

GROUND FISH MANAGEMENT TEAM REPORT ON HARVEST SPECIFICATIONS FOR 2011-2012 FISHERIES

The Groundfish Management Team (GMT) reviewed and discussed the documents provided under Agenda Item I.2 and offers the following considerations.

Relationship to Optimum Yield

The GMT has noted some confusion relating to the relationship between Amendment 23 and the concept of optimum yield (OY). OY is the key conservation objective of the Magnuson-Stevens Act (MSA) and the central concept of national standard 1 (NS1). The legal definition of OY, as summarized in the NS1 guidelines, is:

the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems; that is prescribed on the basis of the MSY from the fishery, as reduced by any relevant economic, social, or ecological factor; and, in the case of an overfished fishery, that provides for rebuilding to a level consistent with producing the MSY in such fishery.¹

Under this definition, NS1 requires the Council to set catches that, at a minimum, maintain the stock at the abundance that produces maximum sustainable yield (MSY) (i.e., B_{MSY}). Adjustments can be made to keep stocks at higher abundance for ecological, social, or economic factors, but the Councils are not required to make such adjustments. Note also that the definition implies that preventing overfishing is a prerequisite of achieving OY.²

The groundfish Fishery Management Plan (FMP) was set up to achieve OY—that is, to provide the greatest overall benefit to the Nation—by employing harvest control rules designed to prevent overfishing and maintain stocks at the best estimate of abundance that produces MSY. This is why the Council chose to use the very term “OY” for identifying the annual harvest limit. For category 1 stocks, the Council has sought to set OY at the harvest projected to maintain

¹ 50 C.F.R. § 600.310. This NS1 guideline provisions simply restates the definition of “optimum” found in section 3(33) of the MSA.

² By definition, OY cannot be achieved if overfishing occurs over the long-term. To explain, the definition of OY states that OY is “prescribed on the basis of MSY.” Overfishing, in turn, is defined to occur “whenever a stock or stock complex is subjected to a level of fishing mortality or annual total catch that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis.” 50 C.F.R. § 600.310(e)(2)(i) (B). Therefore, OY cannot be achieved if catch is set at a level that jeopardizes the stock’s capacity to produce MSY. In addition, this logic explains why the MSA defines OY for overfished stocks as the level of harvest expected to rebuild the stock back to the abundance that produces MSY.

stocks at the best estimate of B_{MSY} .³ For category 2 and 3 stocks, the Council recognizes there is insufficient information to identify B_{MSY} , and has set precautionary OYs at a level that has a high probability of preventing overfishing. It is unclear how the adjustments were made for ecological, social, or economic reasons.⁴ This approach is consistent with the Council's other three FMPs.

As the GMT understands it, the Council does not intend to change this approach with Amendment 23. And nothing in the 2006 annual catch limit (ACL) amendments would require changing this approach. The ACL amendments did not alter the MSA definition of OY, but rather, focused on methods for preventing overfishing. The major change devised by the NS1 guidelines for preventing overfishing is the incorporation of a scientific uncertainty buffer between the OFL and the acceptable biological catch (ABC). The NS1 guidelines concluded that the Councils must take scientific uncertainty into account to effectively prevent overfishing.

In sum, although the Council will use "ACL" instead of "OY" starting with the 2011-12 biennial cycle, the ACL is still set at the level expected to produce MSY for category 1 or to prevent overfishing for category 2 and 3 stocks. The acronym used to represent the annual limit on harvest has changed but the intent is still to set that limit at the level the Council expects to achieve OY. **Therefore, for 2011-2012 the GMT recommends the Council establish the ACL as equal to the OY for all stocks and complexes.**

Considerations for P* - Category 1

The revised NS1 guidelines state the buffer between the overfishing limit (OFL) and the ABC (i.e., the "ABC control rule") is built on two considerations: (1) scientific uncertainty in estimation of the OFL; and, (2) the acceptable level of risk resulting from that uncertainty. The NS1 guidelines state the first component of the control rule—the scientific uncertainty—is a technical matter for the Scientific and Statistical Committee (SSC). The second—the "risk call"—is a policy issue for the Council and refers to the probability of overfishing. As a general principle, the SSC and the NS1 guidelines also state that "Control rules should be designed so that management actions become more conservative [...] as science and management uncertainty increases." To this end, the SSC has designated three stock categories and subcategories to characterize the differences in data and model types that may lead to greater reductions when uncertainty is greatest.

