

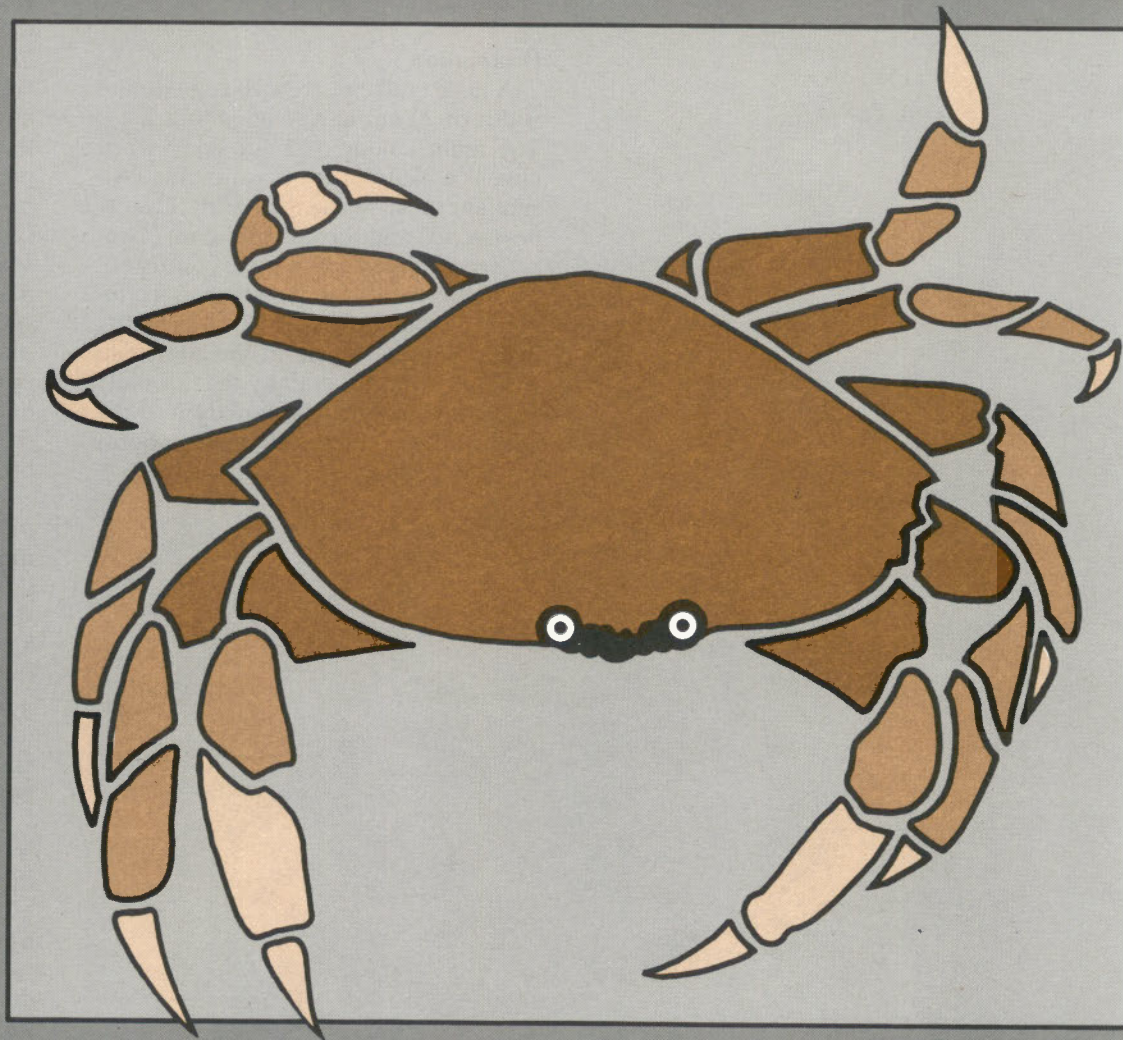
DFO - Library / MPO - Bibliothèque



02021248



UNDERWATER WORLD



Dungeness Crab

118976

QL
626
U52
no. 37
1988
c. 2

Fisheries
and Oceans

Pêches
et Océans

Canada

Dungeness Crab

People living along the west coast of North America are familiar with the Dungeness crab (Fig. 1) as a highly-prized sport and commercial shellfish species. In British Columbia the reported landed value in 1981 was \$2.6 million. This crab, one of the 35 true crabs living in Canadian Pacific waters, has the scientific title of *Cancer magister*. Freely translated, the first word is the Latin name for crab and the second means chief, or principal. The common name Dungeness is derived from a fishing port near Puget Sound, Washington.

Description

A male crab can grow to a maximum width of 23 cm and weigh about 2 kg. The main colour of both sexes when alive is a blend of brown and tan. Two similar crabs, — the rock crab (*Cancer productus*) and the graceful crab (*Cancer gracilis*) may cause some confusion. The Dungeness crab, however, is distinguished from the red crab by its slender, light-coloured fingers of the claw, and from the graceful crab by the normally 10 teeth along the lateral margin of the shell, and broad flat walking legs. Sport fishermen catch the red rock crab.

