6. DUNGENESS CRAB

Overview of the Fishery

Dungeness crab, *Cancer magister*, also known as market crab or edible crab, was first taken commercially off San Francisco around 1848. Currently, Dungeness crab is fished from Avila (San Luis Obispo County) to the California-Oregon border, with commercial and recreational seasons beginning in late fall and ending in early summer.

Before the 1944-1945 season, the commercial fishery was centered in the San Francisco area, with average annual statewide landings of 2.6 million lb (Figure 6.1 and Table 6.1). As the fishery expanded into the Eureka-Crescent City area near the end of World War II, landings significantly increased. Since 1945, annual statewide landings have averaged about 9.7 million lb (Figure 6.1 and Table 6.1), fueled partly by the replacement of hoop nets with crab traps in the early 1940s. Annual ex-vessel value of Dungeness crab landings have ranged from less than $10 million to about $20 million during the last decade. Approximately three-quarters of the catch is sold as whole crab (live, fresh-cooked or frozen), and the remainder is processed to remove the meat and the meat is vacuum packed before being sold.

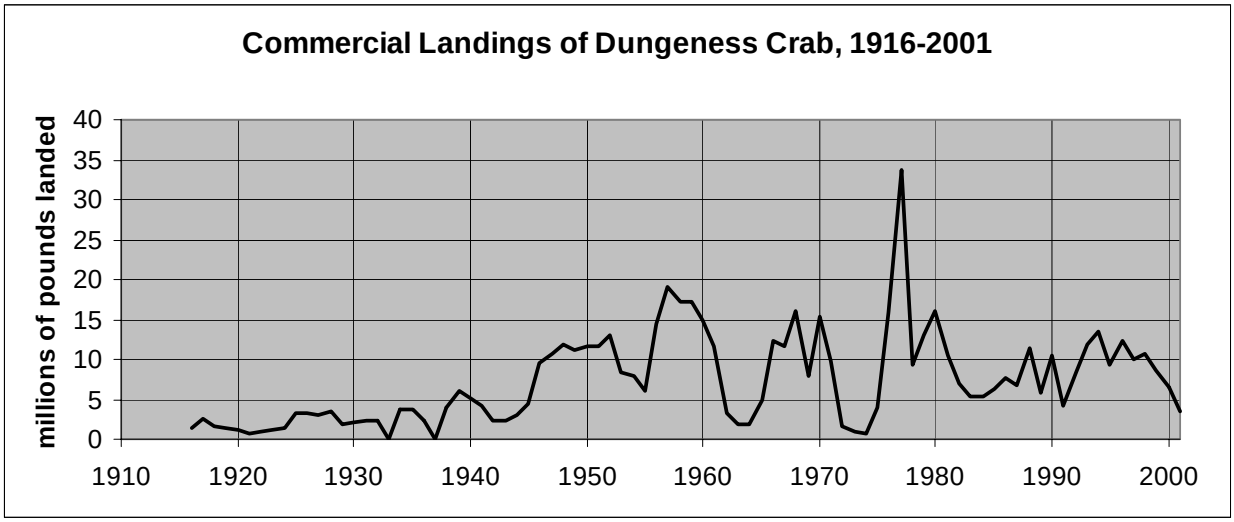

Figure 6.1. Annual (calendar year) commercial landings (pounds) of Dungeness crab from 1916 to 2001. Data sources are California Department of Fish and Game (DFG) Catch Bulletins (1916-1983) and the DFG commercial landing receipt database (1984-2001).

The commercial fishery for Dungeness crab occurs in two main areas: northern California and central California. Central California fishing areas include Avila-Morro Bay, Monterey, and San Francisco-Bodega Bay. The Morro Bay and Monterey fisheries are minor compared to the San Francisco-Bodega Bay fishery. Central California landings were relatively stable from the 1945-1946 season to the 1955-1956 season, peaking at 9.3 million lb during the 1956-1957 season (Figure 6.2). Thereafter, landings declined by more than one million lb per season through the 1961-1962 season, when only 735,000 lb of Dungeness crab were landed. The central California fishery remained depressed from the 1962-1963 season through the 1985-1986 season, with landings averaging less than 1 million lb per season. Since the 1986-1987 season,