For category 1 stocks the GMT recommends using a default P* that could then be modified if the Council wanted to be more risk averse in setting the probability that the ABC would in fact be

³ On the advice of the SSC, the Council has attempted to maintain stocks at $B_{40\%}$ (i.e., at 40 percent of the unfished biomass) because the best scientific information available has identified it as a reliable (or "robust") proxy of MSY. The Council recently recommended a new harvest target for flatfish at $B_{25\%}$.

⁴ The Council may wish to revisit how to best achieve OY by considering additional social, ecological, and economic factors at a later date. Considering social, ecological, and economic factors, is meant by ecosystem based fisheries management. The required analyses are something the Council may wish to look at during development of the Ecosystem FMP.

greater than the “true” OFL. Criteria for diverging from this default P* would be based on the cost of overfishing in terms of achieving OY over the long term. Cost can be thought of in terms of the magnitude of overfishing – where the OFL were relatively small and the ability of the fleet to harvest above that OFL is significant. It can also be thought of in terms of the potential length of overfishing – there is less risk of continually exceeding the OFL for stocks that are assessed on a more frequent basis. Other considerations include the potential for a stock ending up in a precautionary or overfished state or the desire to limit the ABC contribution of a discard species managed within a species complex. Any or all of these considerations could lead the Council to choose a lower P*. As such the choice of P* will be somewhat arbitrary until an objective method for applying it can be developed.

Considerations for P* - Category 2 and 3

Currently, the category 1 species (‘data-rich’) define the ABC buffer via P* (as assigned by the Council) and scientific uncertainty (as quantified by the SSC). Status quo ABC control rules for category 2 and 3 stocks would be flat reductions from the OFL of 25 percent and 50 percent, respectively. These reductions are based on the work of Restrepo et al. (1998), who defined their categories based on assumptions about current stock status and recent catch (Table 1).

The GMT recognizes several reasons why category 2 (‘data moderate’) and 3 (‘data poor’) stocks should also adopt the P* approach to defining ABCs: 1) neither stock status or recent catch are used to define category 2 and 3 stocks, and thus have no real relation to the Restrepo et al. (1998) guidelines; 2) to provide a consistent framework with category 1 that allows the SSC to determine scientific uncertainty and the Council to define risk. Status quo does not decouple the two; 3) this approach is flexible and allows a mechanism for future improvements on estimating uncertainty in these stocks and does not constrain the Council’s choice of P*.

Given stock category tiers are meant to address increasing uncertainty, complications may arise when specifying absolute relationships among tiers. One option is to ensure that the resultant ABC buffers are greatest for category 3 stocks and least for category 1 stocks. The GMT strongly advises against this approach because it could constrain the Council’s choice of P*. For instance, a category 1 species that exhibits scientific uncertainty greater than expected would place a hard ceiling on the amount of risk the Council can specify for category 2 and 3 stocks. Additionally, if the Council wanted to be more conservative with a category 1 stock (thus implementing a small P*), this could also place an undesirably low ceiling on buffers for category 2 and 3 stocks. A more appropriate approach would be for the scientific uncertainty (as specified by the SSC) to be greatest for category 3 species and least for category 1, freeing the Council to choose any P* ≤ 0.45 (the Council’s preliminary preferred ceiling for all P*).

The status quo reductions for category 2 and 3 species can be achieved within this P*-based ABC buffer framework. Given the scientific uncertainty for each category (as proposed by the SSC), there exists a P* value that will result in buffers of 25 percent and 50 percent, respectively. The Council could therefore choose those P* levels for this biennium to maintain status quo reductions for category 2 and 3 species (see Agenda Item I.2.a Supplemental Attachment 3, Table 2-1e).

