

B.1 Allocating Overfished Species on a Bycatch Rate (Proxy Species)

B.1.1 Introduction

This document describes a proposed methodology for allocating overfished species quota to LE trawl permits in the non-whiting sector based on a bycatch rate. This concept was originally proposed by the Groundfish Management Team as a mechanism to allocate overfished species in a manner that would allow for the prosecution of current fishing practices given the constraints overfished species place on access to target species.

Empirical evidence from other quota programs throughout the world have shown that initial allocations of IFQ that differ substantially from current or recent fishing practices result in some negative consequences during the initial years of the program (dislocation of fishermen, high discard rates). Over time these consequences are fixed through the natural trading of quota on the market, but a more refined initial allocation may still be able to avoid such negative consequences in the first place.

Preliminary analysis of initial allocation options has shown that, in general, if allocations of overfished species are made based on landings history, the distribution of overfished species quota would be heavily weighted toward a relatively few number of permits. This is because those were the permits that had previously targeted those species when they were abundant, and because under more recent regulations catch of overfished species in the shoreside non-whiting fishery has been largely discarded rather than landed. For the foreseeable future, overfished species will be a constraint to the access of target species, so an argument can be made for a more refined and equitable distribution of overfished species in order to allow permits to gain access to target species. While the market is likely to end up making necessary adjustments to the ownership of quota, overfished species quota is likely to be extremely costly because it will constrain access to target species. This means that those permits not receiving enough overfished species quota would be forced to essentially buy-in to the fishery again at a high cost, or leave the fishery all together. Allocating overfished species based on a bycatch rate is an attempt at making the initial allocation more equitable and avoiding such negative consequences.

B.1.2 General Description

The objective of allocating based on a bycatch rate is to allocate those species in a way that accommodates the current and recent spatial fishing patterns of LE non-whiting trawl vessels, to the extent possible. The bycatch rate of overfished species exhibit clear patterns across depth and latitude, and matching those patterns in the bycatch rate against relevant target fishing patterns can result in allocations that better accommodate recent fishing practices. Several sources of information are available for making allocations in a manner that accommodates these fishing practices:

- Logbooks are required of LE trawl vessels that deliver shoreside. Logbook information shows location, depth, and quantity of species that have been harvested by a particular vessel, among other things.
- The West Coast Groundfish Observer program samples the LE trawl fishery and records depth and location of species caught in observed fisheries.
- Information from these two data sets can be merged to allocate overfished species based on the spatial distribution of catch by LE trawl vessels and the corresponding spatial bycatch rates as estimated from WCGOP data.

During a 2007 meeting of West Coast fisheries management agencies, it was revealed that logbook compliance in the shoreside trawl fishery was over 90 percent in recent years for all three West Coast states. This information was contrary to the belief that logbook compliance was around 60-70 percent in

some cases. Based on this information, the GMT recommended using permit-specific logbook information to determine a vessel’s spatial and temporal catch history in recent years. In cases where there are no logbook records for a particular permit, then the fleet average would be used.

B.1.3 Data used in Application

The information used in this application includes fish ticket data, logbook data, and overfished species bycatch rates from the observer program. Fish ticket data is used because it is treated as the record of landed catch made by a vessel. Logbook data is used to stratify landed catch recorded on fish tickets into shoreward or seaward of-the-RCA locations for use in applying an overfished species bycatch rate, and to also identify the latitudinal area of catch. Observer program data is used for estimating shoreward and seaward bycatch rates of overfished species that are differentiated by latitudinal area. Several different latitudinal areas were considered including: 1) stratifying north and south of 40° 10’ North latitude and south of 40° 10’ North latitude, and 2) stratifying at 47° 40’ North latitude, 43° 55’ North latitude, 40° 10’ North latitude, and 38° North latitude. The Council’s decision resulted in a hybrid of those two options, using latitudinal stratifications at 47° 40’ North latitude, 43° 55’ North latitude, and 40° 10’ North latitude.

Logbook records are used for estimating the location of catch. Location of catch in this case is defined as a latitudinal area, and whether that location was shoreward or seaward of the RCA. These estimates of catch location are developed for those species categorized as “target species” in existing trawl management. Hypothetical catch location percentages (in terms of seaward and shoreward of the RCA) are shown in the table below.

Table Error! No text of specified style in document.-1. Hypothetical percentage of target species catch that were caught shoreward and seaward of the RCA (2003-06)

	Shoreward Catch Percentage	Seaward Catch Percentage
Dover	48%	52%
Longspine	5%	95%
Shortspine	12%	88%
Sablefish	11%	89%
Petrals	22%	78%
Other Flatfish	98%	2%
English sole	95%	5%
Splitnose	35%	65%
Pacific cod	88%	12%
Slope Rockfish	3%	97%
Arrowtooth	12%	88%

B.1.4 Model Development and Application

The model for this approach uses fish ticket data during the qualifying period, logbook data from 2003–06, and observer data from 2003–06. Quota shares of target species are first calculated from the fish ticket data, then target species quota shares are split by latitudinal area and by shoreward and seaward amounts based on catch depth recorded in 2003–06 logbook data. This information is then multiplied by the trawl allocation amount of target species in place during the implementation year to get an estimate of

implementation year quota pounds that are stratified by latitudinal area, and by seaward and shoreward of the RCA. These depth-stratified quota pounds are then multiplied by West Coast Groundfish Observer Program bycatch rates that are stratified by latitudinal area and by shoreward and seaward of the RCA for the years 2003–06. The result is then converted to an overfished species quota share by dividing each permit’s overfished species calculation by the sum of all non-whiting overfished species calculations.