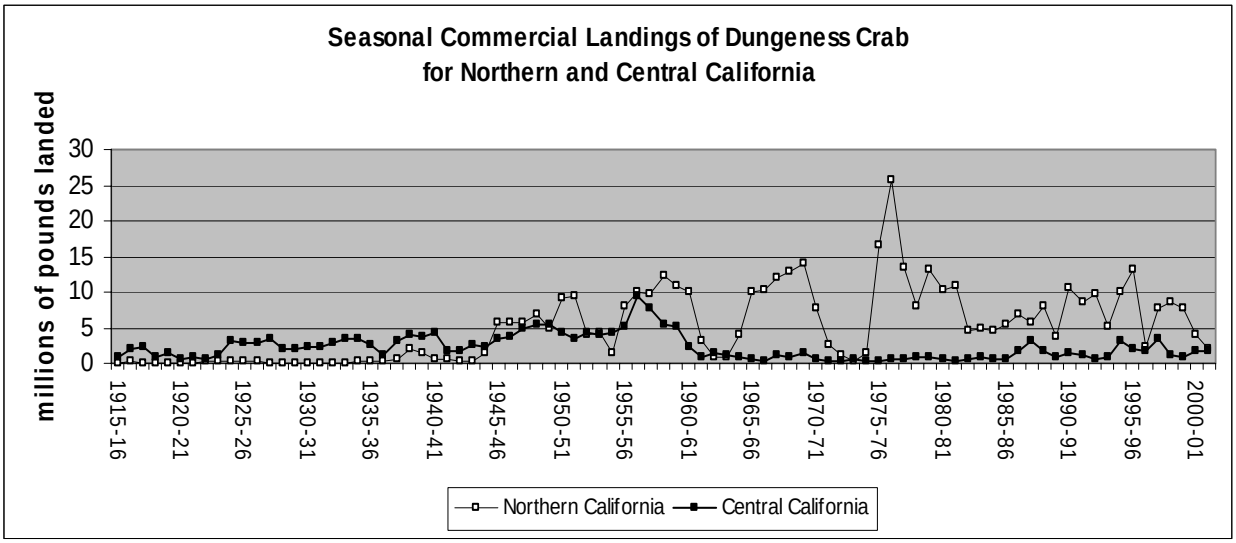

Figure 6.2. Commercial landings of Dungeness crab by season (late fall to early summer) for northern California (includes Eureka, Crescent City, and Fort Bragg) and central California (includes Bodega Bay, San Francisco area, Monterey, and Morro Bay). Data sources are California Department of Fish and Game (DFG) Catch Bulletins (1916-1983) and the DFG commercial landing receipt database. The 2001-2002 season data is preliminary.

however, landings have ranged from slightly less than 500,000 lb to more than 3 million lb with an average 1.7 million lb.

The central California fishery uses a 400 sq. mi area, including the Gulf of the Farallones and waters north to the Russian River (Sonoma County). During the 1950s, the Dungeness crab fleet consisted of 200 to 250 boats. A number of boats left the fleet as the fishery began to decline in the 1960s. Currently, the fleet consists of about 190 vessels.

The northern California fishery increased substantially after 1945, reaching its peak in the late 1950s. Unlike the central California fishery, which peaked and then experienced low production levels for many years, the north coast fishery exhibited three 10-to-11-year “cycles” of production between 1945 and 1982. These repeating cycles consisted of about 6 years of good to outstanding landings (as high as 25.6 million lb in the 1976-1977 season) followed by about 4 years of poor to extremely poor landings (as low as 354,000 lb in the 1973-1974 season). Since the 1982-1983 season, landings have fluctuated, but they have not been clearly cyclic. From the 1982-1983 season to the 2001-2002 season, landings have ranged from 1.9 to 13.1 million lb, averaging about 6.9 million lb per season (Figure 6.2).

Dungeness crab fishing grounds off northern California are more than twice as large as those in central California. Northern California fishing grounds extend from Fort Bragg to the California-Oregon border, with the prime area located between Eureka and Crescent City. The size of the northern California fleet fluctuated between 100 and 200 vessels in the 1950s and 1960s. Fleet size dropped to a low of 61 during the 1973-1974 season, and then rose to 410 during the 1976-1977 season. Since then, effort has been high. Between the 1991-1992 season and the 2001-2002 season the number of boats in the fleet has ranged from 201 to 449. Before the mid-1970s, most vessels in the northern California crab fleet were converted salmon trollers that measured 30 to 60

ft in length; however, the composition of the fleet shifted during the record production years of the 1970s. With the boom in landings, boats as small as 22-ft dories and as large as 100 ft also entered the fishery.

The dividing line for management of the northern and central California areas is the Mendocino-Sonoma County border. Both areas are managed on the basis of the "3-S" principles— sex, season, and size. Only male crabs may be retained in the commercial fishery (thus protecting the reproductive potential of the populations). The fishery has open and closed seasons, and a minimum size limit is imposed (6.25 in. across the widest part of the carapace). The central California season opens November 15 and continues through June 30, whereas the northern California season opens December 1 and continues through July 15. The summer/fall closed periods are intended to prevent fishing for soft-shelled (recently molted) male crabs. During the closed seasons, male crabs are more vulnerable to fishery-related handling mortality and have a lower market quality (low meat content). During open seasons, however, male crabs are usually in prime condition for the market (high meat content). The season opens two to three weeks earlier in central California than in northern California because crabs in central California molt earlier and achieve adequate market condition earlier than northern crabs. The Director of the California Department of Fish and Game (DFG) may delay the northern California season opening to January 15 at the latest, if the market condition of crabs is not sufficiently high on December 1. Depending on crab condition, marketable crabs typically yield from 20% to 28% of their body weight as cooked meat.

