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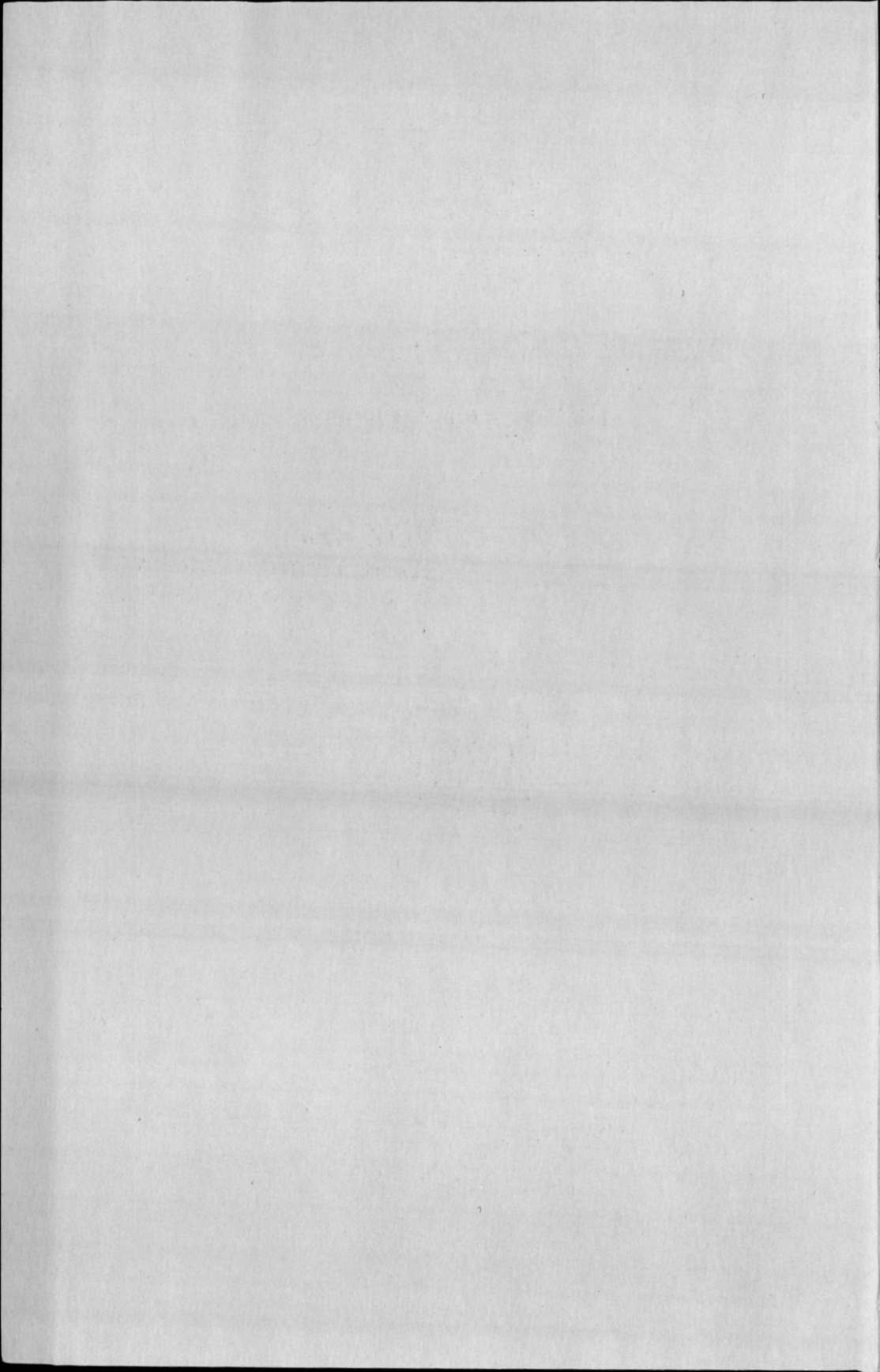
Maryland Commercial Fishing Gears
III. The Crab Gears

DAVID G. CARGO



Educational Series No. 36
APRIL, 1954

CHESAPEAKE BIOLOGICAL LABORATORY
Solomons Island, Maryland



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MARYLAND'S COMMERCIAL FISHING GEARS

III. THE CRAB GEARS

INTRODUCTION

This is the third report by the Department of Research and Education, Chesapeake Biological Laboratory, on Maryland's fishing gears. Those previously published described the gears and operations in the oyster and the fin-fish industries. Set forth herein are brief descriptions of the various types of gear used to capture blue crabs commercially. The four major units employed in the Maryland portion of Chesapeake Bay are: (1) trotline; (2) pot; (3) scrape, and (4) dip net. There are four other methods which are either prohibited by law in Maryland or are employed so seldom as to be of little consequence, the dredge, the fyke, the haul seine and the push net.

The crab industry has a comparatively short history, having been started at Crisfield, Maryland, about eighty years ago. Some of the methods employed in the capture of crabs date back to the early days of the industry, but two are of relatively recent origin. The pot and patent dip net are recent inventions and have been patented. The various gears are designed to take advantage of the crab's behavior such as feeding, migrating, hiding, and its tenacity in holding on to bait.

