SCOPING OF TRAWL CATCH SHARES DISCARD SURVIVAL CREDITS FOR SABLEFISH AND LINGCOD

Introduction

The annual estimates of groundfish mortality, prepared by the West Coast Groundfish Observer Program (WCGOP), include the application of discard mortality rates (DMR) of 50 percent for trawl caught lingcod and sablefish, 20 percent for hook-and-line and pot caught sablefish, and 7 percent for longline caught lingcod (Table 1). Therefore it's assumed that 50 percent of trawl caught lingcod and sablefish, 80 percent of longline caught sablefish, and 93 percent of longline caught lingcod survive after being discarded, regardless of tow depth, tow duration, time on deck, or location of catch/discard.

Under the trawl catch share program, 100 percent of the estimated discards, regardless of survival, is debited from vessel quota pound accounts and tracked inseason against the trawl allocation and annual catch limits; there is no postseason quota pound adjustment. Industry has requested consideration of an IFQ "survival credit" for discarded lingcod and sablefish, particularly for the discard of small sized lingcod (less than 22 inches) for which discard is currently required by regulation. The industry generally retains small lingcod and sablefish regardless of low price or marketability since 100 percent of the discard is debited from quota pound accounts. Under this action small sablefish and lingcod would likely be discarded. The additional quota due to a survival credit could provide additional opportunities to target other species by allowing fisherman to utilize their remaining quota throughout the year. In addition, discarding small fish rather than landing them could provide an opportunity to catch some of the fish when they are more marketable.

Draft Purpose and Need

There is a need to increase attainment of annual catch limits, allocations, and quota pounds provided to participants in the trawl catch share program and reduce wastage of small fish. The purpose of this action is to create a mechanism that would apply a discard mortality rate to the estimated discard prior to debiting an IFQ account. This would provide fishermen with credit for discard survival of lingcod and sablefish in order to increase the attainment of allocations of co-occurring species.

Discard Accounting for IFQ Quota Pound Accounts

Annually, each IFQ participant is provided a certain amount of quota in the vessel accounting system (VAS). A vessel's discard (estimated by observers or electronic monitoring if discard is allowed) and landings are debited from a fisherman's account by NMFS through the VAS. Under the action being scoped, a single species and gear-specific rate could be applied to a vessel's discards on a trip by trip basis (Table 1). The account would be debited throughout the season. In order to implement the program and apply rates for lingcod and sablefish, some additional coding

in the vessel accounting system (VAS) would be require by WCGOP to reduce the amount debited from accounts.

Scoping and Discussion

Lingcod

Lingcod are targeted by vessels and caught with other species such as arrowtooth flounder, Dover sole, spiny dogfish, longnose skate, and petrale sole; therefore, additional targeting of lingcod may increase the attainment of some of these species. High-grading of lingcod may occur; however, it's difficult to estimate the weight of fish that would otherwise be discarded. Based on some industry feedback and logbooks, lingcod is not a significant "choke" species when targeting other species, so additional fish in IFQ accounts may not be needed. Industry feedback on the level of attainment in IFQ accounts and the need for additional quota to target species other than lingcod is needed to examine the need for applying a DMR in the VAS.

This action may increase the amount of lingcod discards; however, it's unlikely that additional discards would cause the allocation to be exceeded. Lingcod discard has been reduced since the inception of the trawl catch share program (Table 2 and 3) and the allocation attainment is only 12.7 percent (Table 4). It's likely that small and unmarketable fish that are currently landed would be discarded in the future.

In addition to the survival credit, a revision or removal of the minimum size limit for lingcod (less than 22 inches) could increase the available amount of quota pounds for participants. Changing the size limit was scoped in 2013-2014 specifications Final Environmental Impact Statement (Appendix C, page C-58). At that time the Council did not change the limit and the Enforcement Consultants Advisory Body recommended not changing it for the IFQ fishery because it would create different size restrictions between the non-IFQ and IFQ fisheries (Agenda Item D.5.b, Supplemental EC Report). The EC recommended that if a lingcod size limit for the shoreside IFQ fishery is adopted, that this change be implemented in the non-IFQ sectors as well. However, the Council already retains the ability to reduce or increase the size limit through an inseason action if needed.

