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BLUE CRAB TRAWL FISHERY OF GEORGIA

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SUMMARY

A year-round trawl fishery for blue crabs is conducted in the coastal waters of the South Atlantic States. Off Georgia, the sheltered bays and sounds close to the home ports of the trawlers are the trawling grounds. Consequently, weather seldom interferes with fishing and trips can be kept short. From June through December the trawlers drag small-mesh nets for both shrimp and crabs; from January through May, when shrimp are scarce, large-mesh nets are dragged solely for crabs. A good double-rigged trawler can average approximately 1,500 to 2,000 pounds of crabs a day. Most of the trawl-caught blue crabs from the grounds off Georgia are processed in Brunswick.

BACKGROUND

Blue crabs (Callinectes sapidus) are the basis for one of the most stable commercial fisheries of the South Atlantic States. In 1959, over 32 million pounds of crabs, worth roughly $1.7 million ex-vessel, were landed in ports in North and South Carolina and Georgia (Power 1961).

Conventional blue crab gear and fishing methods have been described by Andrews (1947), Cargo (1954), and Wharton (1954) from observations made in the Chesapeake Bay States. Gear described by one or more of those authors includes pots, trotlines, scrapes, dredges, fyke nets, haul seines, push nets, and dip nets.

Blue crab fishing in the South Atlantic States, however, is unique in that specially designed crab trawls are used in addition to pots and trotlines. The trawl fishery for blue crabs has never been adequately described.

This article is based on observations of the blue-crab trawl fishery as it is carried out in coastal waters of Georgia. In general features at least, the descriptions of trawling methods and gear are applicable also to crab trawling in North and South Carolina.

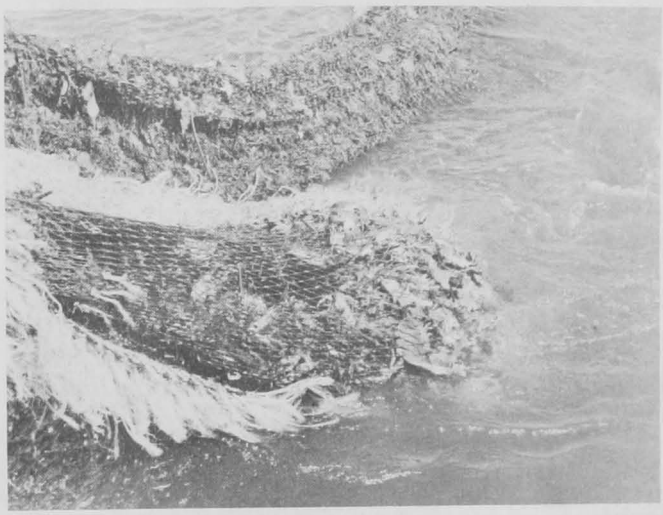

Fig. 1 - Hauling aboard a crab trawl laden with "grass."

THE FISHERY

The fishery operates year-round. From June through December, both shrimp and crabs are fished, and small mesh nets are used. From January through May, owing to a usual gen-

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eral scarcity of shrimp, only crabs are fished, and there is a general switch to larger mesh nets.

GROUNDS: Crab trawling is conducted, primarily, in sheltered bays and sounds along the coast of Georgia where, except for occasional fog, fishing is seldom stopped by bad weather. Fishing depths seldom exceed 50 feet. Few obstructions interrupt the mixture of sand, mud, and clay that uniformly characterizes the coastal grounds, and home ports for the trawlers are rarely far distant. Principal drawbacks to crab trawling in the area are: (1) large amounts of "grass" (fig. 1) and jellyfish that, when caught, clog the trawls and occasionally cause some gear damage; and (2) the presence in early summer of loggerhead turtles and large numbers of stingrays that make handling the catch more difficult and that also occasionally cause gear damage.

FISHING OPERATION: Fishing is done from conventional shrimp vessels of the types described by Sundstrom (1957) and Knake, Murdock, and Cating (1958). The procedure followed varies only slightly from shrimp fishing. The boats arrive on the grounds near daylight, and the trawls are set, usually with a warp-scope ratio of 5:1 (5 feet of trawl warp for every 1 foot of water depth). Average dragging time is 2 hours, after which the gear is retrieved. The bag is tripped (fig. 2), and most of the catch falls on deck (fig. 3). Crabs clinging to the webbing (fig. 4) are knocked loose with a stick ("crab knocker"), and the emptied trawl is reset immediately. Only after resetting does sorting of the catch begin. When only crabs are fished, 3 to 4 drags are considered a day's work, and the vessel usually returns to port late in the afternoon. When shrimp as well as crabs are fished, the working day is usually longer, and trips may last 2 to 3 days.

