

14 Sablefish, *Anoplopoma fimbria*



Sablefish, *Anoplopoma fimbria*. Photo credit: Wade Smith.

History of the Fishery

Since the early 1900s, *Anoplopoma fimbria*, more commonly known as sablefish or blackcod, has been commercially harvested in great quantities from California waters. The California Department of Fish and Game (Department) began recording commercial landings in 1916; during that year sablefish accounted for 83,623 pounds (38 metric tons). Between 1916 and 1941 the average annual landings of sablefish was 897,484 pounds (407 metric tons) with a range of 83,623 to 2,848,672 pounds (38 to 1293 metric tons). Beginning in 1942, an increase in landings occurred when 1,972,522 pounds (896 metric tons) were recorded. This trend continued over the next few years reaching 6,262,397 pounds (2843 metric tons) by 1945. This surge was not unique to sablefish as other commercial fisheries experienced a strong market demand during and shortly after World War II. Since 1945, the sablefish fishery continued to grow gradually before a significant increase during the 1970s (Figure 14-1).

At various times in the past, long line, trawl or trap gears were used to land the majority of sablefish. Longline was the dominant gear type prior to 1969 and then consistently accounted for about 20 percent of the landings from 1969 to 1973 and 1980 to 2008. In general, trawl gear accounted for 66 percent of annual landings from 1969 to 1973, while trap gear accounted for only 2 percent of landings. From 1974 to 1979 trap landings increased in importance; these years had very high landings including 1979 when 396 vessels landed 28.6 million pounds (12,972 metric tons) valued at \$6.7 million dollars (Figure 14-2); 57 percent taken with trap gear and 36 percent with trawl gear. The shift away from trawl gear would be short lived; from 1980 until 2008 the trawl fishery continued to dominate landings averaging 58 percent annually, while trap gear averaged about 20 percent of annual landings from 1980 to 2008.