There are two phases of the crab industry in Maryland which are based on the stage of the crab, whether hard or soft. Hard crabs are sold by the pound and soft crabs are sold by count either singly or by the dozen. An average of 21,000,000 pounds of hard crabs with a value to the crabber of about \$950,000 is caught and delivered to the commercial houses every year. Approximately 8,000,000 peeler and soft crabs are caught yearly, the value of which is approximately \$400,000. These figures do not include crab imported from other states to be processed in Maryland nor those caught privately for family use.

There is shown in Table I the catch by gear for 1948 and on through 1952. Catches by certain lesser gears are not recorded. However, it has been estimated that the catch by trotline, pot and scrape make up more than ninety-seven percent of the total catch. The remaining three percent is taken by dip nets and other gears.

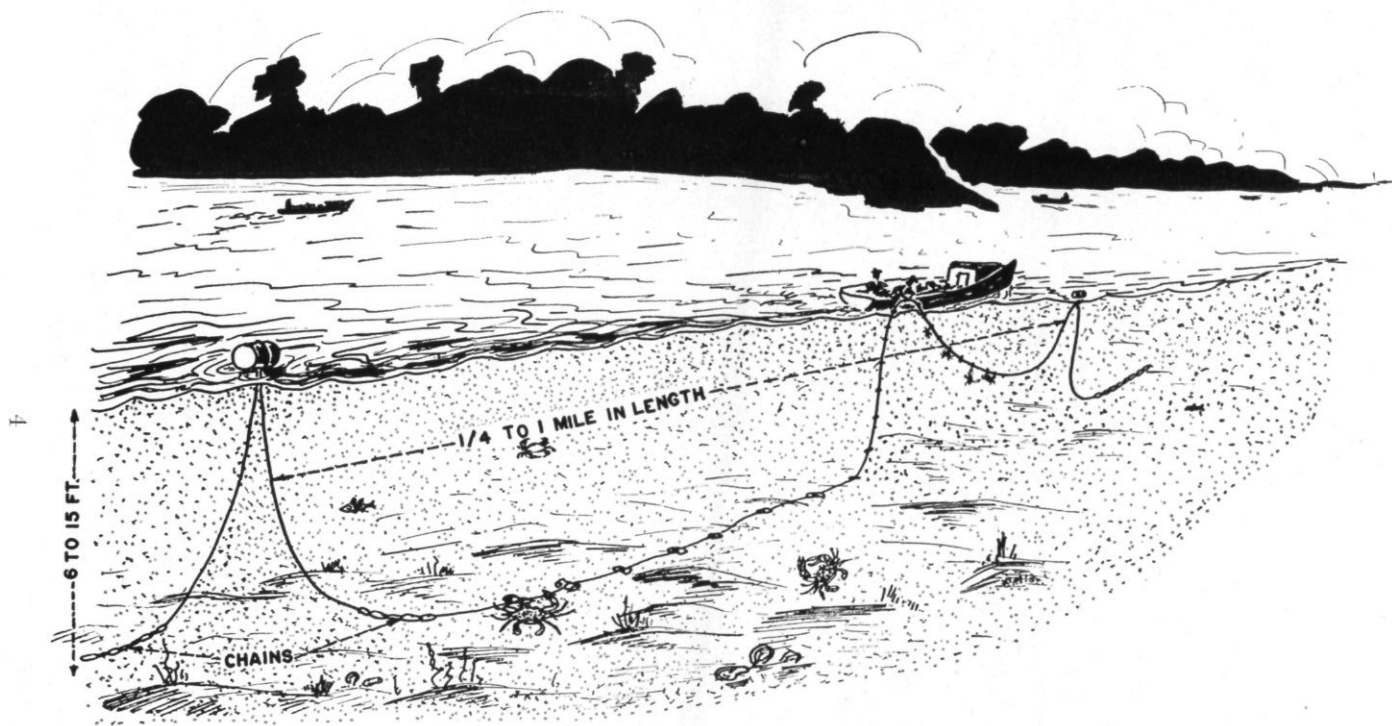


FIGURE 1. *Trotline*. This semidiagrammatic sketch of a typical Maryland trotline being fished, shows the anchored and bouyed line, baits in place, passing over the roller on the side of the boat. The fisherman dip nets the crabs as they are brought to the surface.

THE TROTLINE

Description of Gear: The trotline is one of the oldest and most widely used methods of catching crabs. The gear is comparatively inexpensive and the yield from it is fairly high, depending, of course, upon the experience and diligence of the crabber. It is made from one-eight inch cotton line which may be as much as one mile in length, although usually shorter. Cuts of bait from tripe, salted eel or other coarse fish, such as hogchoker, are fastened to the line at two to five foot intervals. These may be attached by using a snood, which is a small mesh bag containing the bait, or by tying a slip knot in the line itself and clinching the bait in that fashion. This latter method is the generally used one on the Chesapeake Bay.

A trotline, while being operated, is marked at each end by a buoy and held in place by a weight or anchor. A short piece of chain is inserted about sixty feet from each end. This serves to keep the line in place on the bottom and, at the same time, indicate that the end of the line is being approached by the crabber. Chain is sometimes used for weighting purposes because it is heavy, compact and can be stored with the line in a barrel thus to save space (Fig. 1).