Fig. 2 - "The moment of truth"--tripping the bag.

Fig. 3 - Catch of a Georgia crab trawl on deck.

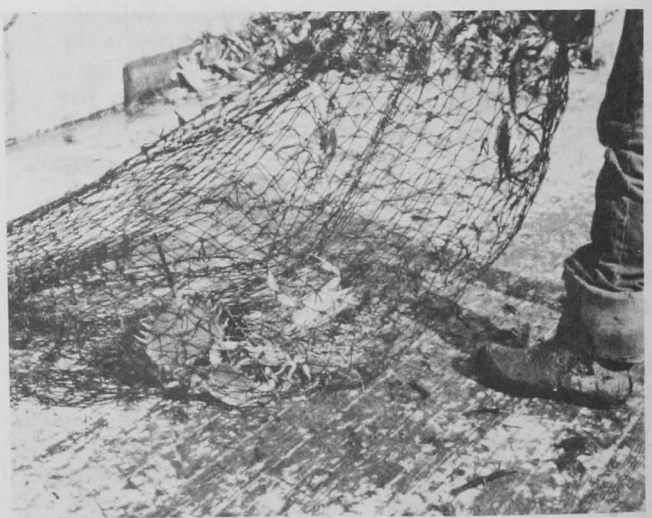

Fig. 4 - Blue crabs and a horseshoe crab tangled in the trawl webbing.

CRAB CATCHES AND CRAB PRODUCTION: Catches vary widely. As many as 2,800 pounds of crabs have been reported from a single 1-hour drag. But the average catch, from the usual 2-hour drag with a single 55- to 60-foot trawl appears to be close to 250 pounds. Double-rigged vessels would, therefore, average roughly 500 pounds in a 2-hour drag, or 1,500 to 2,000 pounds daily (fig. 5).

Wharton (1954) states that the average daily catch from 50 chicken-wire crab pots in the Chesapeake Bay is between 200 and 500 pounds. A double-rigged vessel making 4 drags a day could be expected to average as many crabs as could be caught on the average with 150 to 500 pots (assuming that differences in availability of crabs between the Chesapeake and the coast of Georgia can be disregarded).

A good crab trawler, operated by a crew of two men, can expect to stock $110 in crabs in two days. Half of this goes to the vessel. Additional stock is obtained from seasonal shrimp catches and from the small amounts of food fish that are taken incidentally.

Table 1 - Blue Crab Landings in Georgia[1/]

Year	Total Landings, all Gear	Trawl Landings	Portion of Landings Caught by Trawling
	(Pounds)		Percent
1960	15,766,000	2,576,700	16
1959	12,682,500	4,192,600	33
1958	10,185,000	3,658,300	26
1957	8,968,000	2,067,000	24
1956	8,542,000	2,140,800	25
1955	10,745,000	2,012,500	19
1954	10,640,000	2,259,400	21
1953	9,486,000	1,985,000	21
1952	9,458,200	4,410,400	47
1951	6,526,400	1,535,000	24
1950	5,027,600	1,045,000	21

1/From Fishery Statistics of the United States, U. S. Fish and Wildlife Service, 1950-59.

Fig. 5 - A good day's catch (2,500 pounds of blue crabs) being unloaded at a Georgia plant.

The percentage of total crab landings due to trawling varies from year to year (table 1) as does the number of vessels engaged in the crab trawl fishery. Availability of other, more profitable, fishery resources is apparently a major determining factor.

PORTS: Most of the crabs caught along the coast of Georgia are processed in Brunswick in the largest processing plant in that State. Some crabs are landed directly in Brunswick; others are landed in the northern part of the State, especially in Thunderbolt, and are either trucked to Brunswick or processed locally.