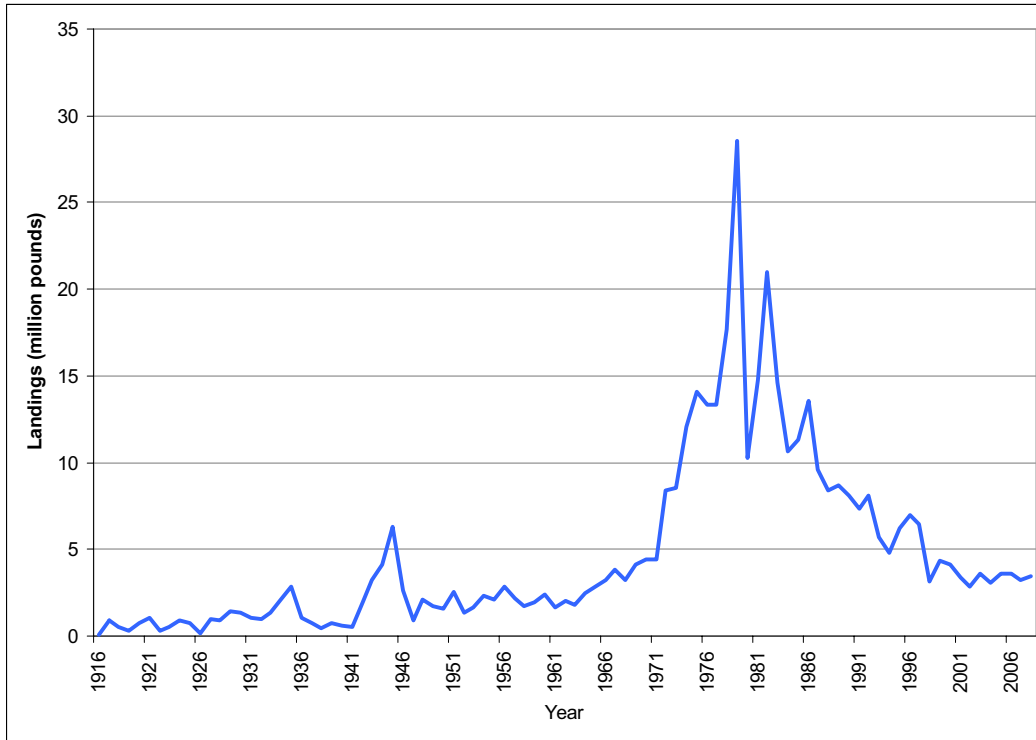


Figure 14-1. Sablefish commercial landings, 1916-2008. Data source: Department catch bulletins (1916-1968) and CFIS data (1969-2008), all gear types combined.

From the 1970s to present day, changes in management authority and regulations to restrict the sablefish fishery were implemented that shifted the dynamics of the fishery. The explosion of the fishery during the 1970s has been attributed to foreign fishing fleets from the former Soviet Republic, Japan and the Republic of Korea, and heavy market demand for foreign export to Asia. Partly to quell further foreign fishing pressure and also to prevent overfishing, the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) of 1976 established a fishery conservation zone (later changed to the U.S. Exclusive Economic Zone or EEZ) which extended control of U.S. waters from 3 to 200 miles (5 to 322 kilometers). The Magnuson-Stevens Act also created the Pacific Fishery Management Council (PFMC) to oversee the development and implementation of fisheries management on the Pacific west coast. This process set the stage for the sablefish fishery to experience many changes during the next 30 years.

In response to the development of improved fishing technology, the PFMC adopted the Pacific Coast Groundfish Fishery Management Plan (Groundfish FMP) in 1982, which covers almost 90 species, including sablefish. The Groundfish FMP imposed trip limits on the fishery to prevent exceeding the Allowable Biological Catch (ABC). Trip limit regulations would facilitate a downward trend in sablefish landings. By 1987, the sablefish ABC was allocated between the trawl and non-trawl fleets. This resulted in derby style management throughout the 1990s resulting in high fishing pressure during very short seasons. In response to substantial harvesting capacity (Figure 14-2) that exceeded the sustainability of the entire groundfish fishery, in 1994

the PFMC adopted and implemented Amendment 6 of the Groundfish FMP requiring vessel owners using trawl, long line and trap gear to hold a federal limited entry permit to catch and retain all groundfish species including sablefish. All other gears utilized for groundfish were able to continue harvesting under an open access system. This process diversified the fleet into the limited entry and open access sectors with an average of 79 percent of the landings coming from the limited entry sector during 1994-2008 (Figure 14-3). The refinement of harvest limits, trip and landing frequency limits, mesh size requirements for trawl gear, size limits, and separate allocations between sectors began to shape the fishery into its present form.