How Fished: One end of the buoyed and baited line is put overboard and the rest of the line is paid out from the boat, usually parallel to a nearby shore. This is generally done at dawn since it is the common experience of watermen that crabs feed more actively at that time of day. After casting overboard the second buoy, the line now having been set, the crabber returns to the first one put overboard and picks up the end of the line with a boat hook and places it on a roller (Fig. 2) which projects over the side of the boat. From this point on, as the boat moves slowly toward the second buoy, the line passes over the roller and back to the water. Characteristic of crabs, they cling to the bait as the line is lifted, and as they near the surface they are dipped up by means of a long handled net and placed in barrels. This continues until the end of the line is reached. The operation is then repeated. The barrels, when full, are covered with wet burlap or canvas to quiet the crabs and to protect them from the sun. Although this procedure is most common, there are variations of it in use. The trotline, instead of being laid in one long line, may be a series of short ones, sometimes set on both sides of a cove in the shape of a "V". The rigging is also subject to some variation.

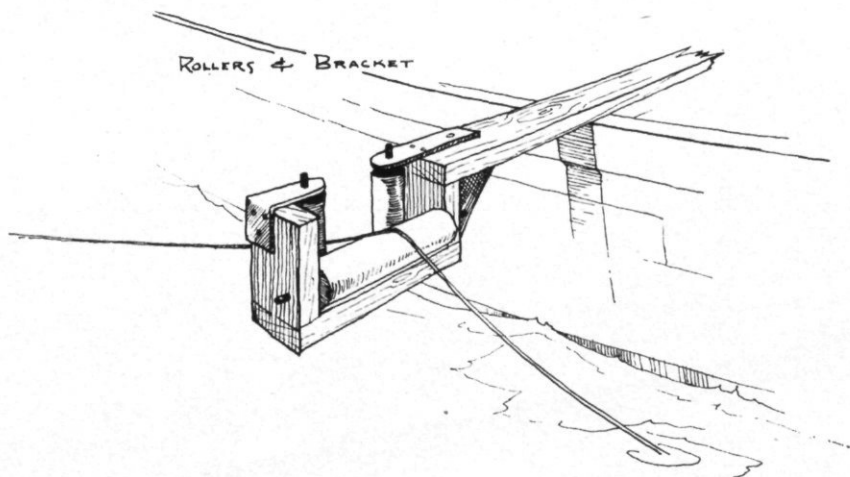


FIGURE 2. *Roller and Bracket.* Sketch of a roller and bracket attached to side of boat. The trotline is shown passing over the roller, an operation that lifts the feeding crabs to the surface to be taken in a dip net.

Catch: The yield from the trotline, as in the case of other crabbing gears, varies greatly from day to day. Generally, from two to four barrels of crabs are taken by this method of crabbing in an average day.

Care and Maintenance: When the fishing trip is over, the line is rebaited where needed, coiled in a barrel and sprinkled with dry salt to preserve the bait. It is now ready for the next day's crabbing. Typically, the crabber stops fishing by or before noon since many crabs die because of the heat and direct sunshine at mid-day and since fewer crabs are tempted to the bait as the day wears on.

A new line must be well soaked in a strong brine solution before it is first used, in order to have it sink rapidly to the bottom when paid out from the boat. The maintenance consists chiefly of repairing any weak or frayed spots in the line and in preventing corrosion of the chains and floats. The cans, which typically are used as floats, usually last a full season if given two coats of paint. The lines are subjected to abuses and the life of them varies greatly. A line should, under normal use, last at least one-half of the summer season.

Modifications: Many variations are found in the construction and rigging of a trotline. Different areas have their own modifications

