SUPPLEMENTAL ANALYSIS

This supplement provides information in response to actions taken at the May Groundfish Allocation Committee (GAC) and Trawl Individual Quota Committee (TIQC) Meetings:

A-1.2 Scope for IFQ Management **Page 4**

Species to be covered by the Primary Catch Control Tool (i.e. Individual Fishing Quotas [IFQs] or co-ops)

> The TIQC reviewed data on levels of catch for a variety of species in the groundfish fishery and on that basis recommended that certain rarely taken species not be managed with IFQs nor with co-ops. Their recommendations and the data they reviewed is provided.

A-1.2 IFQ Management Units **Page 8**

Area Subdivision

> The GAC asked the Groundfish Management Team (GMT) and TIQC to consider subdivisions of the IFQ by area. The current option would create a subdivision at 40°10' N latitude. If this becomes a preferred alternative, additional analysis will be required in order for the Council to take final action on this provision in November. One of the first steps required is a determination of the proportion of the quota share (QS) that would be allocated north and south of the line. Excerpts from previous GMT reports are provided, including an example of an approach that would base the north-south allocation on fleet catch history in each area for 1994-2003. The entire June 2007 GMT report is appended to the end of this document (page 27).

A-2.1.1.d Allocation Formula, Permits with Catcher Vessel History **Page 9**

Equal Allocation of History Associated with Buyback Permits **Page 9**

> The GAC has recommended equal sharing of the catch history associated with buyback permits among permits eligible for QS allocations. Figures are provided which illustrate the effect of allocation to permits with and without the equal sharing component compared with their average shares of groundfish catch during 2004-2006.

Bycatch Rates for Use in Allocating Overfished Species **Page 10**

> Under Overfished Species Option 2, nonwhiting QS would be allocated based on the target species QS a permit received, fleet average bycatch rates, and permit specific logbook records. The current methodology would stratify bycatch rates by depth (inside and outside the RCA) and latitude (north and south of 40°10'). The GAC requested consideration of finer degrees of north-south stratification. Two options are illustrated.

A-2.2.1 Permit/IFQ Holding Requirement **Page 15**

Fishing Prohibitions and Groundfish Catch in Nongroundfish Fisheries.

The IFQ alternatives specifies that if a vessel is over its Quota Pounds (QP) limit it may not fish in fisheries within the scope of the program. Additionally, at its November 2007 meeting, the Council added an option:

Option: There may be exceptions and additions to the activities which will be prohibited when a vessel has an overage (see footnote)

Footnote/
Within the scope of the IFQ program.
An, overage **will not** prevent a vessel from using the following gears to target on nongroundfish species, even if there is some incidental groundfish catch:
Salmon troll; HMS troll gear and other legal surface hook-gear that also qualify as vertical hook-and-line or dinglebar under the groundfish FMP.
Outside the scope of the IFQ program.
An, overage **will not** prevent a vessel from fishing using:
Dungeness crab gear
all, other HMS gears (including pelagic longline) except small mesh gillnet
or purse seine gear for coastal pelagic species
An overage **will** prevent a vessel from using: small mesh gillnet for highly migratory species.

Provisions based on Amendment #6 to Motion 20 at the November, 2007 Council meeting.

At that time the Council also requested some analysis of amounts of bycatch in some of the non-groundfish fisheries. Some of the requested information is provided here.

A-2.2.3.e Accumulation Limits **Page 16**

Changes in Permit Ownership

The TIQC has recommended that consideration be given to establishing control accumulation limits (percentages of total QS) based on the maximum QS that would be allocated to entities calculated on their permit holdings as of January 1, 2004 or January 1, 2008 (whiting). As a first step in developing an analysis of these options, we need to determine ownership differences compared with the current data set (which was constructed in the fall of 2006). A table is provided indicating permits that may have changed hands over the period. These were identified based on differences in registered names and addresses. However, there are circumstances where both names and addresses can change without an actual change in ownership. We are therefore seeking comment on whether the list provided actually reflects real changes in ownership.

A-4 Halibut Individual Bycatch Quota (IBQ) Page 19

Development of the Halibut IBQ Option.

Halibut IBQ would essentially function in the same way and according to the same rules as the IFQ for other species, except that retention of the halibut would be prohibited. Some of the main issues to be addressed are: how the amount of bycatch allocated to the trawl fishery would be determined; how halibut bycatch might be reduced over time; and whether only legal sized halibut or both legal and sub-legals would count against the halibut IBQ. The TIQC posed a number of questions to be addressed in order to move forward with an option for halibut IBQ. These questions and the responses are provided.

B-2.2.1.a Catcher Vessel Mothership Whiting Endorsement Qualification and History Assignment Page 23

The GAC recommended adding the 1994-2003 time period as an option for allocating catch among permits qualifying for participation in the mothership co-op fishery. The options would then be:

Option 1: best 6 out of 7 years from 1997 through 2003
Option 2: best 8 out of 10 years from 1994 through 2003

The option for allocating IFQ for shoreside whiting is best 8 out of 10 years from 1994-2003. The new coop option, matching the option for IFQs, was added partially out of concern that if the shoreside and mothership options do not match, a vessel that fished in the shoreside fishery in the early years of the allocation period and in the mothership fishery in the later years of the allocation period might receive a near full allocation for both fisheries and, in a sense, would be "double dipping." Some data tables are provided to illustrate this issue.

Previously, the IFQ alternative specified that a permit must drop the same two years in the allocation formula for the shoreside and mothership QS allocation formulas. A similar provision was in place for the co-op alternative. If the GAC recommendation is followed and IFQs are used for the shoreside whiting fishery and co-ops for the at-sea mothership fishery, and if the same time period is used for both fisheries (1994-2003), is it still the Council's intent that the same two years must be dropped? If so, a complexity is created in that relative pounds are used in the IFQ allocation formula (pounds are counted as a percent of the fleet's total catch for each year) but absolute pounds are used in the co-op allocation formula. Absent direction otherwise, analysts will develop a methodology that drops the lowest two years of each permits' catch history such that the permit receives the maximum combined allocation of shoreside QS and mothership coop quota for which it could possibly qualify under the existing options.

A-1.2 Scope for IFQ Management

Species to be Covered by the Primary Catch Control Tool

Catch data provided to the TIQC in May 2008

Table 1. from NMFS report on Total Mortality Report from WCGOP – Estimated total mortality (mt) of major west coast groundfish species during 2005, by sector.
Table 2. from NMFS Report on Total Mortality Report from WCGOP – Estimated total mortality (mt) of major west coast groundfish species in 2006, by sector.
Table 3. Catch of Groundfish in Non-tribal At-sea Fisheries by Year and Species.

Excerpts from the TIQC Report from May 2008:
Species recommended for trigger mechanism management in the shoreside fishery are listed in the table below:

SHORESIDE FISHERY NON-COVERAGE	
Longspine S 34°27'	California Scorpionfish
Minor Nearshore Rockfish N	Cabezon
Minor Nearshore Rockfish S	Kelp Greenling
Black Rockfish (WA)	Shortbelly
Black Rockfish (OR-CA)	Other Rockfish

At-Sea: The TIQC recommended two options for Council consideration: 1) status quo or 2) a trigger mechanism for certain species. The suggested management action at the trigger point could be a bycatch cap that is distributed to the co-ops. At-sea sector species that are recommended for either the trigger mechanism or status quo management are listed in the table below:

AT-SEA FISHERY COVERAGE	
STATUS QUO (and existing co-op alternative)	PROPOSAL FOR COVERAGE
WIDOW	SLOPE ROCK
DARKBLOTCHED	SHELF ROCK
CANARY	CANARY
	DARKBLOTCHED
	LINGCOD
	POP
	SABLEFISH
	WIDOW
	YELLOWTAIL

Table 1. Estimated total mortality (mt) of major west coast groundfish species during 2005, by sector.

	Shoreside commercial fisheries				All at-sea hake fisheries	Shore-side WA Tribal	Total recreational fishing mortality			Research	Remaining GMT Scorecard [3] Values	Estimated total fishing mortality
	Estimated non-hake trawl [1]	Estimated hake trawl	Estimated non-trawl [2]	Total shoreside mortality			CA	OR	WA			
Target species												
Sablefish	2,553	22	3,242	5,817	15	700	0	1	0	10		6,543
Shortspine thornyhead	627	0	147	774	7	11	0	0	0	4		796
Longspine thornyhead	723	0	17	740	0	0	0	0	0	10		750
Dover sole	7,327	0	6	7,333	0	145	0	0	0	28		7,507
Petrale sole	2,732	0	0	2,733	0	30	0	0	0	4		2,766
English sole	1,151	0	0	1,151	0	66	0	0	0	4		1,222
Arrowtooth flounder	3,450	1	87	3,539	4	158	0	0	0	5		3,706
Other Flatfish	1,872	0	2	1,874	3	47	25	0	2	13		1,965
Blackgill rockfish [4]	53	0	36	89	0	0	0	0	0	0		90
Splitnose rockfish [4]	230	0	1	231	0	0	0	0	0	7		237
Other slope rockfish	171	4	87	262	51	28	0	0	0	4		345
Yellowtail rockfish [5]	56	173	10	239	112	539	9	13	20	3		935
Chilipepper rockfish [6]	76	0	3	79	0	0	4	0	0	14		97
Other shelf rockfish	98	27	52	176	6	10	281	6	1	19		501
Black rockfish	1	0	174	175	0	0	180	311	271	0		937
Other nearshore rockfish	1	0	99	100	0	0	441	41	7	0		590
Cabezon	0	0	62	62	0	0	47	17	7	0		133
Kelp greenling	0	0	23	23	0	0	5	4	2	0		35
Pacific hake/whiting	826	97,574	0	98,400	151,003	11,767	0	0	0	42		261,212
Pacific cod	726	1	5	732	0	124	0	0	8	0		864
Spiny dogfish	1,194	96	383	1,672	355	6	3	0	0	9		2,044
Longnose+big+Unsp. skate	1,745	1	141	1,887	1	23	0	0	0	8		1,920
Other groundfish	1,633	188	160	1,981	417	20	0	0	0	8		2,425
Dungeness crab	254	0	1	255	0							255
Tanner crab	252	0	9	261	0							261
Rebuilding species (as of 2005)												
Lingcod	266.3	5.9	91.2	363.4	3.4	29.9	299.3	131.7	58.6	4.0	0.0	890.4
Canary rockfish	26.0	2.2	1.9	30.1	1.4	4.3	2.0	4.9	1.9	2.3	1.8	48.7
Widow rockfish	6.3	76.8	2.1	85.2	80.0	28.6	1.6	1.6		1.6	0.4	198.9
Yelloweye rockfish	0.8	0.0	2.9	3.8	0.0	0.8	0.9	4.1	5.2	0.6	0.3	15.7
Bocaccio [6]	29.3	0.0	4.5	33.8	0.0	0.0	38.1	0.0	0.1	1.7	1.3	75.1
Cowcod [6]	1.4	0.0	0.0	1.5	0.0	0.0	0.4	0.0	0.0	0.1	0.0	2.0
Pacific ocean perch [7]	67.7	0.5	1.0	69.2	1.7	3.5	0.0	0.0	0.0	1.8	0.0	76.2
Darkblotched rockfish	100.4	5.5	4.8	110.6	11.1	0.1	0.0	0.0	0.0	2.1	0.0	123.9

[1] Includes minor landings by trawlers not targeting groundfish

[2] Includes minor landings made with troll gear

[3] The Pacific Fishery Management Council's Groundfish Management Team Bycatch Scorecard (Table 17) contains estimates of mortality for species that are managed under rebuilding plans.

