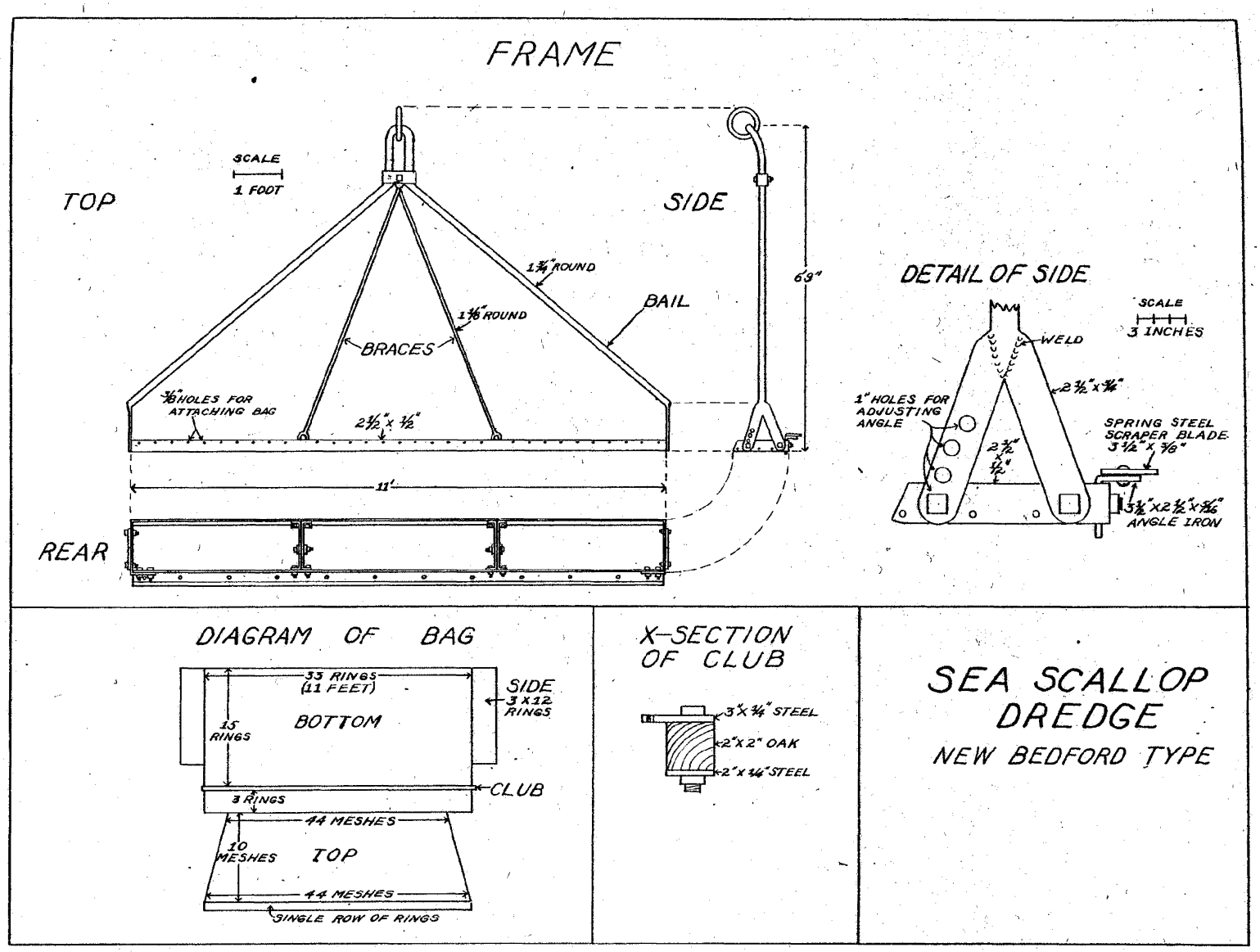
FRAME
TOP
SCALE
1 FOOT
SIDE
1¾" ROUND
1⅛" ROUND
BAIL
BRACES
63"
⅜" HOLES FOR ATTACHING BAG
2½" x ½"
11'
REAR
DETAIL OF SIDE
SCALE
3 INCHES
WELD
2½" x ¾"
1" HOLES FOR ADJUSTING ANGLE
2½" x ½"
SPRING STEEL SCRAPER BLADE 3½" x ⅜"
3½" x 2½" x 5/16" ANGLE IRON
DIAGRAM OF BAG
33 RINGS (11 FEET)
SIDE 3 x 12 RINGS
15 RINGS
BOTTOM
CLUB
3 RINGS
44 MESHES
10 MESHES
TOP
44 MESHES
SINGLE ROW OF RINGS
X-SECTION OF CLUB
3" x ¾" STEEL
2" x 2" OAK
2" x ¼" STEEL
SEA SCALLOP DREDGE
NEW BEDFORD TYPE

FIGURE 3

and prevents the bag from filling up with sand and mud. On harder bottoms, the frame is turned back to allow the dredge to dig in the bottom a little more and insure a better catch.

