

NOAA Fisheries Service

Alaska Fisheries Science Center

Snow Crab

Chionoecetes opilio

Width 78 mm (3.1 in) legal

Weight 200 g (22 oz) legal

Age 12 years (maximum)



Range/Habitat

Snow crab are distributed on the continental shelf of the Bering Sea, in the Chukchi Sea, and in the western Atlantic Ocean as far south as Maine; they are not present in the Gulf of Alaska. In the Bering Sea, snow crab are common at depths less than 200 m. The eastern Bering Sea population within U.S. waters is managed as a single stock; however, the distribution of the population extends into Russian waters to an unknown degree. In recent years large numbers have been found in the Barents Sea.

Diet/Role in Ecosystem

The diet of snow crab depends on the life stage. Larvae feed primarily on phytoplankton. Juveniles and adults are opportunistic omnivores and will eat almost anything. Major components of their diet include bivalves, polychaete worms, gastropods, crabs (including other snow crab), shrimp, and fish. In turn, they are consumed by a wide variety of predators, including groundfish, bearded seals, Pacific cod, halibut and other flatfish, eelpouts, sculpins, and many skate species.

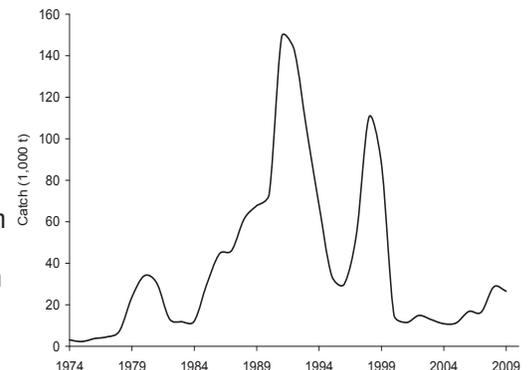
Reproduction

Snow crab mate in the late winter to early spring. Female snow crab are able to store spermatophores in spermathecae and fertilize subsequent egg clutches without mating. At least two clutches can be fertilized from stored spermatophores, but the frequency of this occurring in nature is not known. Females carry between 6,000 and 140,000 eggs for approximately 2 years in colder waters.

Population

Fishery and Catch History

The Japanese harvested snow crabs from the 1960s through 1980. The American pot fishery began in the 1970s. The fishery peaked in the 1990s and crashed in the 2000s. Since the crash, the harvest has been low, but slowly increasing. Since 2005 the fishery has been under a Crab Rationalization program under which qualified participants are issued individual fishing quotas.



Resource Status

Total mature biomass continues to rebuild since a low in 1999. In 2008/2009 snow crab was not overfished. That year catch was less than the OFL therefore overfishing was not occurring.

Protecting
Conserving
Managing
Marine Resources
in
Alaska

The Alaska Fisheries Science Center is a scientific research organization responsible for the development and implementation of NOAA's scientific research on marine resources in Alaska waters. Our research focuses on more than 250 fish and 42 marine mammal stocks off the coasts of the Bering Sea, Gulf of Alaska and Aleutian Islands.



National Marine Fisheries Service
National Oceanic and Atmospheric Administration
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RESEARCH

In addition to the biological measurements taken on the eastern Bering Sea crab survey by the Alaska Fisheries Science Center's (AFSC) Resource Assessment and Conservation Engineering (RACE) Division out of Kodiak, Alaska, field and laboratory studies occur year-round at the RACE Shellfish Laboratory in Kodiak. Recent research on snow crab has focused on basic life history parameters, disease, reproductive biology, larval transport, and fisheries mortality. NMFS and university scientists are assessing the prevalence of bitter crab syndrome and its effects on crab mortality. Reproduction studies conducted by University of Alaska and ADFG staff are focused on estimating the reproductive potential of snow crab to assess 1) reductions in fecundity during brooding and occurrence of unfertilized or non-viable eggs, (2) egg quality by female size and reproductive history, and (3) larval fitness by female size, reproductive history, and egg quality. Another NPRB funded project, conducted by AFSC Kodiak Laboratory and the University of Wyoming, will assess snow crab growth and size with climate warming in the northern Bering Sea. Scientists from NMFS and universities are correlating spatial stock structure of female crab with the transport of larval stages, and the coupling of ice-edge phytoplankton with larval and early settler survival, using Individual-Based models. To better assess fisheries mortality, NMFS staff are quantifying the unobserved injury and mortality of crab due to encounters with trawls on the seafloor and the handling mortality associated with snow crab fisheries.