Commercial traps for Dungeness crab are essentially the same throughout California. The average circular steel crab trap is 3 to 3.5 ft in diameter and weighs 60 to 120 lb. Each trap is required to have two circular openings that measure 4.25 in. in diameter. Sub-legal male and small female crabs escape through these "escape ports", which reduce the amount of potentially harmful handling that undersized crabs may be exposed to, and increases the likelihood that the crabs captured will be mostly males that meet or exceed the minimum size limit. Traps must also possess a destruction device that will release captured crabs should the trap become lost. The traps are heavily-weighted and rest on the sea floor; each trap is independently marked with a numbered buoy that floats on the surface. Traps are fished overnight or longer, depending on sea conditions. Most traps are fished at depths ranging from 60 to 240 ft, but some traps are fished in shallower or deeper waters.

Almost all of California's commercial Dungeness crab catch is landed in the trap fishery. Trawl vessels north of Point Reyes (Marin County) are allowed an incidental take of 500 lb per trip during the regular season, but only a few thousand pounds of trawl-caught crab is landed annually in California. Incidental landings of Dungeness crab are generally small due to the prohibition on commercial trawling within three miles of shore, where the vast majority of Dungeness are captured.

There is limited sport take of Dungeness crab in central and northern California. The total annual recreational harvest is unknown, but it is believed to be less than 1% of the commercial take. The recreational fishery is managed through seasonal and area closures, gear restrictions, size limits, and a limit on the number of crabs that may be possessed. Either sex may be taken in the recreational fishery. The size limit is 5.75 in. across the widest part of the carapace and the bag/possession limit is 10 crabs,

except when fishing from a commercial passenger fishing vessel in Sonoma, Marin, San Francisco, San Mateo, Santa Cruz and Monterey counties, when the size limit is 6 in. and the bag/possession limit is 6 crabs.

Because Dungeness crabs are caught almost exclusively within 3 mi. of shore in California, and because California, Oregon and Washington often undertake coordinated management activities under the auspices of the Pacific States Marine Fisheries Commission, the fishery has remained under State jurisdiction despite federal concerns regarding harvests beyond the three-mile state jurisdictional authority. Although total landings are not restricted by quota, the commercial restricted access program is designed to achieve an eventual reduction in the number of fishery participants.

Restricted Access Program

In 1992, the State Legislature began the process of developing a restricted access program by requiring that anyone landing Dungeness crab for commercial purposes have an annual Dungeness crab permit, and by establishing qualifying criteria for that permit. During the first three seasons of the program (1992-1993, 1993-1994, and 1994-1995 seasons), the annual Dungeness crab permit was issued to an applicant based on his or her history in the fishery. The initial legislation attempted to slow entry into the fishery while the Legislature evaluated the need for a restricted access program. The initial legislation stipulated that the program would end on January 1, 1995 unless a law was enacted to continue the program.

The Legislature reviewed the restricted access program in 1994 and determined that it was necessary to limit the number of vessels to protect the fishery. With this

Historical timeline for the Dungeness crab restricted access program

1992	State Legislature begins a restricted access program. The permit is based on an individual's landing of Dungeness crab.
1994	State Legislature reviews the program and modifies the program to make it vessel-based beginning with the 1995-1996 season.
1995 - 1997	State Legislature enacts various modifications to the program.
2000	State Legislature extends the program until 2006.
2006	The program will end April 1, 2006 unless a law is enacted to continue the program.

determination, the Legislature revised the restricted access program making it a vessel-based system (that is, the permit became attached to a specific vessel not to an individual). The law required that the Dungeness crab vessel permit be renewed annually, but it did not require that a minimum landing be made each year. The law provided for the transfer of a permit upon sale of the vessel or upon replacement of the vessel with another vessel of equivalent or slightly greater capacity. The vessel-based program became effective with the 1995-1996 season. The 1994 law specified that the program would end on April 1, 1998 unless subsequent legislation extended or repealed the program. The program was modified in 1995, 1996 and 1997, and extended until

April 1, 2001. In 2000, the program was again extended, and is now scheduled to end on April 1, 2006.