Sablefish

Sablefish are caught in the Dover sole/thorny head/sablefish fishery complex trawl fishery, and are considered bycatch in other targeted fishing strategies for petrale sole and arrowtooth flounder. Trawl fisherman generally do not target just sablefish because most fishers need to stretch out the use of the quota while targeting other species. Based on industry feedback these fisherman could harvest nearly all of their sablefish quota in a few tows in particular spots along the coast. The hook-and-line fixed gear fishery targets sablefish and bycatch tends to be low, consisting of rougheye rockfish, longnose skate, and shortspine thorny head. The pot fishery targets sablefish and tends to also get blackgill rockfish, shortspine thornyhead and lingcod. The sablefish IFQ for each fisherman will likely be attained at some point throughout the year but it's anticipated that most vessels would stretch out the use of their quota over a longer period of time under the action. An analysis of additional attainment is needed if additional quota is available.

The amount of sablefish discard has fluctuated since the inception of the trawl catch share program but remains below 5 percent of the total catch in each fishery (Tables 5 through 7). In 2015, only

1.2 percent of the total fish caught (landed and discarded) in all fisheries combined were discarded (23.63 mt discarded of the 1,942 mt caught). Attainment of the allocation has not been exceeded between 2011 and 2015 and attainment has ranged from 86.9 percent to 96.8 percent (Table 8). The action would likely increase sablefish discards, especially for small or unmarketable fish. At this time it is difficult to speculate on the amount of small fish that may be discarded vs landed in the future under this action.

We assume under this action that future discards of sablefish would be similar in size as those that are currently discarded (Figures 1 through 3). These figures provide length-frequency distributions for the three LE trawl sectors from 2011 to 2013 (data is from the 2015 sablefish stock assessment). The trawl sector discarded fish that were generally smaller than 40cm and the pot fishery generally discarded 50 cm fish, but some larger fish were also discarded (most likely due to depredation by hagfish or some other factor), and the hook and line fishery generally discarded fish around 50 cm. These fish tend to be lower value and ex-vessel price of fish that are 2 pounds or less generally range from $0.75 to $1.00 per pound.

Amendment 20 Objectives

It's expected that this action would meet the goal and objectives of Amendment 20; mainly items 1, 2, 4, 5, 6 and 8:

Goal:

Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.

Objectives:

1. Provide a mechanism for total catch accounting.
2. Provide for a viable, profitable, and efficient groundfish fishery.
3. Promote practices that reduce bycatch, discard mortality, and minimize ecological impacts.
4. Increase operational flexibility.
5. Minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical.
6. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
7. Provide quality product for the consumer.
8. Increase safety in the fishery.

Sablefish and lingcod discards would continue to be closely monitored by observers or with electronic monitoring (EM), and accounted for in the total mortality estimates under this action. Exceeding an allocation is not expected since all vessels are required to cover the amount of IFQ harvested or must stop fishing. However there is a potential increase in the management risk if the DMRs are higher than what is currently be used. If so, and catch/discard increases, then the action could increase the annual mortality of both species.

Discard Mortality Rates Used to Manage West Coast Groundfish Stocks

Some groundfish species caught in the west coast groundfish fishery are discarded at sea because they are incidentally caught and are not marketable (market-induced discards) or they are not of a legal size to keep (regulatory discards). The SSC recommended the discard mortality rates by gear type that were modeled in approved stock assessments be used to manage the fishery. Table 1 shows the discard mortality rates by commercial gear type used in the most recent assessments for lingcod and sablefish. These discard mortality rates are applied by the WCGOP when estimating total discard mortality in west coast groundfish fisheries.

The GMT recommended using the 50 percent mortality rate for lingcod discarded in west coast bottom trawl fisheries based on a study that evaluated tow duration and time on deck of trawl-caught lingcod that were ultimately discarded (Parker, *et al.* 2003). The 2009 lingcod stock assessment also modeled the 50 percent discard mortality rate for discarded lingcod in trawl fisheries (Hamel, *et al.* 2009). The GMT recommended a 7 percent lingcod discard mortality rate be used for commercial fixed gear fisheries based on a study off California evaluating immediate and delayed mortality of lingcod caught using these gears.