1. The first step is to estimate each permit’s target species quota shares.
2. The second step is to estimate the latitudinal area and depth of target species catch from logbooks for determining what each permit has caught by area over the period 2003-2006.
3. The third step is to stratify each permits’ target species quota shares by latitudinal area and shoreward and seaward catch amounts based on each permits’ depth stratified catch from step 1.
4. The fourth step is to multiply the depth and area stratified quota shares by the trawl allocation amounts during the initial implementation year to get quota pounds for the initial implementation year.
5. The fifth step is to multiply the corresponding latitudinal area and shoreward and seaward fleet average overfished species bycatch rates by the implementation year quota pounds of target species given to each permit.
6. The final step is to calculate overfished species quota shares by summing together the shoreward and seaward implementation year quota pounds for each permit and dividing that amount by the total non-whiting trawl sector amount of implementation year quota pounds for those overfished species. This final step calculates the overfished species share.

The following tables illustrate the development and application of the proposed method. The table above (Table **Error! No text of specified style in document.-1**) shows the first step in the model. The second step is to stratify each permit’s target species quota shares into shoreward and seaward of the RCA portions and then estimate shoreward and seaward implementation year quota pounds. The following table shows an example of splitting quota shares for a hypothetical permit into seaward and shoreward areas.

Table Error! No text of specified style in document.-2. Derivation of seaward and shoreward quota shares to a hypothetical permit.

Area	Species	Quota Share to Permit X	Shoreward Share	Seaward Share
North of 47 40	Dover	1%	48%	52%
	Longspine	2%	5%	95%
	Shortspine	3%	12%	88%
	Sablefish	3%	11%	89%
	Petrals	1%	22%	78%
	Other Flatfish	1%	98%	2%
	Pacific cod	1%	88%	12%
	English sole	1%	95%	5%
	Splitnose	0%	0%	0%
	Slope			
	Rockfish	4%	3%	97%
	Arrowtooth	3%	12%	88%

The table below shows hypothetical quota shares for a permit that has only caught fish north of 47° 40' N latitude. Target species quota shares are differentiated by seaward and shoreward of the RCA from logbook information as shown in the table above. The trawl allocation is then multiplied by those shares to derive an implementation year quota poundage of target species for that permit. This amount is shown in the right two columns of the table.

Table Error! No text of specified style in document.-3. Hypothetical development of seaward and shoreward implementation year target species quota pounds.

Area	Species	Shoreward Share	Seaward Share	Implementation Year Trawl Allocation (mt)	Shoreward Lbs	Seaward Lbs
North of 47 40	Dover	48%	52%	16000	169,315	183,424
	Longspine	5%	95%	2000	4,409	83,776
	Shortspine	12%	88%	1200	9,524	69,842
	Sablefish	11%	89%	2600	15,763	127,537
	Petrals	22%	78%	2500	12,125	42,990
	Other Flatfish	98%	2%	7000	151,237	3,086
	Pacific cod	88%	12%	1000	19,401	2,646
	English sole	95%	5%	14000	293,214	15,432
	Splitnose	0%	0%	460	-	-
	Slope Rockfish	3%	97%	800	1,852	59,877
	Arrowtooth	12%	88%	10000	79,366	582,020

After determining a seaward and shoreward implementation year quota poundage, seaward and shoreward bycatch rates are applied to determine hypothetical darkblotched poundage. That poundage is then divided by the sum of all permits' poundage to derive a quota share of overfished species. The following table illustrates this method by continuing the use of shoreward and seaward implementation year quota pounds. Hypothetical darkblotched bycatch rates are multiplied by this amount in order to determine a darkblotched poundage. That poundage is then divided by a hypothetical fleetwide poundage to derive that permits quota shares of darkblotched rockfish.

Table Error! No text of specified style in document.-4. Hypothetical derivation of darkblotched quota shares using proposed method.

Area	Species	Shoreward Lbs	Seaward Lbs	Shoreward bycatch rate	Seaward bycatch rate	Shoreward Drkbltchlbs	Seaward Drkbltch lbs	Total	Fleet total	Darkblotched QS
North of 47 40	Dover	169,315	183,424	0.0001	0.02	16.93	3,668.49			
	Longspine	4,409	83,776	0.0001	0.02	0.44	1,675.51			
	Shortspine	9,524	69,842	0.0001	0.02	0.95	1,396.85			
	Sablefish	15,763	127,537	0.0001	0.02	1.58	2,550.75			
	Petrale	12,125	42,990	0.0001	0.02	1.21	859.80			
	Other Flatfish	151,237	3,086	0.0001	0.02	15.12	61.73			
	Pacific cod	19,401	2,646	0.0001	0.02	1.94	52.91			
	English sole	293,214	15,432	0.0001	0.02	29.32	308.65			
	Splitnose	-	-	0.0001	0.02	-	-			
	Slope Rockfish	1,852	59,877	0.0001	0.02	0.19	1,197.55			
	Arrowtooth	79,366	582,020	0.0001	0.02	7.94	11,640.39			
								23,488	705,478	3%