[4] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.

[5] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.

[6] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

[7] Amounts in this row are for the area north of 40°10' N. Lat.

Table 2. --Estimated total mortality (mt) of major west coast groundfish species during 2006, by sector.

	Shoreside commercial fisheries				All at-sea hake fisheries	Shore-side WA Tribal	Total recreational fishing mortality			Research	Remaining GMT Scorecard [3] Values	Estimated total fishing mortality
	Estimated non-hake trawl [1]	Estimated hake trawl	Estimated non-trawl [2]	Total shoreside mortality			CA	OR	WA			
Non-rebuilding species												
Sablefish mortality	2,654	11.0	3,119	5,785	2	669	0.0	2.1	0	11		6,470
Shortspine thornyhead	649	0.1	178	827	0.5	21	0.0	0	0	4		853
Longspine thornyhead	821	0	21	843	0.0		0	0	0	11.6		854
Dover sole	7,476	0.0	5	7,480	0.0	221	0	0.0	0	28.8		7,730
Petrale sole	2,690	0.0	4	2,694	0	26	0.5	0.0	0	2.3		2,723
English sole	1,291	0.0	0.0	1,291	0.0	42	0.0	0.0	0	2.5		1,336
Arrowtooth flounder	2,818	2.3	79	2,899	2.8	197	0	0.0	0	6.1		3,105
Other Flatfish	1,855	0.1	4	1,859	0.3	60	27.6	3.3	0.2	11.8		1,962
Blackgill rockfish [3]	66	na	57	123	na	na	0	na	na	0.4		123
Splitnose rockfish [3]	159	na	0	160	na	na	0	na	na	2.1		162
Other slope rockfish N	187	2.8	58	248	8.2	25	0	0.0	0	2.5		283
Other slope rockfish S	122	na	10	132	na	na	0.0	na	na	1.3		133
Yellowtail rockfish [4]	32	153.7	3	189	109	172	0.4	8.7	13.9	1.2		493
Chilipepper rockfish [5]	116	na	0	116	na	na	1.6	na	na	8.3		126
Other shelf rockfish N	46	9.2	18	73	4	10	5.8	6.3	0.6	4.6		104
Other shelf rockfish S	22	na	35	57	na	na	275	na	na	3.1		334
Black rockfish	5	0	156	161		0.0	186	281	268	0		896
Other nearshore rockfish N	3	0.1	34	37	0.0	1.1	18.3	31.5	7.9	0.0		96
Other nearshore rockfish S	0	na	61	61	na	na	649	na	na	0.0		711
Lingcod mortality	272	5.4	100	378	3.2	45	348	127	47	5.3		952
Cabezon	0	0	51	51	0	0	31.6	18.7	4.3	0		106
Kelp greenling	0	0	17	17	0	0	8.2	21.7	1.6	0.0		48
Pacific hake	942	97,078	0	98,021	139,774	29,896	0.1	0.1	0	16.0		267,707
Pacific cod	344	0.9	0.5	346	0.1	36	0	0.0	3.5	0.2		385
Spiny dogfish	666	33.2	563	1,262	59	77	3.9	0.0	0	5.8		1,407
Longnose+big+Unsp. skate	780	1.7	198	980	0.8	39	1.1	0	1.6	7.3		1,029
Other groundfish	842	1.7	78	922	1.0	0.9	88.6	0.0	0.2	2.6		1,015
Rebuilding species												
Canary rockfish	23.7	1.6	2.9	28.2	1.1	2.9	12.3	2.9	1.1	7.2	1.3	57.0
Widow rockfish	6.5	47.9	0.8	55.2	143.3	9.9	3.3	1.1	0	0.2	0.9	213.8
Yelloweye rockfish	1.4	0.1	1.5	2.9	0.0	0.5	4.1	2.5	1.7	0.1	0.4	12.2
Bocaccio [5]	18.8	na	0.0	18.8	na	na	42.0	na	na	0.2	0.3	61.3
Cowcod [5]	0.9	na	0	0.9	na	na	0.2	na	na	0.0	0.0	1.1
Pacific ocean perch [6]	71.7	0.1	0.3	72.1	3.1	3.9	0	0	0	1.2	0.0	80.3
Darkblotched rockfish	178.5	2.1	0.5	181.1	11.1	0.1	0	0	0	0.9	0.0	193.3

[1] Includes minor landings by trawlers not targeting groundfish [2] Includes minor landings made with troll gear [3] The Pacific Fishery Management Council's Groundfish Management Team Bycatch Scorecard (Table 17) contains estimates of mortality from non-groundfish fisheries for species that are managed under rebuilding plans.

[4] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Slope Rockfish category.

[5] Amounts in this row are for the area north of 40°10' N. Lat. Southern catch is included in the Other Shelf Rockfish category.

[6] Amounts in this row are for the area south of 40°10' N. Lat. Northern catch is included in the Other Shelf Rockfish category.

[7] Amounts in this row are for the area north of 40°10' N. Lat.

Table 3.

Catch of Groundfish in Non-Tribal At-Sea Fisheries by Year and Species

Species	YEAR 2005	2006	2007
ARROWTOOTH FLOUNDER	1.3	1.1	2.5
AURORA ROCKFISH	0.0	0.0	0.0
BANK ROCKFISH	0.0	0.0	0.2
BIG SKATE	0.7	0.6	0.7
BLACK ROCKFISH	0.0	0.0	0.0
BLACKGILL ROCKFISH	0.0		0.0
BLUE ROCKFISH		0.0	
BOCACCIO	0.3	0.1	0.1
CANARY ROCKFISH	1.0	1.0	2.0
CHILIPEPPER	1.1	3.8	0.3
DARKBLOTCHED ROCKFISH	11.1	11.0	12.0
DOVER SOLE	0.4	0.0	0.1
ENGLISH SOLE	0.1	0.0	0.0
FLATHEAD SOLE	0.0	0.0	0.0
GREENSTRIPED ROCKFISH	0.0	0.0	0.0
HARLEQUIN ROCKFISH		0.0	
KELP GREENLING	0.0	0.0	
LINGCOD	2.4	3.1	5.2
LONGNOSE SKATE	0.6	0.1	0.6
LONGSPINE THORNYHEAD		0.0	
PACIFIC COD	0.0	0.0	0.0
PACIFIC HALIBUT	1.8	0.6	1.1
PACIFIC OCEAN PERCH	1.6	2.6	3.6
PETRALE SOLE			0.0
QUILLBACK ROCKFISH		0.0	
REDBANDED ROCKFISH	0.0		
REDSTRIPE ROCKFISH	4.5	0.2	1.1
REX SOLE	3.2	0.3	0.3
ROSETHORN ROCKFISH	0.0	0.0	0.0
ROUGHEYE ROCKFISH	35.9	6.6	28.9
SABLEFISH	15.1	2.5	3.1
SHARPCHIN ROCKFISH	0.0	0.0	0.8
SHORTBELLY ROCKFISH	2.7	11.4	0.0
SHORTRAKER ROCKFISH	0.3	0.4	0.3
SHORTSPINE THORNYHEAD	7.1	0.5	2.8
SILVERGREY ROCKFISH	0.1	0.0	0.1
SLENDER SOLE	0.0	0.0	0.0
SOUPFIN SHARK	0.4	0.9	0.5
SPINY DOGFISH	70.1	22.9	86.4
SPLITNOSE ROCKFISH	15.1	1.0	2.2
SPOTTED RATFISH	0.0	0.0	0.0
STRIPETAIL ROCKFISH	0.1	0.0	0.0
TIGER ROCKFISH		0.0	
WIDOW ROCKFISH	78.6	139.2	145.5
YELLOWEYE ROCKFISH		0.0	0.0
YELLOWFIN SOLE		0.0	
YELLOWMOUTH ROCKFISH		0.0	0.0
YELLOWTAIL ROCKFISH	72.9	63.1	68.5

A-1.2 IFQ Management Units

Area Subdivision

Excerpt from GMT Report on Amendment 20 from November 2007:

Currently, the Council uses latitudinal and depth-based spatial management measures, as well as gear restrictions, to achieve area management objectives. If implemented as currently specified, trawl IQs may result in catch being more concentrated in smaller areas than under status quo. The GMT reiterated its recommendation that IQ be allocated on a more refined spatial scale than is currently being considered. In doing so, the GMT noted that care should be taken to balance biological objectives with economic objectives.

Establishing an IQ system that **separates groundfish stocks north and south of 40° 10'** North Latitude (e.g., **based on average fleet catch history in each area during the 1994-2003 period**) – and allocates individual fishing quotas accordingly – would provide an appropriate balance between biological, economic, and administrative objectives until a more appropriate set of areas can be established.