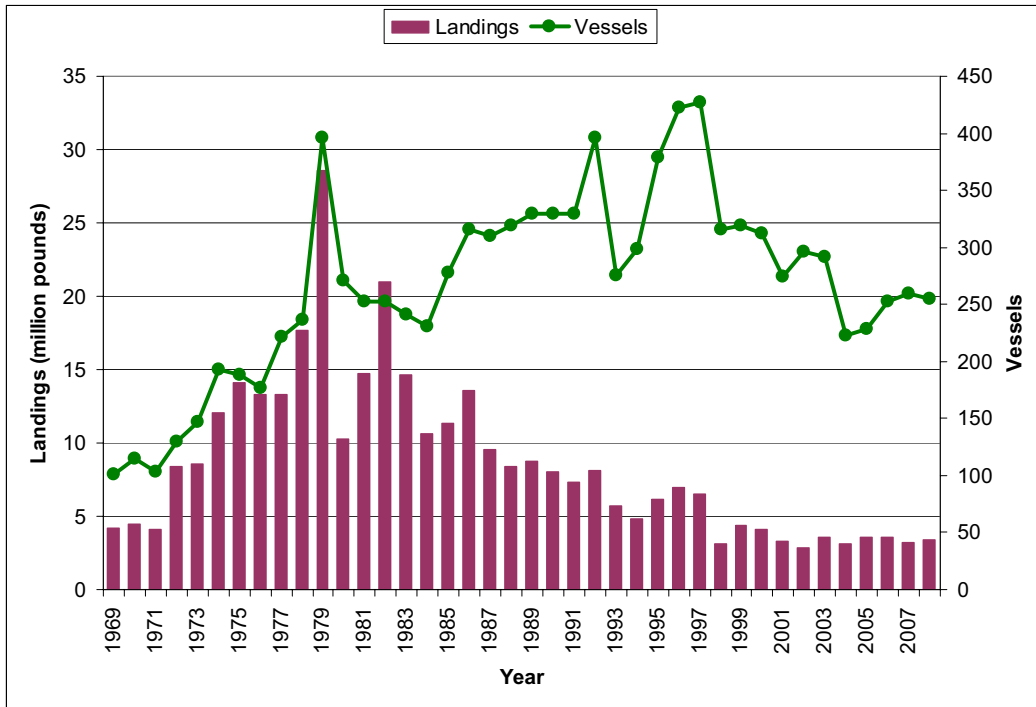


Figure 14-2. Sablefish commercial landings and participating vessels, 1969-2008. Data source: CFIS data, all gear types combined.

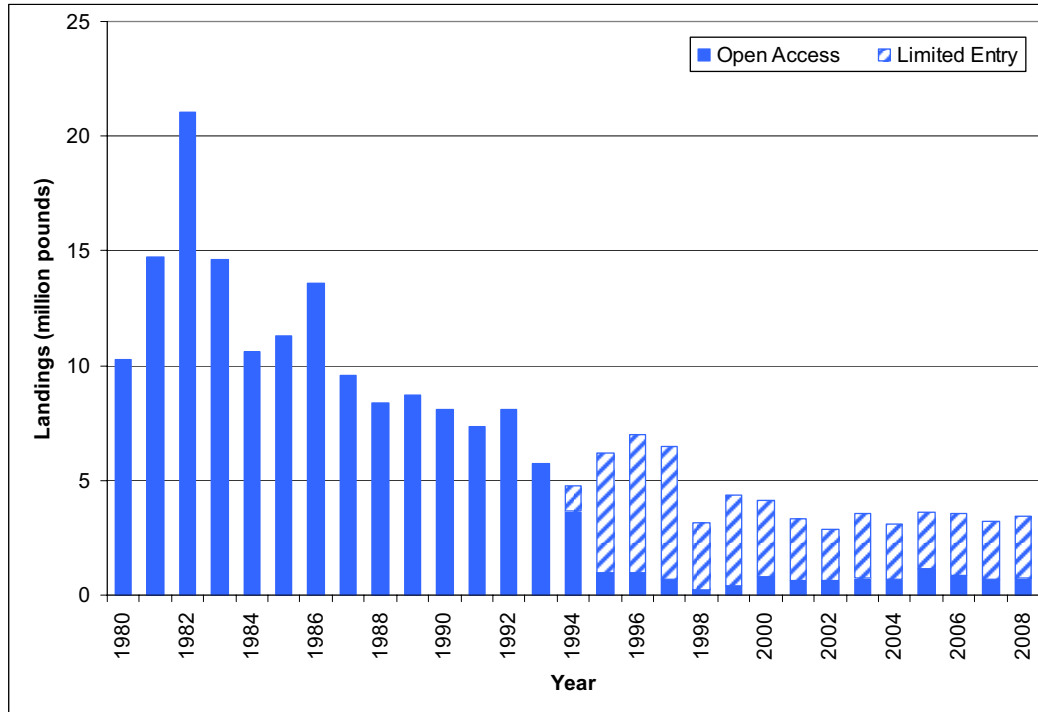


Figure 14-3. Sablefish commercial landings by fishing sector, 1980-2008. Data source: CFIS data, all gear types combined.

