Sablefish (*Anoplopoma fimbria*)

Certification Units Considered Under this Species:

- Trawl IFQ
- Longline IFQ
- Trap IFQ

Summary

Sablefish are the highest valued finfish per pound in the west coast commercial fisheries as of 2013. In 2011, National Marine Fisheries Service (NMFS) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries implemented a new management system for a section of the West Coast Groundfish Trawl Fishery known as the Catch Share or Individual Fishing Quota (IFQ) Program, in which area specific annual catch limits are allocated among limited entry trawl permit holders (though multiple gear types may be used). The 2011 West Coast sablefish stock assessment indicates that the stock is in decline. Although not considered overfished, it is in the precautionary zone which causes more restrictive harvest levels to be implemented. Note: The West Coast limited entry groundfish trawl fishery is currently undergoing MSC assessment, which includes the IFQ sector.

Strengths:

- Individual fishing quota must cover all target species catch in additional to bycatch species
- High observer coverage
- Tightly managed (limited entry, depth limit, annual catch limits, gear restrictions, area closures)
- Stock assessments frequently prepared (began in 1984, most recent in 2011)

Weaknesses:

- Food web and ecosystem impacts are currently unknown at this time, however the PFMC recently drafted a new Fishery Ecosystem Plan
- More information is needed on habitat impacts of gear
- Stock is below the healthy target level (the stock is on a downward trajectory according the 2011 stock assessment)

History of the Fishery in California

Biology of the Species

[From CDFG 2008 unless cited otherwise]:

Sablefish is one of two members of the fish family Anoplopomatidae. 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 black cod, widely used among commercial fishers. The geographic distribution of sablefish ranges from southern Baja California, Mexico to the northern stretches of the Bering Sea and Japan. 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 (inner ear bones) to determine age suggests 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 (2011) 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.

Commercial Fishery

Sablefish is the most valuable species in the West Coast groundfish fishery. If the sablefish stock becomes overfished, it will likely impact the entire west coast fishery (Grebel, pers. comm.). The California Department of Fish and Wildlife (DFW, formerly California Department of Fish and Game) began recording commercial landings in 1900 (Figure 1). Since 1945, the sablefish fishery continued to grow gradually before a significant increase during the 1970s due to foreign vessels (Van Houten Lynde 1986, McDevitt 1987), then transitioning to a domestic fleet. A decline in domestic landings through the 1980s was likely due to a combination of reduced Asian market strength and increasing regulation of the fishery. Annual landings have remained below 10,000 mt in subsequent years (PFMC 2011b).

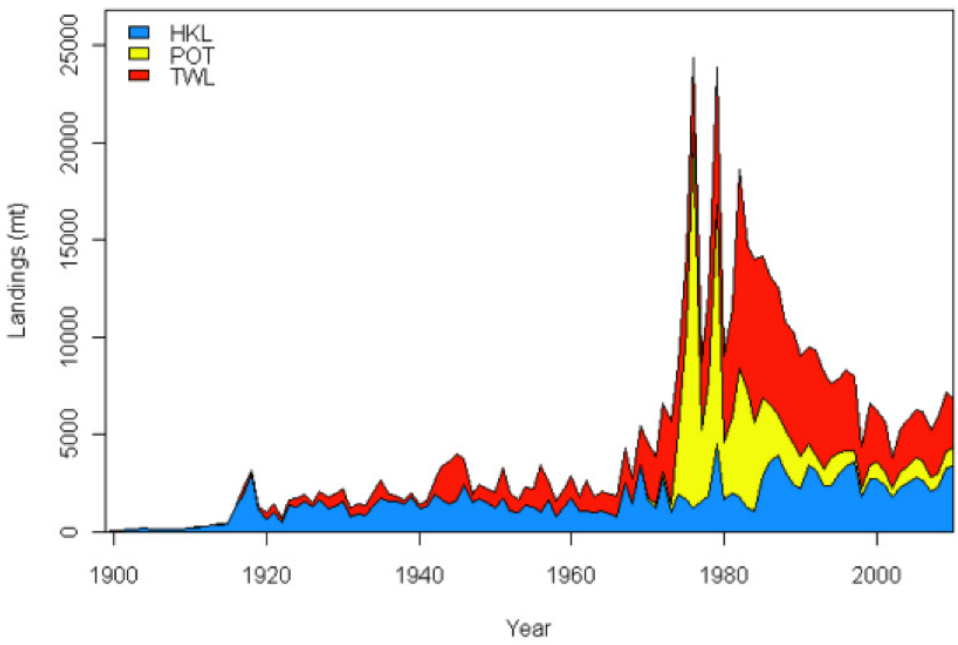

Figure 1. Sablefish landings history, 1900-2010. Fleet names indicate gear (HKL = Hook-and-line, POT = Pot, and TWL = Trawl). Foreign fleets are included and are largely responsible for the large values in 1976 and 1979 (PFMC 2011b).

The fishery is divided into the following management areas (Figure 2; PFMC 2011a):

Conception - Southern boundary of EEZ to 36^{0}00' N. latitude

Monterey - 36^{0}00' N. latitude to 40^{0}30' N. latitude

Eureka - 40^{0}30' N. latitude to 43^{0}00' N. latitude

Columbia - 43^{0}00' N. latitude to 47^{0}30' N. latitude

Vancouver - 47^{0}30' N. latitude to northern boundary of the EEZ

During the most recent decade, the commercial fishery has been split approximately 44% from hook-and-line, 14% from pot and 43% from trawl gear, although this is changing with the onset of the catch shares IFQ program (PFMC 2011). The IFQ program allocates a set quota of the allowed harvest to individual fishermen, allowing them the flexibility to harvest their share of the catch whenever they want and with a variety of gears. The annual catch limit (ACL) is allocated between northern and southern regions, approximately 74% and 26% respectively (Federal Register 2013). Within these regions, the ACL is reduced by some amount to account for research, tribal, incidental open access, leaving an amount for the "fishery harvest guideline." That number is then split between the trawl and non-trawl sectors. The non-trawl allocation may be further sub-divided into limited entry fixed gear, open access fixed gear (PFMC 2011). As of 2013, approximately 31% of the Northern region and 29% of the Southern region ACL were allocated to the IFQ program (Federal Register 2013). Within the IFQ program, trawl is the dominant gear type, however preliminary data for the entire west coast fishery indicate the use of fixed gear increased for sablefish, due to hook□and□line gear landings increasing from 13 to 19 percent of IFQ sablefish landings from 2011 to the 2012 season (Matson 2013). The fixed gear fishery generally targets sablefish along with thornyheads and slope rockfish (very

little Dover sole or other flatfish), while the trawl fishery generally targets sablefish with other deepwater species such as Dover sole and thornyheads (NMFS 2011). All vessels participating in the 2011 established West Coast groundfish IFQ program are required to carry a NOAA Fisheries–certified observer during all IFQ fishing trips (with few exceptions), while vessels participating in the non-IFQ limited entry or open access fixed gear sablefish fisheries are subject to random observer coverage (Table 1).