Distribution and Habitat

The Dungeness crab is distributed from the Aleutian Islands, Alaska, to Monterey Bay, California, from low water to a depth of about 180 m. It lives in bays, inlets, around estuaries, and on the continental shelf. Although it is found at times on mud and gravel, this crab is most abundant on sand bottoms; frequently it occurs among eelgrass.

Reproduction and Growth

During breeding, the male crab clasps the female so that the undersides of each are in close contact. Sperm is placed into the female's body by means of the male breeding structures; this is only possible while the female is soft-shelled, following moulting. Breeding actually lasts less than 30 minutes, but a male may transport his partner about for several days prior to her moulting. Eggs are not fertilized and spawned until autumn, the sperm remaining viable since the summer breeding. There is evidence that the sperm supply is sufficient to fertilize a second batch of eggs. After fertilization, eggs, estimated at half a million to a million, are extruded and are attached to the female's abdomen where they are brooded until spring.

After hatching, the young crab is pelagic or free swimming for four months and longer, passing through five larva stages termed the zoea. This shrimp-like larva is able to swim, but appears to be primarily transported through the water by currents. In the next and last stage, termed the megalops, the larva is recognizably a young crab with its tiny claws and other legs, but still has the tail of a shrimp.

Throughout its life, a crab's growth is restricted by having the skeleton on the outside. Consequently, it does not grow gradually like a fish, but increases by periodic moulting, the frequency of which decreases with age. After shedding the old shell, swallowed water causes the crab to swell to the new larger size. Shell hardening and the accompanying gain in usable weight requires one to three months.

Fig. 1 Male Dungeness crab (*Cancer magister*).



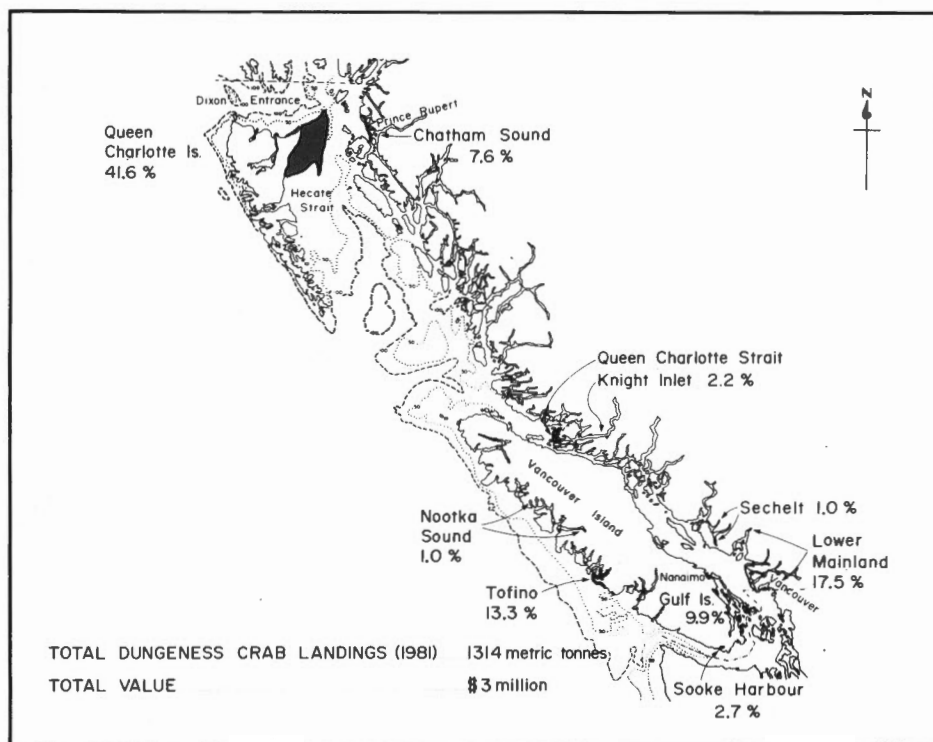


Fig. 2 Dungeness crab fishing areas of British Columbia, each with percentage of total landings.

After the crab settles to the bottom, it attains maturity after 10 to 11 moults at two or three years. The male reaches legal size (165 mm, or 6½ inches in shell width) after 12 or 13 moults at about four years. Because they grow slower after the third year, few females ever reach legal size.

Habits

The Dungeness crab often buries itself almost completely in sand. It accomplishes this feat by hairs located above water intakes located at the bases of its claws that keep the gill chamber free of sand grains. This crab finds and captures its prey, mainly animals living partly or completely buried, by probing its slender sensitive claws into the sand. One associates sideways movement with crabs, but they can walk in all directions. On occasion, Dungeness crabs run quickly, at a rate to tire a pursuing scuba diver.

Food and Predators

Live prey such as clams, other crustaceans, and small fish is preferred by this crab, which uses its claws to tear apart food and its smaller feeding appendages to pass it to the mouth opening where pieces are crushed by two hard mandibles or "jaws". In the stomach there is further cutting and crushing by tooth-like structures, known collectively as a gastric mill.

