

Dungeness Crab (*Cancer magister*)



Photos courtesy of Oregon Department of Fish & Wildlife.

Life History

Species of the **genus *Cancer*** are hard-shelled crabs characterized by broad oval **carapaces** that are sawtoothed on the front side. Nine species of this genus inhabit the marine waters of California. The largest edible species is the **Dungeness Crab**, which can be found from the eastern Aleutian Islands, AK to Santa Barbara, CA. The range of the crab is temperature dependent; therefore they are rarely found in the waters south of **Point Conception**. The species may be found on any **substrate** type on the seafloor from the intertidal zone to depths of 228 m (750 ft). However, they show a preference for the **soft sediments** (See Biology & Ecology – Ecosystems Where Fish Live) of the seafloor, usually sandy-mud substrates, and seldom are found in large quantities beyond depths of 107 m (350 ft).

Hard-shell crabs must go through a **molting process**, where the **existing shell splits and falls off** ([video](#)). After shedding their old hard shell, the crabs go through a rapid period of growth. During this process the crabs are considered soft-shelled and are highly vulnerable to **predators**. Male and females do not molt at the same time of year. Mating occurs between February and June in California when females molt. Males detect when females molt and will carry the females in a protective embrace until the molting process is completed. Once the old shell of the female has been discarded the male deposits sperm, which is then stored inside the female for up to 2.5 years. Depending on the size, a female may produce between half a million to two million eggs. Fertilization of the eggs takes place between October and December when the eggs are extruded. The eggs hatch between November and February.

The **larvae** transition among several stages before metamorphosing into the adult form. Larval development takes 105-125 days to complete. In the initial zoeal stages, the larvae spend most of the time in offshore waters and then are transported to inshore waters around April when the megalops stage begins. During the first year, Dungeness Crabs molt an average of six times, growing to a carapace width of one inch. By the end of the second year, after six more molts, the crabs are sexually mature. Females will molt once a year after reaching maturity, generally



Fishery Basics — California Fisheries

reaching a maximum size of 17.8 cm (7 in), while males will molt twice in their third year and once a year after, reaching a maximum size of 22.9 cm (9 in).

Fishery History

The first **commercial** take of Dungeness Crab in California occurred in 1848 off of San Francisco. Initially, hoop nets were used to capture the crabs, but in the early 1940s they were replaced with **pots** (See Fishing Gear – Traps), which significantly increased the **landings**. Originally, the **fishery** was focused around the San Francisco area, fishing from late fall through the end of spring, and averaged 1,179 t (2.6 million lbs) annually. During the 1944-45 **fishing season**, the fishery expanded north into the Eureka-Crescent City area and expanded south in the 1945-46 season. Since the expansions, the average annual harvest of Dungeness Crab in California has been around 4,535 t (10 million lbs).

The Dungeness Crab fishery occurs in two areas of California: northern and central. The management line that divides the northern and central fisheries is the Mendocino-Sonoma county line. The central California fishery, which utilizes a 1,036 km² (400 mi²) area, is focused primarily in three areas: Avila-Morro Bay, Monterey, and San Francisco-Bodega Bay. The Avila-Morro Bay and Monterey fisheries are considered minor, as the San Francisco-Bodega Bay fishery has always been the center of the fishery. Between 1945 and 1956, the central California fishery averaged around 2,270 t (5 million lbs) in landings, with the peak during the 1956-1957 season with 4,220 t (9.3 million lbs) in landings. Since then landings have remained relatively low ranging from 226-1,360 t (500,000-3 million lbs). The central California fleet reached a maximum of 230 vessels during the 1950s, but when the fishery declined so did the number of vessels. By 2001, the central California fleet consisted of approximately 100 vessels.

The northern California fishery, which covers an area over twice the size of the central California fishery, extends from Fort Bragg, CA to the Oregon border. From the early 1950s to the mid 1970s the northern California fishery followed a 10-11 year cycle, in which there would be 6 years of substantial landings followed by 4-5 years of poor or extremely poor landings, as low as 159 t (350,000 lbs). The northern California 1975-76 season was the highest on record, with 11,612 t (25.6 million lbs) in landings. Since the 1982-83 season, the landings in the northern California fishery have fluctuated less and the cyclical nature of the fishery is not as clear as it once was. The northern California fleet peaked at 410 vessels during the 1976-77 season and by 2001 had dropped to approximately 33 vessels.

Current Fishery

Most capture of Dungeness Crab occurs within **state waters** (See Where do we fish? - California). The **California State Legislature** regulates the commercial Dungeness Crab fishery and the **California Fish and Game Commission** manages the recreational fishery. The **California Department of Fish and Game** is the entity responsible for enforcing and



Fishery Basics — California Fisheries

administering the regulations for both the commercial and **recreational** fisheries. The commercial fishery is a **restricted access** fishery and is limited to 600 permits. The fishery operates from November 15 – June 30 in central California and from December 1- July 15 in northern California.