FISHING GEAR

Gear used in the trawl fishery for blue crabs is nearly identical with that used in the shrimp fishery. The principal difference lies in the larger mesh (4-inch stretched mesh) used in crab trawls only when crabs are fished. Large mesh nets are favored, for they can be repaired more easily and cheaply than small mesh nets, and they allow small fish and shrimp to escape more readily. Also, many fishermen believe that large mesh nets spread better and fish a larger area than do small mesh nets. When both shrimp and crabs are fished, nets similar in size to shrimp trawls are used.

Gear combinations vary widely in the crab fishery, just as Juhl (1961) has shown they do in the shrimp fishery. Combinations used in the crab fishery range from 50-foot nets and $6\frac{1}{2}$-foot doors pulled by 35-foot single-rigged vessels, to 96-foot nets and 9-foot doors pulled by 55- to 60-foot single-rigged vessels, and twin 45- to 50-foot nets and $7\frac{1}{2}$-foot doors pulled by 55- to 60-foot double-rigged vessels. The most popular nets used in the crab fishery are similar to the 4-seam shrimp trawls described by Bullis (1951).

CONSTRUCTING A 57-FOOT CRAB TRAWL: Materials needed for a 57-foot 4-seam crab trawl are listed, with their approximate (1961) prices, in table 2. The starting point for trawl construction is a rectangular piece of webbing, 373 meshes long by 100 meshes deep