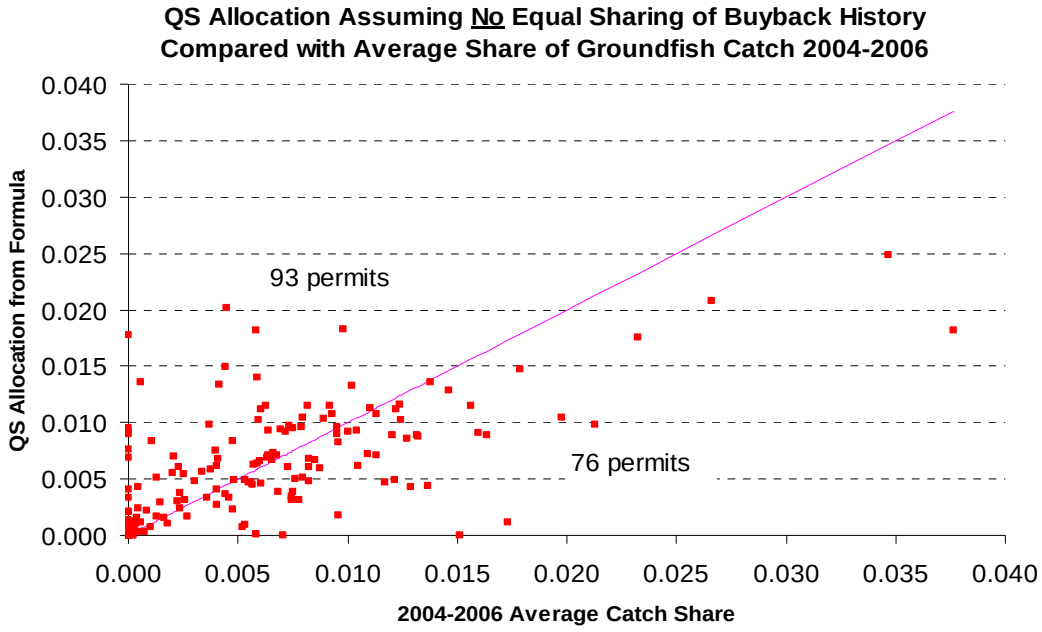
Excerpt from GMT Report on Amendment 20 from June 2007 (see page 27 for full report):

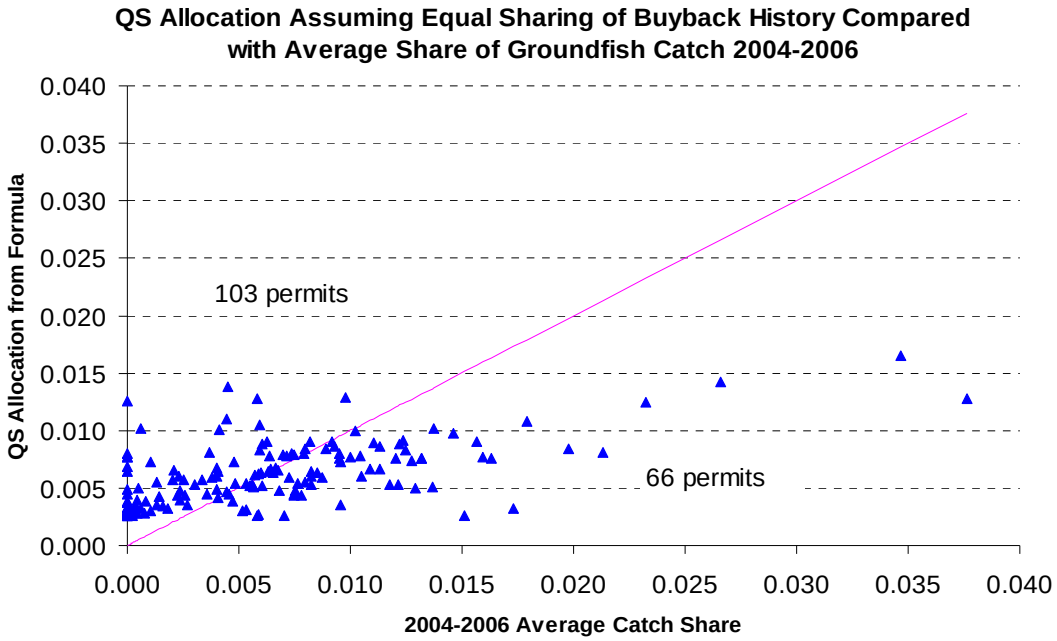
The GMT recommended that **the TIQ program incorporate area management tools currently in use** and continue to pursue data and research informing spatial management. Depending on the results of the data compilation and review, determine whether and how spatial management concepts could be used in developing fishery management measures for the 2009-2010 biennium as well as the development of an Ecosystem Fishery Management Plan.

A-2.1.1.d Allocation Formula, Permits with Catcher Vessel History

Equal Allocation of History Associated with Buyback Permits

The figure below illustrates expected shares of non-whiting harvest allocated to each permit as compared (vertical axis) to the 2004-2006 average share of nonwhiting harvest for each permit (horizontal axis). The top graph shows this comparison using a QS allocation formula based entirely on catch history and the bottom graph shows the comparison using a QS allocation formula that includes equal sharing of the catch history related to buyback permits. Permits along the diagonal line would be expected to receive an allocation comparable to their 2004-2006 catch. The graphs show that with an allocation formula based only on catch history 93 permits would receive more than their 2004-2006 average but with a formula that includes an equal allocation component 103 permits would receive more than their 2004-2006 average. At the same time, with an allocation formula based on catch history the maximum share of total QS revenue by any permit would be about 0.025 while with an equal allocation the maximum share would be about 0.016. Under equal allocation, the minimum share would be about 0.002.





Bycatch Rates for Use in Allocating Overfished Species

Area Stratification of Bycatch Rates for Use in Assigning Overfished Species Quota Shares based on a Bycatch Rate

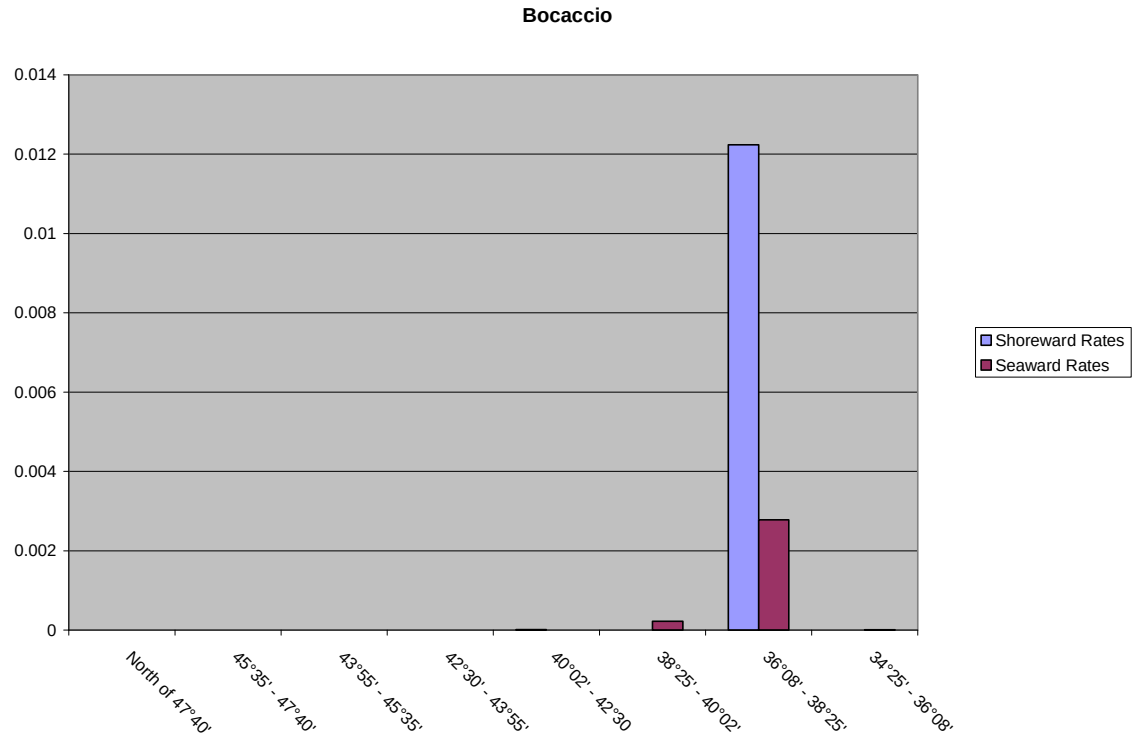
At the May meeting of the Groundfish Allocation Committee (GAC), the GAC requested that staff look into a more refined spatial scale of bycatch rates that could potentially be used for allocating overfished species based on a bycatch rate. Available data indicates that bycatch rates can differ substantially by latitudinal area and also by seaward or shoreward of the RCA. However, some limitations exist on refining data spatially because that data is a sample. In some cases, insufficient sample sizes exist for estimating a bycatch rate.

Based on patterns evident in available data and the limitation of available, staff developed the following proposals that illustrate areas to be considered for allocating based on a bycatch rate. These proposals would replace the existing proposal of allocating based on bycatch rates north and south of 40 10 if it is determined that allocating based on areas north and south of 40 10 is too broad and does not adequately capture variations in overfished species bycatch along the coast:

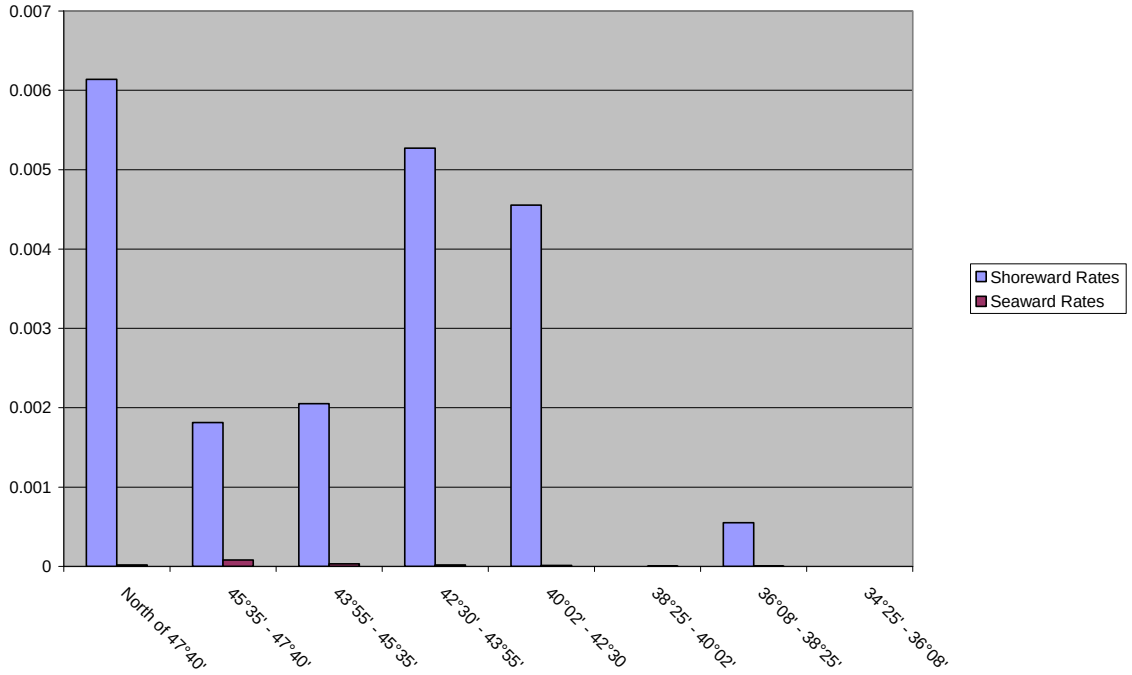
Existing Proposal:	North of 40 10 South of 40 10
Option 1:	North of 47 40 Between 47 40 and 43 55 Between 43 55 and 40 10 Between 38 and 40 10 South of 38
Option 2:	North of 47 40 Between 47 40 and 43 55 Between 43 55 and 40 10 South of 40 10