These management tools began to stabilize the sablefish fishery maintaining an average annual take of 4.2 million pounds (1900 metric tons) during 1994-2008. During this time period, deepwater species, such as sablefish, were predominately taken with trawl gear, averaging 54 percent of total landings. Interestingly, during the same time period as annual landings were decreasing due to additional restrictions to the fishery, the value increased totaling \$6.2 million dollars in 2008 (Figure 14-4). This increase in value can be attributed to the increased landing of live sablefish. Live fish often command a much higher price per pound from market dealers. Since 1994, annual landings of live sablefish have experienced a substantial upward trend, going from less than 10,000 pounds (5 metric tons) in 1994 and 1995 to just over 160,000 pounds (73 metric tons) in 2007 valued at \$410,000 (Figure 14-5). Although the live component of the fishery averages only 4 percent of the entire fleets' ex-vessel value, this growth demonstrates how the sablefish fishery continues to diversify and evolve through regulatory change and economic pressures. Despite challenges, such as inflated fuel prices that reached unprecedented levels in 2007 and 2008, the sablefish fishery remains one of the most valuable groundfish fisheries in California.

There is no recreational fishery for sablefish due to its deeper water distribution.

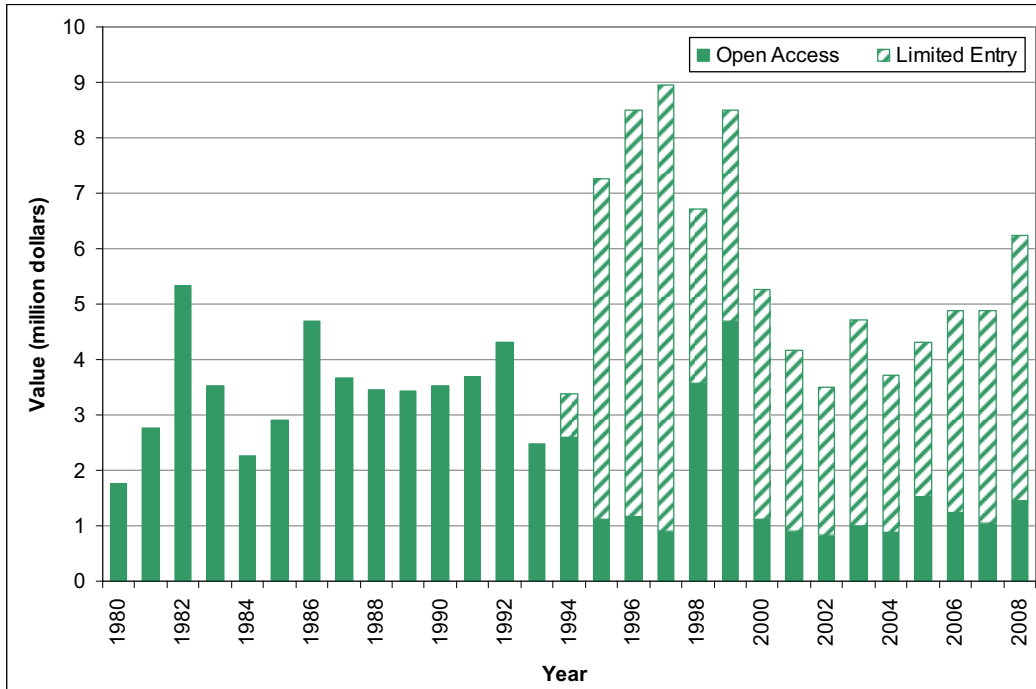


Figure 14-4. Sablefish commercial value by fishing sector, 1980-2008. Data source: CFIS data, all gear types combined.

