

ALASKA'S SHRIMP INDUSTRY

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INTRODUCTION

One of the oldest operating fishery industries in Alaska is the shrimp fishery. Started in the vicinity of Petersburg, Alaska, in 1915, it has continued to be one of the most important "off-season" fisheries in the Territory. The primary and most important fisheries of Alaska--salmon and halibut--are of extremely short duration and occur in the summer months. But the shrimp fishery could be exploited on a year-round basis except for a short closed season (established by Federal regulations) in certain areas of South-eastern Alaska from February 15 through April 30.

SPECIES OF SHRIMP

Although numerous species of shrimp from Alaska have been identified (Hynes 1930), these five are of major importance in the commercial shrimp fishery:

1. Pink, Pandalus borealis.
2. Side-stripe, Pandalopsis dispar.
3. Humpy, Pandalus goniurus
4. Spot or prawn, Pandalus platyceros.
5. Coon-stripe, Pandalus hypsinotus.

Of these, the first three make up from 85 to 95 percent of the commercial catch divided almost equally among them. The sizes of the pink and humpy vary from about 60 to 150 whole shrimp per pound. Side-stripe range from 20 to 75 whole shrimp per pound. The spot or prawn are the largest, averaging 8 to 10 whole shrimp per pound. Coon-stripe run about 30 to 50 whole shrimp per pound.

CATCH AND FISHING AREAS

The average annual shrimp catch for 1940 through 1945 was around 900,000 pounds. From 1946 through 1951 Alaska shrimp fishermen made an average annual catch of 2,146,000 pounds. The highest annual catch of shrimp in Alaska was 2,835,000 pounds in 1948.

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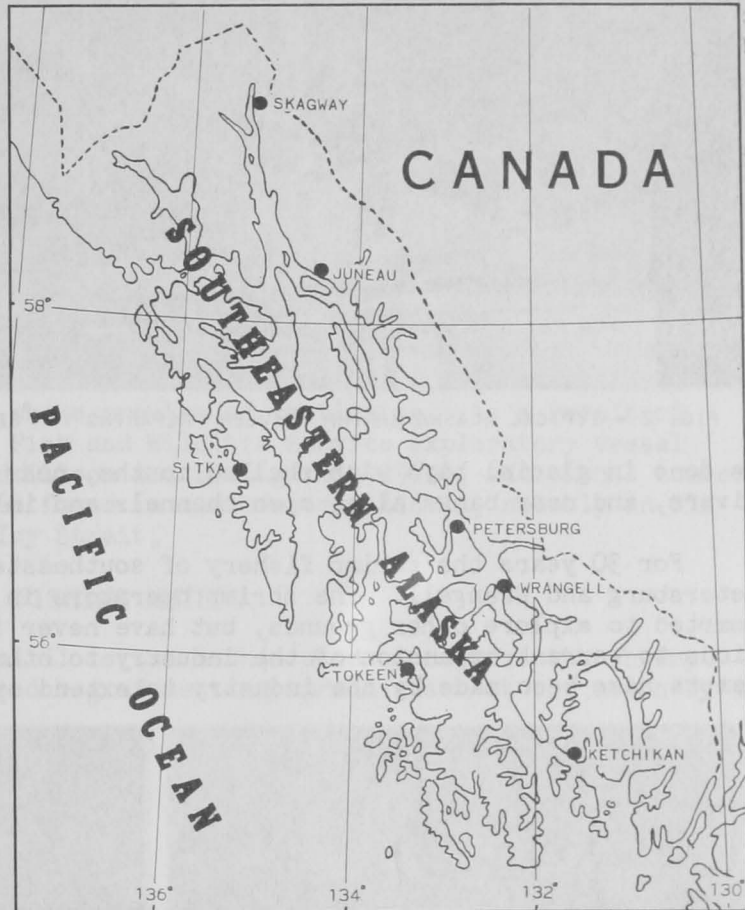


FIG. 1 - SOUTHEASTERN ALASKA. PETERSBURG AND WRANGELL HAVE BEEN THE CENTER OF THE ALASKA SHRIMP FISHERY FOR THE PAST 30 YEARS.

Unlike the shrimp fishery in the Gulf of Mexico, which is carried on in open waters, shrimp fishing in Alaska is conducted in "inside" waters. Most fishing



FIG. 2 - TYPICAL ALASKA SHRIMP TRAWLER PREPARING TO "SET" THE BEAM TRAWL.

is done in glacial bays with shallow mouths, near the flats off the mouths of large rivers, and near banks along open channels and inlets.