The difference between options 1 and 2 is the treatment of the area between 38 and 40 10. That area has a distinctly different bycatch of darkblotched rockfish, however the use of available data would result in no canary being allocated to vessels with catch history in that area. Therefore, option 2 results in more vessels receiving at least some overfished stocks, while option 1 results in a potentially more refined allocation of darkblotched based on recent fishing patterns. In both cases the entire area south of 38 is combined because several sub-areas do not appear to have sufficient observations for calculating an independent bycatch rate.

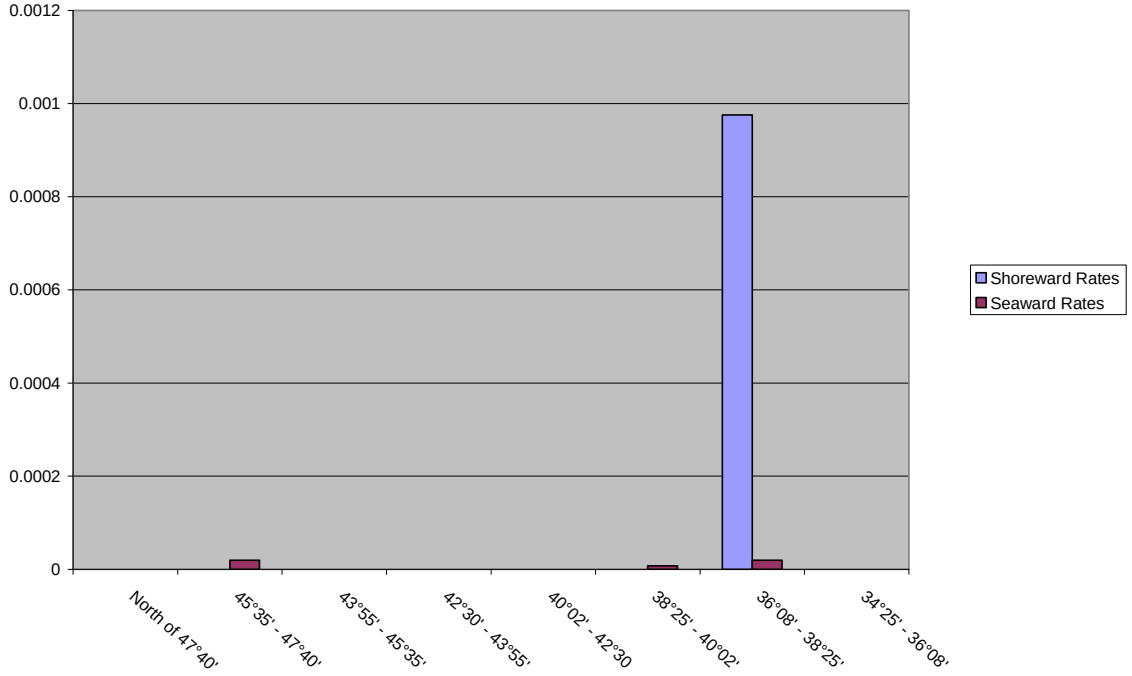
Figures illustrating the data used to develop the above options are shown in the figures below.



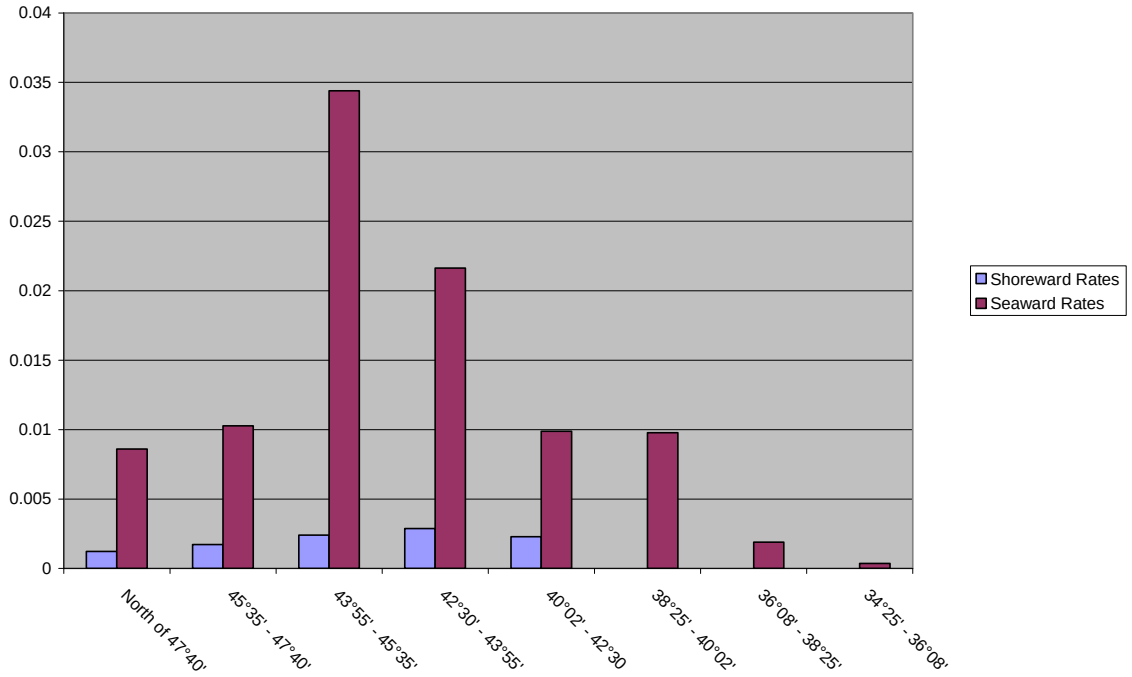
Canary



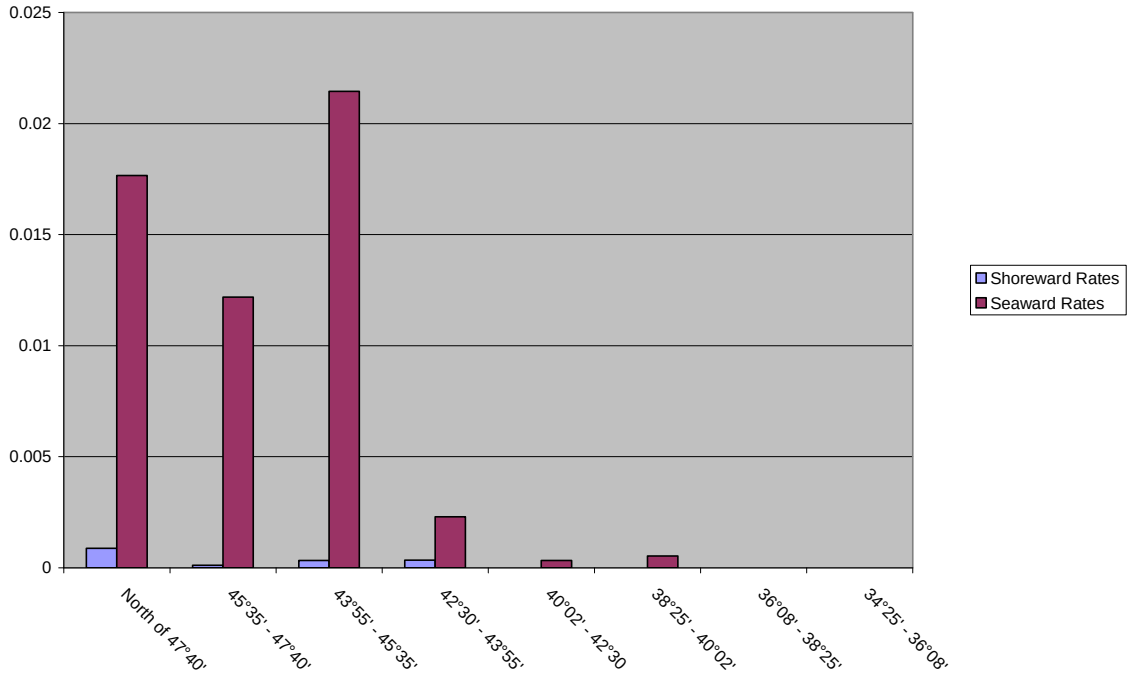
Cowcod



Darkblotched



Pacific Ocean Perch



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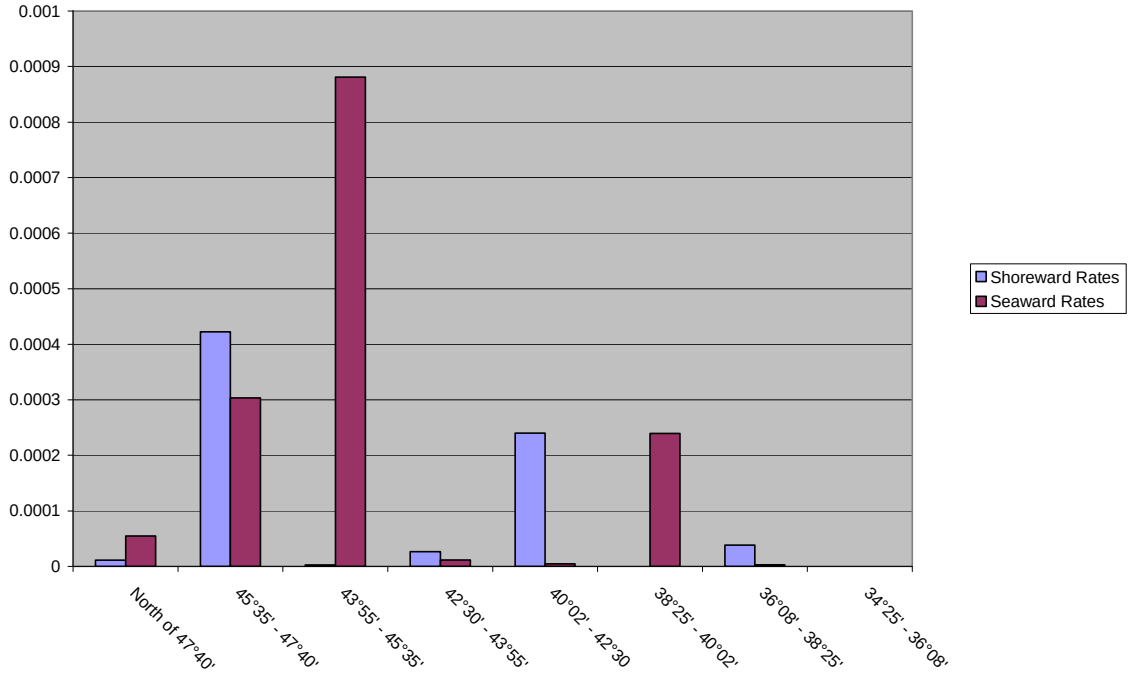