In the season prior to the initiation of the restricted access program (1991-1992), 769 vessels made commercial landings of Dungeness crab. During the first season of the initial restricted access program (1992-1993), 805 permits were issued (Figure 6.3). During the first season of the vessel-based system (1995-1996), 681 permits were issued (Figure 6.3). The number of permits increased during the next two seasons, and then gradually declined. For the 2001-2002 season, 654 permits were issued. The number of vessels actually making landings has been far less than the number of permits issued in recent years; only 59% of the permits were used in the 2001-2002 season.

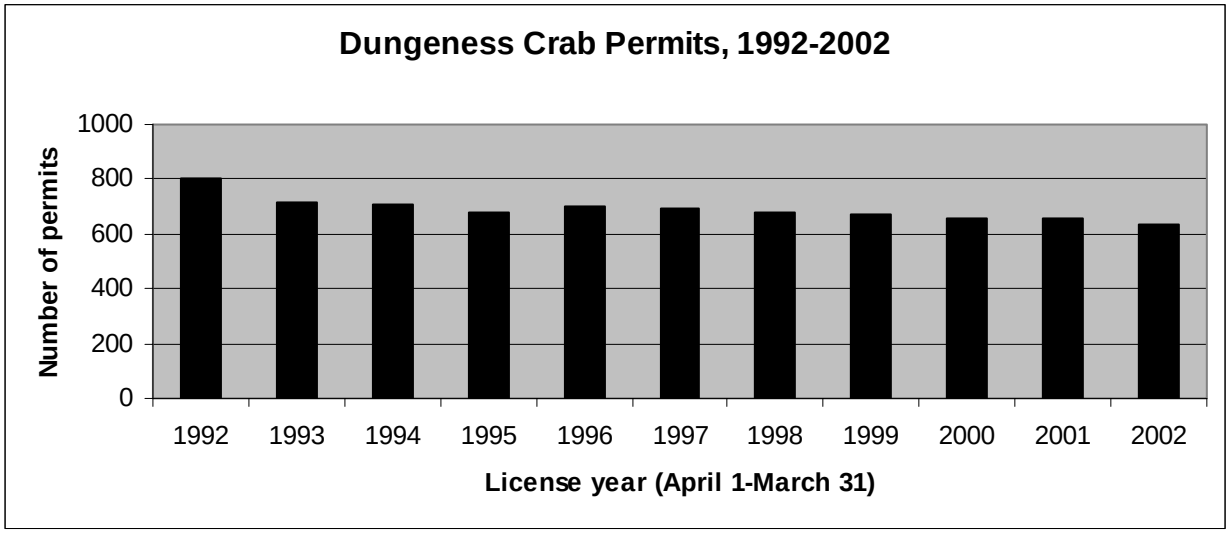

Figure 6.3. Total number of permits (resident and non-resident) issued for the commercial Dungeness crab fishery from the 1992-1993 license year (April 1 through March 31) to the 2002-2003 (preliminary) license year. The restricted access program began in 1992. Dungeness crab permits were issued to individuals for the 1992-1993, 1993-1994 and 1994-1995 license year; thereafter, vessel-based permits were issued. Data sources are DFG license reports.

The restricted access program remains under the authority of the State Legislature. However, the Marine Life Management Act (passed by the Legislature in 1998) requires that each restricted access program be reviewed for consistency with the Fish and Game Commission's (Commission's) policies on restricted access at least every five years (Fish and Game Code §7065(b)). Table 6.2 provides an evaluation of the current restricted access program's consistency with the Commission's policies on restricted access. The primary feature of the restricted access program that is inconsistent with the Commission's policies is that the program lacks a capacity goal.

Although the imposition of restricted access in California should prevent any further increases in the total number of vessels that participate in the Dungeness crab fishery, it does not prevent increases in fishing effort. There is currently no limit to the number of traps that may be fished, or the intensity with which they are fished. As the allowable take of groundfish has declined, many larger multi-purpose vessels have devoted more effort to the Dungeness crab fishery. Some of these vessels can fish

upwards of 1,000 traps. Early in the season, these larger vessels fish continuously, day and night, even in heavy seas. Total annual landings of Dungeness crab are largely unaffected by such increases in concentrated fishing effort, but it has changed the distribution of the catch over time. Prior to about 1980, crab landings in northern California were normally spread throughout the entire open season. Now, in a typical season in northern California, more than 80% of total landings are made during the month of December.

Uncontrolled increases in the numbers of traps fished by individual vessels and the front-loading of annual landings may have important consequences with respect to the allocation of fishery income among Dungeness crab vessel permit holders. Also, the shortened period of substantial crab landings means that live Dungeness crabs, the fishery's most valuable products, are only available for a relatively short time period, which could diminish the total economic value of the fishery. These and other fishery economics issues are currently being researched.

Status of Biological Knowledge

Dungeness crabs range from the eastern Aleutian Islands, Alaska, to around Santa Barbara (Santa Barbara County); however, the species is considered rare south of Point Conception (Santa Barbara County). Temperature apparently determines this species' distribution, with the 38° to 65° F surface temperature defining the range. The geographic range of the species probably depends more on the temperature tolerance range of larvae than of adults. Optimal temperatures for larval growth and development are 50° to 57° F.