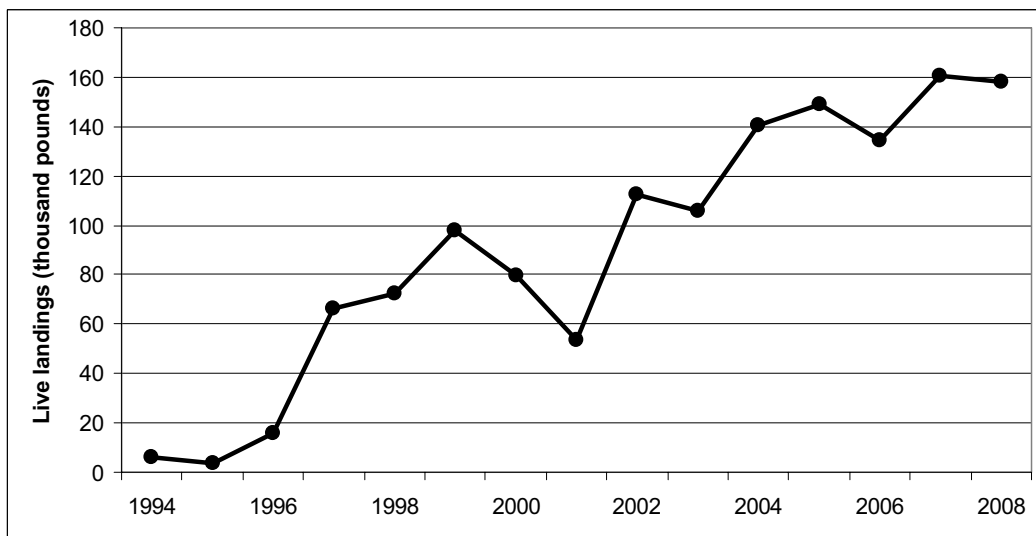


Figure 14-5. Live sablefish commercial landings, 1994-2008. Data source: CFIS data, all gear types combined.

Status of the Biological Knowledge

Sablefish belong to the taxonomic class of ray-finned fish which includes skiffish. Sablefish can grow to 3-4 feet (91-122 centimeters) in length and are blackish-gray in color. The dark color earned them the common name of blackcod, widely used among commercial fishers. The geographic distribution of sablefish ranges from southern Baja California, Mexico to the northern stretches of the Bering Sea in Alaska. Sablefish spawn during winter months, laying eggs in water generally deeper than 1000 feet (300 meters). Eggs become more buoyant as they mature bringing them closer to the surface. These first few months of larval life are imperative to survivorship and are highly dependent on oceanic conditions to provide nutrients. Once hatched, juvenile sablefish will remain within inshore waters until reaching maturity, between 4 and 6 years, at which time they migrate offshore to deep water (greater than 1600 feet; 500 meters). They are commonly found on muddy bottoms and can be found as deep as 6500 feet (2000 meters). Examination of otoliths to determine age has confirmed that sablefish, much like other species of groundfish, are long lived and slow growing after maturity and both sexes reach maximum growth around age 10. Females grow larger and live longer than males; the largest female included in the most recent stock assessment measured 40 inches (102 centimeters) and was estimated to be between 80 and 92 years old. The largest male, at 35 inches (91 centimeters) was estimated to be 68 years old. Based on fishing depth information the older sablefish are caught in deeper water. As adults, carnivorous sablefish are effective predators that target crustaceans, cephalopods and other fish. Conversely, sablefish are preyed on by other fishes and marine mammals, such as Pacific cod, Pacific halibut, spiny dogfish, elephant seals, harbor seals and California sea lions.

Status of the Population

In 2007, a stock assessment was conducted on sablefish. For the first time, the geographic stock (or population) considered by the assessment ranged from the U.S./Canadian border to Point Conception, California (San Luis Obispo County). This differed from previous assessments which ended at Lopez Point (Monterey County). The results of the stock assessment indicate that the sablefish population may be supported by fewer, less frequent, strong year classes rather than by a greater number of "average" strength year classes. This is likely due to the fact that sablefish recruitment is strongly dependent on favorable oceanic conditions that provide nutrients during early larval stages. The stock assessment authors recommended that further research be conducted in order to evaluate alternative methods for incorporating environmental information into the modeling process.