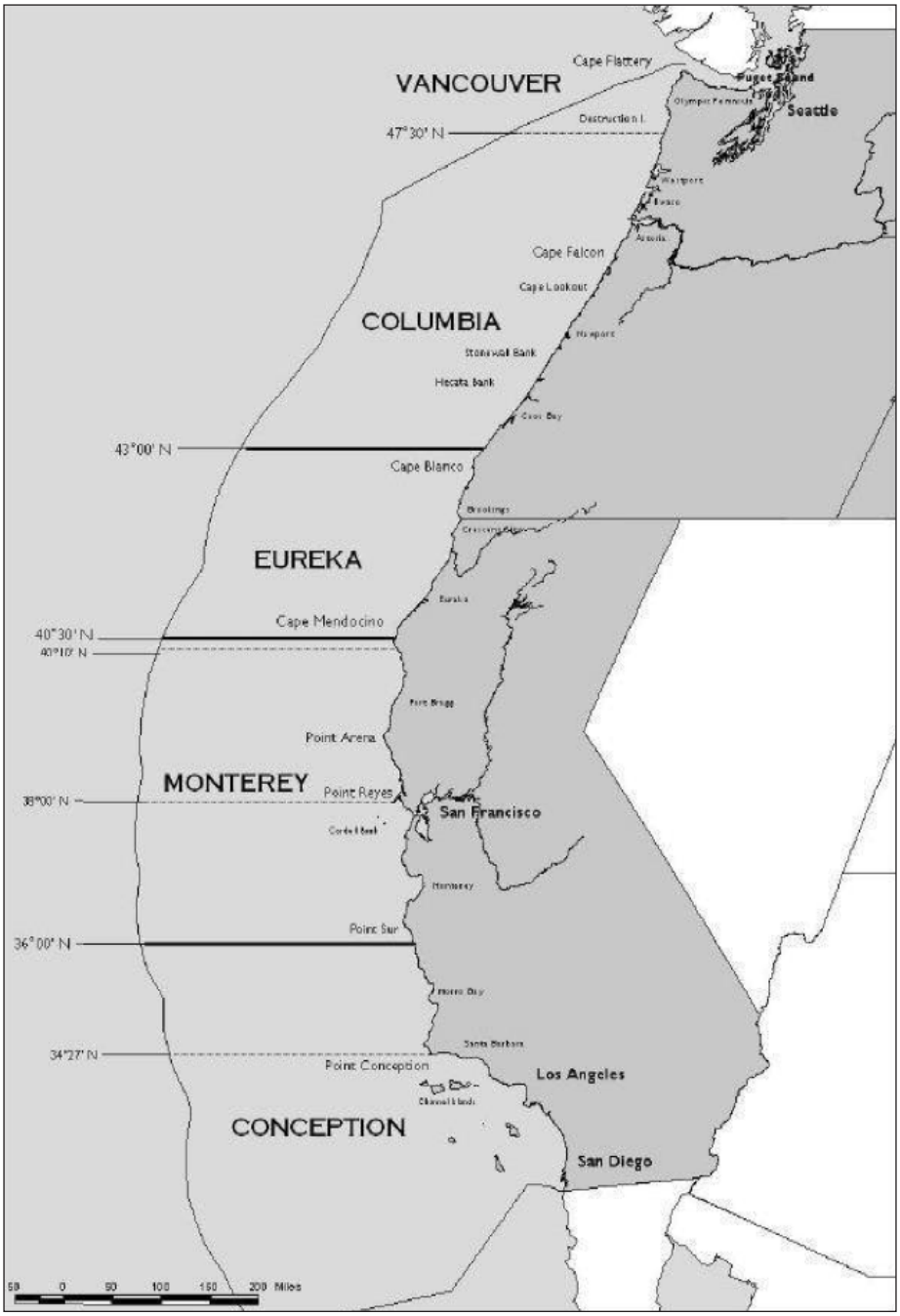

Figure 2. International North Pacific Fisheries Commission (INPFC) statistical areas in the U.S. exclusive economic zone seaward of WA, OR, and CA (PFMC 2011a).

Table 1. Sablefish vessel observer coverage by sector in 2011 (NWFSC 2011b).

Sector	% Coverage
IFQ	
Hook-and-Line	98.9%
Pot	99.7%
Trawl	94.8%
Non-IFQ	
Limited Entry Fixed Gear	25%
Open Access	6%

Recreational Fishery

Sport utilization of sablefish is considered negligible (Grebel, pers. comm.). The depth distribution of sablefish normally places them beyond most sport fishing activity; however, recreational anglers can land this species with a recreational fishing license if it is encountered while fishing in legal depths when groundfish fishing is open (CDFG 2001; CDFG 2008). The estimated recreational catch allocation was less than 0.2% of the ACL for the Northern region in 2013, although it is unclear whether records are kept to verify if these allocations are actualized (Matson 2013).

MSC Principle 1: Health of Fish Stock

*Sustainability of Target Stock

[From PFMC 2011b unless cited otherwise]

Previous analyses have suggested the existence of several 'stocks' of sablefish in the Eastern Pacific, including a southern California stock, a central California through Washington stock and a British Columbia to Gulf of Alaska (Schirripa 2007; and earlier assessments). Differences in maximum body size (larger to the north) and growth rates (slower to the north) are apparent; however environmental effects cannot easily be isolated from stock structure. The U.S. North Pacific sablefish fishery (Bering Sea and Gulf of Alaska longline fishery) has been certified sustainable by the Marine Stewardship Council (MSC)[1] since 2006 and the U.S. West Coast limited entry groundfish trawl fishery (including the IFQ sector) is currently undergoing MSC assessment[2].

Stock assessments of sablefish began in 1984 and have been conducted frequently since then. The most recent sablefish stock assessment was conducted in 2011. The coast-wide overfishing limit (OFL) for sablefish has ranged from 4,977 (2002), 9,914 mt (2009) and 6,621 mt (2013) during the last decade. Annual catch limits have ranged from 4,596 (2002), 8,423 mt (2009) and 5,451 (2013) over the same period. Landings are estimated to have been below the catch limits in all years. As of 2011, the relative spawning biomass for the West Coast sablefish

*For California's Sustainable Seafood Program, this category must score an 80 or higher during an MSC assessment

[1]The U.S. North Pacific sablefish fishery MSC assessment is available at: http://www.msc.org/track-a-fishery/fisheries-search/us-north-pacific-sablefish/files/73d901a7528b54d02266102d2ab0d5221815c0f4/@@display-file/file_data

[2]Information for the West Coast groundfish limited entry trawl fishery currently in MSC assessment is available at: http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/pacific/us-west-coast-limited-entry-groundfish-trawl

stock is at 34% of unfished levels. The stock is considered to be overfished when current SSB is less than 25% of unfished biomass, thus current estimates of SSB suggest that the stock is not overfished. However, the stock is in the precautionary level (meaning that it falls in between the healthy level of 40% of the overfished level of 25%). Given it is in the precautionary zone, the PFMC implemented more restrictive management measures, including an automatic precautionary reduction to the harvest limit that is set. According to the 2011 stock assessment the coast-wide abundance was estimated to have dropped below the healthy target level (SSB = 40%) in 2009 and is currently declining steeply in part due to poor recruitment. In addition, fishery independent data, including the NWFSC shelf and slope trawl survey time series from 2003-2010, indicates the biomass index shows a relatively precise and strongly declining trend.