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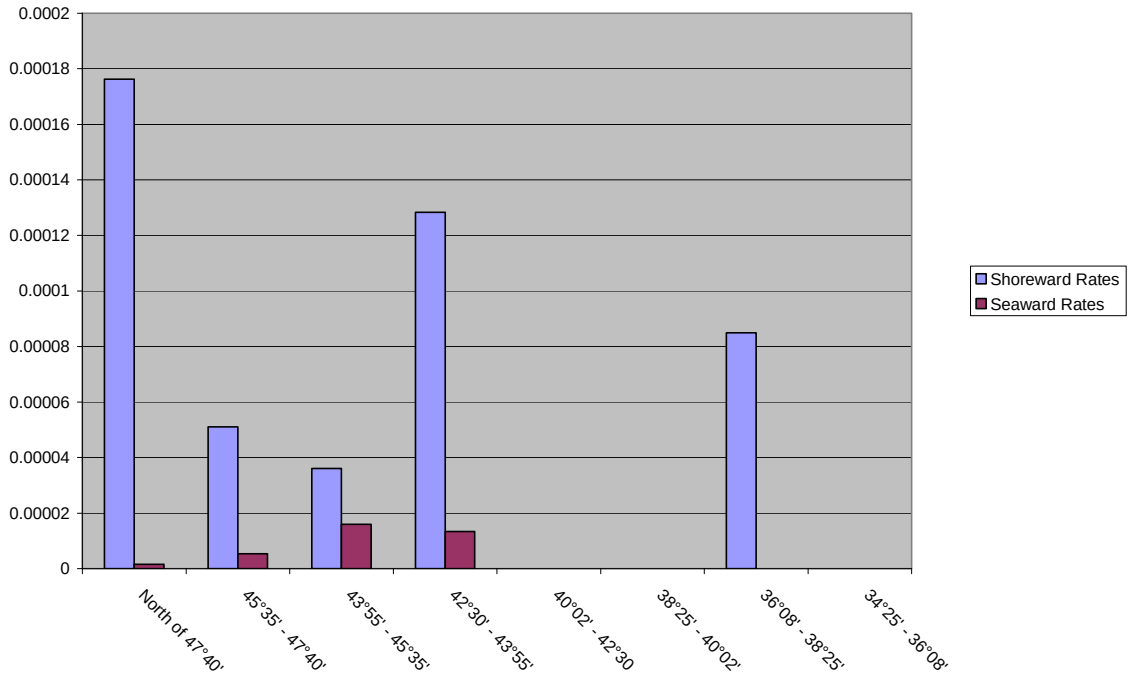

A-2.2.1 Permit/IFQ Holding Requirement

Fishing Prohibitions and Groundfish Catch in Nongroundfish Fisheries

Table 4. Groundfish catch in non-groundfish fisheries.

		Pacific Halibut Longline	Ridgeback Prawn Trawl	Cal Halibut Hook and Line	Dungeness crab - Pot	Shrimp pot	Pink Shrimp Trawl	Salmon troll	Cal Halibut Trawl
Year	lbs range	Number of boats							
2000	<100	29	19	69	32	9	18	253	21
	100-200	12	11	2	1	2	11	40	9
	>200	8	7	1	1		54	40	13
2001	<100	24	13	67	24	7	26	230	29
	100-200	10	11	4	1	5	15	34	16
	>200	10	10	1	1	1	42	19	18
2002	<100	34	11	58	21	4	21	191	27
	100-200	8	6	3	1	3	10	21	14
	>200	10	5		1	1	38	13	9
2003	<100	25	11	45	15	4	4	184	17
	100-200	13	8	1	1	3	1	24	3
	>200	14	6	2	2	2	3	12	3
2004	<100	17	4	44	5	3	2	209	11
	100-200	11	2	8	2	1	1	51	9
	>200	27	2	4	1	1	1	18	8

A-2.2.3.e Accumulation Limits

Changes in Permit Ownership

In order to evaluate the TIQC recommendation to establish control accumulation limits based on permit as of January 1, 2004 (shoreside) or January 1, 2008 (at-sea) we need to determine how that ownership varies from the ownership relationships identified in the current data set. The following are the permits for which we believe there may have been a change in ownership during this period (January 1, 2004 through January 1, 2008). Change was evaluated based on comparisons of names and addresses. This information is being published here and comment is requested on whether of any of the possible ownership changes we have identifies are not, in fact, ownership changes.

Table 5 – Permits and Ownership Change from January 1, 2004 to January 1, 2008

PERMIT	2004 Vessel	2004 Owner	Current Data Set (fall 2006)	2008 Vessel	2008 Owner
GF0026	CASSANDRA ANNE	CASSANDRA ANNE LLC	CASSANDRA ANNE LLC	CASSANDRA ANNE	OLYMPIC STAR LLC
GF0433	SEA CLIPPER	SEA PACIFIC INC	CALIFORNIA SHELLFISH COMPANY INC	SEA CLIPPER	SEA CLIPPER LLC
GF0008	UNIDENTIFIED	STANDARD FISHERIES CORP	THE NATURE CONSERVANCY	SOUTH BAY	THE NATURE CONSERVANCY
GF0068	UNIDENTIFIED	DILLER, WILLIAM G AND DILLER, JANA R	THE NATURE CONSERVANCY	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0083	CYNTHIA	LARSEN, HARLEN K AND LARSEN, DARLENE R	LARSEN, HARLEN K AND LARSEN, DARLENE R	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0110	UNIDENTIFIED	TORACCA, GIOVANNI AND LEE, GORDON AND LEE, SHARON	THE NATURE CONSERVANCY	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0453	UNIDENTIFIED	B & J FISHERIES INC	THE NATURE CONSERVANCY	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0470	UNIDENTIFIED	KUBIAK, DONALD J AND KUBIAK, CHRISTOPHER J	THE NATURE CONSERVANCY	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0589	UNIDENTIFIED	KUBIAK, DAVID ALLEN AND KUBIAK, DONALD J	THE NATURE CONSERVANCY	UNIDENTIFIED	THE NATURE CONSERVANCY
GF0031	FATE HUNTER	SEA SYSTEMS INC	LARKIN, MARION JEAN	UNIDENTIFIED	LARKIN, MARION JEAN
GF0136	OCEAN HUNTER	FLOTRE, MICHAEL G	LARKIN, MARION JEAN	OCEAN HUNTER	LARKIN, MARION JEAN
GF0675	NORDIC FURY	RAINIER INVESTMENTS INC	FURY GROUP INC	NORDIC FURY	FURY GROUP INC
GF0064	MARIE KATHLEEN	FREDERIC, GARY LOUIS	HODGES MICHAEL E AND JOHN MORELAND FISHING	MARIE KATHLEEN	HODGES MICHAEL E AND JOHN MORELAND

Table 5 – Permits and Ownership Change from January 1, 2004 to January 1, 2008

PERMIT	2004 Vessel	2004 Owner	Current Data Set (fall 2006)	2008 Vessel	2008 Owner
			INC		FISHING INC
GF0239	SOJOURN	F/V LIBRA INC	HODGES MICHAEL E AND JOHN MORELAND FISHING INC	SOJOURN	HODGES MICHAEL E AND JOHN MORELAND FISHING INC
GF0111	TRAVELER	F/V LESLIE LEE INC AND HALL DAN AND HOCKEMA REX	TRAVELER FISHERIES LLC	TRAVELER	TRAVELER FISHERIES LLC
GF0143	TWO SAINTS	ASTUY JR, PETER R	RIPKA, GARY A AND RIPKA, SHERRI	TWO SAINTS	RIPKA, GARY A AND RIPKA, SHERRI
GF0280	WESTERN BREEZE	ST CLAIR, JUNE M	RIPKA, GARY A AND RIPKA, SHERRI	WESTERN BREEZE	RIPKA, GARY A AND RIPKA, SHERRI
GF0947	UNIDENTIFIED	KUNTZ, LEO AND KUNTZ, KAREN	F/V LESLIE LEE INC	UNIDENTIFIED	F/V LESLIE LEE INC
GF0639	UNIDENTIFIED	CRAMER, LEO J AND CRAMER, JUNE I	WEST COAST FISHERY INVESTMENTS LLC	UNIDENTIFIED	WEST COAST FISHERY INVESTMENTS LLC
GF0971	STARWARD	FISH PRODUCTS INC	PEESHBAD LLC	STARBOUND	WEST COAST FISHERY INVESTMENTS LLC
GF0222	UNIDENTIFIED	HAMANN, FREDERICK L	JOHNSON, CARROLL R	ANDIAMO	JOHNSON, CARROLL R
GF0705	STORMBRINGER	JOHNSON, JAMES W	JOHNSON, CARROLL R	STORMBRINGER	JOHNSON, CARROLL R
GF0268	MISTASEA	RODGERS, BLAINE B	SMITH, RANDY JAY	MISTASEA	SMITH, RANDY JAY
GF0272	CALAMARI	HOGEVOLL, BENSON AND HOGEVOLL, RODNEY	F/V CALAMARI INC	CALAMARI	F/V CALAMARI INC
GF0273	PACIFIC CHALLENGER	PETERSON, CHESTER T	PACIFIC DAWN LLC	PACIFIC CHALLENGER	PACIFIC DAWN LLC
GF0376	UNIDENTIFIED	GREEN, DONALD WESLEY	PACIFIC DAWN LLC	UNIDENTIFIED	PACIFIC DAWN LLC
GF0279	CAPT. RYAN	M/V LILY MARLENE INC	MORRISON, THOMAS H	CAPT. RYAN	MORRISON, THOMAS H
GF0435	GOD'S WILL	CAPT NICE INC	UNDER GOD'S WILL INC	GOD'S WILL	UNDER GOD'S WILL INC
GF0665	OCEAN BEAUT	BARTLEY, RONALD W AND BARTLEY, ANNETTE M	F/V OCEAN BEAUT INC	OCEAN BEAUT	HODGES MICHAEL E AND JOHN MORELAND FISHING INC
GF0689	BRANDY	HOCKEMA FISHING INC	F/V BRANDY INC	BRANDY	F/V BRANDY INC
GF0078	PACIFIC FUTURE	BLUE WATER FISHERIES INC	PACIFIC FUTURE LLC	PACIFIC FUTURE	PACIFIC FUTURE LLC
GF0126	SEA PRINCESS	NOYO MARITIME INC	SEA PRINCESS LLC	SEA PRINCESS	SEA PRINCESS LLC
GF0315	PRIVATEER	DODSON, DONALD E AND DODSON, BERNADINE L	PACIFIC CHOICE SEAFOOD COMPANY	JO MARIE	PACIFIC CHOICE SEAFOOD COMPANY