The results of the 2007 stock assessment concluded that the spawning stock biomass of the sablefish population is currently at 207 million pounds (93,900 metric tons) which represents 38.3 percent of the unfished stock size. This is a relative improvement from the previous 2005 assessment but is dependent on strong 1999 and 2000 year class recruitment. Harvest limits for 2009 and 2010 were set conservatively so the stock will not be fully dependent on these strong recruitment year classes. It

should be noted that 1999 and 2000 were considered strong recruitment years for other groundfish species including lingcod, bocaccio and cabezon. For the current 2009-2010 management cycle, the Pacific coastwide sablefish optimum yield (OY) increased modestly from 13 million pounds (5934 metric tons) in 2008 to 18.6 million (8423 metric tons) in 2009.

Management Considerations

Sablefish are currently managed under joint jurisdiction by the federal PFMC and the Department. Prior to 1982, sablefish was managed under state jurisdiction by the Department along with the California Fish and Game Commission, and the state legislature. Sablefish was designated a federal groundfish in 1982 when the PFMC implemented the Groundfish FMP. Following the 1994 creation of the federal limited entry permit program, the PFMC adopted Amendment 14 to the Groundfish FMP in 2001 adding another major management change to the sablefish fishery. This amendment, known as the “tier program” replaced the derby style fishery by creating permit stacking in the limited entry fixed gear (long line and trap) sector (hence “tiers”) which allows permittees to take multiple trip limits based on the number of permits stacked on a vessel. For the fixed gear sector, the tiered program has resulted in extended fishing seasons and has allowed commercial fishers greater flexibility and efficiency during the fishing season by maximizing individual business strategies and promoting safety.

In the early 2000s, a significant change to all groundfish fisheries occurred in response to the growing declaration of overfished groundfish species. Because these overfished species co-occur with many other healthy groundfish species, trip limit restrictions were implemented in specific species groups to reduce the take of overfished species. Additionally, in 2002 depth management restrictions were created in the form of Rockfish Conservation Areas (RCAs). The RCA depth closures prevented commercial and recreational fishing for groundfish on the shelf between 30-50 fathoms and 150-200 fathoms (55-91 meters and 274-366 meters), depending on regional management area, along the California coastline. In some areas, this process pushed commercial fishers further outside of their normal fishing grounds.

Due to the increased need to monitor the effectiveness of RCAs and protect overfished species, a federal Vessel Monitoring System (VMS) program was implemented. This program required Global Positioning Systems equipment to be installed on any vessel intending to target groundfish species in or transiting through federal waters with groundfish onboard. Because sablefish fishing grounds are in deep water seaward of the RCA, almost the entire fleet complied as a result—the only exception would be deep water canyons inside state waters. In 2004, VMS was implemented for the limited entry sector (both fixed gear and trawl) and by early 2008 was required within the open access sector as well.

Beginning in 1998, the PFMC began looking more closely at the open access sector of the groundfish fishery—sablefish compose a significant component of the open access fishery. Historically, the open access fishery experienced high variation in

participation from fishers and was intermittently utilized. In 2000, the Groundfish Strategic Plan identified the open access fishery as being overcapitalized and made permitting that sector a priority. In subsequent years, the PFMC looked at a range of alternatives to restrict the fishery with a limited entry permit. After much deliberation, the PFMC adopted a registration only option that will require any vessel participating in groundfish fisheries to register with the National Marine Fisheries Service each year beginning in 2011. This option will provide annual fleet accountability for management tracking while maintaining flexibility for fishery participants. This is particularly important for sablefish because the open access sablefish fishery has been used as an alternative fishery in years when salmon are not available.

In the near future, all fixed gear groundfish fisheries will be required to maintain a logbook. It is anticipated this information will be instrumental in calculating effort and can be used in making management decisions.