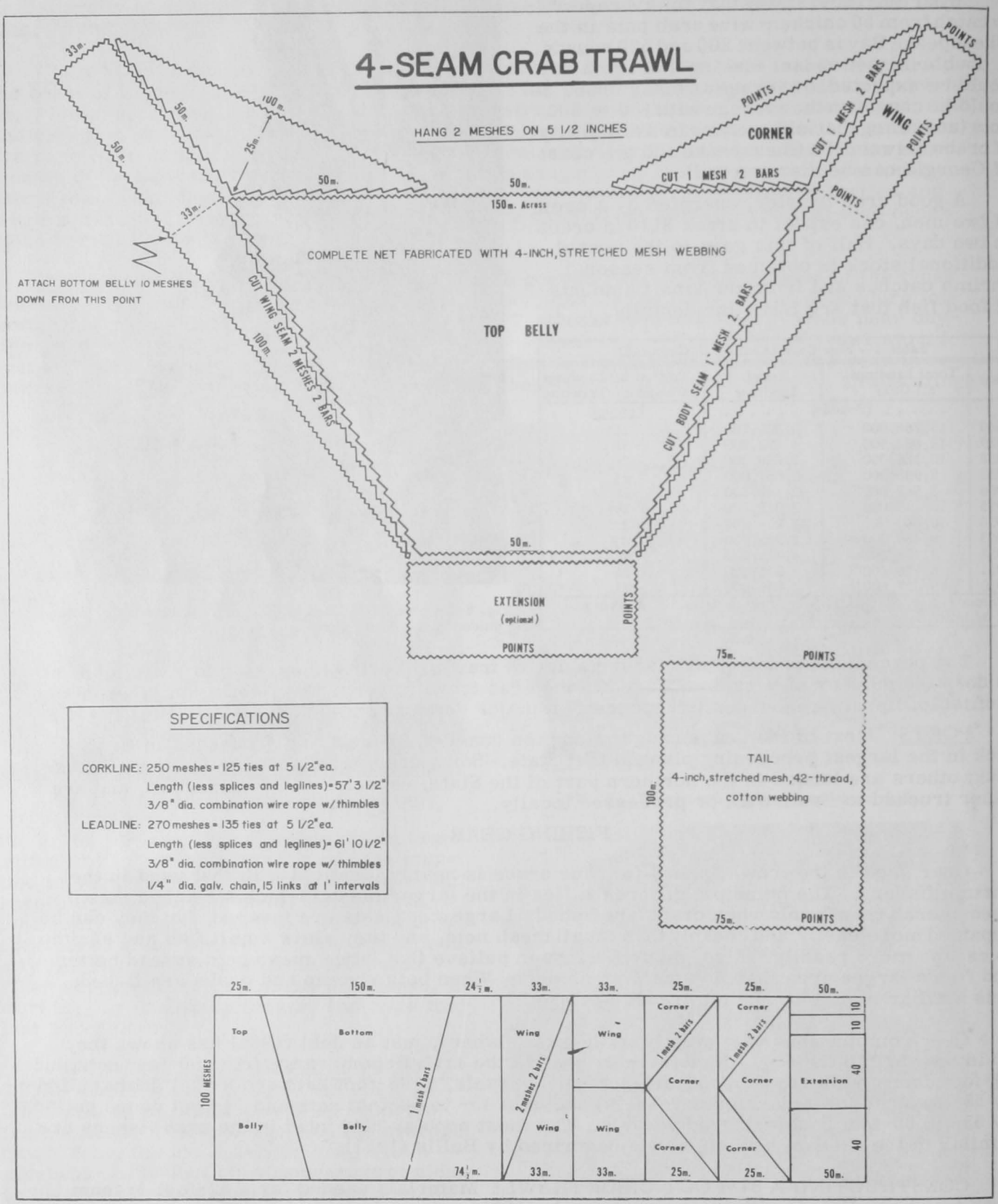

Fig. 5 - Construction diagram and cutting pattern for a 4-seam crab trawl.

Table 2 - Materials Needed for Construction of a 57-Foot 4-Seam Crab Trawl

Trawl Part	Description	Quantity	Unit Price (1961)	Total Price (1961)
Webbing:			$	$
Net	Panel, 373 by 100 meshes, 21-thread cotton, 4-inch mesh	44 lbs.	1.60/lb.	70.40
Cod end	Panel, 75 by 100 meshes, 42-thread cotton, 4-inch mesh	15 lbs.	1.90/lb.	28.50
Chafer	Panel, 40 by 100 meshes, 42-thread cotton, 4-inch mesh	9 lbs.	1.90/lb.	17.10
Floatline1/:				
Wire rope	3/8-inch diameter combination rope	72 ft.	.12/ft.	8.74
Thimbles	3/8-inch, galvanized	2 ea.	.14 ea.	.28
Floats	Sponge (synthetic)	7 ea.	.49 ea.	3.43
Brail lines	6-thread fine or cotton equivalent	12 ft.	.02/ft.	.24
Leadline1/:				
Wire rope	3/8-inch diameter combination rope	76 ft.	.12/ft.	9.12
Thimbles	3/8-inch diameter, galvanized	2 ea.	.14 ea.	.28
Chain	1/4-inch diameter, galvanized, proof coil	53 lbs.	.40/lb.	21.20
Accessories:				
Tickler chain	1/4-inch diameter, galvanized, proof coil	45 lbs.	.40/lb.	18.00
Shackles	5/16-inch diameter (for tickler chain)	2 ea.	.65 ea.	1.30
Swivels	5/16-inch diameter (for tickler chain)	2 ea.	1.35 ea.	2.70
Bag rings	2-inch, galvanized	15 ea.	.15 ea.	2.25
Twine	36-thread cotton, for hanging	3 lbs.	1.30/lb.	3.90
Rope yarns	Polyethylene (for chafing gear and tying loop chain)	15 lbs.	.55/lb.	8.25
Preservative	Tar or green-treat (copper naphthenate)	74 lbs.	.20/lb.	14.80
Total				210.49

1/Including 6-foot leglines and splices.

and preferably with a double selvage. The webbing should be laid out and cut as shown in figure 6. Net sections should then be sewn together according to the instructions provided by Bullis (1951). Special attention should be paid to Bullis' discussion of the difference between body seam cuts and corner seam cuts and to his description of techniques for sewing tapered seams[1/]

EXTENSION PIECE: Depth of the extension piece used with the 4-seam trawl varies with the individual preferences of the netmaker concerned. Some netmakers prefer to use minimum webbing in the trawl. This they do by matching the top and bottom bellies and cutting off the overlap that results from the drop-back. Others add sufficient meshes to the top belly to compensate for the drop-back. Still others compensate for the drop-back and then add an additional 20 to 50 meshes to both top and bottom bellies to extend them further. There is, at present, no way of properly evaluating these modifications.

TRAWL ACCESSORIES: Two important accessories are added to the basic net; the first increases the effectiveness of the trawl, and the second prolongs its life. These accessories are the tickler chain and chafing gear.

Tickler Chain: The tickler chain sets up a disturbance in front of and parallel to the leadline and also acts as a snagline (Scolfield 1948). Both actions are believed to improve the catch. The tickler generally consists of a piece of $\frac{1}{4}$-inch-diameter chain fastened between the doors from points of attachment at their bottom trailing edges.