The GMT reviewed the research studies informing sablefish discard mortality and recommended the mortality rates of 50 percent for trawl discards and 20 percent for fixed gear discards as shown in Table 1. Stewart et al. (2011) assumed the same discard mortality rates by gear type in the 2011 sablefish assessment (the same discard mortality rate assumptions were made in the 2015 update assessment). Sablefish discard mortality rates have been the subject of numerous research studies and analyses supporting historical sablefish stock assessments. Sablefish, lacking a swim-bladder (and therefore the propensity for severe barotrauma), have a very good chance of survival after capture depending on the specific conditions they experience during the process. Generally warmer water results in higher mortality, as the physiological stress of transitioning from very cold bottom temperatures to warmer surface water and air temperatures can be great (Davis, *et al.* 2001). Further, some gears, such as pot and hook-and-line gear are less physically damaging to sablefish than, for example, spending an extended period of time in a trawl cod-end with a large catch volume. Treatment and handling of captured fish, including time-on-deck is also important for subsequent survival.

In November 2016, the Council adopted the methodology review topics and timeline for 2017 reviews as recommended by the Groundfish Management Team and the Scientific and Statistical Committee (SSC) detailed in Agenda Item F.2.a, Supplemental SSC Report. Therefore in March 2017, and provided again under this agenda item, the GMT provided a report that discussed the current discard mortality rates for sablefish and lingcod being used in management (Agenda Item F.3.a, GMT Report 1, June 2017). The GMT again considers the information on the current discard mortality rates used for the longline and trawl sectors to be the best available information and recommended no changes to the current rates. The SSC intends to review the GMT report during the June meeting.

Table 1. Mortality rates applied in bottom trawl and fixed gear fisheries. Species without a rate listed for a given fishery and gear were assumed to have a 100 percent mortality rate.

Species	Fishery	Gear	Discard Mortality Rate
Lingcod	California Halibut	Trawl	50%
	IFQ Bottom Trawl[1/]	Trawl	50%
	IFQ Fixed Gear[1/]	Line	7%
	Non-Nearshore Fixed Gear	Line	7%
Sablefish	California Halibut	Trawl	50%
	IFQ Bottom Trawl[1/]	Trawl	50%
	IFQ Fixed Gear[1/]	Line and Pot	20%
	Non-Nearshore Fixed Gear	Line and Pot	20%

Note: [1/] Catch share fisheries under consideration for this action

Table 2. Lingcod bottom trawl total landings and discard, 2011-2015.

Year	Sum of Total BTM Landings (mt)	Sum of Total Discard (mt)	Sum of Total Discard with 50% Mortality Rates Applied (mt)	Sum of Landings and Discard	Percent of Discard
2011	241.28	40.51	20.26	282	14%
2012	343.24	30.21	15.11	373	8%
2013	321.23	23.99	12.00	345	7%
2014	220.63	22.26	11.13	243	9%
2015	170.77	25.16	12.58	196	13%

Table 3. Lingcod limited entry trawl permit hook and line total landings and discard, 2011-2015.

Year	Sum of Total H&L Landings (mt)	Sum of Total Discard (mt)	Sum of Total Discard with 7% Mortality Rates Applied (mt)	Sum of Landings and Discard	Percent of Discard
2011	0.30	0.05	0.0037	0.4	15%
2012	0.15	0.04	0.0031	0.2	23%
2013	0.28	0.03	0.0024	0.3	11%
2014	0.30	0.03	0.0019	0.3	8%
2015	1.19	0.01	0.0008	1.2	1%

Data source for Tables 2 and 3: August 2016 - Groundfish Expanded Mortality Multiyear (GEMM)

Table 4. Fishery harvest guidelines, allocations, catch, and percent attainment for catch share species, 2015