Dungeness crabs have a preference for sandy and sand-mud bottoms but may be found on almost any bottom type. They may range from the intertidal zone to a depth of at least 750 ft, but are not abundant beyond 300 ft.

The Dungeness crab population off California, as demonstrated by tagging experiments, consists of five sub-populations, located in Avila-Morro Bay, Monterey, San Francisco, Fort Bragg, and Eureka-Crescent City. Only the latter three are commercially important. DFG surveys indicate that the San Francisco and Fort Bragg sub-populations combined are smaller than the sub-population extending from Eureka into Oregon. Little or no intermixing of the sub-populations occurs. Tagging studies have also demonstrated random movement by both sexes. At times, an inshore or offshore migration may be observed, but most movement is restricted to less than 10 mi. Movement of up to 100 mi. has been noted for individual males, but female movement seems much more limited.

Female molting and mating occurs from February through June in California. Male crabs are able to sense when females are about to molt (presumably through detection of pheromones released by females). When male crabs find pre-molt females, they carry the females in a protective pre-mating embrace for several days until they molt. Hard-shelled males then mate with the freshly molted, soft-shell females. Male sperm is stored inside the female. Fertilization of the eggs takes place when the female pushes the eggs outside of her body sometime between October and December. Thereafter, the eggs are carried under the abdominal flap of the female. The smallest females carry about 500,000 eggs, while the largest females carry from 1.5 to 2.0 million eggs. Freshly-molted females carry larger numbers of eggs than egg-

bearing females that have missed a molt. “Skip-molt” females that have extruded eggs but have not molted recently must rely on stored sperm for fertilization of their eggs. Females may store viable sperm for at least 2.5 years. The eggs, which are about the size of small sand grains (0.016 to 0.024 in.), are bright orange after extrusion and become progressively darker as they develop. Hatching occurs between November and February.

Newly hatched larvae pass through six different larval stages before taking on the adult form. Larval development takes from 105 to 125 days in central California, and is inversely related to water temperature. It is believed that larvae are carried offshore during the first five larval stages, and that this movement is regulated by ocean currents, depth, temperature, and salinity. Larvae are found near the surface at night and at depths of up to 80 ft during the day. From April through June, larvae are transported to nearshore waters, where they change into adult form. Estuaries such as Humboldt Bay and San Francisco Bay are important nursery areas for young Dungeness crabs, but most rearing must take place in nearshore coastal waters.

Growth is accomplished through a series of discrete molts. In northern California, Dungeness crabs of both sexes molt an average of six times during their first year and attain an average width (at the widest part of the carapace) of 1 in. Six more molts are required to reach sexual maturity at the end of the second year, when crabs are approximately 4 in. in width. Once mature, females grow more slowly than males. Females molt once per year at most after reaching maturity and rarely exceed the legal size for males. The maximum size for females is about 7 in.in width. Male crabs usually molt twice during their third year and once per year thereafter. The average width of males three, four and five years of age is about 6, 7 and 8 in., respectively. Males may undergo a total of 16 molts during a lifetime, reaching a maximum width of 9 in. at 6 to 8 years of age.

Dungeness crabs are opportunistic feeders not limited by the abundance or scarcity of a particular prey. Clams, fish, isopods and amphipods are preferred, and cannibalism is prevalent among all age groups. Predators of Dungeness crabs, especially larvae and small juveniles, include octopuses, larger crabs and as many as 28 species of fish, including coho and chinook salmon, flatfishes, lingcod, cabezon and various rockfishes.

Status of the Population

Dungeness crab populations in California have been fully exploited for at least 40 years and intensity of effort is extreme. In most years, from 80% to 90% of all available legal-sized male crabs are captured in the fisheries. Although such high exploitation rates on adult males might give rise to concerns that female mating success might be reduced as a consequence, recent studies have shown that essentially all molting females receive attention from males in northern California. Usually one or two year-classes of male crabs dominate annual landings. Thus, since about 1960, annual landings have provided a reasonable notion of abundance of legal-sized males and also a strong signal of variation in year-class strength of recruited crabs.

The dramatic decline in Dungeness crab catches in the central California fishery during the late 1950s caused considerable research attention to be focused on this resource during the 1970s. No definitive reason for the decline in the central California

fishery has been established. Researchers have assessed the effects of changes in ocean climate on survival and development of crab eggs and larvae, the role of nemertean worm predation on egg survival, the effects of pollution on survival of juvenile crabs in San Francisco Bay, and the possibility of unstable internal population dynamics. Of these possible causes, a shift to warmer waters during and following the decline in the late 1950s seems the most plausible. If this is the cause, it is reasonable to assume that the abundance of crabs in the central California fishery may improve over the next two decades if California coastal water temperatures remain cooler as a consequence of apparent ocean regime shifts.