Considering Scientific Uncertainty

This Council has long recognized that scientific uncertainty creates challenges to preventing overfishing and achieving OY. In the past, the Council has addressed different sources of scientific uncertainty by adjusting the OY downward from the ABC (e.g., uncertainty in alternative states of nature presented in a stock assessment decision table, uncertainty involved with apportioning OYs between areas like with sablefish). In addition, the Council has adjusted OYs down from ABC for other purposes like the 40-10 control rule.

With Amendment 23, the Council is developing a more structured approach for considering scientific uncertainty, centered on the P* approach. The P* approach is intended to account for uncertainty in the estimate of the OFL and characterize the probability that a given ABC would exceed the “true” OFL. The P* adjustment may not capture all of the adjustments the Council has made in the past between ABC and OY.

Table 1 is intended to illustrate this point. A wide range of P* equivalents are shown to get to the status quo harvest levels from 2010.

Table 1. 2010 ABCs, OYs, and the P* value that would have been necessary to reach the OY. The P* equivalent assumes that the difference between ABC and OY was analogous to the scientific uncertainty buffer under Amendment 23 with a sigma of 0.36.

	2010 ABC (mt)	2010 OY (mt)	P*	2011 OFL	2011 ABC based on 2010 methodology	% reduction
Lingcod - coastwide	4,829	4,829	0.50	4,961	4,961	0%
Sablefish - coastwide	9,217	7,729	0.31	8,808	7,390	16%
Chilipepper	2,576	2,447	0.44	2,229	2,118	5%
Splitnose	615	461	0.21	2,381	1,786	25%
Yellowtail N. of 40°10' N latitude	4,562	4,562	0.50	4,566	4,566	0%
Shortspine Thornyhead - coastwide	2,411	2,001	0.30	2,384	1,979	17%
Longspine Thornyhead - coastwide	3,671	2,560	0.16	3,577	2,504	30%
Black Rockfish (WA)	464	464	0.50	445	445	0%
Black Rockfish (OR- CA)	1,317	1,000	0.22	1,217	925	24%
California scorpionfish	155	155	0.50	141	141	0%
Cabazon (CA)	111	79	0.17	187	133	29%
Dover Sole	28,582	16,500	0.06	44,400	25,752	42%
English Sole	9,745	9,745	0.50	20,675	20,675	0%
Arrowtooth Flounder	10,112	10,112	0.50	44,400	44,400	0%
Longnose skate	3,269	1,349	0.01	20,675	8,477	59%

Given that a number of types of scientific uncertainty may be contained in the risk call that the Council considers for setting P* and the ability to further reduce the harvest by setting ACL lower than ABC, the GMT recommends using the aforementioned P* approach in conjunction with the considerations outlined below for setting ACL to achieve OY.

Annual Catch Limit Considerations

For the majority of category 1 stocks that are healthy stocks (e.g., above $B_{40\%}$) the GMT recommends setting the ACL equal to the ABC. The Council should consider exceptions to this to account for management uncertainty and in other instances as outlined below (e.g. setting area specific ACLs in relation to a coastwide OFL/ABC).

Sablefish

The 2007 coastwide sablefish stock assessment indicates the stock is in the precautionary zone, with depletion levels at 36 percent. The strength of the stock is reliant upon the strong 1999 and 2000 year classes, with the possibility of a strong incoming 2004 year class. The 2010 OY was previously set by applying a 40-10 harvest control rule to a coastwide ABC. The coastwide yield was then apportioned north and south of 36° N lat. using the average 2003-06 proportions of the swept-area biomass estimates of sablefish from the Northwest Fisheries Science Center (NWFSC) shelf-slope trawl survey (72 percent north; 28 percent south). The OY south of 36° N latitude was then adjusted by 50 percent to account for greater assessment and survey uncertainty in that area.