Stocks	2015						
	Fishery HG (mt)	Trawl Sectors			Non-Trawl Sectors		
		Alloc (mt)	Catch (mt)	% Attain	Alloc (mt)	Catch (mt)	% Attain
Arrowtooth Flounder	3,410	3,240	1,727	53.3%	171	38	22.3%
Chilipepper S. of 40°10'	1,604	1,203	192	16.0%	401	7	1.8%
Darkblotched	317	301	103	34.1%	16	4	23.2%
Dover Sole	48,406	45,986	6,227	13.5%	2,420	10	0.4%
English Sole	9,640	9,158	325	3.6%	482	4	0.8%
Lingcod	3,547	1,596	203	12.7%	1,951	1,244	63.7%
Longspine N. of 34°27'	3,124	2,968	756	25.5%	156	7	4.3%
Other Flatfish	8,545	7,691	832	10.8%	855	162	18.9%
Pacific Cod	1,091	1,036	377	36.4%	55	6	11.5%
POP N. of 40°10'	143	136	40	29.4%	7	1	7.1%
Petrale Sole	2,579	2,450	2,498	101.9%	129	9	7.1%
Sablefish N. of 36° a/	4,281	2,250	2,177	96.8%	2,031	1,997	98.3%
Sablefish S. of 36°	1,714	720	161	22.4%	994	444	44.7%
Shortspine N. of 34°27'	1,686	1,602	717	44.7%	84	48	56.7%
Shortspine S. of 34°27'	881	50	1	1.3%	831	78	9.4%
Slope RF N. of 40°10’	1,629	1,319	143	10.8%	310	60	19.4%
Slope RF S. of 40°10’	673	424	69	16.3%	249	36	14.3%
Splitnose S. of 40°10’	1,705	1,620	29	1.8%	85	0	0.3%
Starry Flounder	1,524	762	6	0.8%	762	23	3.0%
Widow	1,880	1,711	338	19.8%	169	7	4.2%
Yellowtail N. of 40°10'	5,560	4,893	993	20.3%	667	44	6.6%

Table 5. Sablefish bottom trawl total landings and discard, 2011-2015.

Year	Sum of Total BTM Landings (mt)	Sum of Total Discard (mt)	Sum of Total Discard with 50% Mortality Rates Applied (mt)	Sum of Landings and Discard	Percent of Discard
2011	1677.43	9.37	4.69	1687	1%
2012	1443.76	7.74	3.87	1451	1%
2013	1400.67	7.60	3.80	1408	1%
2014	1279.01	21.19	10.60	1300	2%
2015	1398.65	11.17	5.58	1410	1%

Table 6. Sablefish limited entry trawl permit hook and line total landings and discard, 2011-2015.

Year	Sum of Total Landings H&L (mt)	Sum of Total Discard (mt)	Sum of Total Discard with 20% Mortality Rates Applied (mt)	Sum of Landings and Discard	Percent of Discard
2011	304.59	7.97	1.59	313	3%
2012	205.53	8.61	1.72	214	4%
2013	72.85	2.78	0.56	76	4%
2014	82.75	2.79	0.56	86	3%
2015	120.51	5.10	1.02	126	4%

Table 7. Sablefish limited entry trawl permit pot total landings and discard, 2011-2015.

Year	Sum of Total Pot Landings (mt)	Sum of Total Discard (mt)	Sum of Total Discard with 20% Mortality Rates Applied (mt)	Sum of Landings and Discard	Percent of Discard
2011	810.06	11.78	2.36	822	1%
2012	729.39	12.28	2.46	742	2%
2013	449.67	8.68	1.74	458	2%
2014	678.09	10.16	2.03	688	1%
2015	399.52	7.36	1.47	407	2%

Data source for Tables 5 - 7: August 2016 - Groundfish Expanded Mortality Multiyear (GEMM)

Table 8. Annual allocations and catches of sablefish north of 36° N lat. for non-tribal commercial sectors, 2011-2015.

Year	Comm HG	LE Trawl			LEFG			OA		
		Allocation	Catch	% Attain	Allocation	Catch	% Attain	Allocation	Catch	% Attain
2011	4,941	2,597	2,399	92.4%	1,880	1,954	103.9%	464	437	94.0%
2012	4,790	2,517	2,187	86.9%	1,823	1,625	89.1%	450	273	60.6%
2013	3,575	1,878	1,835	97.7%	1,360	1,199	88.1%	336	155	46.0%
2014	3,878	2,038	1,876	92.1%	1,476	1,221	82.7%	365	265	72.7%
2015	4,281	2,250	2,177	96.8%	1,629	1,469	90.2%	402	450	111.9%