Table 5 – Permits and Ownership Change from January 1, 2004 to January 1, 2008

PERMIT	2004 Vessel	2004 Owner	Current Data Set (fall 2006)	2008 Vessel	2008 Owner
GF0323	UNIDENTIFIED	LIBERTY RIDGE SEAFOOD INC AND BANK OF AMERICA NW NT AND SA DBA SEAFIRST BANK	S & S SEAFOOD CO INC	PRIVATEER	S & S SEAFOOD CO INC
GF0417	UNIDENTIFIED	SYLVESTER, EDWARD J AND SYLVESTER, LUPE G	PACIFIC CHOICE SEAFOOD COMPANY	UNIDENTIFIED	PACIFIC CHOICE SEAFOOD COMPANY
GF0956	PACIFIC HOOKER	JOHNSON, CARROLL R	PACIFIC HOOKER LLC	PACIFIC HOOKER	PACIFIC HOOKER LLC
GF0351	PACIFIC PRINCE	PACIFIC PRINCE LICENSE PARTNERS	AMERICAN SEAFOODS COMPANY LLC	PACIFIC PRINCE	AMERICAN SEAFOODS COMPANY LLC

A-4 Halibut Individual Bycatch Quota (IBQ)

TIQC Questions on Halibut IBQ

Is trawl caught halibut a conservation issue?
No. The International Pacific Halibut Commission (IPHC) manages the conservation and sustainability of the Pacific halibut resource by conducting an annual coastwide stock assessment, and developing and setting directed fishery catch limits. IPHC accounts for bycatch mortality in an area prior to setting the catch limits for the directed halibut fisheries. Halibut individual bycatch quota (IBQ) could provide a way to proactively and effectively account for bycatch of halibut in the trawl fishery, which is an objective of the Trawl Rationalization program.

Is trawl caught halibut an allocation issue?
Yes. As in all areas, Area 2A has a Total Constant Exploitation Yield (TCEY), and the estimated amount of trawl bycatch of halibut is taken off the top of the Area 2A TCEY. The trawl caught halibut subtracted from the TCEY is expressed in pounds of legal-sized halibut mortality. Under the Trawl Rationalization program, all bycatch will likely be accounted for. If the trawl bycatch of halibut increases, or is more than what is currently being estimated, then the trawl sector bycatch may constrain directed halibut fisheries inseason and/or in the future. If the trawl sector mortality is stabilized then the likelihood of the trawl fishery pre-empting directed halibut fisheries is minimized. Conversely, if it increases, the allocation to the directed fisheries goes down.

How is Constant Exploitation Yield (CEY) determined?
CEY is the yield associated with an exploitation rate, which when applied to the entire population would achieve something like maximum sustainable yield (MSY), maximum sustainable production (MSP), optimum sustainable yield (OSY), etc. TCEY is the product of the exploitable biomass times the exploitation, or harvest, rate. TCEY is expressed in terms of legal-sized halibut, since the primary target halibut fishery can only retain and land legal-sized halibut.

How is the halibut bycatch rate in the west coast trawl fishery currently determined?
The halibut bycatch rate in the west coast trawl fishery is based on data from the West Coast Groundfish Observer Program, including observed rates of bycatch and stratified by season, depth, latitude and amount of arrowtooth flounder catch. Effort information is from Oregon and Washington trawl logbooks.

What are the factors that determine mortality, and do they include sublegal halibut? If so, should there be Quota Shares (QS) for sublegal halibut?
For Area 2A, the discard mortality rate (DMR) is 50 percent of total catch, and mortality of legal and sublegal are treated the same. At this time, the DMR is based on some historical average and is not based on condition/release data collected by observers. Although using the observed condition may be possible depending on observer coverage, the current percentage of observer coverage is not extensive enough. In British Columbia

(B.C.), where the trawl fleet has near 100 percent observer coverage, the DMR is based on observed condition and in some instances is lower than 50 percent. IPHC studies have found that discard mortality in trawl fisheries is dependant on the size of the fish, the target fishery, and the duration and size of the trawl haul. The IPHC staff recommends that tradable quota shares/pounds apply to all halibut of any size to be fully effective at managing bycatch, same as the B.C. Individual Vessel Quota (IVQ) program.

How are these [bycatch rate] estimates generated for west coast areas, which data is being used, and what does it show?

The bycatch rate estimates are generated by National Marine Fisheries Service (NMFS) Northwest Region using West Coast Groundfish Observer Program (WCGOP) halibut bycatch information, stratified by season, depth, latitude and amount of arrowtooth flounder, and multiplied by effort in each stratum using Oregon and Washington logbook information. In the 2007 NMFS report by Hastie and Wallace halibut bycatch was estimated to be 923,693 lbs. in 2003, declined to 489,882 lbs. in 2004, then increased to 715,752 lbs. in 2005, and was 666,782 lbs. in 2006. In order to compare those numbers to the TCEY, the legal-sized mortality were estimated in the same NMFS report as follows; 366,745 lbs (2003); 171,754 lbs. (2004); 228,049 lbs. (2005); and 251,507 lbs (2006).

What did they do in Area 2B to get the mortality down?

Up until 1995, before trawl rationalization, the B.C. trawler fishery was estimated to have taken 1.5-1.7 million pounds of halibut bycatch mortality annually (all sizes). At the onset of the IVQ program, a cap of 1 million pounds was established by Canada's Department of Oceans and Fisheries for the B.C. trawl sector. In 1996, after implementation of the trawl IVQ management program and an IBQ program for managing the halibut bycatch, bycatch was just under 300,000 pounds. Reasons for this large reduction include: the concurrent decline of the cod fishery; avoidance behavior by harvesters; and slower conduct of fishing operations. In addition, 100 percent observer coverage allowed quick and accurate feed back to the skipper of pounds of halibut caught and discarded each trip.

Is the trawl share of Pacific halibut based on abundance, mortality, or catch?

Currently the trawl fleet has no cap on the amount of halibut caught, discarded or killed. The estimated mortality of the legal-sized halibut comes from the WCGOP. Thus, the basis of the accounting of halibut mortality in the groundfish trawl fishery is catch. Mortality is estimated using the 50 percent discard mortality rate.

Submit a request to Northwest Fishery Science Center (NWFSC) for the halibut catch information in the bottom trawl fishery (we have all the other sectors information currently).

Request drafted for finer scale geographic information on trawl halibut bycatch.

Consider whether different bycatch rates in the Vancouver and Columbia management areas would produce different IBQ allocations. Would this be an issue for those who fish near that dividing line?

Halibut bycatch rates are different in the two areas. There is no biological reason to divide Area 2A into finer scales of management, and therefore a policy matter. The Council may wish to base initial allocation of IBQ on the different rates of bycatch in the two areas, but after initial allocation IBQ would be tradable to anywhere in Area 2A and would not be tracked by sub-area.

From what pool would the Halibut IBQ be allocated? In other words, we don't have an ABC/OY for this species so what would the starting amount be for IBQ shares? Should that amount be determined through the Intersector Allocation process? Or could the assumed catch amount in the trawl fishery be the starting point?

A cap on the amount of halibut caught by the trawl sector is necessary to determine quota shares and quota pounds. The cap could be based on past catch amounts, it could be a poundage amount or a percentage of the CEY or directed fishery catch limit, and the cap could ramp down over time. Washington Department of Fish and Wildlife (WDFW) has developed a draft proposal on how to link the cap to the Area 2A directed fishery catch limit (see proposal attached). The best place to deal with the establishing the halibut IBQ pool would be under Fishery Management Plan (FMP) Amendment 21 on Intersector Allocation.

Would recent catch history be used to reflect the establishment of Rockfish Conservation Areas (RCA), or would it be better to look at a longer range of years because the abundance of halibut varied?

Before 2002, the estimate of the trawl fishery halibut bycatch mortality was based on NMFS gear experiments involving limited fishery observations. After 2002, the bycatch rate and estimated amounts were based on the West Coast Groundfish Observer program, which more closely reflects the fishery today under the RCA configuration. The halibut bycatch cap could also be linked to current halibut abundance, as in the WDFW draft proposal.

WDFW DRAFT

PROPOSED PROCESS FOR ANNUAL HALIBUT INDIVIDUAL BYCATCH QUOTA (IBQ) UNDER TRAWL RATIONALIZATION PROGRAM

Current Process

- National Marine Fisheries Service Northwest Fisheries Science Center produces annual report using West Coast Groundfish Observer Program data to estimate bycatch of legal-sized halibut in trawl fishery

- Report presented to Pacific Fishery Management Council (PFMC) November of following year (i.e., trawl bycatch estimate for 2006 presented in November 2007)

- Annual Total Allowable Catch (TAC) set by International Pacific Halibut Commission (IPHC) in January
    - Using stock assessment and survey data, determine harvestable amount of halibut in Area 2A (West Coast)
    - Subtract trawl bycatch estimate from harvestable amount to set annual TAC
    - TAC distributed to directed and incidental fisheries (tribal, commercial, and recreational) through PFMC Catch Sharing Plan

Problem

Trawl sector quota and individual quotas need to be set in advance of start of fishing year; waiting until January IPHC meeting to determine trawl and IBQ amounts is not feasible.