Fig. 7 - Cod end of a Georgia crab trawl showing the 4-inch stretched mesh webbing and polyethylene chafing gear.

1/A few net makers prefer nets with rolled seams similar to those described by Knake (1956) for fish trawls. They feel that such seams are stronger and lessen the chance of the cod end becoming separated from the body under strain.

Determination of chain length is related to the size of the trawl mouth, measured from door to door along the floatline or leadline, and to the personal preferences of the user. Three common methods of determining tickler-chain length are: (1) the chain is made equal to the length of the floatline; (2) it is cut 4 to 5 feet shorter than the leadline; or (3) it is made equal to one-half the combined length of the floatline and leadline. In all three methods, lengths of the trawl leglines are included in the measurements.

Chafing Gear (fig. 7): Long-lasting polyethylene rope yarns have largely replaced manila rope yarns and strips of automobile inner tubes as chafing gear. The polyethylene yarns are almost 35 percent lighter than manila, are non-absorbent, and are approximately 7 times as resistant to abrasion. Polyethylene gear has one serious disadvantage. Being buoyant, the yarns tend to float up from under the trawl, thereby reducing the amount of protection afforded. Constant attention is necessary to see that the yarns remain properly and firmly secured to the cod end.

LITERATURE CITED

ANDREWS, EMMETT
1947. Crab Pot Construction (Chesapeake Bay Type). U. S. Fish and Wildlife Service, Fishery Leaflet 262 (September), 4 pp.

BULLIS, HARVEY R., Jr.
1951. Gulf of Mexico Shrimp Trawl Designs. U. S. Fish and Wildlife Service, Fishery Leaflet 394 (September), 16 pp.

CARGO, D. G.
1954. Maryland Commercial Fishing Gears. Part 3. The Crab Gears. Educational Series No. 36, Board of Natural Resources, State of Maryland, Department of Research and Education (April), 18 pp.

JUHL, ROLF
1961. A Study of Vessel and Gear Usage in the Shrimp Fishery of the Southeastern United States. Commercial Fisheries Review, vol. 23, no. 8 (August), pp. 1-8. (Also Separate No. 624.)

KNAKE, BORIS O.
1956. Assembly Methods for Otter Trawl Nets. U. S. Fish and Wildlife Service, Fishery Leaflet 437 (December), 29 pp.

KNAKE, BORIS O.; MURDOCK, JAMES F.; and CATING, JAMES P.
1958. Double-Rig Shrimp Trawling in the Gulf of Mexico. U. S. Fish and Wildlife Service, Fishery Leaflet 470 (September), 11 pp.

POWER, E. A.
1961. Fishery Statistics of the United States, 1959, U. S. Fish and Wildlife Service, Statistical Digest 51, 457 pp.

SUNDSTROM, GUSTAF T.
1957. Commercial Fishing Vessels and Gear. U. S. Fish and Wildlife Service, Circular 48, 48 pp.

SCOLFIELD, W. L.
1948. Trawling Gear in California. State of California, Division of Fish and Game, Fishery Bulletin No. 72, 63 pp.

WHARTON, JAMES
1954. The Chesapeake Bay Crab Industry. U. S. Fish and Wildlife Service, Fishery Leaflet 358 (Revised), (September), 17 pp.

CURED FISH FIRST MANUFACTURE ON NORTH AMERICAN PACIFIC COAST

"Cured fish of various types were the first manufactured products prepared on the Pacific coast. The Indians had a considerable dried-salmon industry at The Dalles, on the Columbia River, long before the coming of the white man. The fish were traded to the plains tribes of the interior. . . . The Russians operated a commercial salt-salmon industry in Alaska at the beginning of the 19th century. Salt salmon was shipped as far as St. Petersburg. Soon afterward the Northwest Fur Company started a salmon-salting business on the Columbia River. The Northwest Company merged with the Hudson's Bay Company which shipped salt salmon to Hawaii, Australia, China, Japan, and the eastern United States. American fishermen salted salmon in Alaska while it was still a Russian possession. A number of the large salmon canneries of today were originally established as salmon salteries."

--Principles and Methods in the Canning of Fishery Products, Research Report No. 18 (page 5), U. S. Fish and Wildlife Service.