Caroline Mcknight

California Department of Fish and Game
CMcknight@dfg.ca.gov

Robert Leos

California Department of Fish and Game
RLleos@dfg.ca.gov

Further Reading

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Sablefish commercial landings and value, 1980-2008.				
Year	Dead (pounds)	Live (pounds)	Total (pounds)	Value
1980	10,284,920	0	10,284,920	\$1,763,395
1981	14,727,473	0	14,727,473	\$2,764,070
1982	21,018,966	0	21,018,966	\$5,323,652
1983	14,613,390	0	14,613,390	\$3,531,071
1984	10,633,319	0	10,633,319	\$2,253,646
1985	11,306,064	0	11,306,064	\$2,897,656
1986	13,585,933	0	13,585,933	\$4,695,310
1987	9,585,595	0	9,585,595	\$3,670,009
1988	8,360,438	0	8,360,438	\$3,449,234
1989	8,720,361	0	8,720,361	\$3,424,398
1990	8,070,375	0	8,070,375	\$3,512,553
1991	7,353,503	0	7,353,503	\$3,681,681
1992	8,098,798	0	8,098,798	\$4,318,290
1993	5,720,045	0	5,720,045	\$2,481,213
1994	4,784,144	6,129	4,790,273	\$3,375,080
1995	6,183,154	3,635	6,186,789	\$7,254,744
1996	6,981,661	15,785	6,997,446	\$8,505,608
1997	6,411,701	66,281	6,477,982	\$8,961,132
1998	3,094,214	72,108	3,166,322	\$6,715,824
1999	4,238,004	98,181	4,336,184	\$8,501,141
2000	4,056,350	79,715	4,136,065	\$5,260,841
2001	3,291,323	53,346	3,344,669	\$4,173,748
2002	2,726,528	112,328	2,838,856	\$3,509,313
2003	3,469,774	105,536	3,575,310	\$4,719,560

Sablefish commercial landings and value, 1980-2008.				
Year	Dead (pounds)	Live (pounds)	Total (pounds)	Value
2004	2,969,247	140,574	3,109,821	\$3,723,153
2005	3,445,402	149,020	3,594,422	\$4,310,083
2006	3,426,912	134,687	3,561,600	\$4,888,379
2007	3,032,639	160,470	3,193,109	\$4,871,286
2008	3,264,320	158,042	3,422,402	\$6,233,813

Data Source: CFIS data.

Sablefish commercial landings by fishing sector, 1980-2008.			
Year	Open access pounds	Limited entry pounds	Total pounds
1980	10,284,920	0	10,284,920
1981	14,727,473	0	14,727,473
1982	21,018,966	0	21,018,966
1983	14,613,390	0	14,613,390
1984	10,633,319	0	10,633,319
1985	11,306,064	0	11,306,064
1986	13,585,933	0	13,585,933
1987	9,585,595	0	9,585,595
1988	8,360,438	0	8,360,438
1989	8,720,361	0	8,720,361
1990	8,070,375	0	8,070,375
1991	7,342,150	0	7,342,150
1992	8,078,145	0	8,078,145
1993	5,720,285	0	5,720,285
1994	3,697,677	1,089,671	4,787,348
1995	956,483	5,230,404	6,186,887
1996	963,884	6,034,312	6,998,196
1997	659,585	5,822,716	6,482,300
1998	222,663	2,943,460	3,166,123
1999	401,235	3,936,011	4,337,246
2000	780,045	3,354,801	4,134,846

Sablefish commercial landings by fishing sector, 1980-2008.			
Year	Open access pounds	Limited entry pounds	Total pounds
2001	649,499	2,694,975	3,344,474
2002	610,256	2,228,599	2,838,856
2003	744,985	2,829,703	3,574,688
2004	673,667	2,432,502	3,106,169
2005	1,126,288	2,468,353	3,594,642
2006	852,154	2,704,238	3,556,392
2007	666,852	2,523,583	3,190,436
2008	722,016	2,700,386	3,422,402

Data Source: CFIS data.