Proposed Process

- Set trawl sector allocation based on proportion from 2005-06 time period (~15%)
- Apply to previous year's TAC to calculate amount (sector quota, quota shares, and quota pounds)
- Annual TAC set by IPHC in January
    - Using stock assessment and survey data, determine harvestable amount of halibut in Area 2A
    - Subtract trawl sector quota from harvestable amount to set annual TAC

For example:

1. IPHC sets TAC for 2010 at 1 million lbs and trawl rationalization (and trawl IBQ at 15%) becomes effective 2011
2. Using 2010 TAC, trawl IBQ set at 150,000 lbs. for 2011
3. In 2011, halibut TAC reduced to 900,000 lbs
4. Harvestable TAC for 2011 would be 900,000-150,000 = 750,000 lbs (to be shared according to catch sharing plan)
5. In 2012, halibut TAC increased to 1 million lbs. Using 2011 TAC, trawl IBQ set at 135,000 for 2012 (which is 15% of 900,000 lbs)
6. Harvestable TAC for 2012 would be 1,000,000-135,000 = 865,000 lbs

B-2.2.1.a Catcher Vessel Mothership Whiting Endorsement Qualification and History Assignment

The figure illustrates total shoreside and mothership whiting "allocations" for two different combinations of qualifying periods: 1994-2003 shoreside and 1997-2003 mothership on the vertical axis; and 1994-2003 for both shoreside and mothership on the horizontal axis. Points represent permits. Permits along the diagonal line are relatively unaffected by the different formulas. The table shows participation pattern of permits in the whiting fishery. For each year it is indicated whether the vessel participated in the shoreside whiting fishery (S), mothership whiting fishery (M), or both (MS). The right hand columns show the proportion of each vessel's total years of participation in each sector during 1994-2003 that occurred between 1994 and 1996. If the 1997-2003 allocation period is used for the mothership sector, then those permits participating in the shoreside fishery early, and in the mothership fishery late, would benefit (see for example, rows one and two).

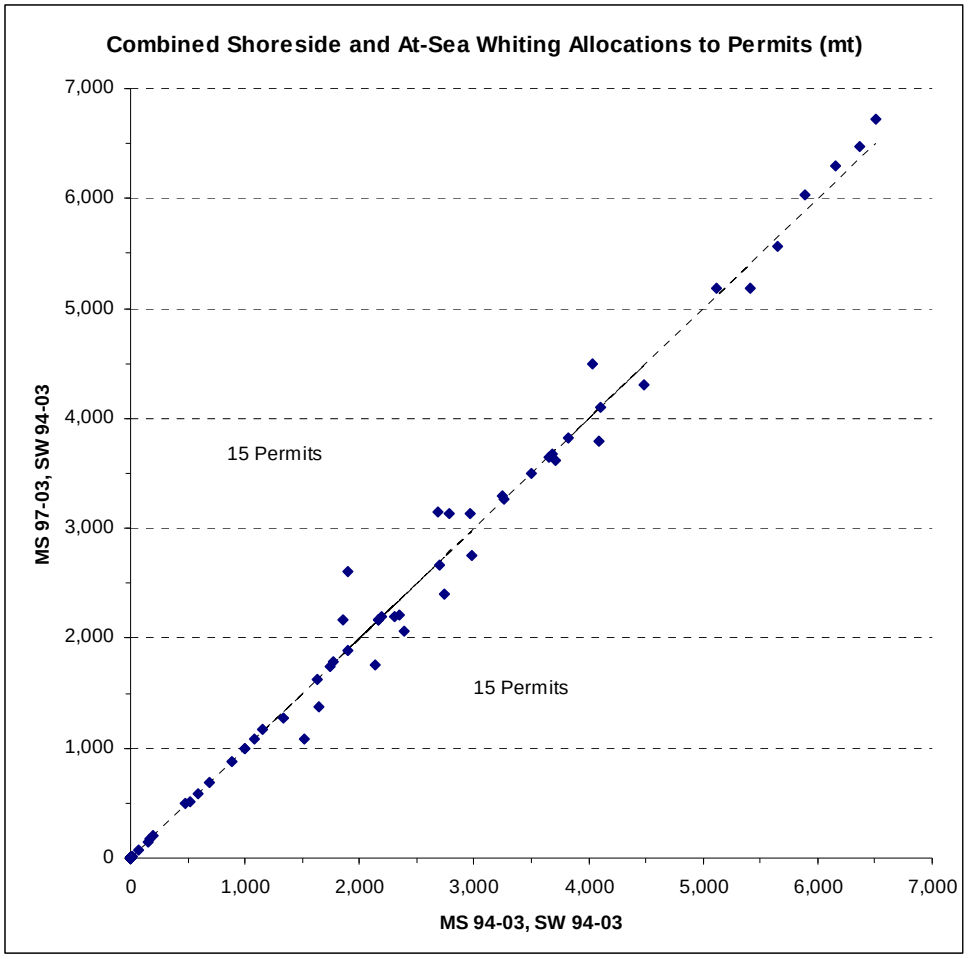

Table 6. Participation in shoreside (S), mothership (M) and shoreside and mothership (MS) fisheries by permit (rows) and years (columns), number of years of shoreside participation in 1994-1996 (S or MS) as a proportion of total years of shoreside participation 1994-2003 (S or MS), and number of years of mothership participation in 1994-1996 (M or MS) as a proportion of total years of mothership participation 1994-2003 (M or MS)

														Count of Years			94-96 Shoreside Years as a Proportion of 94-03 Shoreside Years	94-96 Mothership Years as a Proportion of 94-03 Mothership Years
Permit	94	95	96	97	98	99	00	01	02	03	04	05	06	Mother-ship only	Shore-side only	Mother-ship and Shoreside		
1	S	S	S	S	M	MS	MS	M	M	M			M	5	4	2	0.50	
2	S	S	S	S	M	M	M	M				M	M	6	4		0.75	
3	MS	S	S	S	S		S			S	S	S	S		9	1	0.30	1.00
4	S	MS	S	S	S	S	S	S	S	S	S	S	S		12	1	0.23	1.00
5	S	MS	S	S											3	1	0.75	1.00
6	S	MS	S	MS	S	S		S	S	S					7	2	0.33	0.50
7	MS	S	S	MS	MS	MS	S					M	M	2	3	4	0.43	0.17
8	M	S	S	MS	MS	S	S	S	S	S		S	MS	1	8	3	0.18	0.25
9	MS	S	MS	MS	S	S	S	S	S	S	S	S	S		10	3	0.23	0.67
10	MS	S	MS	MS	MS	MS	MS	MS	S	S	S	MS	MS		4	9	0.23	0.22
11	MS	S	MS	MS	MS	MS	MS	MS	MS	S	S	S	MS		4	9	0.23	0.22
12	MS	S	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS		1	12	0.23	0.17
13	MS	MS	S	MS	MS	MS	MS	MS	S	S	MS	MS	MS		3	10	0.23	0.20
14	MS	MS	S	MS	MS	S	S	S	S	S	S	S	S		9	4	0.23	0.50
15		S			M	M	M	M	M	M	M			7	1		1.00	0.00
16	MS	MS	MS	MS	MS	MS	MS	S	S	S		S	MS		4	8	0.25	0.38
17	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS	MS			13	0.23	0.23
18	MS	M	MS	M	MS	MS	MS	MS	MS	MS	MS	MS	MS	2		11	0.18	0.23
19	MS	M	M	M	M	M	M	M	M	M	M	M	M	12		1	1.00	0.23
20	MS	M	M	M	M	M	M	M		M		M	M	10		1	1.00	0.27
21	M	MS	MS	MS	MS	MS	MS						MS	1		7	0.29	0.38
22	M	MS	MS	M	M	M	M	M	MS	M	MS	MS	MS	7		6	0.33	0.23
23			MS	MS	MS	MS	MS						S		1	5	0.17	0.20
24	M	M	M	M	M	M	M	MS	S	S	S	MS	MS	7	3	3		0.30
25	M	M	M	M		M		MS		S	S	S	S	5	4	1		0.50

Table 6. Participation in shoreside (S), mothership (M) and shoreside and mothership (MS) fisheries by permit (rows) and years (columns), number of years of shoreside participation in 1994-1996 (S or MS) as a proportion of total years of shoreside participation 1994-2003 (S or MS), and number of years of mothership participation in 1994-1996 (M or MS) as a proportion of total years of mothership participation 1994-2003 (M or MS)

														Count of Years			94-96 Shoreside Years as a Proportion of 94-03 Shoreside Years	94-96 Mothership Years as a Proportion of 94-03 Mothership Years
Permit	94	95	96	97	98	99	00	01	02	03	04	05	06	Mother-ship only	Shore-side only	Mother-ship and Shoreside		
26	M	M	M	MS	MS	M	M	M				M	M	8		2		0.30
27	M	M	M	M	M	MS	MS			M		M		7		2		0.33
28	M	M	M	M	M	M	M	M	M	M	M	M	MS	12		1		0.23
29			M			MS	MS							1		2		0.33
30			M	M	M									3				0.33
31		M	M	M	M	M	M	M	M	M	M	M	M	12				0.17
32	M	M	M				M	M	M	M	M	M	M	10				0.30
33	S	S	S	S	S	S	S	S	S	S	S	S	S		13		0.23	
34	S	S	S	S	S	S		S		S	S	S	S		11		0.27	
35	S	S	S	S	S		S	S	S	S	S	S	S		12		0.25	
36	S	S	S	S	S	S	S	S	S	S	S	S	S		13		0.23	
37	S	S	S	S	S	S									6		0.50	
38	S	S	S	S	S	S	S	S					S		9		0.33	
39	S	S	S	S	S			S	S		S	S	S		10		0.30	
40	S	S	S	S		S	S	S	S	S	S	S	S		12		0.25	
41	S	S	S	S			S								5		0.60	
42		S	S	S											3		0.67	
43		S	S												2		1.00	
44	S			S			S	S	S	S	S	S	S		9		0.11	
45		S													1		1.00	
46		S		S											2		0.50	
47			S	S	S			S		S			S		6		0.17	
48			S	S	S	S	S	S	S	S	S	S	S		11		0.09	
49			S	S	S										3		0.33	
50				S	S	S	S	S	S	S	S	S	S		10			