The dramatic and periodic landings cycles in the northern California fishery from about 1945 to 1982 have caused this fishery to receive even greater attention from population dynamics modelers. Possible causes for the fluctuations in this fishery are infestation by nemertean worms, various internal density-dependent processes that reflect fluctuations in the abundance of unharvested females or cannibalism by adults on juveniles, and combinations of internal density-dependent controls and fluctuating oceanographic factors. There seems little doubt that crab populations, with their ability to produce large amounts of eggs and their extreme vulnerability in the early larval stages, are prone to great natural fluctuations in abundance. It also seems that variable oceanographic factors (such as temperature, wind, and currents) have significant impacts on the survival of year classes.

Although many crustacean fisheries throughout the world have been overexploited and are now at low abundance levels, Dungeness crab populations off northern California, Oregon and Washington have produced landings that have fluctuated around a fairly stable long-term mean for more than 30 years. One might, therefore, consider this resource to have a healthy status. Formal fishery management plans and stock assessments have not been produced for any West Coast population. Fishery management has rested on the very simple, though biologically sound, “3-S” principles (sex, season, and size). Typically restrictive fishery regulations such as landing quotas have never been used in this fishery. A casually assigned healthy status therefore rests on limited information.

Management Considerations

The Dungeness crab resource is fully exploited in California. Responsibility for managing the commercial Dungeness crab fishery lies with the State Legislature. While the Legislature has authorized the Commission to regulate the recreational fishery, it has not authorized the Commission to regulate the commercial fishery. The commercial restricted access program will expire on April 1, 2006 unless the Legislature extends the program. It would be beneficial to conduct a formal review of the current restricted access program before the Legislature decides whether to extend the program. Issues that could be considered during the review include:

- The creation of a capacity goal. No goal currently exists.
- Whether other effort controls, such as limits on the number of traps, need to be enacted to reduce capacity.
- The potential impacts of the latent capacity in the fishery (the capacity of the permits that are not used each season).

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Section on Restricted Access Program added December 2002
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Further Reading

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Table 6.1. Commercial landings (pounds) of Dungeness crab, 1916-2001									
Year	**Pounds**	**Year**	**Pounds**	**Year**	**Pounds**	**Year**	**Pounds**	**Year**	**Pounds**
1916	1,296,912	**1933**	3,208,494	**1950**	11,704,648	**1967**	11,716,488	**1984**	5,340,031
1917	2,580,840	**1934**	3,768,081	**1951**	11,568,353	**1968**	16,015,581	**1985**	6,210,359
1918	1,619,280	**1935**	3,680,188	**1952**	12,997,451	**1969**	7,938,996	**1986**	7,758,251
1919	1,304,904	**1936**	2,311,802	**1953**	8,278,519	**1970**	15,413,589	**1987**	6,857,070
1920	1,220,568	**1937**	1,627,753	**1954**	7,829,651	**1971**	9,662,265	**1988**	11,297,696
1921	800,952	**1938**	3,873,600	**1955**	6,119,320	**1972**	1,563,006	**1989**	5,718,017
1922	860,328	**1939**	5,953,361	**1956**	14,320,549	**1973**	1,022,873	**1990**	10,369,518
1923	1,075,800	**1940**	5,151,014	**1957**	19,118,484	**1974**	685,000	**1991**	4,246,044
1924	1,506,816	**1941**	4,260,340	**1958**	17,282,766	**1975**	3,934,663	**1992**	8,327,150
1925	3,234,312	**1942**	2,414,110	**1959**	17,262,261	**1976**	15,726,774	**1993**	11,958,039
1926	3,296,280	**1943**	2,315,338	**1960**	14,876,148	**1977**	33,647,863	**1994**	13,491,363
1927	2,960,712	**1944**	2,934,776	**1961**	11,711,327	**1978**	9,362,197	**1995**	9,236,191
1928	3,574,464	**1945**	4,334,383	**1962**	3,222,580	**1979**	12,978,505	**1996**	12,331,365
1929	1,792,776	**1946**	9,624,368	**1963**	1,951,461	**1980**	15,934,778	**1997**	9,908,520
1930	1,992,384	**1947**	10,733,398	**1964**	1,815,363	**1981**	10,435,441	**1998**	10,692,760
1931	2,231,384	**1948**	11,892,891	**1965**	4,803,906	**1982**	6,973,679	**1999**	8,713,823
1932	2,433,987	**1949**	11,115,476	**1966**	12,376,390	**1983**	5,301,828	**2000**	6,476,494
								2001	3,536,099
Data sources: DFG Catch Bulletins (1916-1983) and DFG commercial landing receipt database (1984-2001).									