For 30 years the shrimp fishery of southeastern Alaska has centered about Petersburg and Wrangell. The shrimp operators in these towns have, at times, attempted to explore other grounds, but have never found sufficient shrimp populations to warrant expansion of the industry to other places. From time to time attempts have been made by the industry to extend operations into central Alaska,



FIG. 3 - SHRIMP BEAM TRAWL BEING RAISED FROM WATER.



FIG. 4 - BRAILING SHRIMP FROM THE BEAM TRAWL.

especially in Prince William Sound, where the same species of shrimp are known to occur. So far these attempts have proved unsuccessful. On occasion, an individual fishing boat is outfitted with a beam trawl and a few hundred pounds of shrimp are landed in Cordova. This is infrequent and sporadic and no consistent fishery has yet been established there.

SHRIMP EXPLORATIONS

In 1947, after the explorations reported by Carlson (1945), a small shrimp fishery was started at Token, on the west coast of Prince of Wales Island. That



FIG. 5 - THE SHRIMP IS DUMPED ONTO A SORTING TABLE.



FIG. 6 - GETTING READY TO HOIST BOXES OF WHOLE SHRIMP TO LANDING DOCK OF PROCESSING PLANT.

operation is doing very well and shows promise of continuing. As a result of shrimp explorations by the U. S. Fish and Wildlife Service exploratory vessel John N. Cobb (Schaefers 1951, and Ellson and Livingstone 1952), additional commercially-exploitable areas have been found in southeastern Alaska, notably in Glacier Bay and inlets adjacent to Icy Strait.

FISHING METHOD

Beam trawling has been and still is the method used to capture the shrimp. A beam trawl is a partially tapered bag of netting spread apart at the mouth by a

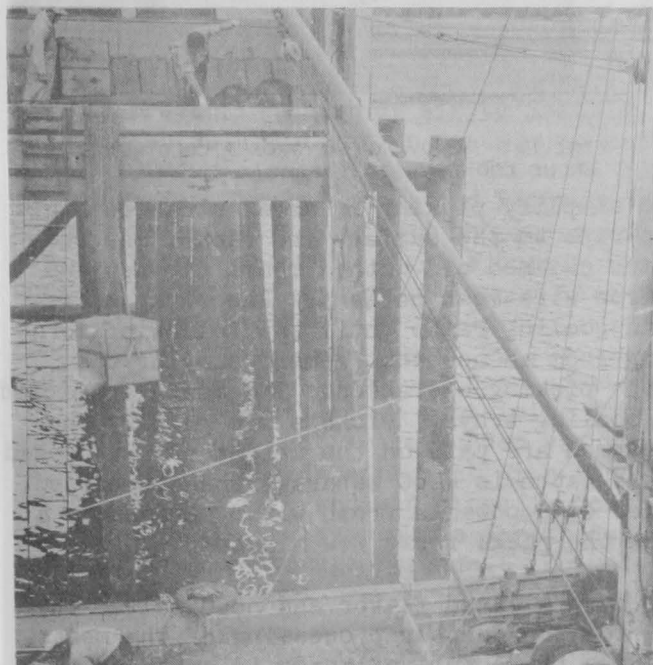


FIG. 7 - UNLOADING BOXES OF WHOLE SHRIMP AT THE PROCESSING PLANT.



FIG. 8 - COOLING RACKS FOR TRAYS OF WHOLE COOKED SHRIMP AND FOR COOKED MEATS.

beam or timber. The trawl is set on the bottom and towed behind the vessel. After an hour or two it is hauled up, the shrimp are brailed out and stored whole on deck in wooden boxes holding from 150 to 200 pounds each. Because of prevailing cool air temperatures and the fact that shrimp are landed daily, no ice is used. The shrimp trawlers usually leave port in the very early hours of the morning and return to the processing plants with their catches in the late afternoon or early evening. A complete and detailed description of the fishing vessels, the beam trawl, and the fishing method, is given in a report on experimental and exploratory shrimp fishing conducted in 1944 by the Alaska Fisheries Experimental Commission (Carlson 1945). Ellson and Livingstone (1952) describe a smaller trawl used in exploratory fishing operations. Collapsible shrimp traps were also used in the explorations of the John N. Cobb, and are described in detail by Ellson and Livingstone.

