F I S H E R I E S R E S E A R C H B O A R D

O F C A N A D A

MANUSCRIPT REPORTS OF THE BIOLOGICAL STATIONS

No. 313

Title

QUEEN CHARLOTTE ISLAND CRAB FISHERY

Author

D. B. Quayle

QUEEN CHARLOTTE ISLAND CRAB FISHERY

While the author was making a survey of the clam beds in the Prince Rupert area in May of 1941, an opportunity was provided to visit and observe the crab fishery as it is carried on in the neighbourhood of Masset on Graham Island. Every courtesy and co-operation was provided by the operators of the business, Mr. S. Simpson and Mr. M. MacCallum.

History of the Fishery

The fishery was first begun in 1933 in Naden Harbour, a long inlet to the west and north of Masset Inlet. There the first cannery was located and the fishery was operated along the lines of that in Boundary Bay, described in detail elsewhere (Bulletin by D.C.G. MacKay).

Along with the regular rectangular traps, rings were also used. These rings are merely iron hoops about 3 feet in diameter to which is attached a rather loose net. In the centre of the net a small purse of netting for holding the bait is attached. The rings lie flat on the bottom and the crabs are attracted by the bait in the centre. The rings are pulled up and re-baited quite frequently for if they remain down too long the crabs doubtless wander off after the bait has been devoured. These types of fishing are suited for shallow, protected waters and small boats.

In time, however, the abundance of crabs in Naden Harbour became seriously reduced and in 1939 the whole fishery, including the cannery was moved over to Masset Inlet. The cannery is located at Old Masset, mainly because of the presence of an adequate labour supply. At first the fishing was confined to the shallow bar just outside Masset, using the equipment which had been standard for Naden Harbour.

However, increased markets and decreasing catches on Masset Bar necessi-

tated exploration and as a result crabs were found in quantity in deeper water off Tow Hill and Rose Spit, from 15 to 25 miles east of Masset Inlet.

These areas, though quite close to shore, border the open ocean and are subject to a great deal of wind, storm and strong tide. This necessitated larger boats and also traps which would not only withstand prolonged periods of use but which would be heavy enough to hold to the bottom in spite of the strong tides. To meet these needs, traps were obtained which were modelled on the types used in the Washington and Oregon crab fisheries.

These traps are cylindrical, about 33 inches in average diameter, the top circle being slightly less in diameter than the bottom. These circles are made of 5/8" iron rod. The traps are 15 inches high and the two circles are held apart by uprights of 5/8" iron rod to which they are welded. In addition there are supporting bars of 3/4" iron rod across the top and bottom circles. This framework is then tightly bound by strips of red inner tubing from old tires, the purpose of which is to prevent electrolytic action between the iron frame and the heavy three to four inch mesh copper-wire netting which covers the trap. The trap weighs about sixty-five pounds.

There are two entry holes in the sides of the trap and half of the top of the trap is hinged, giving quite a large opening for removal of the crabs and for re-baiting. The bait box is a purse-like structure of hemp netting, the opening of which is formed by a rubber band which, when stretched taut (as it is) between the two entry holes, keeps the purse closed. Each trap has its own buoy to which it is attached by 10-20 fathoms of 3/8" hemp line. The buoys are bullet-shaped cedar blocks about 18 inches long and 4 inches in diameter. They are brightly painted and each fisherman has his own color scheme. About 15 traps constitute a "string" and one of the terminal traps has a flag buoy similar to the type used by halibut fishermen.

Each fisherman is allowed approximately 100 traps, which are owned by the cannery but rented by the fishermen. Once the traps are set out on the grounds at the beginning of the season they are not taken in again until the end of the season. Thus they may work continuously for a period of six months. The various "strings" of traps are placed in different localities and the distance between the first "string" of traps and the last may be ten miles or more. The individual traps of a string are placed approximately 50-75 yards apart.

Bait

Much experimenting has been done to discover the most efficient bait. All sorts of fish and fish parts have been used as well as many types of shellfish. The consensus of opinion now is that razor clams form the best bait. This is the bait used almost exclusively in Washington and Oregon. The razor clams for the Masset fishery are obtained from the North Beach which is immediately adjacent to Masset. A crew of 10-15 diggers goes out almost daily during the crab fishing season to procure bait, which they obtain in amounts up to 1 1/2 to 2 tons daily. The cannery supplies this bait to fishermen at 2 1/2 cents per pound. Up to 200 pounds of clams may be used daily by each boat. In baiting the traps, a handful of clams, shells and all, are taken and stuffed inside the bait purse. By the time the traps are hauled, if there are any crabs in them at all, the bait is usually used up, and the shells are all that remain and these are, though not always, removed before re-baiting.