Table 6.2. Consistency of the restricted access program for the Dungeness crab commercial fishery with the Fish and Game Commission policies on restricted access for commercial fisheries (policy adopted June 18, 1999)	
Fish and Game Commission policies	**Dungeness crab restricted access program's consistency with the policies**
Restricted access as a management tool	
POLICY 1.1: The Fish and Game Commission (Commission) and the Department of Fish and Game (DFG) may use restricted access programs as one of a number of tools to conserve and manage fisheries as a public trust resource.	CONSISTENT The program was established by the State Legislature and remains under the authority of the Legislature. However, restricted access is one of the tools used to manage the fishery and conserve the resource. The program is due to end on April 1, 2006 unless the Legislature extends the program.
Goals and objectives of restricted access programs	
POLICY 2.1: The Commission may develop restricted access programs for fisheries that retain the public ownership status of the resource for one or more of the following purposes: 1) to promote sustainability; 2) to create an orderly fishery; 3) to promote conservation among fishery participants; 4) to maintain the long-term economic viability of fisheries.	CONSISTENT The legislative intent as stated in Fish and Game Code §8280 was "to protect the Dungeness crab fishery". However, there is some question whether the program is meeting the legislative intent for an orderly fishery and for the long-term economic viability of the fishery.
Development and review of restricted access programs	
POLICY 3.1: Restricted access programs shall be developed with the substantial involvement of participants in the affected fishery and others, consistent with the	NOT APPLICABLE The program was developed prior to the adoption of Fish and Game Code §7059 or the Commission policy

Table 6.2. Consistency of the restricted access program for the Dungeness crab commercial fishery with the Fish and Game Commission policies on restricted access for commercial fisheries (policy adopted June 18, 1999)	
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stakeholder participation requirements of Fish and Game Code §7059. This approach shall balance the specific needs of the fishery with the desirability of increasing uniformity among restricted access programs in order to reduce administrative complexity.	on restricted access. However, constituents were involved in the development of the initial and subsequent legislation regarding the Dungeness crab program.
POLICY 3.2: Each restricted access program shall be reviewed at least every four years and, if appropriate, revised to ensure that it continues to meet the objectives of the State and the fishery participants. Review of each restricted access program shall occur at least as often as the particular fishery is reviewed in the annual fishery status report required by Fish and Game Code §7065. The general restricted access policy should be reviewed at a regularly scheduled Commission meeting at least once every four years following its adoption.	CONSISTENT IN PART • The program has been reviewed and revised by the State Legislature a number of times. • This report (*Annual Status of the Fisheries Report* required by Fish and Game Code §7065) briefly reviews the program, but does not formally measure participants' perceptions on whether the program is meeting its goals and objectives.
Elements of restricted access programs	
POLICY 4.1: Each new restricted access program shall be based either on one or more species or species groups targeted by the fishery or on a type of gear. In programs based on a type of gear an endorsement may be required for one or more species or species groups targeted by the gear type. Each restricted access program should take into account possible impacts of the program on other fisheries.	CONSISTENT IN PART • The program is based on one species and one gear type. • It is not clear whether the impacts on other fisheries were evaluated during the development of the program.
POLICY 4.2: Each restricted access program that is not based on harvest rights shall have a capacity goal. The Commission, Department and stakeholders will use the best available biological and economic information in determining each capacity goal.	NOT CONSISTENT No capacity goal was set by the State Legislature. The Legislature limited the number of permits, but this may not have limited capacity or effort.
POLICY 4.3: Each restricted access fishery system shall have an equitable, practicable, and enforceable system for reducing fishing capacity when the fishery is exceeding its participation goal and for increasing fishing capacity when the fishery is below its fishery capacity goal.	NOT CONSISTENT No capacity goal exists, and there is no method to increase or decrease capacity. Under the program, capacity, in terms of numbers of permits, is decreasing by attrition. However, it is not clear if capacity, in terms of number of traps or size of vessels, is increasing or decreasing.
POLICY 4.4: In fisheries that exceed their fishery capacity goals, permit transfers will be allowed only if they are consistent with the means for achieving the fishery capacity goal.	NOT CONSISTENT No capacity goal exists, and permit transfer is allowed.
Permits	
POLICY 5.1: The Commission will give adequate public notice of intent to establish a restricted access program. The Commission may set a Control Date for determining qualification for a restricted access program. A new restricted access program shall not allow fishing effort to increase beyond recent levels. Some level of fishery participation may be required to qualify for an initial permit. Fishery qualification can be based upon fishery participation during a period of time preceding notification of intent or on other factors relevant to the particular	NOT APPLICABLE The program was established by the State Legislature.