Sablefish is arguably one of the most important species to both the fixed gear and the trawl fisheries and as such the choice of sablefish harvest specifications for 2011-12 will be extremely important. A further consideration for the trawl fishery is the transition to a rationalized fishery. In deciding the 2011-12 ABC and ACL, the Council will need to consider management and scientific uncertainty. Management uncertainty for sablefish is low. The trawl fishery will be rationalized (with 100 percent observer coverage) and the limited entry fixed gear sector is a limited access program (i.e., managed under tiers) and has traditionally underharvested its allocation; so the risk of overharvesting is low based solely on management. Therefore, the Council may want to focus more on scientific uncertainty and stock status (e.g., trajectory of stock biomass).

In determining the 2011-12 specifications for sablefish, the Council will need to consider the following items: (1) how to apply the 40-10 control rule since this stock is in the precautionary zone; (2) how to apportion the stock north and south of 36° N lat.; and (3) whether to precautionary reductions are needed to the southern ACL to account for greater scientific uncertainty.

40-10 Control Rule

Under option 1, the 40-10 reduction is taken directly off the OFL, whereas under option 2 the 40-10 adjustment is taken off the ABC. At the March 2010 meeting, the Council adopted Option 2 as the preliminary preferred alternative for the 40-10 control rule under Amendment 23. The GMT recommends that the Council consider the 40-10 reduction for sablefish in terms of its management implications for all groundfish species that are now or may be in the precautionary zone in the future such that it is applied consistently (i.e., the same as it will be under

Amendment 23). Table 2 summarizes the various options given numerous P* options for sablefish in 2011.

Table 2. Options for 2011 sablefish ACLs under proposed 40-10 control rule options

2010 ABC (mt)	9,217						
2010 OY (mt)	7,729						
2011 OFL (mt)	8,808						
Depletion	36.0%						
	Probability of Overfishing						
	0.45	0.40	0.35	0.30	0.25	0.20	0.15
2011 ABC	8,418	8,040	7,667	7,293	6,909	6,506	6,065
Opt 1 ACL	8,485						
	<i>(exceeds ABC)</i>						
Opt 2 ACL	7,296	6,968	6,645	6,321	5,988	5,639	5,256

Option 1

In Table 2 the proposed ACL under Option 1 (8,485 mt) exceeds the ABCs under the range of proposed P* and is not viable since the ACL cannot exceed the ABC. If Option 1 is chosen the ACL will be determined by P* under the assumed scientific uncertainty of 0.36. As previously demonstrated in Agenda Item E.4.b, Supplemental GMT Report, March 2010, any ABC buffer values greater than 0.20 will automatically eliminate all catch reductions due to the 40-10 control rule. Additional analysis indicates the point at which, for a given depletion rate, the ABC buffer subsumes the 40-10 adjustment. For a depletion of 36 percent, this level is <5.3 percent. The reduction under the option 1 is only 3.7 percent, thus the P*-based ABC buffer is always greater than option one under all P* values. Therefore under Option 1, the ACL would be set equal to the ABC.

Option 2

The ACL alternatives under option 2 are always more precautionary than the ABC buffer reduction because 40-10 reductions are taken from the ABC. These reductions are reflected in Table 2.

Apportionment and scientific uncertainty

In 2009-2010 the Council used swept area biomass from the trawl survey from 2003-2006 to apportion the stock north and south of 36 degrees. A precautionary adjustment of 50 percent was then applied to harvest in the southern area to account uncertainty based on historic harvest and lack of survey samples within the Cowcod Conservation Area (CCA) (i.e. biomass estimates are assumed to be the same within the CCA as those sampled outside it). The GMT has updated swept area biomass and variance estimates by International North Pacific Fishery Commission

(INPFC) area. In addition to the ACL alternatives presented in Tables 2-2a and 2-2b, the Council may want to consider an alternative using a variance weighted swept area biomass (i.e., 2003-2008) as being representative of current abundance north and south. This would be equivalent to 5,431 mt in the north and 3,055 mt in the south for 2011 and 5,265 mt in the north and 2,961 mt in the south. Applying the precautionary 50% reduction to the southern area would result in ACL alternatives of 1,527 mt and 1,481 mt for 2011 and 2012 respectively.

