

Alaska King Crabs

King or stone crabs occur around the world. Commercial fisheries have existed for them in Alaska, Canada, Russia, Japan, Korea, New Zealand, Australia, South Georgia and Falkland Islands, Argentina, and Chile. King crabs have "tails," or abdomens, that are distinctive, being fan-shaped and tucked underneath the rear of the shell. They also have five pairs of legs; the first bears their claws or pincers, the right claw is usually the largest on the adults, the next three pairs are their walking legs, and the fifth pair of legs are small and normally tucked underneath the rear portion of their carapace (the shell covering their back). These specialized legs are used by adult females to clean their embryos (fertilized eggs) and the male uses them to transfer sperm to the female during mating.

Distribution: In Alaska there are three commercial king crab species. **Red king crabs**, *Paralithodes camtschaticus*, have been the commercial "king" of Alaska's crabs. It occurs from British Columbia to Japan with Bristol Bay and the Kodiak Archipelago being the centers of its abundance in Alaska. **Blue king crabs**, *P. platypus*, live from Southeastern Alaska to Japan with the Pribilof and St. Matthew Islands being their highest abundance areas in Alaska. **Golden king crabs**, *Lithodes aequispinus*, are distributed from British Columbia to Japan with the Aleutian Islands their Alaska stronghold of abundance. Red and blue kings can occur from the intertidal zone to 100 fathoms or more. Golden king crabs live mostly between 100-400 fathoms, but can occur from 50-500 fathoms.

Life History: Adult females brood thousands of embryos underneath their tail flap for about a year's time. When the embryos are fully developed they hatch as swimming larvae, but they are still susceptible to the movements of tides and currents. After feeding on plant and animal plankton for several months and undergoing several body changes with each molt, the larvae settle to the ocean bottom and molt into nonswimmers, looking for the first time like king crabs as we normally think of them, except they are smaller than a dime. Red and blue king crabs settle in waters less than 90 and 200 feet deep respectively, while golden king crabs appear to settle in waters 300 feet or deeper!

Because a crab's skeleton is its shell (made mostly of calcium), it must molt its shell in order to grow. Juveniles molt many times in their first few years, then less frequently until they reach sexual maturity in four or five years. Adult females must molt in order to mate but males do not. Adult males often skip a molt and keep the same shell for one or two years. Red king crabs are the largest of these three species with the record female and male weighing 10.5 and 24 pounds, respectively. These large crabs were estimated to be 20-30 years old. The male's leg span was nearly 5 feet across.

Adult red and blue king crabs exhibit nearshore to offshore (or shallow to deep) and back, annual migrations. They come to shallow water in late winter and by spring the female's embryos hatch. Adult females and some adult males molt and mate before they start their offshore feeding migration to deeper waters. Adult crabs tend to segregate by sex off the mating-molting grounds. Red, blue, and golden king crabs are seldom found co-existing with one another even though the depth ranges they live in and habitats may overlap. Adult male red king crabs have been known to migrate up to 100 miles round-trip annually, moving at times as fast as a mile per day! Less is known of the migration of golden king crabs, but it is believed they migrate more in a vertical fashion since they generally inhabit steep-sided ocean bottoms.

Food eaten by king crabs varies by species, size, and depth inhabited. King crabs are known to eat a wide assortment of marine life including worms, clams, mussels, snails, brittle stars, sea stars, sea urchins, sand dollars, barnacles, crabs, other crustaceans, fish parts, sponges, and algae.

King crabs are eaten by a wide variety of organisms including but not limited to fishes (Pacific cod, sculpins, halibut, yellowfin sole), octopuses, king crabs (they can be cannibalistic), sea otters, and several new species of nemertean worms, which have been found to eat king crab embryos.

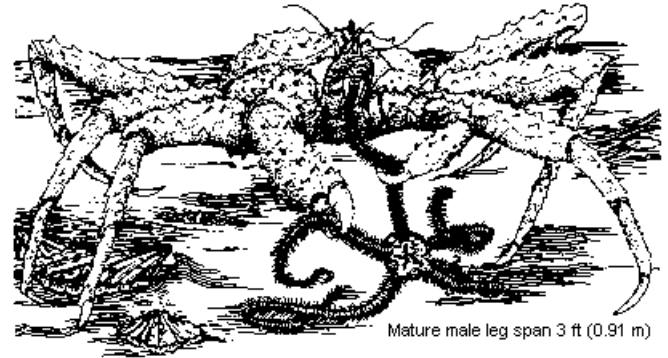
Commercial Fisheries: King crabs are most commonly fished using pots, large 600- to 700-pound steel frames covered with nylon-webbing. Commonly, each pot is baited, with chopped herring, and then dropped to the water where it sinks to the bottom and is generally allowed to soak for one or two days when fishing red or blue kings, but longer when fishing for golden king crabs. Buoys attached to the pots with heavy line are retrieved and lifted onto the boat by use of powerful hydraulic systems. Boats fishing king crabs are 40-200 feet long, the largest cost several million dollars. Those vessels fishing in the Bering Sea or Aleutian Islands average over 100 feet. King crab fishing can be very dangerous due to the heavy pots, coils of line, long hours, and rough seas which at times can exceed 20 feet! Only male crabs can be legally sold. Minimum width size limits vary by species and management area, ranging from 4 3/4 inches in Norton Sound to 8 inches in Southeast Alaska.

Historically, the red king crab fishery has been Alaska's top shellfish fishery. Since statehood in 1959, U.S. fishers have harvested nearly 2 billion pounds of red king crab worth \$1.6 billion from Alaska waters, making red king crabs the second most valuable species to fishers during this period. Sockeye (red salmon), has been the most valuable species. Record statewide harvest and value for red king crabs was 183 million pounds and \$235 million during the 1966/67 and 1978/79 seasons, respectively.

A near peak harvest of red king crabs occurred in the 1980/81 season, but three years later the fishery crashed, as harvests were down sixty-fold, and the four top historical producing areas were closed completely to red king crab fishing for the first time. A long period of few juvenile king crabs surviving to adult size (recruitment) was the primary reason for the crash. Biologists theorize that fish predation on king crabs and a warmer ocean environment were probably responsible for the poor recruitment. Red king crab populations have remained depressed statewide (except in Southeast Alaska) since 1983. Major blue king crab fishing grounds have been adjacent to the Pribilof and St. Matthew Island in the Bering Sea. Peak blue king crab statewide harvest and value were 14 million pounds and \$32 million in the 1981/82 and 1983/84 seasons. Like red king crabs, the blue king crab populations have dropped to historic low levels.

With the sharp decline of red and blue king crab populations, some commercial fishers have targeted on golden king crabs. From 1980-95 122 million pounds of golden king crabs, worth \$338 million, have been harvested by fishermen statewide, with the bulk of this catch coming from the waters surrounding the Aleutian Islands.

Preparation: Commercially, king crabs are delivered live, then cleaned, leaving two sets of legs, each termed a section. Sections are cooked in boiling water then dipped in cold water, both baths slightly brined. Sections are then frozen and shipped primarily to U.S. and Japanese restaurants. Private individuals clean the



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crabs, then boil or steam the legs in either salted or unsalted water for 20-30 minutes. The meat is eaten hot or cold, plain or with melted butter, or with garlic or seafood sauce. King crab is also delicious in salads, sandwiches, and a variety of other dishes.

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