Some groundfish have shown decadal changes in productivity linked to ocean conditions, including El Niño and La Niña regimes. For sablefish, recruitment success has been correlated with productivity in the California current (Schirripa et al. 2009). Future environmental conditions, changes in the timing, dynamics and productivity of the California current ecosystem may have potential to directly affect the sablefish stock through changes in recruitment success.

Life history characteristics of sablefish indicate sablefish generally grow rapidly reaching nearly asymptotic size and beginning to mature after 5-7 years and full size and maturity in their first decade of life. These traits show a strong latitudinal gradient, with slower growth and maturity schedules moving north along the distribution, as well a high degree of variability among studies. Female sablefish generally reach larger sizes than males; however, the sex-ratio tends to be skewed toward males at the oldest ages, implying a lower natural mortality rate for males relative to females. The fish are long-lived, regularly living over 40 years of age. The longest living sablefish on record was 114 years of age (Sigler et al. 2001). Females are highly fecund, and fecundity increases with size, however it is unclear whether there is a size or age-dependent effect on relative fecundity. A 28-inch, 7-year-old female is capable of producing 100,000 eggs, while a 40-inch, 20-year-old female is capable of producing 1 million eggs (Hanselman et al. 2006). Available data suggests that sablefish are determinate spawners (i.e. total advanced oocytes at the beginning of the spawning season is equivalent to total annual spawning output) and spawn 3-4 times per year (Hunter et al. 1989, Macewicz and Hunter 1994).

Evaluation against MSC Component 1.1: Sustainability of Target Stock

MSC Performance Indicators	Rating	Justification
1.1.1 Stock Status		The stock is in the precautionary zone, it is estimated at 33% of its unfished biomass (i.e. it falls between the healthy level of 40% and the overfished level of 25%); reference points are in place; the fishery is evaluated annually
1.1.2 Reference Points		There are well established reference points
1.1.3 Stock rebuilding		Not triggered; stock is not considered overfished

Harvest Strategy (Management)

From the early 1900s to the early 1980s, management of the sablefish fishery was the responsibility of the individual coastal states (California, Oregon, and Washington). Since the adoption of the Groundfish Fishery Management Plan by the Pacific Fishery Management Council (PFMC) in 1982, sablefish was designated a federal groundfish and responsibility has rested with the federal government and the PFMC. The first coast-wide-established regulations on the sablefish fishery off the U.S. Pacific coast were implemented as trip limits (total allowable amount of a groundfish by weight that may be landed per vessel from a single fishing trip) in October 1982 and has been followed by a rich history of management via seasons, size-limits, trip-limits, and a complex permit system (Figure 3; PFMC 2011b).

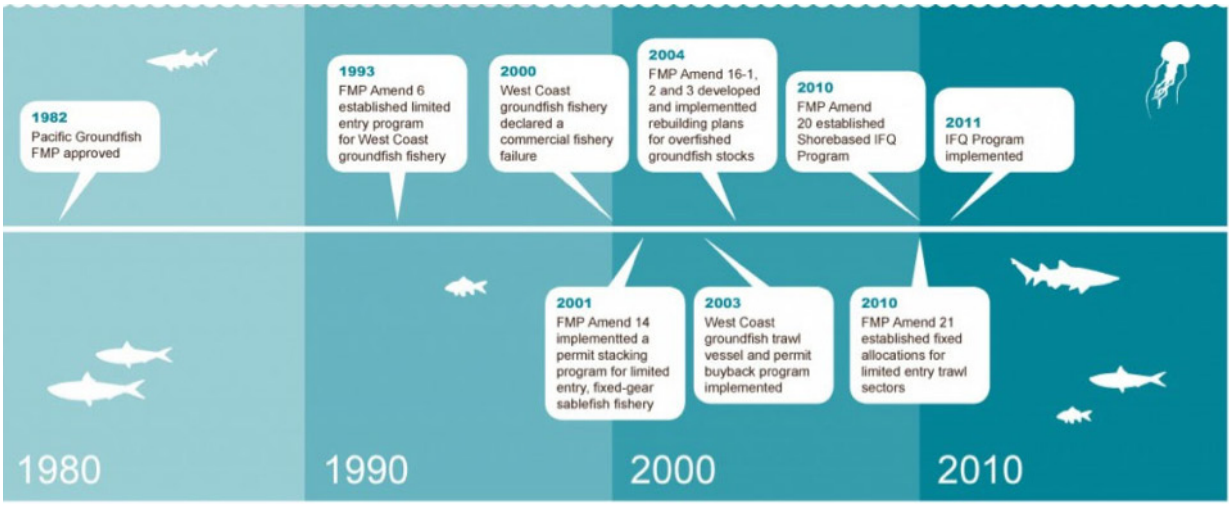

Figure 3. Management timeline for the West Coast groundfish fishery. (MRAG Americas 2013)

A federal limited entry permit (LEP) program was created in 1994. It was designated to control the capacity of the groundfish fishing fleet by limiting the number of fishing vessel permits, limiting the number of vessels using each of the three specified gear types (trawl, trap, and longline) and limiting increases in harvest capacity by limiting vessel length. In 2001, the PFMC adopted Amendment 14 to the Groundfish FMP known as the “tier program” for the northern fishery (PFMC 2011a). This program replaced the derby style fishery by creating permit stacking in the limited entry fixed gear (longline and trap) sector which allows permittees to combine multiple landings limits based on the number of permits (up to 3) stacked on a vessel. For the fixed gear sector, the tiered program extended fishing seasons and allowed commercial fishers greater flexibility and efficiency during the fishing season by maximizing individual business strategies and promoting safety.

In 2011, NMFS and NOAA Fisheries implemented a new management system for the West Coast Groundfish Trawl Fishery known as the catch shares system, trawl rationalization program, or the Individual Fishing Quota (IFQ) program. The new framework sets area specific catch limits which are allocated among limited entry trawl permit holders. The IFQ systems give each fisherman a share of the trawl allocation. Since the allocation can change from year to year, the IFQ is usually a percentage of the allocation. Fishermen can increase their share of the catch by buying or leasing IFQs from other fishermen. The program initially allocated IFQ as quota share (QS) based on fishery participants’ historic involvement in the fishery. Prior to the start of each fishing year, NMFS issues quota pounds (QP) to entities based on the amount of QS they hold. When a vessel goes fishing under the IFQ program, all catch (including discards)

must be recorded and counts against the vessel's QP account.

Groundfish sectors are observed by the West Coast Groundfish Observer Program (WCGOP), which was established in May 2001 as a Cooperative Agreement between PSMFC and NMFS in response to the West Coast Groundfish Fishery being declared a failure on January 19, 2000 (WCGOP 2013). This requires that all vessels that catch groundfish in the US EEZ from 3-200 miles offshore to carry an observer when notified to do so by NMFS or its designated agent. The IFQ program has close to 100% monitoring of the catch through at-sea observers and dockside catch monitors. Subsequent state rulemaking has extended NMFS's ability to require that California and Oregon vessels, which only fish in the 0-3 mile state territorial zone, also carry observers. WCGOP observers are stationed along the US west coast from Bellingham, Washington to San Diego, California (NMFS 2011a). In addition, trawl fishery logbook data have been collected by CDFG since the 1970s. These records provide tow-by-tow information regarding groundfish species including sablefish (PFMC 2011b).