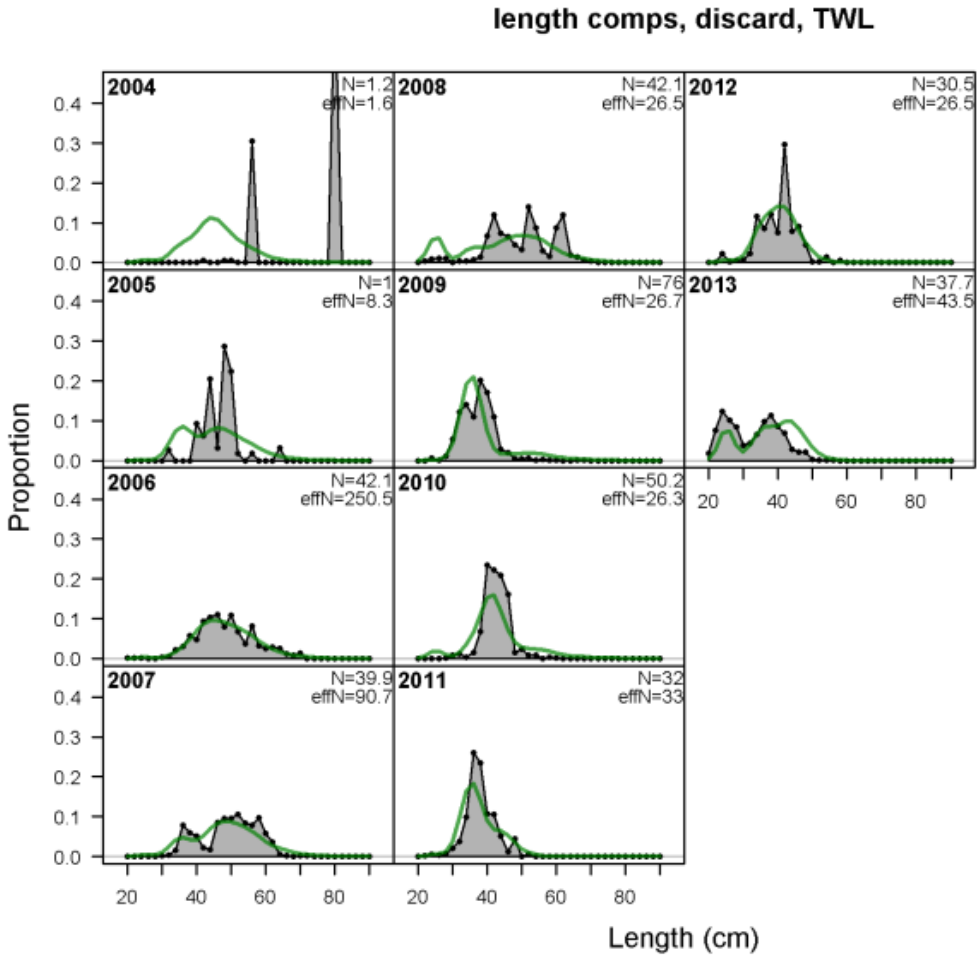

Figure 1. Length-frequency distributions for sexes-combined sablefish from the discarded catch in the trawl fishery by year.