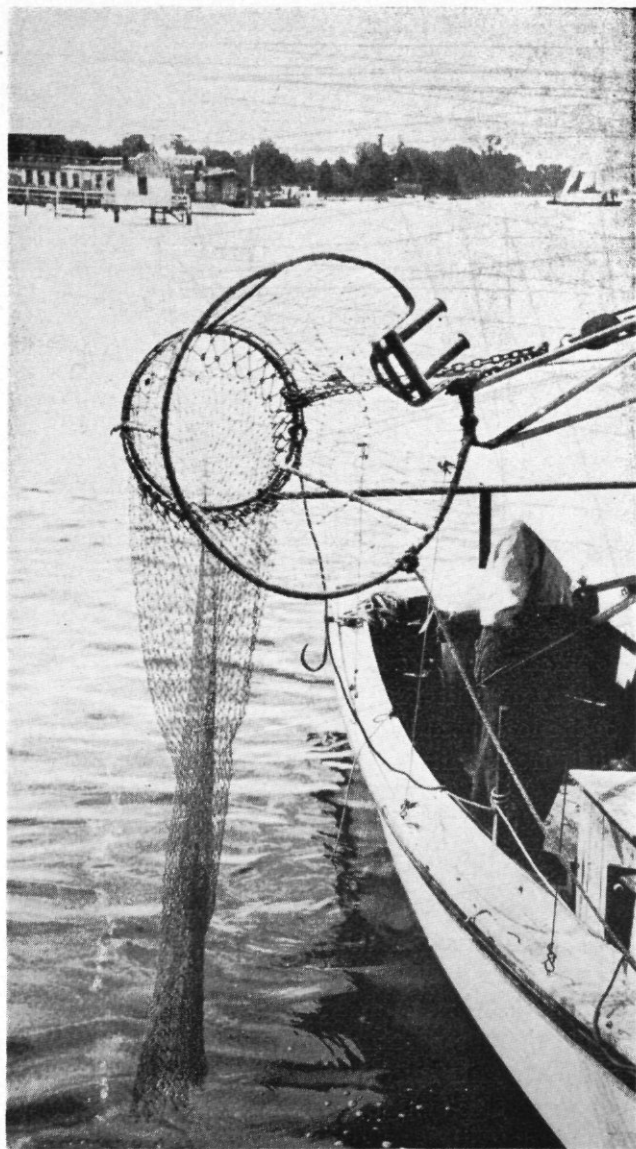


FIGURE 3. *Patent Dip Net*. Note the bracket and roller on the nearer bow which fastens to the boat. The trotline runs over the roller and the crabs drop into the net which is fished, that is, emptied according to the abundance of crabs in the catch. Used in Virginia's summer fishery.

which are followed closely by the crabbers operating in them. There are makeshift floats of many types. The construction of the roller also is widely modified. In the Virginia part of the Bay, where trotlines are set in water from ten to thirty feet in depth, a patent dip net arrangement is used (Fig 3). This is a frame made of iron rods with a large net and rollers attached to it. It is swung over the side of the boat and held in place by means of a boom on a short, stout mast. As the baited trotline is run over the roller on this device the crabs release their hold and drop into the net. This method lessens the work of the crabber materially in fishing the gear but it requires considerable time for the culling of the small crabs from the catch since the patent dip net takes all crabs, big and small, that cling to the line. With the hand dipper small crabs are allowed to escape. The patent dip gear finds greatest use where the catch includes few small crabs, thus it is not employed as widely as the common trotline and is not used at all in Maryland waters.

THE CRAB POT

Description of Gear: The crab pot is a trap-like device, patented as recently as 1938 by B. F. Lewis, of Virginia. The design of this gear affords an easy entrance for the crabs through funnels, but makes their escape very difficult (Fig. 4). The pot, typically, is baited with fresh fish of the least used kinds, the so-called trash fish. Contrary to general belief, fresh bait attracts more crabs to the pot than does spoiled bait.

The pot is cube shaped and generally is constructed of one to one and one-half inch chicken wire with heavy wire or iron rod bracing. Its size is limited by law in Maryland to twenty-four inches on a side. It is divided horizontally into two parts by an odd-shaped partition. The lower part has two or four funnels on the sides and contains a cylindrical bait compartment which is closed at the bottom by a metal plate. The partition is raised in the center and has two slits cut in it to permit the crabs to move to the upper chamber after entering the pot. This feature tends to draw the crabs away from the bait so that the pot will continue to lure crabs. The wire on top of the pot is left free on one edge to provide for the removal of the catch when the gear is fished. This opening is closed and held that way by a wire catch. The gear is completed by the attachment of a fiber rope with a small buoy or float, usually bottles or cans, to mark the position

of the pot. Most pots are weighted to hold them in place when water movements become heavy. Generally, handfuls of cement are placed in the bottom of the pot. However, metal weights of various kinds are frequently seen.

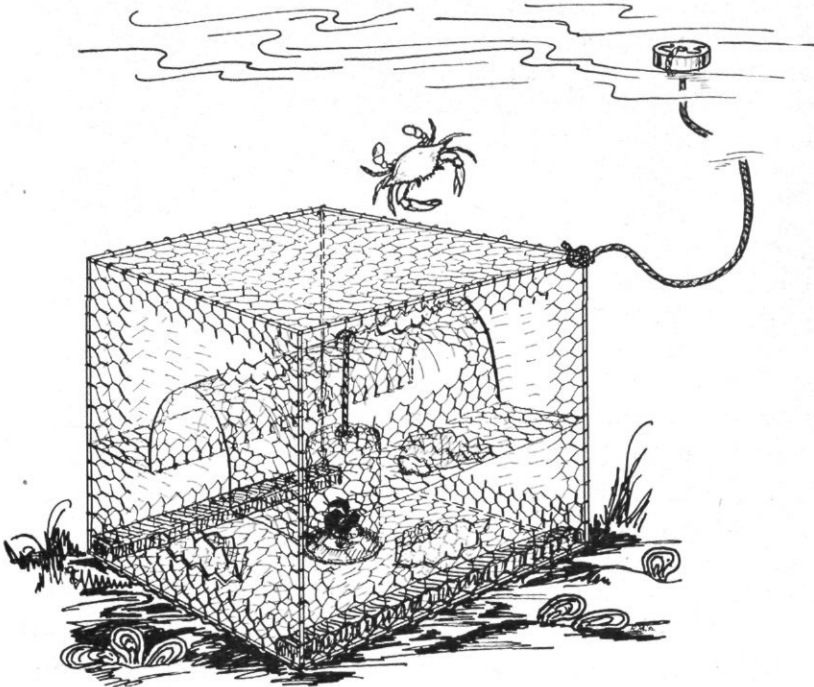


FIGURE 4. *Crab Pot*. Constructed of chicken wire, this cubical trap, 2' x 2' x 2', has four openings or funnels inward. There are two compartments, in the lower of which is a bait holding device. The upper one is a holding chamber.