PROCESSING AND MARKETING PROCEDURES

The method of processing the shrimp in the plants has been the same for a number of years. As soon as a boat arrives at the plant, the boxes of shrimp are unloaded from the deck of the fishing vessel. The whole shrimp are immediately precooked, one boxful at a time, in a tank of fresh boiling water heated by direct



FIG. 9 - PICKING ROOM WHERE MEATS ARE PICKED FROM WHOLE COOKED SHRIMP.

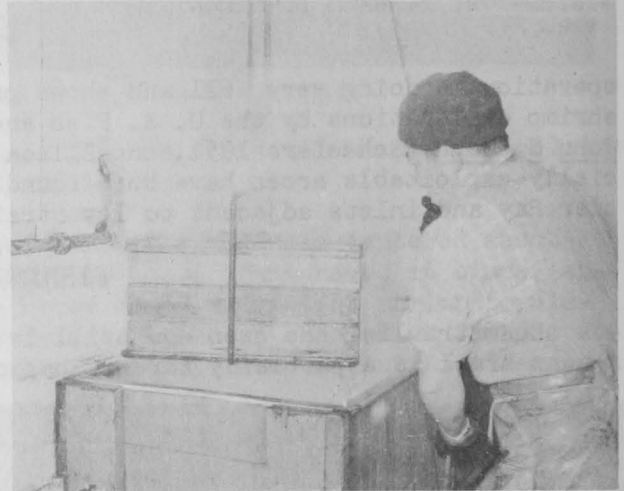


FIG. 10 - REMOVING TRAYS OF PICKED MEATS FROM BRINE COOKER.

injection of live steam. The precook to simplify picking is as short as possible and is judged sufficient when the shrimp rise to the surface and float. As the whole shrimp rise to the surface, they are skimmed off with a short dip net and put into small wooden trays with galvanized wire-mesh bottoms. Each tray holds 20 to 25 pounds. The trays are placed in cooling racks until the following morning, when they are moved into the picking room as needed. Women, many of them Alaska natives, are mainly employed in the picking operation. The meats are picked from the shells and again placed in the cooling trays. Pickers are paid by the weight of meat picked. Because the fishermen are paid on the weight of the cooked meats picked from their catch, each boat's catch is kept separate when processed. The trays of picked meats are washed under cold potable fresh water sprayed by a hose or faucet, and permitted to drain on the racks for a few minutes.

After picking and washing, the meats have a bland flavor and need salt. The industry practices two different methods for the further processing of the meats. The most commonly used method is to cook the trays full of meats in a strong salt solution (25°-30° salometer) for a very short period--from one to three minutes.

This is also done in a vat or tank heated by direct injection or closed coils of live steam. The other method is to first dip the trays of picked meats in a saturated salt solution for about three minutes. After the dip, the trays of meats are allowed to drain. Then the trays are placed in a steam re-tort and cooked without pressure for 3 to 4 minutes. There is some slight variation from plant to plant, and even from day to day in the same plant, in the cooking time and the strength of brines used. After brining and cooking, the shrimp meats are cooled in the trays on the racks for several hours, or overnight. To remove fragments of shell and antennae or "feelers," the meats are then put through a combination shaking and blowing machine or a rotating drum and blower, of which there are about as many different designs as there are processing plants. From the mechanical cleaning machines, the meats are taken to the packing room. Approximately 35 pounds of cooked meats are obtained from 100 pounds of raw whole shrimp.

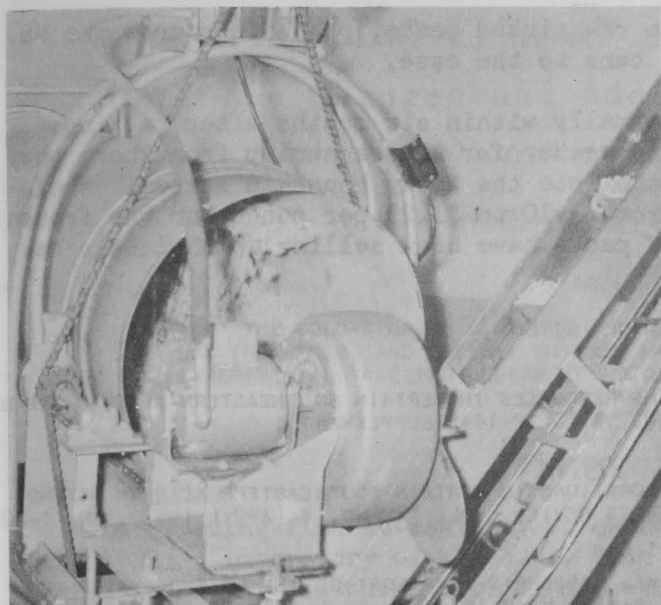


FIG. 11 - BRINE COOKED MEATS PUT THROUGH A REVOLVING SHAKER OR ROTARY DRUM AND BLOWER TO REMOVE FRAGMENTS OF SHELL AND ANTENNAE OR FEELERS. NOTE CONVEYOR ON THE RIGHT WHICH TAKES CLEANED MEATS TO PACKING ROOM.