Before the start of the sablefish primary season, all sablefish landings made by a vessel in the limited entry fixed gear (non-IFQ) are subject to daily, weekly and/or bi-monthly trip limits. Vessels participating in the catch shares/IFQ program are not subject to trip limits and can fish their QP throughout the year. Regulations state that traps or pots must have biodegradable escape panels constructed with 21 or smaller untreated cotton twine in such a manner that an opening at least 8 inches (20.3 cm) in diameter results when the twine deteriorates to prevent ghost fishing should traps become lost.

The PFMC approved Amendment 19 to the Groundfish FMP in 2006, designating Essential Fish Habitat (EFH) for groundfish (PFMC 2011a). EFH is described as all waters from the high tide line (and parts of estuaries) to 3,500 meters (1,914 fathoms) in depth. In addition to identifying EFH, the Council also adopted mitigation measures directed at the adverse impacts of fishing on groundfish EFH. Principal among these are closed areas to protect sensitive habitats. There are three types of closed areas: bottom trawl closed areas, bottom contact closed areas, and a bottom trawl footprint closure. The bottom trawl closed areas are closed to all types of bottom trawl fishing gear. The bottom trawl footprint closure closes areas in the EEZ between 1,280 m (700 fm) and 3,500 m (1,094 fm), which is the outer extent of groundfish EFH. The bottom contact closed areas are closed to all types of bottom contact gear intended to make contact with the bottom during fishing operations, which includes fixed gear such as longline and pots (PFMC 2008).

Evaluation against MSC Component 1.2: Harvest Strategy (Management)

MSC Performance Indicators	Rating	Justification
1.2.1 Harvest Strategy		A harvest strategy is in place which includes an annual harvest limits and harvest control rules; all discards must be covered by quota pounds; 100% observer coverage; area closures and gear restrictions
1.2.2 Harvest Control Rules and Tools		Harvest control rules and reference points are responsive to changes in the stock
1.2.3 Information/Monitoring		Fishery dependent and independent data are collected to support the harvest strategy; control mechanisms are in place to respond to changes in the fishery; observer data; logbooks
1.2.4 Assessment of Stock Status		Stock assessments are conducted regularly using independently reviewed methods

MSC Principle 2: Environment

Retained Species

Longline

The hook-and-line fishery generally targets sablefish, with minor incidental catch (<5% of total catch) of shortspine thornyhead and rougheye rockfish (Table 2). Incidental catch of rebuilding species is relatively low. Each retained species must be covered by a vessel's QP (NMFS 2011).

Evaluation against MSC Component 2.1: Retained Species

MSC Performance Indicators	Rating	Justification
2.1.1 Outcome		Retained catch levels are relatively low; all species are known and quantified
2.1.2 Management		Incidental catch must be covered by quota pounds; high observer coverage; Species are covered under the Groundfish FMP
2.1.3 Information		Observer data (98.9% coverage), logbooks, landings receipts

Trap

The trap gear fishery generally targets sablefish only, though lingcod is occasionally caught incidentally (Table 2). Each retained species must be covered by a vessel's QP (NMFS 2011).

Evaluation against MSC Component 2.1: Retained Species

MSC Performance Indicators	Rating	Justification
2.1.1 Outcome		None of the retained species are depleted and catch levels are low; all species are known and quantified
2.1.2 Management		Incidental catch must be covered by quota pounds; high observer coverage; Species are covered under the Groundfish FMP
2.1.3 Information		Observer data (99.7% coverage), logbooks, landings receipts

Trawl

The trawl fishery generally targets sablefish with other deepwater species such as Dover sole, arrowtooth flounder and thornyheads (Table 2). Each retained species must be covered by a vessel's QP (NMFS 2011).

Evaluation against MSC Component 2.1: Retained Species

MSC Performance Indicators	Rating	Justification
2.1.1 Outcome		Retained catch levels are relatively low; all species are known and quantified
2.1.2 Management		Incidental catch must be covered by quota pounds; high observer coverage; Most species are covered under the Groundfish FMP
2.1.3 Information		Observer data (94.8% coverage), logbooks, landings receipts

Table 2. West Coast Groundfish Observer data for top retained species from IFQ vessels targeting Sablefish in 2011 (NWFSC 2011a,b).

Sector	Species	Amount Retained (mt)	% of total catch (% retained)
IFQ Longline*	**Non-rebuilding species**		
	Sablefish	304.9	70.5 (97)
	Shortspine Thornyhead	19.5	4.6 (96)
	Rougheye Rockfish	6.7	3.3 (45)
	Rebuilding species		
	Darkblotched Rockfish	.04	0.08 (67)
	Pacific Ocean Perch	.01	0.01 (46)
IFQ Trap*	**Non-rebuilding species**		
	Sablefish	809	97.4 (99)
	Lingcod	2.95	0.3 (97)
IFQ Trawl*	**Non-rebuilding species**		
	Dover Sole	7687	39.4 (98)
	Arrowtooth Flounder	2262	12.6 (90)
	Sablefish	1677	8.5 (99)
	Longspine Thornyhead	901	4.7 (96)
	Longnose Skate	774	4.3 (90)
	Shortspine Thornyhead	700	3.5 (99)
	Rex Sole	358	1.9 (94)
	Rebuilding species		
	Petrale Sole	796	4.1 (98)

*Observer coverage in 2011: Longline: 98.9%; Trawl: 2011 = 94.8%; Trap: 99.7%

Bycatch Species

Longline

Under the IFQ program, discards have decreased dramatically compared to the pre-IFQ fishery (Grebel, pers. comm.). Top discards (by % of total catch by weight) in the longline fishery include spiny dogfish, some sharks and skates, and grenadier (Table 3; NWFSC 2011a). Bycatch may occasionally include rebuilding species, though this comprises <0.1% of the total catch. Amendment 18 to the groundfish FMP requires practicable means to minimize bycatch and bycatch mortality and a standardized bycatch reporting methodology. Management measures are in place to reduce bycatch of these species including Individual Bycatch Quotas (for Pacific halibut), area closures (rockfish conservation areas, EFH), and rebuilding plans for overfished species (PFMC 2006).

Evaluation against MSC Component 2.2: Bycatch Species

MSC Performance Indicators	Rating	Justification
2.2.1 Outcome		Bycatch levels are relatively low; all species are known and quantified
2.2.2 Management		Bycatch must be covered by quota pounds or IBQ; high observer coverage; rebuilding plans for overfished species; area closures
2.2.3 Information		Observer data (98.9% coverage in 2011), logbooks

Trap

Discards in the trap fishery are low but include Pacific grenadier, tanner crabs, and Pacific halibut – most are not considered overfished (Table 3; NWFSC 2011a). Bycatch may occasionally include rebuilding species, though this comprises <0.1% of the total catch. Amendment 18 to the groundfish FMP requires practicable means to minimize bycatch and bycatch mortality and a standardized bycatch reporting methodology. Management measures are in place to reduce bycatch of these species including escape panels on traps to prevent ghost fishing, Individual Bycatch Quotas (for Pacific halibut), area closures (rockfish conservation areas, EFH), and rebuilding plans to help overfished species recover.