Crab potting in Maryland is limited to Chesapeake Bay, Tangier and Pocomoke sounds, and the Potomac River. This operation also is practiced extensively in Chincoteague Bay. Each potter must have a license which, in turn, permits him to set fifty pots. There has been a rapid expansion of potting in Maryland due to the advantages this method offers to the crabber. Besides being less demanding on the crabber's time, the catch is somewhat greater than the trotline catch, the estimated daily average of which ranges from three to six barrels. Crabbers average around fifty peeler crabs from their respective catches per day, a number that varies considerably in different regions of the Bay.

How Fished: The crabber usually sets his pots in a line or series of lines parallel to the shore in from eight to forty feet of water. In the fishing operation, the crabber lifts the pot, empties the old bait over the side, removes the crabs by dumping them into a barrel. He then rebaits the pot with fresh fish, closes the bait box and top chamber, drops the pot overboard and goes on to the next buoy. The time of fishing is not set as in the case of trotlining. They are fished once daily. If fished less frequently, the death rate of crabs increases greatly. The catch is usually larger when the pots are emptied regularly, not only because of the reduced loss due to death but because fresh bait is more effective in attracting crabs.

Care and Maintenance: Pots are not expected to last more than one season unless considerable care is taken. They are very susceptible to corrosion in salt water. For this reason, some potters dip them in tar periodically. This may extend their life somewhat. Pots are lost to some extent due to storms, heavy tides and currents. This gear is more often made by the crabber who uses it, in which case the cost is usually less than three dollars apiece. There are however, watermen who specialize in making pots for general sale.

Modifications: The pot described herein is the most common type in use locally. Many minor variations of it exist, however. The potters at Smith Island, for instance, use a low pot, one about nineteen inches high, with no bracing. They place a handful of cement in the lower corners to weight it down. This pot, they feel, is more stable than others and less likely to tip or roll on the bottom during heavy storms. They are more subject to damage because of absence of braces.

THE SCRAPE

Description of Gear: The scrape is the gear most often used in areas where peelers and soft crabs are abundant, that is, on grass covered areas and shallows. The catch from this gear is made up principally of peeler crabs which seek grassy flats, such as those common in the Tangier Sound area, for protection when about to shed. Some hard crabs are caught by this gear but the number is not large. The scrape is not limited to Tangier Sound, but the relatively small number of peeler crabs found in other places in the Bay and its tributaries do not warrant its use. About all of the scraping for crabs is done on the Eastern Shore, principally in Somerset County (Fig. 5).

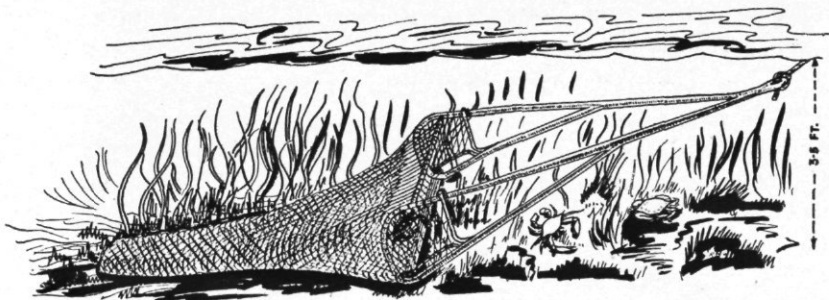


FIGURE 5. *Crab Scrape*. The frame of this sturdy device is made of iron while the bag is of cotton twine. It is hauled on the bottom and is used in the summer soft crab fishery, especially in the Tangier Sound area.

The scrape is a dredge-like device which is dragged over the bottom behind a small power boat. Generally, two scrapes are operated, that is, one from each side of the boat. Upon hauling a scrape from the bottom and on to a culling box on the side of the boat, the crabs are sorted from the grass. The claws of peelers are "nicked," that is broken at the last outward joint to prevent their injuring each other, and then placed in baskets. The residue of grass mixture and other material is then pushed overboard. Soft crabs taken in this operation, fewer than peelers, are readily subject to injury, thus special care in handling is necessary. They are kept cool, damp and without pressure on them.

Catch: The yield from scrapes varies greatly from day to day over long periods. Generally, however, it averages about four hundred peelers per day per man. The soft crab yield of 1950 in the Tangier Sound region totaled about eight million crabs, nearly all of which were taken by scrapes, mainly as peelers. The state-wide total during the same year was only a little over eleven million soft crabs. As these figures indicate, the soft crab fishery of the Bay is concentrated in the region of Tangier Sound.

Care and Maintenance: There is very little maintenance involved in the use of the scrape. The frame, rather strongly constructed of iron, corrodes slowly. The mesh bag is subjected to damage by snags and by deterioration, but is replaceable and, generally speaking, is not expensive. Prices, quoted in 1954, placed the cost of a net at \$4.50 and the frames at \$9.00 apiece. Small repairs to the bag can be made by the crabber with a netting needle and twine.

Modifications: There are few modifications of this gear. Most crabbers use the two scrapes allowed by law, each being forty-two inches wide at the mouth. This is the maximum size permitted by law. The size of craft used may vary but of necessity they are shallow draft boats that range from eighteen to thirty-six feet in length.