For more information

Most recent stock assessment:
<http://www.fakr.noaa.gov/npfmc/SAFE/SAFE.htm>

Research:
http://www.afsc.noaa.gov/RACE/shellfish/default_sf.php

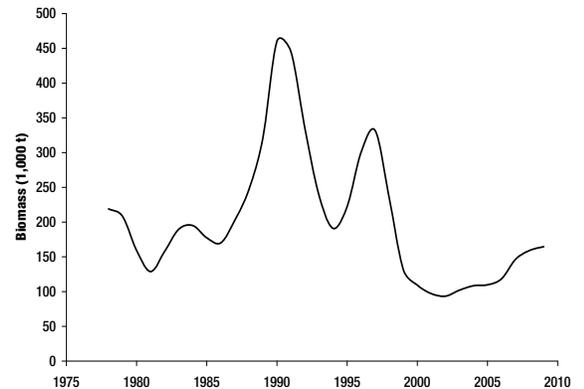
Management:
<http://www.fakr.noaa.gov/sustainablefisheries/crab/default.htm>

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Questions or Comments?
email: afsc.outreach@noaa.gov

Stock Assessment

Abundance estimates are obtained through the National Marine Fisheries Service (NMFS) annual bottom trawl surveys every summer using an area-swept method. The data is applied to a length-based stock assessment model which NMFS and the Alaska Department of Fish and Game (ADFG) use to determine the status of stocks and set the harvest levels.



Management

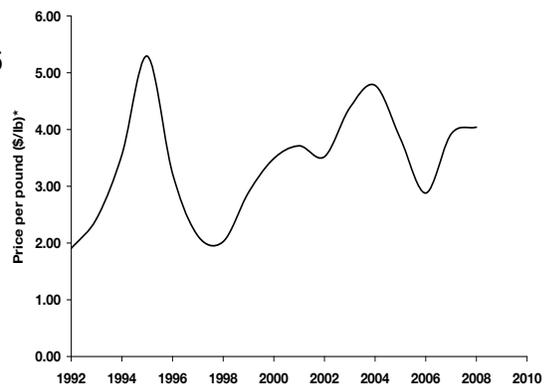
Snow crab stocks in the Bering Sea are cooperatively managed by NMFS and the State of Alaska through the North Pacific Fishery Management Council's (NPFMC) Fisheries Management Plan (FMP) for Bering Sea/Aleutian Islands (BSAI) King and Tanner crabs. State harvest regulations comply with the FMP and the national standards of the Magnuson-Stevens Act. The State of Alaska institutes minimum size and sex restrictions, vessel registration, licenses and permits, observer coverage, and gear requirements.

The Crab Rationalization program applies to the BSAI snow crab fisheries and was implemented in 2005 by the NPFMC to limit access by decreasing fishing capacity (number of vessels and processors in Alaska) to improve conservation and management. In addition, the community development quota (CDQ) program allocates 10 percent of the total allowable catch to CDQ groups (community interests), and is managed by the State of Alaska with federal oversight.

State of Alaska regulations for BSAI crab fisheries include vessel registration with the State of Alaska and a requirement of licenses and permits; registration for each fishery and each area; observer coverage; and gear restrictions such as pot limits, degradable escape mechanisms, and web specifications. Season opening dates are set to maximize meat yield and minimize handling of softshell crab. The State of Alaska sets pre-season guideline harvest levels for snow crab based on a mature male harvest rate of 58% for snow crab larger than 4 inches. Although the minimum legal size for snow crab is 78 mm (3.1 inches), the fishery generally harvests crab over 4 inches in carapace width. Only male crabs are harvested.

Economics

Snow crab is the market name for both *C. opilio* and *C. bairdi*. The average price from 1992-2005 was \$4.25/lb. Price peaked in 1995 at \$6.90/lb after a sharp decline in the early 1990s, declined again then began to increase slightly in the late 1990s. Prices rose slightly from 1999-2004 and then declined slightly to the current 2005 price of \$3.84/lb. The primary product is shellfish sections. (data obtained from ADFG Alaska Commercial Shellfish Catches & Exvessel Value webpage: <http://www.cf.adfg.state.ak.us/geninfo/shellfish/06value.php>).



* The inflation-adjusted prices shown in the graph are 1st wholesale (2008 U.S. currency). Numbers are from NMFS and ADF&G price data.