The commercial fishery is managed on the **“3-s” principles: sex, season, and size** (See Management Approaches). The recreational fishery is limited by size and season. Only male crabs with a carapace width greater than 16.5 cm (6.5 in) may be taken in the commercial fishery, but the take of both males and females (greater than 14.6 cm/5.75 in) is permitted in the recreational fishery. No take of Dungeness Crab is permitted when the season is closed. The commercial fishery is generally considered a **derby fishery**, in which most of the catch occurs within the first six weeks of the season. Although the fishery is a restricted access fishery, there are no limits on the **total allowable catch** or the number of pots that can be set by a vessel. On average boats may set between 100 and 200 pots, but the larger vessels use up to 1,500 pots.

Current Challenges in Fishery

A **2008 report** by the **Center for Disease Control and Prevention (CDC)** reported that between 2000 and 2006 the fisherman fatality rate of the Dungeness Crab fishery off the coasts of California, Oregon, and Washington was higher than any other fishery in the United States including those in Alaska. Some **observers** and participants of the fishery believe the derby style dynamics of the fishery can lead to an unsafe work environment. Additionally, the derby fishery oversaturates the market for Dungeness Crab due to the high volume of landings during these first weeks of the season. Approximately 80% of the seasons catch is landed during this time, causing much of the landed catch to be frozen, which in turn reduces the market price.

The **Dungeness Crab Task Force (DCTF)** was created in 2008 to address the major issues in the fishery. The DCTF suggested that pot limits be implemented not only to reduce the derby fishery but also to allow smaller fishing vessels to remain competitive in the fishery. Pot limits are currently in place in both the **Oregon** and **Washington** Dungeness Crab fisheries. In February 2011, **California Senator Noreen Evans** introduced **CA Senate Bill 369** in an attempt to follow the recommendations of the DCTF. The bill was heard on May 2, 2011 and passed by a vote of 6-3. To further track the progress of this bill click [here](#).

References

California Department of Fish and Game. Dungeness Crab of California and its close relatives [Internet]. Sacramento (CA): California Department of fish and Game; c2010 [cited 2011 May 15]. Available from: http://www.dfg.ca.gov/marine/dungeness_crab.asp



Fishery Basics — California Fisheries

California Dungeness Crab Task Force. [Recommendations from the California Dungeness Crab Task Force regarding management of the fishery in accordance with SB 1690](#). Report. Oakland (CA): California Ocean Protection Council; 2010 Jan 15.

California Dungeness Crab Task Force. [Recommendations from the California Dungeness Crab Task Force regarding management of the fishery in accordance with SB 1690 Report #2](#). Report. Oakland (CA): California Ocean Protection Council; 2010 Mar 31.

California Fish and Game Code 2010. Section 9000-9024: Article 1. Traps [Internet]. Available from: <http://law.justia.com/codes/california/2010/fgc/9000-9024.html>

California Fisheries Fund. California fisheries atlas. [Internet]. San Francisco: California Fisheries Fund; c2010. Dungeness crab; 2010 [cited 2011 May 15]. Available from: http://www.californiafisheriesfund.org/reso_atlas_crab.html

Center for Disease Control. Commercial fishing fatalities: California, Oregon and Washington 2000-2006 [Internet]. Report. Atlanta (GA): Centers for Disease Control and Prevention; 2008 [cited 2011 May 15]. Available from: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5716a2.htm>

Dungeness Crab Task Force [Internet]. Oakland (CA): California Ocean Protection Council; c2010 [cited 2011 May 15]. Available from: <http://www.opc.ca.gov/2009/04/dungeness-crab-task-force/>

ELobbyist. CA Senate bill 369 [Internet]. Available from: <http://e-lobbyist.com/gaits/text/171763>

Hackett SC, Dewees CM, Krachey MJ. [Race for Dungeness crab influences processing markets](#). California Agriculture. 2004; 58(4): 190-193.

Hankin D, Warner RW. [Dungeness crab](#). In: Leet W, Dewees C, Klingbeil R, Larson E, editors. California's living marine resources: a status report. Sacramento (CA): California Department of Fish and Game; 2001. p 107-111.

Monterey Fish Market. Dungeness crab [Internet]. San Francisco (CA): Monterey Fish Market; c2001 [cited 2011 May 15]. Available from: <http://www.montereyfish.com/seafood/dungenesscrab.htm>

Seafood Watch (US). [Dungeness crab](#). Report. Monterey (CA): Monterey Bay Aquarium; 2007.