Table 6. Participation in shoreside (S), mothership (M) and shoreside and mothership (MS) fisheries by permit (rows) and years (columns), number of years of shoreside participation in 1994-1996 (S or MS) as a proportion of total years of shoreside participation 1994-2003 (S or MS), and number of years of mothership participation in 1994-1996 (M or MS) as a proportion of total years of mothership participation 1994-2003 (M or MS)

														Count of Years			94-96 Shoreside Years as a Proportion of 94-03 Shoreside Years	94-96 Mothership Years as a Proportion of 94-03 Mothership Years
Permit	94	95	96	97	98	99	00	01	02	03	04	05	06	Mother-ship only	Shore-side only	Mother-ship and Shoreside		
51				S	S	S	S	S	S	S	S	S	S		10			
52				S		S				S					3			
53				S		S	S	S	S		S	S	S		8			
54					S	S		S	S	S	S	S	S		8			
55					S	S	S	S	S	S	S	S	S		9			
56					S	S	S								3			
57					S										1			
58					S										1			
59						S									1			
60							S	S							2			
61								S	S		S				3			
62								S							1			
63										S					1			
64											S	S	S		3			
65													S		1			
66													S		1			
67													S		1			
					Count of Permits													
M	9	10	11	10	11	10	10	10	6	9	5	9	8					
S	15	23	24	24	21	20	20	24	22	26	23	22	25					
MS	13	9	10	14	13	13	12	8	5	3	5	7	12					

GROUNDFISH MANAGEMENT TEAM REPORT ON AREA MANAGEMENT UNDER TRAWL RATIONALIZATION

Introduction

Currently, the Council uses latitudinal and depth-based spatial management measures, as well as gear restrictions, to achieve area management objectives. Latitudinal area management is outlined in the acceptable biological catch (ABC) and optimal yield (OY) tables within the biennial specifications (e.g., North 40°10 N. Latitude and South 40°10 N. Latitude) and in the trip limit tables where, in some instances, limits differ from the ABC/OY delineations because of bycatch considerations. These subdivisions were created based on species abundance and stock assessments results. Regulations relative to rockfish conservation areas (RCA), boundaries which approximate various isobaths along the coast, achieve depth-based area management. Gear restrictions have also been implemented to achieve area management. For example, large footrope gear restrictions for bottom trawlers have been used to limit access to rocky habitat, areas that depleted rockfish species inhabit.

As evidenced by the March 2007 groundfish inseason action, increasingly complex spatial management measures may be necessary within the existing management framework. Intersector allocations and the implementation of trawl individual fishing quotas (TIQ) may further increase the need for spatial management, perhaps in a manner different than status quo. A thorough evaluation of the cumulative consequences of spatial management measures, both current and those expected from future initiatives, should be undertaken. Additionally, research efforts and analyses of current data sources is needed to support more refined area management approaches. This paper considers biological, economic, and administrative aspects of area management as well as their relevancy to the proposed TIQ program.

Biological considerations

A recent National Research Council (NRC) report found that "Spatial analyses may be one of the greatest obstacles faced by fishery managers." Several literature reviews of contemporary modeling abilities have noted that applied fisheries science has lagged behind more academic research in marine and terrestrial ecology with respect to an increasingly "spatially-rich" interpretation of population structure and complexity (Wilen 2004, Pelletier and Mahevas 2005). Such issues will be integral elements of fisheries science and management in the future, and advances in both assessment methods and simulation techniques should provide the means to better cope with the challenges of incorporating such complexity in the face of increasingly complex and spatially explicit management regimes (NRC 2006).

West Coast groundfish management has clearly become increasingly spatial. In addition to the RCAs, spatial management measures such as "hotspot" or "coldspot" analyses are increasingly

available to help identify areas where available target species might be accessed with acceptable impacts on overfished species. Such measures benefit management actions by allowing fishing to occur on healthy stocks while minimizing the bycatch of rebuilding species. Yet the underlying causes and consequences for spatially varying abundance and bycatch rates are often unclear. For example, the RCA configuration adopted in March 2007 to minimize canary rockfish bycatch created a spatial management regime considerably more complex than past management measures, yet this regime was implemented without the knowledge of whether the differences in high versus low bycatch rates by area reflected habitat association and stock distribution, or historical patterns of depletion that leave depleted (low bycatch) regions more vulnerable to localized depletion. There are also some legitimate concerns that the implementation of a TIQ program could result in the spatial concentration of fishing effort. Over larger spatial scales, such issues speak not only to the potential impacts of localized depletion, but to issues of equity with respect to historical exploitation rates and subsequent allocation of allowable catches.

The Cape to Cape group suggested that management of West Coast fisheries would benefit by matching the spatial scales of interest for coastal communities with those scales naturally found within marine ecosystems. The evidence reviewed in that statement suggests while nearshore ecosystems exhibit marked regional differences in their species composition, dynamics and productivity, and the specialization of associated fishery, offshore ecosystems (particularly the slope ecosystem and species) tend to have more population connectivity and more homogenous distribution and life history characteristics. Yet even at a coastwide scale, spatial differences in fishing mortality can lead to altered perceptions of stock status depending on the spatial scale at which a given stock is assessed. For example, sensitivity analysis of different stock boundaries for the shortspine thornyhead stock assessment in 2006 demonstrated that overall depletion and status was considerably more optimistic with a coastwide assessment relative to an assessment that only included the four International North Pacific Fisheries Commission (INPFC) areas north of Point Conception.

Spatially-explicit management has proven to be critical to meeting conflicting management goals and objectives, such as maintaining fishing opportunities on healthy stocks while reducing incidental catches of rebuilding species, and meeting habitat protection requirements. Furthermore, there is a growing appreciation of the significance of heterogeneity in population structure for most marine organisms, as well as for the potential interaction between population structure and fishing behavior, that scientists and managers alike will find increasingly necessary to confront in population models and management measures. An example is the research that has been presented to the Council which recommended the need to spatially preserve larger, older females in rockfish populations to enhance larval viability and survival (Berkeley, et al 2004).

The GMT has frequently recommended that a more strategic consideration of the cumulative consequences of spatial management measures be undertaken, and that efforts be made to develop information to support more refined area management approaches. Current spatial management utilizes six INPFC boundaries and twenty two other available management lines (Agenda Item E.5.b, GMT Report, March 2007). However, these management lines may not represent natural stock breaks. A concerted research effort to compile and review available data on landings, survey indices, population structure and other factors could be part of a long term strategy to inform area management. As part of this effort, the GMT recommends accessing the

expertise and information being developed outside the immediate Council process with regard to spatial management (e.g., the PMCC "Cape to Cape" Workshop and the upcoming Temperate Reef Workshop). Additionally, an ecosystem based fishery management plan could act as a coordinating mechanism for evaluating and perhaps implementing spatial management measures. However, it may be unlikely that these overall efforts will provide sufficient information in time to inform further spatial division of quota shares beyond our current OYs prior to the planned implementation of the TIQ program. The GMT recommends incorporating current area management tools within the TIQ program, recognizing the limitations, and continue to pursue research and data that may further inform spatial management. As data become available, area management within the TIQ program is expected to evolve and adapt.

Economic considerations

Area management within a TIQ program has the potential to generate both positive and negative economic impacts. Positive economic impacts may occur at a regional level if IFQ shares are area based. Catch harvested from an area-specific IFQ would most likely be landed in adjacent ports, which would disperse economic activity along the coast, providing community stability, as opposed to being concentrated in a few regions. However, creating area-specific quota could also have negative economic impacts. The fishing industry requires the flexibility to adapt to changing market conditions and quota shares based on small geographic scales may reduce this flexibility. For example, non-whiting trawl vessels in the Astoria fleet routinely travel to areas near the US/Canada border. Area-specific quota shares could restrict fleet mobility, which may limit access to target species that are not evenly distributed along the coast. Additionally, finer scale area-specific quotas could restrict the fleet's ability to adapt to market changes. In order to avoid this situation, care should be taken when creating area-based quota so that area-specific IFQ shares are not so small as to erode the economic gains typical of rationalization programs.

Administrative considerations

The feasibility of implementing area-based management and the ability to adapt to area-based scientific information, after the implementation of a rationalization program, are important considerations. An overly complex program designed to achieve area-based management objectives may increase operational costs and may be too bureaucratic to adapt to changing fishery and environmental conditions. Area-based quota shares substantially increase program complexity because each area may require quota shares by species, by permit, a set of minimum holding requirement rules, and a set of concentration-of-ownership rules amongst others. When determining the number of areas with quota share designations, administrative cost and burden should be balanced with economic and biological considerations.

In addition, a program that is too rigid to adapt to new scientific information (such as information suggesting a modification of area-based management tools) may result in a fishery that is unable to easily take into account negative biological consequences that may be occurring. In order to avoid this scenario, information can be collected in a rationalized fishery that could be used to modify area-based quota share allocations if necessary. For example, location of catch by vessel could continue to be recorded in a rationalized fishery and used in a manner to re-assign shares on an area basis. It may be prudent to specifically identify evaluation of the adequacy of any existing area-based quota management as part of the periodic routine review being considered for the TIQ program.

Data Sources

- Retained catch data by area from trawl logbooks
- Spatial distribution of West Coast Groundfish Observer Program (WCGOP) data
- Spatial distribution of National Marine Fisheries Service (NMFS) trawl survey data
- Landings data by port from RecFIN. These data could also be summarized by the 6 INPFC areas

The GMT has requested from the Northwest Fisheries Science Center the catch data, WCGOP data, and NMFS trawl survey. Landings data by port (1994-2005) are already available from information assembled for the GAC. The GMT will review this information, once available, and then identify potential remedies. However, the entire analysis likely cannot be completed in time for TIQ or intersector allocation.

GMT Recommendations

1. The GMT recommends that the TIQ program incorporate area management tools currently in use and continue to pursue data and research informing spatial management. Depending on the results of the data compilation and review, determine whether and how spatial management concepts could be used in developing fishery management measures for the 2009-2010 biennium as well as the development of an Ecosystem Fishery Management Plan.

PFMC
05/25/07

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