For many years, until about 1940, the shrimp meats were packed dry, 5 pounds to a one-gallon can, and shipped in ice by steamship to Seattle brokers, who distributed the perishable product as far east as the Rocky Mountain area. With the advance in the use of freezing in the last several years, the industry has now changed almost completely to marketing its products in the dry frozen state. Freezing is accomplished at temperatures between 0° and 10° F. Most Alaska freezers are the shelf type. One operator, however, ships all his production fresh by air to Seattle. The largest volume of shrimp meats is packed in No. 10 double-seamed cans, 5 pounds of meats per can, for the hotel and restaurant trade. In recent years, with the increased use of frozen products in the home, the shrimp industry of Alaska has turned to one pound and even smaller containers. Very recently the "tuna" can (known in the canning trade as a 307 x 113), has been adopted for a consumer-size package containing four ounces of shrimp meat sealed under vacuum. Vacuum packing yields a product with a superior storage life and minimizes the toughening and loss of flavor of the shrimp during long frozen-storage periods. Enamel-lined cans are used.

Some shrimp are marketed in other forms than as cooked picked meats. These are:

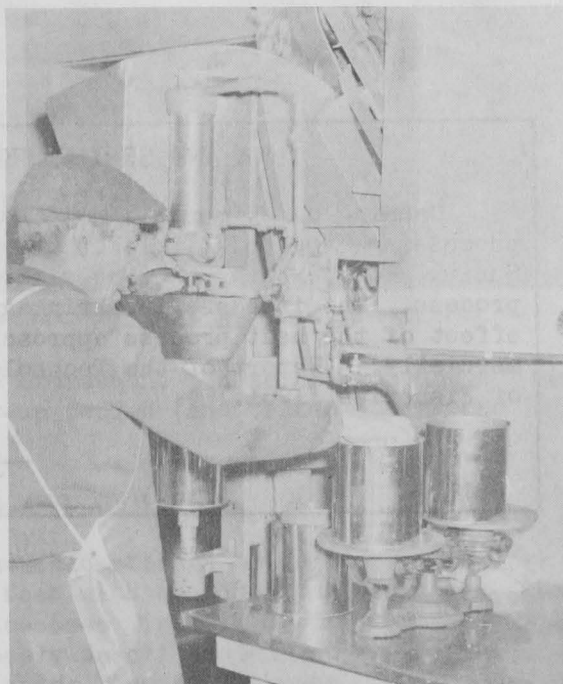


FIG. 12 - PACKING AND WEIGHING NO. 10 CANS. EACH CAN CONTAINS FIVE POUNDS OF MEATS.

Spot shrimp - Cooked whole and frozen, packaged in paper boxes, 20 pounds per box.

Large side-stripe shrimp - Frozen raw picked meats, packed 6 pounds per No. 10 can, hermetically sealed, 6 cans to the case.

All Alaska shrimp are marketed normally within six months after packing. Seattle remains the wholesale marketing center for Alaska shrimp from where they are distributed on the Pacific coast and into the Rocky Mountain states. Wholesale prices in 1951 and 1952 varied from \$1.10 to \$1.25 per pound for the frozen cooked and peeled meats. The uncooked packs have been selling at wholesale between 85 cents and \$1.00 per pound.

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TUNA AND SHRIMP SHRINKAGE DURING CANNING

Canning experiments showed that the shrinkage of tuna meat during heat processing depended little on the sterilizing value of the process used. Shrimp, however, shrunk more with increasing the sterilizing value of the process. The increase in shrinkage gradually fell off when the sterilizing effect of the heat process approached the values which should be used commercially. (Report of the Technological Laboratory of the Danish Ministry of Fisheries, 1951.)

--World Fisheries Abstracts, vol. 3, no. 6
(Nov.-Dec. 1952), p. 1.