Materials List for 11-foot Sea Scallop Dredge

Frame	
18 feet - 1-3/4" round hot rolled mild steel	
14 " - 1-1/8" " " " " "	
21 " - 2-1/2"x 1/2" flat hot rolled mild steel	
11 " - 3-1/2"x 2-1/2"x 5/16" angle hot rolled mild steel	
Bag	
160 pounds - 5/16"x 3" (inside diameter) welded steel rings	
130 " - 5/16"x 1-1/8" open dredge links	
Club	
11 feet - 3"x 1/4" flat hot rolled mild steel bar	
11 " - 2"x 1/4" flat hot rolled mild steel bar	
Frame	
	5 feet - 2-1/2"x 3/4" flat hot rolled mild steel
	11 " - 3-1/2"x 3/8" flat spring steel
	12 - 1/2"x 1" rivets
	18 - 3/4"x 2-1/2" bolts
	12 - 5/8"x 3" bolts
	1 - 1"x 4" bolt
Bag	
	10 pounds - 5/16" cord clips
	500 feet - 5/16" braided cotton sash cord
Club	
	11 feet - 2"x 2" oak
	15 " - 3/16" chain

The bag is constructed, as indicated in the diagram and in Figure 5, of steel links and rings on the bottom and part of the top. The rest of the top is a single piece of webbing made of five-sixteenths inch braided cotton sash cord held together with cord clips or hog links. This piece of webbing is inserted in the top of the net to lighten it and to help insure the dredge landing right side up on the bottom. The meshes are made with the cord clips and sash cord by winding the cord between nails 5 feet apart and forming 6-inch meshes with the cord clips. The technique is similar to that described for the construction of cod ends in the Pacific Coast otter trawl fishery.1/ The diagram of the bag (Figure 3) indicates that the mesh part of the top is attached on the front to 33 rings and on the back to 27 rings. This is accomplished by attaching 1 ring to 2 meshes in 11 instances on the front and in 17 instances on the rear. This top section is not tapered but is simply a square piece of webbing 44 meshes wide and 10 meshes deep.

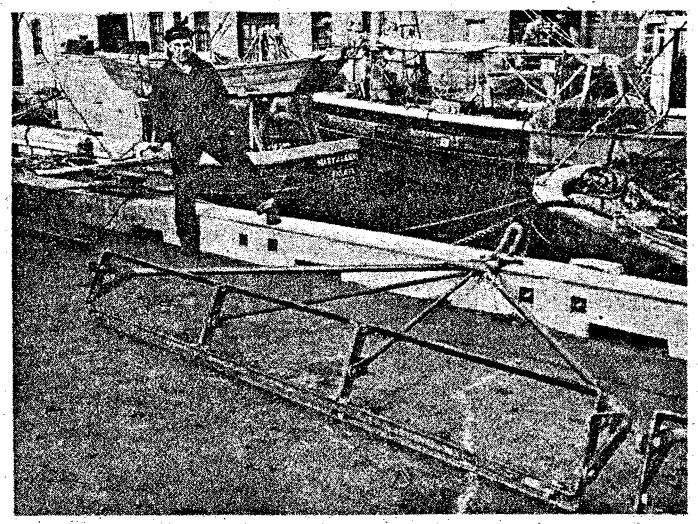

FIGURE 4

The club (Figure 5) is attached to the back of the bag to maintain the shape of the bag and to help in dumping it. When the dredge is brought aboard, the

1/ "Rope Cod Ends," by Carl B. Carlson, published in Fishery Market News, May 1945. Also available as Separate No. 101.

chain attached to the club is hooked to the block and the entire bag hoisted in order to dump the catch on deck. The weight of the dredge plus its contents makes it necessary for almost all operations connected with bringing it aboard and resetting it to be made with the aid of power.

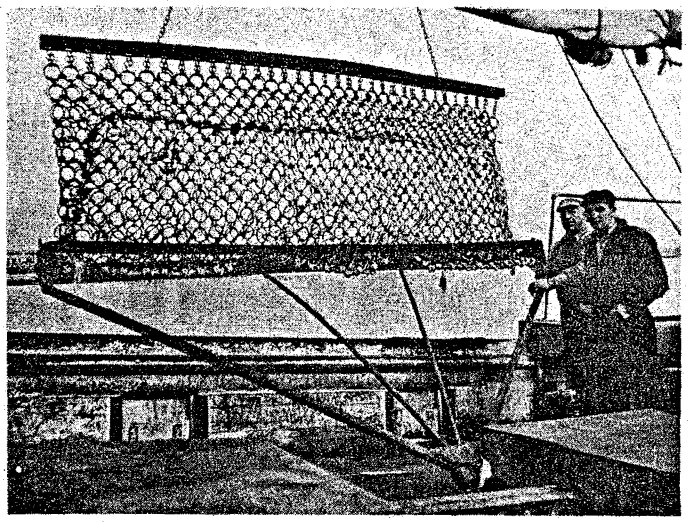

FIGURE 5

The list of materials given on page 10 indicates the requirements for a single dredge. The frame of the dredge may last for several seasons. It is occasionally rebuilt as certain parts wear or are damaged. The bag, however, will require repairs with extra links and rings at the end of each trip and will require complete replacement after about three trips on rough bottom. On smoother bottom, the fishermen report the bag will last for as many as six to eight trips. Accordingly, the materials listed for the bag should be increased several times to allow for bag repairing and replacements according to the anticipated use.