Evaluation against MSC Component 2.2: Bycatch Species

MSC Performance Indicators	Rating	Justification
2.2.1 Outcome		Bycatch levels are low; all species are known and quantified
2.2.2 Management		Bycatch must be covered by quota pounds or IBQ; high observer coverage; rebuilding plans for overfished species; area closures
2.2.3 Information		Observer data (99.7% coverage in 2011), logbooks

Trawl

Discards in the trap fishery are approximately 11% of the total catch, a drastic decrease compared to the pre-IFQ fishery (Table 3; NWFSC 2011a; Grebel, pers. comm.). Bycatch may occasionally include rebuilding species, though this comprises <0.1% of the total catch. Amendment 18 to the groundfish FMP requires practicable means to minimize bycatch and bycatch mortality and a standardized bycatch reporting methodology. Management measures are in place to reduce bycatch of these species including trawl mesh size regulations, Individual Bycatch Quotas (for Pacific halibut), area closures (rockfish conservation areas, EFH), and

rebuilding plans for overfished species.

Evaluation against MSC Component 2.2: Bycatch Species

MSC Performance Indicators	Rating	Justification
2.2.1 Outcome		Bycatch levels are ~11% of total catch; all species are known and quantified
2.2.2 Management		Bycatch must be covered by quota pounds or IBQ; high observer coverage; rebuilding plans for overfished species; area closures
2.2.3 Information		Observer data (94.8% coverage in 2011), logbooks

Table 3. West Coast Groundfish Observer data for top bycatch (discard) species from IFQ vessels targeting Sablefish in 2011 (NWFSC 2011a,b).

Sector	Species	Amount of discards (mt)	% of total catch (% discarded)
IFQ longline*	**Non-rebuilding species**		
	Spiny Dogfish Shark	26.8	6.0 (100)
	Longnose Skate	14.7	3.4 (97)
	Pacific Grenadier	8.23	1.9 (100)
	Non-groundfish species		
	Shark Unid	7.9	1.8 (100)
	Grenadier Unid	7.6	1.7 (100)
	Pacific halibut	6.1	1.4 (100)
	Blue Shark	4.2	0.9 (100)
	Giant Grenadier	3	0.7 (100)
	Filetail Cat Shark	1.5	0.3 (100)
	Rebuilding species		
	Petrale Sole	0.03	0.01 (97)
IFQ Trap*	**Non-rebuilding species**		
	Pacific Grenadier	1.4	0.2 (98)
	Non-groundfish species		
	Tanneri Tanner Crab	3.8	0.4 (100)
	Pacific halibut	3.3	0.4 (100)
	Shark Unid	2.2	0.4 (100)
	Giant Grenadier	0.7	0.1 (85)
IFQ Trawl*	**Non-rebuilding species**		
	Spiny Dogfish Shark	277.8	1.8 (78)
	Pacific Hake	188.7	1.1 (88)
	Pacific Sanddab	91.6	1.2 (40)
	Spotted Ratfish	67.5	0.3 (99)
	Pacific Grenadier	50.5	0.3 (100)
	Splitnose Rockfish	33.7	0.2 (70)
	Big Skate	30.2	0.3 (56)
	English Sole	28.5	0.7 (21)
	Mixed Species	16.3	0.2 (45)
	Non-groundfish species		
	Tanneri Tanner Crab	180.3	0.9 (100)
	Dungeness Crab	146	0.7 (99)
	Giant Grenadier	84.8	0.4 (100)
	Mixed Species	67.3	0.4 (93)
	Pacific halibut	63	0.3 (100)
	Brown Cat Shark	30	0.2 (99)
	Sandpaper Skate	30	0.1 (100)
	Shark Unid	25.2	0.1 (98)
	Black Skate	23.5	0.1 (98)
	Eelpout Unid	20.9	0.1 (100)

Endangered, Threatened, & Protected (ETP) Species

Longline

In a risk assessment conducted in 2011, the NWFSC concluded that the West Coast groundfish likely does not significantly impact Endangered Species Act (ESA) listed marine species found off the West Coast (Table 4; NWFSC 2011c). No ESA listed salmon were reported as bycatch in the IFQ longline fishery in 2011 (NWFSC 2011a).

Evaluation against MSC Component 2.3: ETP Species

MSC Performance Indicators	Rating	Justification
2.3.1 Outcome		All species are known and quantified
2.3.2 Management		Magnuson-Stevens Act, CEQA, Migratory Bird Act, Marine Mammal Protection Act
2.3.3 Information		Observer data (98.9% coverage), logbooks; NWFSC risk assessment

Trap

One humpback whale entanglement is known to be from a West Coast sablefish pot fishery (Carretta et al. 2010), however a risk assessment conducted in 2011 by NWFSC concluded that the West Coast groundfish fisheries are likely not having a significant impact on ESA listed marine species found off the West Coast (Table 4; NWFSC 2011c). No ESA listed salmon were reported as bycatch in the IFQ trap fishery in 2011 (NWFSC 2011a).

Evaluation against MSC Component 2.3: ETP Species

MSC Performance Indicators	Rating	Justification
2.3.1 Outcome		Bycatch levels are low; all species are known and quantified
2.3.2 Management		Magnuson-Stevens Act, CEQA, Migratory Bird Act, Marine Mammal Protection Act
2.3.3 Information		Observer data (99.7% coverage), logbooks; NWFSC risk assessment

Trawl

In 2011, 0.32 metric tons of ESA listed salmon (Chinook and Coho) were reported as bycatch in the IFQ trawl fishery, comprising less than 0.002 % of the total catch in the IFQ trawl sector by weight (NWFSC 2011a). Green sturgeon have also been taken in small quantities in the limited entry West Coast groundfish trawl fishery, however their shallow distribution relative to sablefish makes it an unlikely bycatch species in this fishery (Table 4; NWFSC 2011c). A risk assessment conducted by NWFSC in 2011 concluded that the West Coast groundfish likely does not

significantly impact ESA listed species found off the West Coast (NWFSC 2011c).

Evaluation against MSC Component 2.3: ETP Species

MSC Performance Indicators	Rating	Justification
2.3.1 Outcome		All bycatch species are known and quantified
2.3.2 Management		Magnuson-Stevens Act, CEQA, Migratory Bird Act, Marine Mammal Protection Act
2.3.3 Information		Observer data (94.8% coverage), logbooks; NWFSC risk assessment

Table 4. Risk assessment of impacts to threatened and endangered species by the West Coast groundfish trawl fishery (NWFSC 2011c).