Chilipepper Rockfish

For chilipepper rockfish 7% of the biomass from the last assessment are located north of 40° 10' N. lat. This northern portion of the stock is currently managed as part of the minor shelf rockfish complex. The GMT recommends that the Council continue managing this species within the complex north of 40° 10' N. lat. while managing it separately in the south. This results in OFLs of 2,073 mt for 2011 and 1,872 mt for 2012 (i.e., the coastwide OFL minus the OFL contribution to minor shelf rockfish in the north).

Shortspine Thornyhead

Shortspine thornyhead has a single coastwide assessment, but the authors noted a paucity of survey data south of Pt. Conception which led to greater uncertainty about biomass estimates for that area. In the past the Council has set area specific OYs to account for these differential levels of scientific uncertainty (i.e., split 66 percent north and 34 percent south based on NWFSC trawl survey estimates of swept area biomass). However with a single OFL and ABC using the Amendment 23 framework and advice from the SSC, the GMT recommends using the area specific ACL south of Pt. Conception to accomplish the same end (i.e. applying a 50 percent reduction to the southern portion).

Longspine Thornyhead

The GMT notes that a similar situation exists for longspine thornyhead, except that the SSC has characterized this as a category 2 stock. In the past the Council has applied a 25 percent reduction to the ABC (equivalent to the OFL under Amendment 23) to arrive at a harvest level for category 2 stocks. If that same approach were taken this management cycle, whether through a simple 25 percent reduction or through application of the proposed P* method for category 2 stocks, the Council may still want to apply even greater catch reduction south of Pt. Conception due to less NWFSC trawl survey data in that area. As such the GMT recommends that the Council use area specific ACLs where the area north of Pt. Conception is set equal to a 25 percent reduction from the proportional OFL (i.e., equal to the proportion of the ABC for the area) while the southern area is reduced further due to greater scientific uncertainty (i.e., reduced 25 percent from the proportion of the ABC south of Pt. Conception).

Black Rockfish (OR-CA)

The status quo harvest specification for black rockfish in the south is a 1,000 mt constant catch level. This was chosen by the Council to provide stability in fishing opportunity while maintaining projected stock depletion above $B_{40\%}$. Under Amendment 23 there are two potential paths to maintaining this status quo harvest level. The first is to choose a P^* that results in a 1,000 mt ABC each year and then setting the ACL equal to ABC. However, given that the constant catch harvest level is not based solely on scientific uncertainty, the GMT recommends applying an appropriate P^* and then reducing the ACL to 1,000 mt.

Blue Rockfish (California)

The status quo methodology for estimating the blue rockfish contribution to the minor nearshore rockfish complex was based on setting the statewide harvest guideline equal to the ABC for the assessed areas (42° N lat. to $34^\circ 27'$ N lat.) with the addition of 18 mt added to account for the unassessed portion of the stock south of $34^\circ 27'$ N lat based on catch from 1994-1999. The statewide harvest guideline was further divided north and south of north of $40^\circ 10'$ N lat (12.7 percent north; 87.3 percent south). This harvest guideline does not include a 40-10 adjustment, but was reduced from the estimated ABC by 10 mt.

The decision to manage blue rockfish within the minor nearshore complex was based on both scientific uncertainty and ease of management due to its interactions with other species. This species is covered by a state nearshore permit with mandatory sorting requirements. Landings are routinely tracked and monitored, so management uncertainty is low.

In determining the 2011-12 specifications for blue rockfish, the Council may want to consider whether to apply the 40-10 control rule to achieve a precautionary reduction from the OFL (i.e. since it is in the precautionary zone). Management of this stock within the minor nearshore rockfish complex will be discussed later in this document.

Table 3 shows the projected OFLs for 2011 for blue rockfish. The portion of the assessed stock was listed as a category 2 stock and the unassessed portion was listed as category 3. As such the ABC will be reduced depending on the reductions decided for category 2 and 3 stocks.