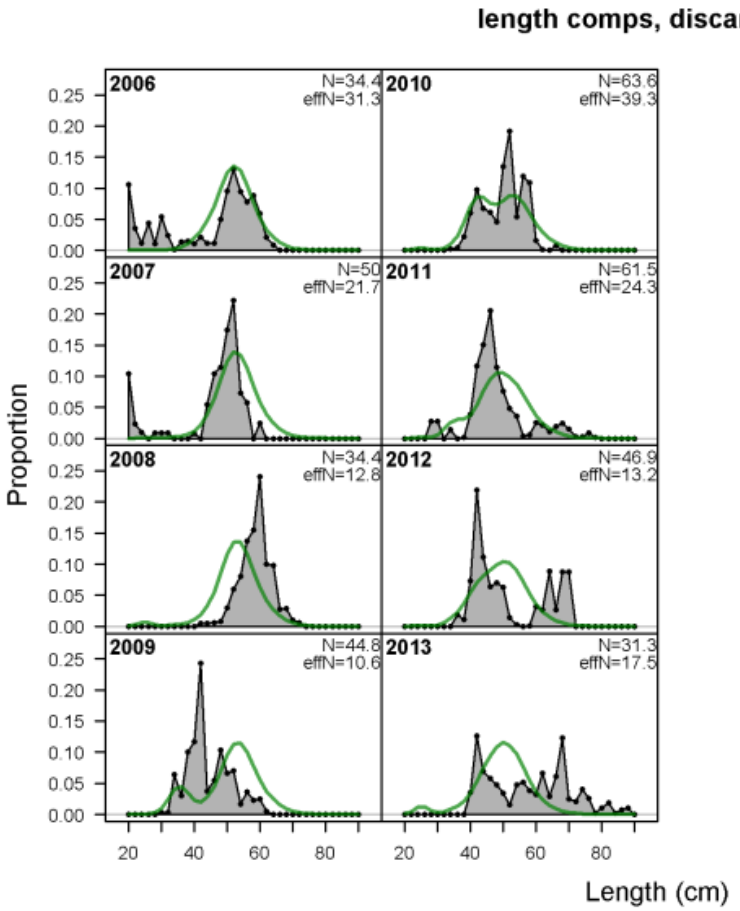

Figure 2. Length-frequency distributions for sexes-combined sablefish from the discarded catch in the pot fishery by year.

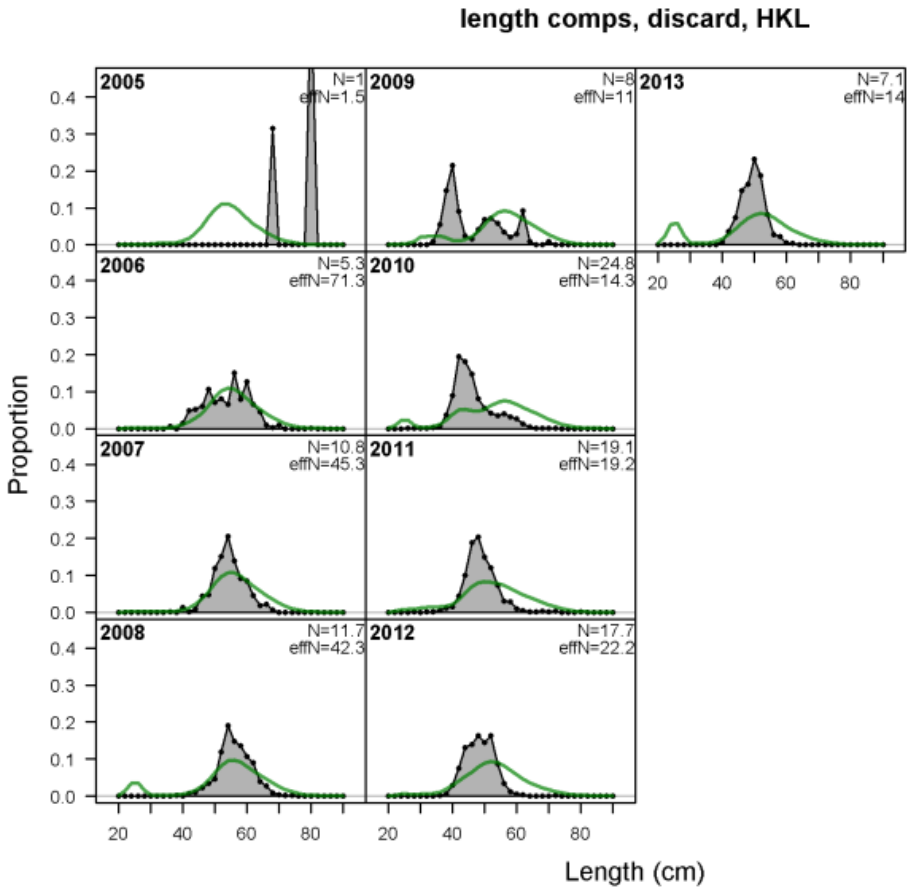

Figure 3. Length-frequency distributions for sexes-combined sablefish from the discarded catch in the hook-and-line fishery by year.

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