Species	ESA listing	Impacts to species likely?	Conclusion	Citation
Whales				
Humpback whale (*Megaptera novaeangliae*)	Endangered	No	Observed take of 3.2 per year in WCGF fishery, however recent impacts from WCGF fishery are not substantially impacting this species	NWFSC 2011c
Sei whale (*Balaenoptera borealis*)	Endangered	No	Lack of observed interactions combined with the limited degree of spatial overlap between the species, impacts are likely to be negligible	NWFSC 2011c
North Pacific Right whale (*Eubalaena japonica*)	Endangered	No	Lack of any observed interactions and the very limited overlap between the species' range and the WCGF fisheries, current impacts appear to be negligible	NWFSC 2011c
Blue whale (*Balaenoptera musculus*)	Endangered	No	Over the period from 2002–2009, there were no observed fishery interactions with blue whales reported by observer programs	Jannot et al 2011; NWFSC 2011c
Fin whale (*Balaenoptera physalus*)	Endangered	No	Over the period from 2002–2009, there were no observed fishery interactions with Fin whales reported by observer programs	Jannot et al 2011; NWFSC 2011c
Sperm whale (*Physter macrocephalus*)	Endangered	No	No observed mortality of sperm whales from the WCGF fisheries, low level of observed non-lethal interactions, unlikely to have a significant impact on this species	NWFSC 2011c
Southern Resident Killer whale (*Orcinus orca*)	Endangered	No	WCGF are likely to have, at most, a negligible effect on the population growth rate of the Southern Resident killer whales	NWFSC 2011c
Pinnipeds				
Guadalupe Fur Seal (*Arctocephalus townsendi*)	Threatened	No	There are no reports of Guadalupe fur seal bycatch from the WCGF fishery	NWFSC 2011c
Stellar sea lion (*Eumetopias jubatus*)	Threatened	No	From 2002–2009, a total of 8 Steller sea lion serious injuries or mortalities were observed in the West Coast Groundfish Program, though recent impacts from fishing are not substantially impacting this species	NWFSC 2011c
Fish				
Eulachon (Thaleichthys pacificus)	Threatened (Southern DPS*)	No	Level of mortality in the WCGF (less than 1000 individuals annually) is very low compared to the probable abundance thus the fishery is likely to have a negligible effect on this species	NWFSC 2011c
Green Sturgeon (Acipenser medirostris)	Threatened (Southern DPS*)	Difficult to predict	Observed take of 9 individuals from 2002-2009 in the CA WCGF LE trawn fishery, however NWFSC concludes that lack of data make it difficult to predict impacts to this species	NWFSC 2011c
Marine Turtles				
Leatherback turtle (*Dermochelys coriacea*)	Endangered	Difficult to predict	Single reported take occurred in a non-nearshore open acesss fixed gear sector with very low observer coverage, NWFSC concludes that lack of data make it difficult to predict impacts to this species	NWFSC 2011c
Green turtle (*Chelonia mydas*)	Threatened	No	No observed bycatch of this species in WCGF fisheries, unlikely to impact this species	Jannot et al 2011; NWFSC 2011c
Olive ridley turtle (*Lepidochelys olivacea*)	Threatened	No	No observed bycatch of this species in WCGF fisheries, unlikely to impact this species	Jannot et al 2011; NWFSC 2011c
Loggerhead turtle (*Carretta carretta*)	Endangered	No	The fixed gear portion of the WCGF fisheries could encounter loggerhead turtles though there has been no observed bycatch of this species in WCGF fisheries, unlikely to impact this species	NWFSC 2011c
Seabirds				
Short-tailed albatross (*Phoebastria albatrus*)	Endangered	No	One lethal take over the period of 2002–2011, impacts likely to be small	NWFSC 2011c
California least tern (*Sterna antillarum browni*)	Threatened	No	No interactions have been recorded from 2002–2009, not likely impacting this species	NWFSC 2011c

Habitats

Longline

Longline fishing consists of baited hooks that are deployed by the fishing vessel, which sink to the ocean floor where sablefish forage (MSC 2011). Longlines are generally considered "fixed gear" because compared to other gears such as trawling, they do not operate by moving along the seafloor. For that reason, bottom longline gear is generally thought to have substantially less impact on bottom habitat compared to mobile gear (Chuenpagdee et al. 2003). Despite its classification as "fixed gear", the gear can move during soak time by ocean currents, and during gear retrieval. Consequently, the bottom line and the hooks can destroy some structural habitat, particularly biogenic habitats including sponges and corals. Sablefish longlining impacts corals by entangling and dislodging them (Hanselman et al. 2009a).

West coast sablefish inhabit deep water (greater than 1600 feet; 500 meters) and are commonly found on soft muddy or sandy bottoms. Studies in the Alaskan fishing grounds indicate sablefish longlining was estimated to have minimal impact on overall habitat (MSC 2011; NMFS 2005). For soft substrates in the Eastern Bering Sea, the index of relative impact was 0.1% for sand / mud biostructure and 0.7% for slope biostructure (i.e. current levels and distribution of fishing impact was estimated to reduce these biostructural habitats by 0.1 to 0.7 percent) (NMFS 2005). According to a risk assessment which drafted an index of adverse effects for fishing gears utilized on the west coast of the US according to habitat type, hook and line gear impacts on soft sandy/muddy habitats from 200-3000 m was given a sensitivity rating of 0.5-1 (i.e. no detectable to minor impacts, on a scale of 0 to 3). In addition, hook and line gear was associated with a 0-3 year recovery time for biogenic habitats, including corals and sponges.

Based on management measures that close off EFH, along with the data indicating minimal impacts from the Alaskan fishery, and modeling data suggesting low sensitivity of sablefish habitat to hook and line gear, longline fishing gear likely does not reduce habitat structure and function in the California fishery to a point where there would be serious or irreversible harm.

Evaluation against MSC Component 2.4: Habitats

MSC Performance Indicators	Rating	Justification
2.4.1 Outcome		Moderate to low impacts
2.4.2 Management		Limited entry permits, gear restrictions, EFH area closures help limit habitat impacts
2.4.3 Information		Data from Alaskan fishery (NMFS 2005), Chuenpagdee et al. 2003, and MRAG Americas 2004 indicate minimal impacts to sablefish fishing grounds and soft bottom habitats; however, studies specific to sablefish habitat in CA may be necessary in the future

Trap

A 2005 review of habitat impacts to EFH for groundfish ranked gear types by relative impact level: dredges > trawls > nets > pots and traps > hook and line (PFMC 2012). Traps are

considered less damaging than trawls or dredges because they are not mobile, so although they are bottom gear, they have contact with a substantially smaller area of the seafloor than these more mobile gears. Traps can affect habitat, however, because they do not necessarily remain stable on the seafloor. Traps bounce off the seafloor in the presence of large swells, and get dragged across the seafloor when being removed, especially during a storm or if they are stuck in the sand (Morgan and Chuenpagdee 2003).

According to a risk assessment which drafted an index of adverse effects for fishing gears utilized on the west coast of the US according to habitat type and depth, pots and trap impacts on soft sandy/muddy habitats from 200-3000 m was given a sensitivity rating of 0.5-1 (i.e. no detectable to minor impacts, on a scale of 0 to 3). In addition, traps and pots were associated with a 0-3 year recovery time for biogenic habitats, including corals and sponges.

Given that there are management measures are in place that closes off EFH, and data to suggest that traps impose minor impacts to sablefish habitat, it is likely that sablefish traps do not reduce habitat structure and function in the California fishery to a point where there would be serious or irreversible harm.