Table 3. Options for blue rockfish ACLs under proposed 40-10 control rule options

2010 ABC (mt)	239
2010 HG (mt)	220
2011 OFL (mt)	219
Depletion	30.4%
2011 ABC	164*
Opt 1 ACL	196
	<i>(exceeds ABC)</i>
Opt 2 ACL	147*

* based on a preliminary 25% reduction for category 2 stocks

Option 1

In Table 3 the proposed ACL under Option 1 (196 mt) exceeds the ABCs under the range of proposed P* and is not viable since the ACL cannot exceed the ABC. If Option 1 is chosen the ACL will be constrained by P*. Under Option 1, the ACL would be set equal to the ABC (as typically done for healthy stocks) and there would be no reduction based on the precautionary stock status. Alternatively the Council could also choose to set a more conservative P*star under Option 1 to set an ACL lower than the ABC.

Option 2

The ACL alternative under option 2 is more precautionary and includes a reduction for scientific uncertainty and the 40-10 control rule. This option takes into account the precautionary nature of this stock and the ACL is not equal to the ABC as it is for healthy stocks.

Dover Sole

Dover is currently above B25%. In 2009-2010 the Council chose to set the OY at the estimated MSY proxy from the last assessment. The GMT recommends continuing setting our ACL at the MSY proxy level, however we do not have that proxy from the latest assessment given the change from F40% to F30% for flatfishes. The MSY run from that assessment does give an estimate of F27%, so it should be fairly close. The MSY at that level is 17,739 mt. Therefore the GMT recommends an ACL alternative of 17,500 mt as a placeholder (i.e. close approximation) of the new MSY proxy. The GMT will update this with the actual MSY proxy value prior to the June meeting.

Longnose Skate

The 2009-2010 OY was based on 2004-2006 catch history and then increased by 50 percent. Total mortality will be updated for longnose skate in the 2009 report. Therefore the GMT

recommends the same approach (i.e. based on catch in 2004-2006) this biennium for setting the ACL at a level lower than the ABC.

Unavailable ACL Alternatives

The GMT also discussed ACL alternatives that are greater than the maximum allowable ABC given a P^* of 0.45 in Tables 2-1c and 2-1d. Those alternatives could still be viable if the ACL is reduced to the ABC level under a P^* of 0.45 (Tables 4 and 5), as such the GMT recommends reducing the maximum ACL alternatives to be equal to ABC for these species.

Table 4. 2011 ACL alternatives that are greater than the maximum allowable ABC, given a P* of 0.45.

Species/Complex		Alternative ^a	2011 ACL under this alternative ^a	Maximum ABC under a P* of 0.45 ^b
Lingcod	Coastwide	3	4,961	4,742
	North of 42 deg.	3	2,438	2,330
	South of 42 deg.	3	2,523	2,411
Sablefish	North of 36 deg.	4	5,770	8,418
	South of 36 deg.	4	2,715	
Chilipepper		1	2,229	2,130
Yellowtail	N of 40° 10' N Lat.	1	4,566	4,364
Shortspine	North of 34 27' N. lat.	2	1,573	2,279
	South of 34 27' N. lat.	2	811	
Longspine	North of 34 27' N. lat.	2	2,825	3,419
	South of 34 27' N. lat.	2	751	
Black Rockfish	WA	1	445	426
California Scorpionfish		2	144	135
Dover Sole		2	44,400	42,436
Petrale Sole	(1,200 mt 2010 OY)	4	1,021	976
	(1,200 mt 2010 OY; no winter fishery)	4	1,170	1,118

^a in Table 2-2a in Agenda Item I.2.a. Attachment 2

^b in Table 2-1c in Agenda Item I.2.a. Attachment 1

Table 5. 2012 ACL alternatives that are greater than the maximum allowable ABC, given a P* of 0.45.