Boats

Since, as mentioned previously, this fishery is practically in the open

Pacific and this stretch of water is noted for its bad weather, stout boats are required. Consequently well-powered boats between 36 and 50 feet are used. Troller or seine boat styles are used exclusively. Slung on the mast is a short boom (sometimes a stout davit from the side of the boat is used), the end of which just reaches over and about three feet above the starboard gunwale immediately aft of the pilot-house. On the end of the boom is attached a free running open-sheave or snatch-block type of pulley. The buoy line is strung over this pulley when the trap is being hauled in. The hauling is done by a small nigger-head or gurdy, powered from the engine. Just aft of this is a small square compartment built up level with the gunwale and just large enough for the trap to saddle it comfortably when lying flat. The combings of this compartment are studded with sections of automobile tires to absorb shock and ease wear when the heavy trap lands upon them when hauled inboard. The compartment is used as a receptacle for the crabs as they are removed from the trap.

The crabs are removed from the trap by opening the door, tipping the trap and sliding the crabs into the compartment below. Here they are sorted and the females, the soft-shelled crabs and any males under the legal size of 6 1/2 inches are thrown overboard without injury. The others are transferred to a much larger storage compartment immediately aft of the sorting compartment. These features are shown in the photographs.

The Fishing Process

The crab fishing boats leave Masset for the grounds very early in the morning, since several of the fishing areas are at least a run of 2 hours or more from port. A crew of two is required, one man to run the boat and the gurdy or nigger-head; the second man to handle the loose lines, the traps, the removal of

the crabs and re-baiting.

The nearest strings of traps are examined first, the process being called "pulling" or "hauling" and takes place as follows: The string is located by the flag buoy. On approaching the buoy the fisherman, pike pole ready, catches the bight of the anchor rope below the buoy which is seldom, if ever, taken on board. He transfers the rope from pike pole to hand, takes a few hauls and hands the bight to his companion who hooks it through the pulley and takes several turns around the nigger-head which then hauls up the trap as pressure is applied to the rope. As soon as the trap reaches the boom block, the fisherman takes hold of it and, as the rope is released from the nigger-head, the trap is swung in board on top of the rubber-cushioned compartment previously described. The top of the trap is opened, the trap tipped over, and the crabs dropped into the compartment below. The trap is then righted, a handful of razor clams shoved hurriedly into the rubber-mouthed bait purse, the top door quickly closed and fastened, the trap pushed to the side of the gunwale ready to be released when the steersman gives the signal as he does just before the boat reaches the buoy marking the next trap. This is then picked up again by the fisherman with the pike pole and the process is repeated. Now, however, as the trap is being hauled up, the fisherman sorts the crabs and removes whatever portion of the marketable crabs he can into the storage compartment before the second trap reaches the surface and is ready to be brought aboard. The whole process - from the time the buoy-rope is picked up by pike pole to the time the baited trap is ready to be released again - requires on the average slightly less than one minute. As these operations are going on the boat is moving towards the next buoy so that No. 1 trap is dropped close to where No. 2 trap has been fishing and the last trap moves into new territory. Thus each time a

"string" is pulled it moves ahead slightly from its former location. After a "string" has been pulled the boat moves on rapidly to the next "string" and so on until all the traps have been "pulled" once. Then, if weather still holds favorable, the traps are pulled again and, if the fishermen are industrious and time allows, the traps may be pulled a third time. Very often catches on the third pull are as high as those on the first, but considerable variation apparently exists.

Even at best, after three pulls, it is late in the evening and dark when the crab boat starts for the cannery. On arrival the catch is tallied as the crabs are thrown into the live tanks where they are held until the next day, or even for several days until enough have accumulated to make it possible for the cannery to operate for a reasonable length of time. The tally of the catch is credited to the fishermen and settlement is made from time to time with cost of bait, trap rental, and other supplies deducted from the value of the catch. Daily catches up to 2,500 crabs have been obtained.

Statistics

At the request of the cannery officials the author outlined a system for gathering statistics which might be of use both to the cannery, which is very interested in the preservation of the fishery, and to the biologist as well. The information is, of course, gathered from the fishermen. This is an excellent opportunity for a statistical study of a commercial sea-fishery, for the grounds, at the present time, are limited in extent. There is only one market and one company which can exercise complete control of the fishermen, which number not more than a dozen. Added to this is the willingness and desire of the company to carry out the collection of necessary data.

The information to be gathered is as follows:

(1) Name of fisherman.

(2) Date.

(3) Place of fishing.

(4) No. of traps of each type - a. round
b. square
c. ring

(5) No. of traps pulled.

(6) Depth of fishery.

(7) Weather.

(8) Bait.

(9) Male/female proportion.

(10) Notes.