Table 6.2. Consistency of the restricted access program for the Dungeness crab commercial fishery with the Fish and Game Commission policies on restricted access for commercial fisheries (policy adopted June 18, 1999)	
Fish and Game Commission policies	**Dungeness crab restricted access program's consistency with the policies**
fishery. Affidavits of fishery participation or medical statements of inability to meet qualification standards shall not be accepted. Vessels under construction or inoperable during the qualification period shall not be considered for a permit.	
POLICY 5.2: New permits in a restricted access fishery shall only be issued when the fishery is below its fishery capacity goal.	NOT CONSISTENT No capacity goal exists, and there are no provisions for issuing new permits.
POLICY 5.3: Restricted access fishery permits shall be of one year duration and are renewed upon annual application and payment of the permit fee and shall be valid, provided they are annually renewed and the permit holder meets the requirements of the restricted access program for the life of the program.	CONSISTENT Annual renewal is required.
POLICY 5.4: Each fisherman-based program shall determine in what circumstances, if any, a substitute may fish the permit.	NOT APPLICABLE This is a vessel-based program.
Permit transfers	
POLICY 6.1: Restricted access permits may be transferable. In fisheries in which the permit is transferable, transfer may be subject to conditions that contribute to the objectives of the restricted access program. In new restricted access programs, permit transfers will not be allowed unless a fishery capacity goal and a system for achieving that goal are part of the restricted access program. In existing restricted access programs, the objective is to review and revise those programs to include fishery capacity goals and systems to achieve those goals. A restricted access program may include a fee on the transfer of permits, in excess of actual administrative costs for the permit change, to offset other costs involved in the conservation and management of that fishery.	NOT CONSISTENT • Permits are transferable under certain conditions, and transfers are subject to a fee. • The program has not been revised to include a capacity goal and a system to achieve that goal.
Vessel issues	
POLICY 7.1: Vessels requested to be retired by the vessel owner will no longer be eligible to participate in commercial fisheries in California.	NOT CONSISTENT A permit may be transferred to a replacement vessel. The program does not restrict the use of the "replaced" vessel.
POLICY 7.2: Replacement vessels of the same or lower fishing capacity as the permitted vessel will be allowed only if the permitted vessel is lost, stolen, retired or no longer able to participate as a commercial fishing vessel.	NOT CONSISTENT The program provides for increase in capacity under certain circumstances.
POLICY 7.3: Each restricted access program that allows for vessel permit transfers may allow for vessel upgrades provided a permit consolidation/vessel retirement process consistent with the fishery capacity goal is made part of the program.	NOT CONSISTENT • No permit consolidation or retirement process exists. • No capacity goal exists.
POLICY 7.4: A restricted access program may prohibit the use of support vessels or require that they be permitted in the fishery or that they pay a fee comparable to the permit fee.	CONSISTENT The program allows vessels without permits to deploy traps, but not to retrieve traps.

Table 6.2. Consistency of the restricted access program for the Dungeness crab commercial fishery with the Fish and Game Commission policies on restricted access for commercial fisheries (policy adopted June 18, 1999)	
Fish and Game Commission policies	**Dungeness crab restricted access program's consistency with the policies**
Harvest rights	
POLICY 8.1: It is the policy of the Commission that harvest rights systems such as individual transferable quotas may be considered only after careful consideration of stakeholder input. In establishing such management systems, the State should consider: (1) fair and equitable initial allocation of quota shares which considers past participation in the fishery, (2) resource assessment for establishing total allowable catch estimates, (3) fishery participation goals and aggregation limits, (4) cost recovery from quota owners, (5) quota transferability, and (6) recreational fisheries issues.	NOT APPLICABLE The program is not based on harvest rights.
Administration of restricted access programs	
POLICY 9.1: Administrative costs shall be minimized and those costs shall be borne by the respective programs. Review or advisory boards may be considered on a program-by-program basis. The programs shall be administered in their entirety within an existing department unit.	CONSISTENT • The program is administered through the DFG Marine Region. • The Dungeness Crab Review Panel reviewed applications for permits.
POLICY 9.2: Fees collected from restricted access initiatives may, for cost accounting and reporting purposes, be deposited in a single dedicated Restricted Access Fishery Account within the Fish and Game Preservation Fund. A fund condition and activity report should be published annually.	CONSISTENT There is no dedicated account.
POLICY 9.3: Restricted access programs should provide specific disincentives for violations of pertinent laws and regulations. Enforcement costs of restricted access programs should be minimized through the use of new technologies or other means.	CONSISTENT IN PART • If a person submits false information to obtain a permit, DFG must revoke the permit and revoke the person's commercial fishing license and commercial boat registration for at least five years. • The Commission may revoke the commercial fishing license and commercial boat registration of anyone owning a boat used to take or land Dungeness crab without a permit.