Species/Complex		Alternative ^a	2012 ACL under this alternative ^a	Maximum ABC under a P* of 0.45 ^b
Lingcod	Coastwide	3	4,848	4,634
	North of 42 deg.	3	2,251	2,151
	South of 42 deg.	3	2,597	2,482
Chilipepper		1	2,013	1,924
Yellowtail	N of 40° 10' N Lat.	1	4,573	4,371
Shortspine	North of 34 27' N. lat.	2	1,556	2,254
	South of 34 27' N. lat.	2	802	
Longspine	North of 34 27' N. lat.	2	2,751	3,329
	South of 34 27' N. lat.	2	731	
Black Rockfish	WA	1	435	415
California Scorpionfish		2	132	126
Dover Sole		2	44,826	42,843
Petrale Sole	(1,200 mt 2010 OY)	4	1,279	1,222
	(1,200 mt 2010 OY; no winter fishery)	4	1,369	1,308

^a in Table 2-2a in Agenda Item I.2.b. Attachment 2

^b in Table 2-1c in Agenda Item I.2.a. Attachment 1

Management Implications Resulting from New Methodologies for OFL Determination and Apportionment North and South of 40-10

The Council will adopt preliminary preferred alternative OFLs and ABCs for the minor rockfish north and minor rockfish south complexes at this meeting. ACLs will also be adopted for rockfish sub-complexes. In 2010, the complex ABCs were the sum of their component subcomplexes (i.e., complex OYs were equal to the ABC). The SSC has recommended OFLs based on depletion-based stock reduction analysis (DB-SRA) and depletion-corrected average catch (DCAC) for the 2011-2012 cycle. The Council will adopt an ABC control rule for stocks in categories 2 and 3. Application of this control rule will generate ABCs based on the SSC-

recommended OFLs. If ACLs are set equal to ABCs (similar to 2010), species and area-specific contributions to the subcomplex ACLs will sum to the complex ABC. The GMT notes that some subcomplex ACLs differ significantly from the 2010 OYs, particularly minor nearshore north, minor shelf north, and minor shelf south (Table 6).

Table 6. Comparison of harvest specifications from 2010 and possible 2011 specifications assuming ABC=ACL. The ACL for minor shelf north includes 150 mt for chilipepper and the ACL for minor slope north includes 818 mt for splitnose.

	2010		2011		
	ABC	OY	OFL	ABC*	ACL
Minor Rockfish North	3,678	2,283	3,767	2,656	2,656
Nearshore North	--	155	--	--	65
Shelf North	--	968	--	--	1,468
Slope North	--	1,160	--	--	1,123
Minor Rockfish South	3,382	1,990	4,302	2,570	2,570
Nearshore South	--	650	--	--	670
Shelf South	--	714	--	--	1,174
Slope South	--	626	--	--	726

* assuming status quo reductions of 25% and 50% for stocks in categories 2 and 3, respectively and P* of 0.45 for category 1 stocks (4% buffer given $\sigma = 0.36$)

The ACL for nearshore rockfish subcomplexes (north and south) depends, in part, on whether the Council chooses a 40-10 rule for category 1 stocks in the complex (i.e., blue rockfish). Although the differences in ACLs are minor for the complex as a whole, the Council's choice of ACL control rule could affect state management if this control rule replaced the status quo California harvest guideline.

The ACL contribution in 2011 for minor shelf rockfish north is 52 percent larger than the 2010 OY (Table 6). The recent assessment for greenstriped rockfish estimates an OFL contribution that is 55 percent of the complex. This is an example of the issues discussed below, specifically, the possibility that non-target species within complexes might inflate landings of other targeted species.

The increase in minor shelf rockfish south (a possible 64 percent increase from the 2010 OY) is largely driven by an increased contribution from yellowtail rockfish. This species makes up 56 percent of the complex, but access to shelf rockfish is currently limited by the RCAs, and should prevent overexploitation of these species.