THE DIP NET

Description of Gear: The dip net (Fig. 6) is a gear that has found widespread use in the crab fishery of Maryland. It is not as important as the gears already described in that the catch per unit from it is relatively small. It is, however, widely used to supplement other methods, particularly that of scraping. It is popular with tourists and vacationers who fish mainly for sportive reasons, although quite a few crabbers, small unit operators, depend upon this means of fishing seasonally to gain a livelihood. The equipment required is simple and inexpensive. A dip net and a small boat or skiff constitute the gear. The net is constructed of a ring or bow of one-quarter inch iron, is about one foot in diameter and carries a net of cotton twine of course meshing mounted on a wooden handle some eight feet long. Dip netters work in shallow water at low tide. Best results are obtained when the surface is calm since the crabs are more easily seen under this condition. Many scrape operators tow skiffs back of their power boats and when

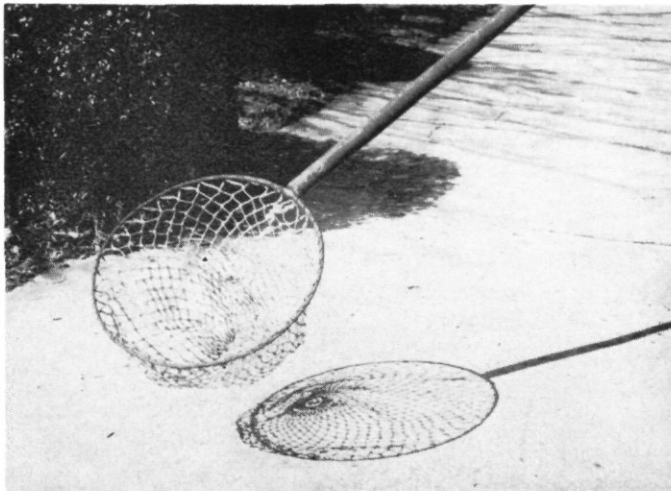


FIGURE 6. *Dip Net.* The form of the net pictured here is characteristic of the gear in general, although it is constructed somewhat more sturdily than those in general use.

they find it impossible to operate in desirable areas because of insufficient depth of water, they anchor their craft and pole the small boats into the shallows and continue crabbing by means of dip nets.

How Fished: The crabber stands in the bow of a skiff and poles the craft along by means of the handle of the net. When a soft crab or a peeler is seen, usually resting on the bottom protected by a submerged object or by seaweed, it is taken by a quick, scooping motion of the dip net. This method requires, at least on a commercial basis, a great deal of experience and dexterity both in sighting and dipping up the crab. Crabbers quickly learn to distinguish soft and peeler crabs from hard crabs. Occasionally, a crabber is found who carries a bottle of linseed or menhaden oil with which to smooth the water around the skiff when the surface is ruffled by the wind and vision is affected. A few drops of oil usually is sufficient for this purpose.

Catch: The catch, as indicated, is composed largely of peeler and soft crabs. Commercial crabbers who employ this gear average about ten dozen such crabs per day. A small catch of hard crabs is made in the course of this type of fishing which, for good results, requires good weather conditions.

Care, Maintenance and Modifications: Very little maintenance is required on this dipping gear. The net is usually replaced when damaged, although small tears are mended by the operator. Only slight modifications have been observed in this gear since the early days of its use. One of these is common among trotliners where a wire mesh instead of cotton is used in the net. This is employed to dip the crab from the trotline and is preferred because crabs do not tangle or cling to the wire as tightly as they do in cotton nets.

THE LESSER GEARS

A. *Push Net:* The push net is used only to a very limited extent in Maryland. It is used to capture soft and peeler crabs on the grassy flats. The net is very similar to the dip net. It is, however, larger and flattened at the far end of the gear. This flattened section, or straight edge, is placed in contact with the bottom and is usually provided with a guard bar to reduce abrasion to the net (Fig. 7).

The push net is operated after the fashion of a vacuum cleaner. The fisherman wades over the shedding grounds and pushes the net on the bottom through the seaweeds. The net becomes filled as it is

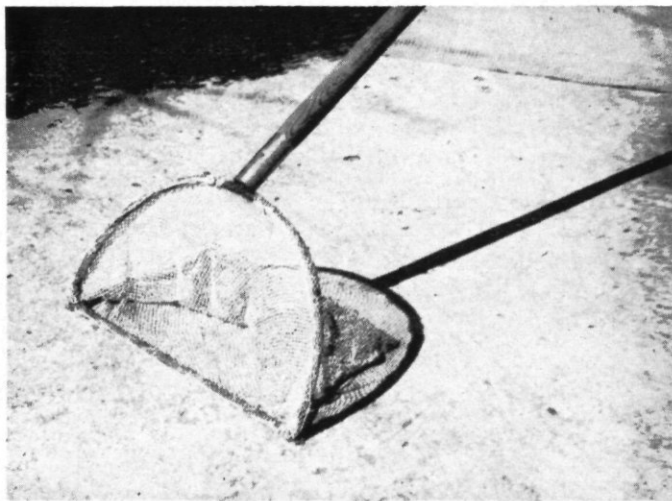


FIGURE 7. *Push Net*. This type of gear is not very extensively used in the crab fishery of Maryland. It finds wide use, however, in the taking of grass shrimp.

moved along the bottom. After short runs, the crabber lifts the net and removes the crabs, placing them in his skiff or in a live box which is towed behind him by a line fastened around his waist. A live box or car, is a small enclosure made of slats to allow water to circulate freely through it to keep the crabs alive and in good condition.