Some predators during the crab's life on the bottom are halibut, dogfish, sculpins and octopus. Cannibalism is known, particularly on young crabs during the first weeks after completing larval life. Coho salmon at times may feed heavily on crab larvae.

Fishery

The first record of crab landings in British Columbia was in 1885. According to early reports, there was fishing near the centres of Vancouver, Victoria, and Nanaimo. Later, operations spread to western Vancouver Island and the Queen Charlotte Islands. Coastwide landings in 1940 totalled 454 tonnes (t). In the early 1950s, crab fishermen discarded their oblong, net-covered traps in favour of a stainless steel circular trap that is still in use. This trap enabled fishermen to exploit above-average stock abundance for high production (1,223 to 2,393 t) over two decades. Fishing effort increased throughout the 1970s, e.g. fleet size grew from 141 vessels in 1976 to 358 in 1980, yet annual landings remained at a low level (890 to 1,179 t). In 1980, crab production rose to 1,698 t, but in 1981 dropped to 1,315 t.

Up to three quarters of the province's total commercial crab catch originates in Hecate Strait and McIntyre Bay. Other areas are in Boundary Bay, the Fraser River Estuary, Burrard Inlet, Gulf Islands, Queen Charlotte Strait, and Chatham Sound (Fig. 2). Although crabs are fished in all months, the main season extends from May to October.

The majority of crab vessels fish 50 to 200 traps, with some vessels handling 500 to 600. The commercial circular trap with two entrances has a diameter of 90 to 100 cm and a height of 30 to 35 cm

(Fig. 3). Traps are fitted with separate lines and buoys on the open coast but are attached at intervals along a ground-line in sheltered bays and inlets. In all areas fishermen leave traps in the water for periods from one to 10 days. Baits in use currently are clams, squid, and fish heads and carcasses.

Smaller traps are also used, as well as ring or hoop traps, and sportsmen harvest crabs by scuba diving and by dip-netting at low tide. The possession limit in any day in the region east of Vancouver Island is four crabs; in all other areas, the limit is six crabs.

Crab processing plants are situated at Masset, Prince Rupert, Nanaimo, Vancouver, and Sidney. Products include whole cooked crabs, fresh and frozen; frozen unshelled but eviscerated crabs; and fresh and canned crab meat.

Management

The primary basis of management is the minimum size limit (165 mm), along with supportive regulation of gear and closures. Rationale for the size limit is protection for crabs until after maturity and first breeding. Due to the fluctuating nature of crab populations, no steady state or equilibrium of harvest is anticipated. Nor is expansion of the fishery foreseen as all stocks are now exploited.

Further Reading:

Butler, T.H. 1960. "Maturity and breeding of the Pacific edible crab, *Cancer magister* Dana." *J. Fish. Res. Board Can.* 17 (5): 641-646.

Butler, T.H. 1961. "Growth and age determination of the Pacific edible crab, *Cancer magister* Dana." *J. Fish. Res. Board Can.* 18 (5): 873-891.

Hart, J.F.L. 1982. *Crabs and their relatives*, B.C. Prov. Mus. Handb. 40: 267 p.

Text:

T.H. Butler
Pacific Biological Station
Nanaimo, British Columbia

Underwater World factsheets are brief illustrated accounts of fisheries resources and marine phenomena prepared for public information and education. They describe the life history,

geographic distribution, utilization and population status of fish, shellfish and other living marine resources, and/or the nature, origin and impact of marine processes and phenomena.

Others in this series:

Alewife
American Eel
American Oyster
American Plaice
American Shad
American Smelt
Arctic Char
Arctic Cod
Atlantic Cod
Atlantic Fishing Methods
Atlantic Groundfish
Atlantic Halibut
Atlantic Herring
Atlantic Mackerel
Atlantic Pelagic and Diadromous Fish
Atlantic Salmon
Atlantic Shellfish
Atlantic Snow Crab
Beluga
Bluefin Tuna
Bowhead Whale
Capelin
Cetaceans of Canada
Crabs of the Atlantic Coast of Canada
Grey Seal
Haddock
Irish Moss
Lake Trout
Lingcod
Lumpfish
Marine Fish Eggs and Larvae
Narwhal
Northern Shrimp
Pacific Salmon
Pollock
Red Hake
Red Sea Urchin
Red Tides
Redfish (Ocean Perch)
Rockfish
Roundnose Grenadier
Sand Lance
Sea Cucumber
Sealing - A Canadian Perspective
Sea Scallop
Selected Freshwater Fish
Selected Shrimps of British Columbia
Soft-Shell Clam
Spiny Dogfish
Squid
Thorny and Smooth Skates
Trout in Canada's Atlantic Provinces
Turbot (Greenland Halibut)
Walleye
White Hake
Winter Flounder
Witch Flounder
Yellowtail Flounder

Published By:

Communications Directorate
Department of Fisheries and Oceans
Ottawa, Ontario
K1A 0E6

DFO/4119 UW/37

© Minister of Supply and Services
Canada 1988
Catalogue Number Fs 41-33/37-1988E
ISBN 0-662-16480-6
Reprint 1993

Aussi disponible en français



Printed on recycled paper

Fig. 3 Fisherman hauling aboard a crab trap.