Evaluation against MSC Component 2.4: Habitats

MSC Performance Indicators	Rating	Justification
2.4.1 Outcome		Moderate to low impacts to habitat structure and function
2.4.2 Management		Limited entry permits, gear restrictions, and EFH area closures help limit habitat impacts
2.4.3 Information		Research suggest traps impart minimal impacts to soft bottom habitats; however, studies specific to sablefish habitat may be necessary in the future

Trawl

Trawling can impact sea-floor communities by scraping the ocean bottom causing: 1) sediment re-suspension (turbidity) and smoothing; 2) removal and/or damage to non-target species; and 3) destruction of three-dimensional habitat (biotic and abiotic) (Auster and Langton 1999). There is a perception that low-relief sand and mud environments, similar to those inhabited by sablefish, will recover more quickly following the cessation of trawling than harder substrates and the fauna associated them (NRC 2002). However, the existing data are conflicting and may be habitat specific. In the North Sea, a study of soft sediment infauna found a measurable impact from a single pass of a beam trawl, even in an environment that had been trawled for decades (Reiss et al. 2009), while a project in South Africa found no measurable impacts to a chronically trawled area (Atkinson et al. 2011). In a three year study conducted on the outer continental shelf of the central coast of California (160-170 meter depth using a small foot-rope bottom trawl), there were no significant differences observed between control and trawled plots with respect to densities of sessile (attached) macro-invertebrates, infaunal invertebrates, and mobile invertebrates (Lindholm et al. 2013). However, there was a small reduction in micro-topographic structure in the trawled plots and larger-scale alteration of the seafloor in the form

of trawl door scour marks that persisted for up to a year after low-intensity trawling.

Sablefish inhabit much deeper waters than the habitats surveyed in the above mentioned studies. According to a risk assessment which drafted an index of adverse effects for fishing gears utilized on the west coast of the US according to habitat type and depth, bottom trawling on soft sandy/muddy habitats from 200-3000 m was given a sensitivity rating of 2.5-3 (i.e. major changes evident, on a scale of 0 to 3). In addition, bottom trawls were associated with a 3.5-10.5 year recovery time for biogenic habitats, including corals and sponges.

While management measures are in place that closes off EFH from trawling, there is some data to suggest that trawling imposes long recovery times for sablefish habitat, though study results are conflicting. More data are necessary specific to sablefish habitat on the west coast of the U.S. in order to determine if trawl gear likely does or does not reduce habitat structure and function in the California fishery to a point where there would be serious or irreversible harm.

Evaluation against MSC Component 2.4: Habitats

MSC Performance Indicators	Rating	Justification
2.4.1 Outcome		Trawl impacts can be damaging to soft biogenic habitats, and impose long recovery times for corals and sponges, however some studies suggest no significant impacts
2.4.2 Management		Limited entry permits, gear restrictions, and area closures help limit habitat impacts
2.4.3 Information		Many studies are available (modeling, ecological research) that assess the risk posed but are conflicting; more info specific to sablefish habitats are necessary

Ecosystem

According to the WCGOP data, retained and discard species caught in West Coast sablefish fisheries are well documented and likely do not cause serious or irreversible harm to key elements of ecosystem structure and function (NWFSC 2011a,b). Some of the sablefish grounds are currently inaccessible to the fishery due to EFH area closures, thus this likely helps limit the amount the fishery disrupts the food web or changes the state of the ecosystem (Grebel, pers. comm.), though more direct measures are still needed.

PFMC has written a draft Fishery Ecosystem Plan (FEP) for the US portion of the California Current Ecosystem. The goal of a FEP is to enhance the Council's species specific management programs with more ecosystem science, broader ecosystem considerations and management policies that coordinate Council management across FMPs and the California Current Ecosystem. This plan is set to be adopted as final during April 6-11, 2013. At this stage however, more information is needed to understand how or if the current management measures protect the ecosystem structure and function.

Evaluation against MSC Component 2.5: Ecosystem

MSC Performance Indicators	Rating	Justification
2.5.1 Outcome		Management measures may indirectly reduce ecosystem impacts; likely does not cause irreversible harm to ecosystem, but more quantitative measures are needed
2.5.2 Management		Area closures, ACLs, quotas, gear restrictions and EFH closures; the PFMC recently drafted a Fishery Ecosystem Plan but it is not currently implemented
2.5.3 Information		EFH well studied; Impacts on target, bycatch and ETP species are well known

MSC Principle 3: Management System

Governance and Policy

Fisheries in the U.S. are governed by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) of 1976. The MSFMCA requires managing at or below MSY levels, rebuilding overfished stocks and ending overfishing, minimizing bycatch and bycatch mortality, identification of essential fish habitat and mitigation of adverse fishing impacts. In addition, the Endangered Species Act, the Marine Mammal Act, the Migratory Bird Treaty Act, the Coastal Zone Management Act, and the Clean Water Act apply to or provide protection for species and/or habitat that may be affected by the target fishery.

The MSFCMA established eight regional fishery management councils to manage fishery resources in the U.S. Exclusive Economic Zone (EEZ). Along the U.S. west coast, the EEZ extends from 3 to 200 nautical miles offshore. Each council is comprised of Federal, State, and stakeholder representatives. Additionally, advisory bodies provide expert advice on matters related to the purpose of the council. The council process emphasizes public participation and involvement in fisheries management; meetings are open to the public and to public comment. Management measures developed by each council are recommended to the Secretary of Commerce through NOAA's National Marine Fisheries Service (NMFS). Along the west coast, management measures are implemented by NMFS Northwest and Southwest Regional offices and enforced by the NOAA Office of Law Enforcement, the U.S. Coast Guard 11th District, and local enforcement agencies.

Each council develops fishery management plans (FMPs) for the stocks in their region specifying how a fishery will be managed. The Guidelines for Fishery Management Plans (NMFS 1997) require that a stock assessment and fishery evaluation (SAFE) report be prepared and reviewed annually for each FMP. SAFE reports are intended to summarize the best available scientific information concerning the past, present, and possible future condition of the stocks, marine ecosystems, and fisheries being managed under federal regulation. Regional fishery management councils use this information to determine annual harvest levels for each stock, document significant trends or changes in the resources, marine ecosystems, and fishery

over time, and assess the relative success of existing state and federal fishery management programs. In California, the Pacific Fishery Management Council (PFMC) is the regional council that makes recommendations to NMFS on federal fisheries.

Evaluation against MSC Component 3.1: Governance and Policy

MSC Performance Indicators	Rating	Justification
3.1.1 Legal and/or Customary Framework		PFMC and NMFS must operate under Magnuson-Stevens Act, National Standard Guidelines, Marine Mammal Protection Act, Endangered Species Act, Migratory Bird Treaty Act, National Environmental Policy Act
3.1.2 Consultation, Roles and responsibilities		PFMC meetings are public and public participation is encouraged
3.1.3 Long-term Objectives		Objectives determined in Magnuson-Stevens Act and Groundfish FMP
3.1.4 Incentives for Sustainable Fishing		Magnuson-Stevens Act

Fishery Specific Management System

The National Marine Fisheries Service (NMFS) manages the fishery in partnership with the Pacific Fishery Management Council (PFMC), and the states of California, Oregon, and Washington. The Pacific Coast Groundfish Fishery Management Plan (FMP) was approved by the U.S. Secretary of Commerce (Secretary) on January 4, 1982, and implemented on October 5, 1982 (PFMC 2011a). Prior to implementation of the FMP, management of domestic groundfish fisheries was under the jurisdiction of the states of Washington, Oregon, and California. Since it was first implemented, the Council has amended the groundfish FMP 20 times in response to changes in the fishery, reauthorizations of the Magnuson-Stevens Act, and litigation that invalidated provisions incorporated by earlier amendments. The FMP includes sablefish and over 90 different species that, with a few exceptions, live on or near the bottom of the ocean. The FMP establishes the fishery management program, the process, and procedures the Council will follow in making adjustments to that program. It also sets the limits of management authority of the Council and the Secretary when acting under the FMP (PFMC 2011a).