MISCELLANEOUS INFORMATION

taken from correspondence with Mr. Simpson

(1) Sex proportions vary very much at different times and in different localities. Also as the mesh of the traps is purposely large enough to let crabs of six inches and under escape, and the females are generally as small as this, the sex proportion as represented in the catch it not at all representative. On the average the males are twice as plentiful as females in the commercial catch.

(2) Maximum size of the male crab is 9 inches measured between the square cuts inside the tips of the ends of the carapace. In general, especially from the Tow Hill area, 20% of the catch is composed of eight inch crabs, the rest being smaller.

(3) In Naden Harbour and outside Masset crabs start to moult in April. Between Tow Hill and Rose Spit there is practically no evidence of moulting until the early part of June. At the former location moulting continues till the end

of September but there seems to be always a large number of hard-shelled crabs available. There seems to be some evidence that the two sexes of Two Hill crabs moult at different times but this needs further investigation.

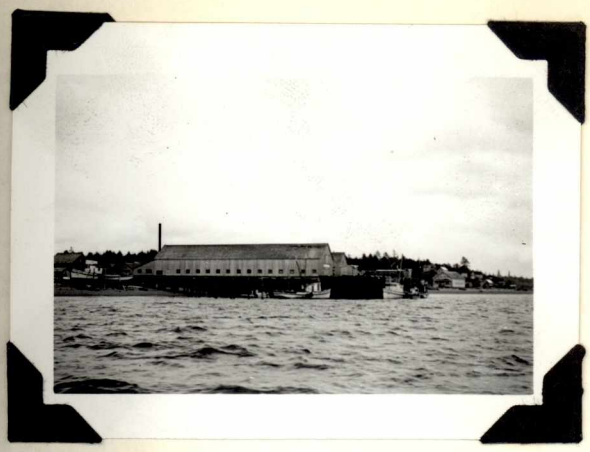
(4) Fishermen receive 7 cents per crab.

(5) Fishing is carried on from March to July inclusive and from September to November inclusive. Bad weather is chiefly responsible for the summer closure.

(6) At the time fishing was commenced at Tow Hill the crabs averaged 10 for each trap. An average of 6 is considered good fishing.

D.B. Quayle.

October, 1941.



(1) Crab cannery at Old Masset, Queen Charlotte Islands.

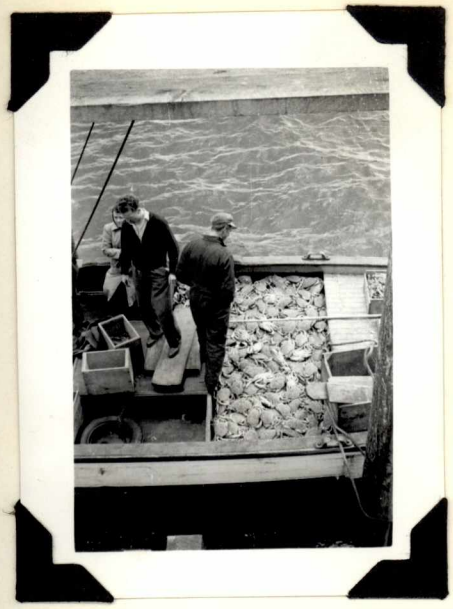
(2) Crab fishing boat on grounds, showing boom slung over side, the snatch block and the trap, which has just been pulled to the surface.

(3) Broadside view of crab fishing boat showing positions of fishermen and apparatus. The trap is ready to be taken inboard.

(4) Crab trap which has just been taken inboard. The boom, snatch block and trap line are shown. Note the crabs in the trap.

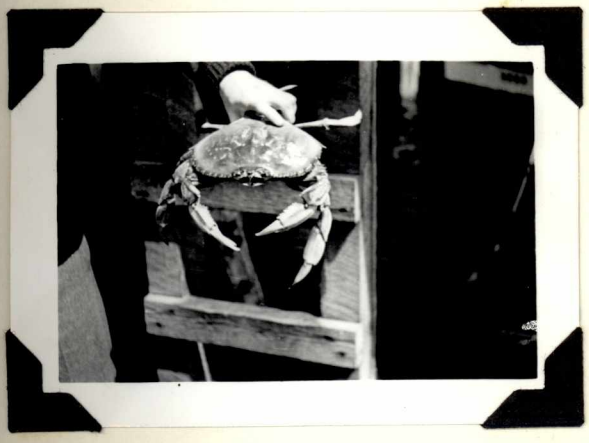
(5) Side view of the crab trap. Note the bait purse inside and the sturdy construction of the trap.

(6) The trap ready to be released. Note the crabs in the temporary storage department below.



(7) A day's catch. This represents the results of one "pull" on one hundred traps. There are about 500 crabs in this catch.

(8) Live tank at the cannery where the crabs are kept alive.



(9) Typical 9 inch crab, Cancer magister.