The push net catch is very limited, being less in the overall than the dip net. Eight or ten dozen crabs would be considered a very good catch for a single day. Weather conditions must be about ideal for such crabbing. As indicated, this method is not in general use. The push net is of such a simple nature that maintenance is slight. If it is injured to a marked extent, its parts may be replaced. The net itself is delicate, and is subject to frequent repairing. Modifications of this gear are not known except for size and differences in materials.

B. *Crab Dredge*: During the cold part of the year crabs are found in the deeper waters where they remain while overwintering. The dredge, which is very similar in structure and appearance to the oyster dredge, is dragged over the bottom and wintering crabs are taken. Tremendous numbers of adult female crabs, ready to spawn the following spring, are caught at this time. The price of crabs is usually high in winter and dredging adds considerably to the income of the crabbers who use this device. The dredging operation requires a rather large boat and crew. Usually, the crew shares in the profits

of each day's work. Vessels of twenty to fifty tons or more, 30 to 55 feet in length, are used. A great many of the crabs dredged in Virginia are exported to Crisfield, Maryland, for packing, thus making of that city an important crab center throughout the year.

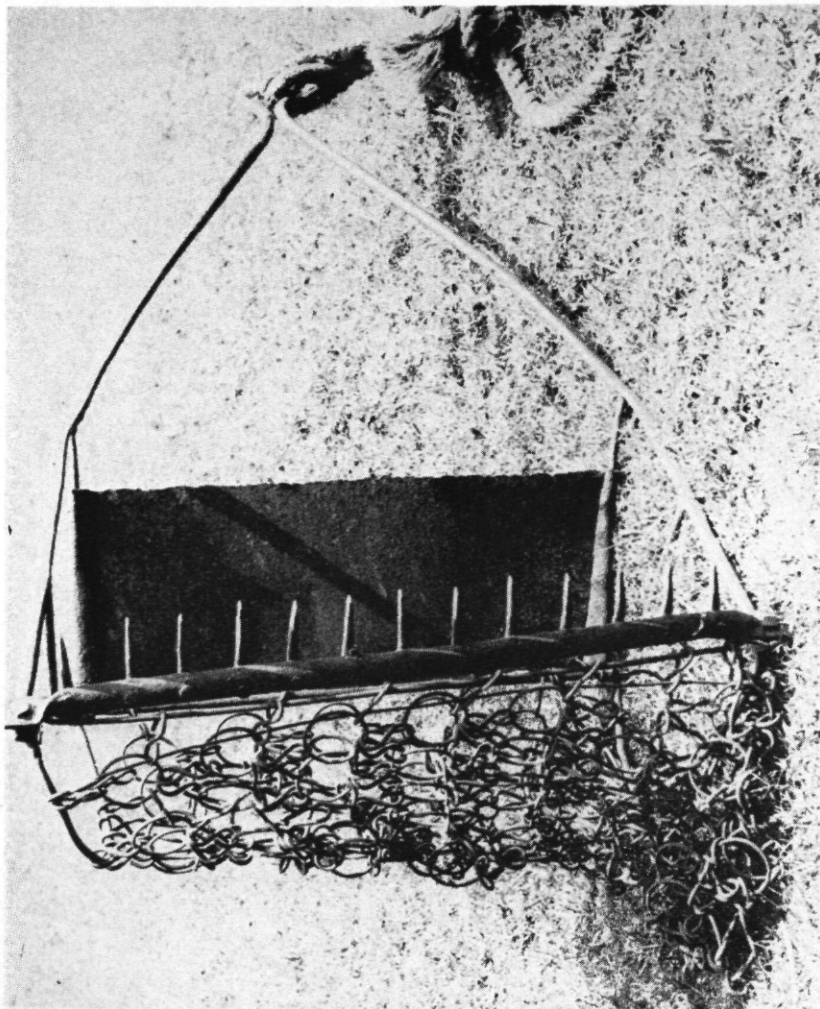


FIGURE 8. *Crab Dredge* (Chincoteague type). The dredge is an important winter gear in Virginia but is not used legally in Maryland except for the Chincoteague Bay where it has not proved to be successful, as indicated by the continued decline in numbers of those who license to operate them.