The following goals for managing the Pacific Coast Groundfish Fishery have been established in order of priority (PFMC 2011a):

1. Conservation. Prevent overfishing and rebuild overfished stocks by managing for appropriate harvest levels and prevent, to the extent practicable, any net loss of the habitat of living marine resources.

2. Economics. Maximize the value of the groundfish resource as a whole.

3. Utilization. Within the constraints of overfished species rebuilding requirements, achieve the

maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

Proposals for management measures may come from the public, from participating management agencies, from advisory groups, or from Council members. If the Council wants to pursue these proposals, it asks for other possible solutions to the problem being addressed and then directs the Groundfish Management Team (GMT), the National Marine Fisheries Service (NMFS), and/or Council staff to prepare an analysis. The Council reviews the analysis and chooses a range of alternatives and possibly a preliminary preferred alternative. The analysis is then made available for public review, and the Council makes a final decision at the next meeting the item is scheduled.

A biennial management process was implemented in 2003 (Amendment 17 to the groundfish FMP). Under this biennial cycle, management measures are implemented for a two-year period, rather than just for one year. Separate harvest specifications (ABCs and OYs) are identified for each year in the two-year period. The Council reviews management performance and socioeconomic impacts relative to management objectives (e.g., rebuilding plans) during the two-year management period in order to consider modifying harvest specifications and management measures in the next biennial management period. New assessment results are also considered when deciding biennial harvest specifications and management measures. After considering Council recommendations and public comments, NMFS publishes the adopted regulations, thereby putting them into effect. For non-routine and annual management decisions, NMFS publishes a Federal Register notice and provides a public comment period before finalizing the recommendations.

The GMT is involved throughout the decision-making process. The team is made up of staff from the three state fishery management agencies (Washington, Oregon, and California), NMFS, and representatives for the tribes with a recognized treaty right to take federally managed groundfish. Traditionally, the GMT monitors catch rates, recommends harvest regulations and annual limits, and analyzes the impacts of various management measures. The GMT members presents information to the Council, Groundfish Advisory Subpanel (GAP), and other Council advisory bodies. GMT meetings are open to the public and public comment is generally accepted during the meetings.

The GAP advises the Council on policies and management decisions that affect the groundfish fishery and the public. The panel includes industry representatives of commercial and recreational groundfish sectors, tribal representatives, charterboat owners and operators, fishing organization representatives, processors, environmental organization representatives, and a public at-large representative. Each major commercial gear group is represented. Meetings are held at most Council meetings. The GAP operates by consensus and through majority and minority position statements that are offered as advice to the Council. GAP meetings are open to the public and public comment is generally accepted during the meetings.

Enforcement of fishing regulations is conducted in state waters by CDFW's Law Enforcement Division and in federal waters by NOAA's Office of Law Enforcement. Additionally tools such as port sampling, logbooks, and observer coverage are used to monitor catch and ensure vessels have the correct permits for the catch they are landing. Violators are prosecuted under the law. There is no evidence of systemic non-compliance.

Evaluation against MSC Component 3.2: Fishery Specific Management System

MSC Performance Indicators	Rating	Justification
3.2.1 Fishery Specific Objectives		Goals and objectives are outlined in the Groundfish FMP
3.2.2 Decision-making Processes		PFMC has an appropriate decision-making process in place, must be open and transparent
3.2.3 Compliance & Enforcement		An enforcement system exists and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.
3.2.4 Research Plan		Research and data needs identified in 2011 stock assessment; Research needs and data gaps analysis for Groundfish Essential Fish Habitat (EFH) detailed in Appendix B to the groundfish FMP
3.2.5 Management Performance Evaluation		Stock assessments are reviewed by the Groundfish Management Team; **biennial management process;** Proposals for management measures may come from the public, from participating management agencies, from advisory groups, or from Council members; Groundfish Advisory Subpanel advises the Council

California Specific Requirements

The California voluntary sustainable seafood program requires fisheries seeking certification to meet California specific standards in addition to the standards and requirements of the Marine Stewardship Council (MSC) sustainable fisheries certification program. These include:

1. Higher scores (80% instead of 60%) for two performance indicators (PI) of the MSC program: “Stock Status” (PI 1.1.1) and “By-catch of Endangered, Threatened, or Protected (ETP) Species” (PI 2.3.1). These two PIs are highlighted in the report.

2. Additional independent scientific review: The OPC Science Advisory Team will be engaged in the certification process through early consultation in reviewing minimum eligibility criteria, and review of the MSC-required pre-assessments and full assessments. The reviews will be conducted in addition to MSC’s peer review, thus bringing additional credibility, transparency, and independence to California’s certification process.

3. Additional traceability components: The California program will develop a unique barcode for California certified sustainable fish. This barcode can be either scanned by a smart-phone or linked to a website that will reveal additional information about the fishery, and information about toxicity when available.

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Appendix A

MSC Assessment Tree			Sablefish		
			Bottom trawl IFQ	Longline IFQ	Trap IFQ
Principle	**Component**	**Performance Indicator**	**All**	**All**	**All**
Principle 1: Health of Fish Stock	Outcome	1.1.1: Stock status			
		1.1.2: Reference points			
		1.1.3: Stock rebuilding	*Did not assess*	*Did not assess*	*Did not assess*
	Harvest Strategy (Management)	1.2.1: Harvest strategy			
		1.2.2: Harvest control rules			
		1.2.3: Info/ monitoring			
		1.2.4: Stock assessment			
Principle 2: Impact on Ecosystem	Retained species	2.1.1: Status			
		2.1.2: Mgmt strategy			
		2.1.3: Information			
	By-catch species	2.2.1: Status			
		2.2.2: Mgmt strategy			
		2.2.3: Info			
	ETP species	2.3.1: Status			
		2.3.2: Mgmt strategy			
		2.3.3: Info			
	Habitats	2.4.1: Status			
		2.4.2: Mgmt strategy			
		2.4.3: Info			
	Ecosystem	2.5.1: Status			
		2.5.2: Mgmt strategy			
		2.5.3: Info			
Principle 3: Management System	Governance & Policy	3.1.1: Legal framework			
		3.1.2: Consultation, roles, and responsibilities			
		3.1.3: Long term objectives			
		3.1.4: Incentives for sustainable fishing			
	Fishery Specific Mgmt System	3.2.1: Fishery specific objectives			
		3.2.2: Decision making process			
		3.2.3: Compliance & enforcement			
		3.2.4: Research plan			
		3.2.5: Management performance evaluation			