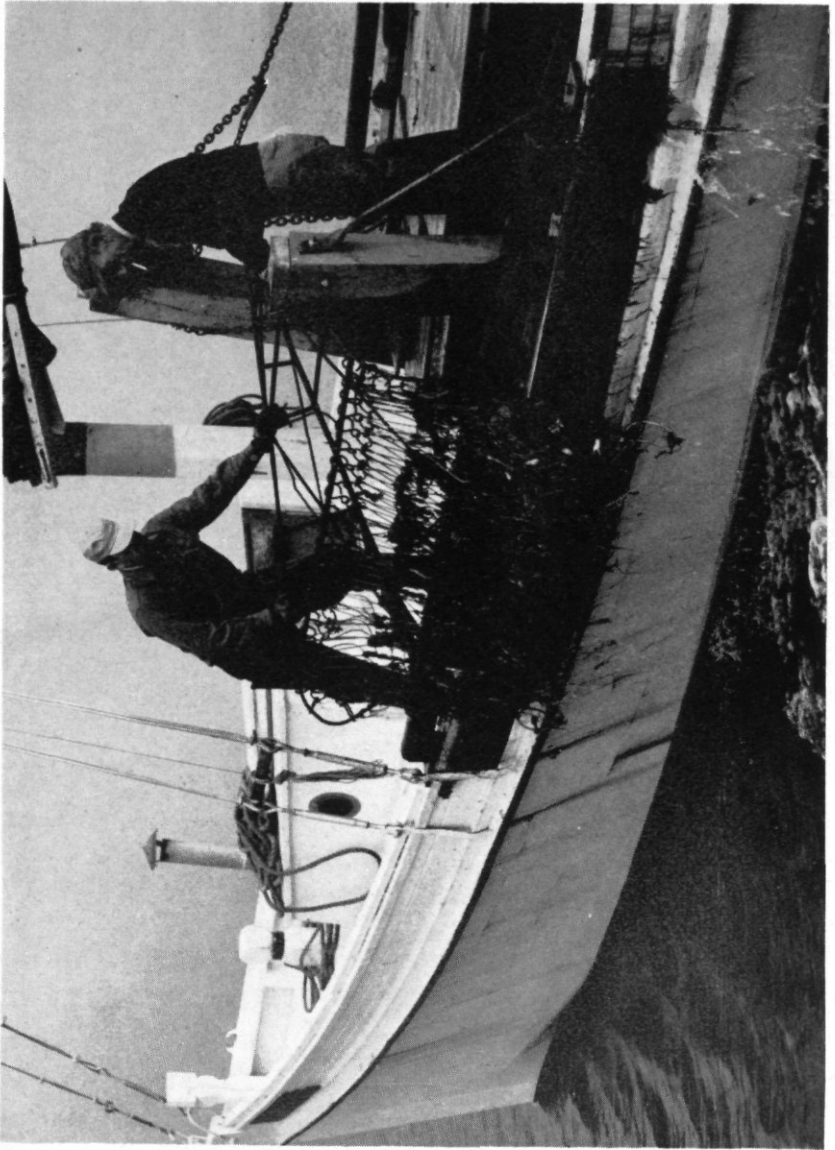


Photo courtesy of the Virginia Chamber of Commerce

FIGURE 9. *Crab Dredge* (Virginia Type). This type of dredge is used in the Chesapeake Bay. It is not used in Maryland but is an important winter gear in Virginia.

C. *Haul Seine*: Haul seining is practiced very little in Maryland's crab fishery. It is restricted by law in most sections of the Bay and its tributaries. It may, however, be used to advantage on shores where operating a scrape would be impractical. This gear looks like a miniature fish seine. It is about forty feet long, three feet deep, and is provided with floats at the top and weights at the bottom. A brail or pole is attached at each end and the gear is fished by two men who wade along grassy areas, dragging the outstretched seine between them. It is raised at intervals to remove the crabs which, in turn, are placed in a live box or aboard a skiff, according to whether they are soft, peelers, or hard crabs. About 150 peeler and soft crabs per day is average for this gear which is operated at low tide and only a short period at a time.

The maintenance required applies mainly to the seine itself. It must be properly dried after use and protected from rot by tarring or by treating it with a protective chemical bath. Snags and abrasions also are factors. However, a seine can be repaired as breaks appear in most cases of such injury.

D. *Crab Fyke*: The crab fyke is not a fyke net at all but rather a pound net designed to catch peeler crabs. It is used in Virginia but prohibited by law in Maryland except for certain waters in Somerset County. The fyke is constructed of poultry wire netting. A fence or leader of this same wire runs out from shore to an impounding type trap with a funnel opening from the leader into the trap, pretty much as fish traps are constructed. Bait is not used in this gear. Crabs, in the course of their activities, contact the leader and move off shore and into the enclosure of the pound. Ten dozen peelers a day is considered very good for this gear, although the catch varies greatly. The gear has not found very extensive use in late years. Its catches are made up of hard crabs as well as peelers, and green or small crabs predominate in the former. This gear is set typically in creeks, guts or other small bodies of water.

SUMMARY

The gears used in the crab industry are, for the most part, simple and comparatively inexpensive. Descriptions of the major gears, trot-line, pot, scrape and dip net have been set forth in some detail in this bulletin. Also, the lesser gears, such as push net, haul seine, crab fyke and dredge (in Maryland) have been described briefly. Maryland

laws prohibit the use of several of these gears. Certain others contribute very little to the overall catch. An estimated ninety-seven percent of the total Maryland catch is taken by trotline, pot, and scrape. The boat employed represents the major investment but otherwise there is very little a crabber needs which cannot easily and cheaply be obtained, or constructed by himself. There follows a list of references in which the different gears and the mechanics of the various operations in the industry are described and discussed in some detail. Other bulletins of this nature are available on fin-fish and oyster gears such as are commonly used in Maryland.

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