Concerns Arising from OFLs Estimated for Unassessed Components of the minor nearshore rockfish Complex North and South of 40°10' N lat

Application of DCAC or DB-SRA methods was used to determine OFLs for unassessed stocks. The apportionment of catch north and south of 40°10' N lat to derive component species OFLs as well as application of status quo scientific uncertainty buffers result in a ~58 percent reduction in ACL of minor nearshore rockfish north of 40°10' N lat relative to the 2010 OY. An assumed 25 percent scientific uncertainty buffer is applied to category 2 species to derive the values in Table 6. The potentially severe reduction in the ACL of minor nearshore rockfish north will adversely affect fishing opportunity for this complex in the region and potentially constrain the take of other species.

While the magnitudes of the OFLs determined using DCAC/DB-SRA methods were approved by the SSC and are considered the best available science, but using catch data to set OFL is not ideal and should be discussed further. The SSC approved use of the input data from 1983 to 1989 and 1993 to 1999 for use in apportioning catch north and south of 40°10' N lat in the 2011-2012 management cycle, while improved methods for apportioning catch using available survey indices of abundance and habitat maps are developed.

In previous years, the 155 mt OY for minor nearshore rockfish north of 40°10' N lat was high enough to prevent concerns over the allocation of catch between states. With the potential for a greatly reduced 2011 ACL, the considerations regarding the portion of the component species that should be apportioned to each state becomes a point of discussion. Division of catch between the states is complicated by the lack of a formal catch sharing agreement. The area included in the blue rockfish stock assessment is between Point Conception and 42° N lat. At present, 13 percent of the OFL for blue rockfish is estimated to occur north of 40°10' N lat. The OFLs for blue rockfish outside the assessed area south of Point Conception and north of 42° N lat (74.0 mt and 33.1 mt respectively) have been determined using DCAC methods. These OFLs have been added to the OFL from the stock assessment with preliminary estimates of scientific uncertainty buffers applied to derive ABCs within and outside the assessed area.

Given the constraints on catch of minor nearshore rockfish north posed by the new OFLs, the Council may want to consider whether the portion of the blue rockfish OFL from the stock assessment between 40°10' N lat and 42° N lat (CA/OR) border should be relegated (e.g., through a management measure like a harvest guideline or other mechanism) to California. Thus the OFL contribution to the minor nearshore rockfish north within California would be increased by retaining this portion of the catch within California based on the geographical range of the assessed portion of the stock. Likewise the Council may consider whether the blue rockfish OFL from the DCAC north of 42 should be relegated to Oregon and Washington.

Historically, the OY for minor nearshore rockfish north has been shared between Oregon and California with no formal catch sharing agreements. When the blue rockfish stock was assessed for California, the portion of the harvest guideline north of 40°10' N lat. (28 mt) was included in the calculation of the northern complex OY. Since this complex has historically been underharvested, there was no issue about the California blue rockfish contribution to the complex.

Under the new methodology, the harvest limits in this area could be severely restricted, essentially resulting in a potential struggle for available fish. The GMT discussed the potential to formalize catch sharing agreements between Oregon and California for minor nearshore rockfish north of 40°10' N lat., but was informed that catch sharing agreements are a time intensive analysis and cannot likely be conducted in time for this biennium.

Alternatively, the GMT discussed estimating the ABCs for component species such that the ACL for minor nearshore rockfish is less constraining. Using the P* approach for category 2 and 3 species discussed earlier in this report, the Council could choose values that result in scientific uncertainty buffers that are less than 25 percent for category 2 stocks and 50 percent for category 3 stocks. Should the Council choose the least risk averse P* for all of the component species of the minor nearshore rockfish north complex (i.e., 0.45), the resultant ACL would be 91 mt. This is still a substantial reduction from the 2010 OY of 155 mt (i.e., 41 percent). It also may not reflect the level of risk the Council is comfortable with in the long term, but would provide a tool for reducing the short term impacts to the fishing community until the composition of stock complexes, OFL estimations, and quantification of scientific uncertainty can be more thoroughly reviewed prior to the next management cycle.

The GMT would appreciate guidance from the Council as to their preference given the options provided below and the specifics of any catch sharing (e.g., harvest guidelines, etc.) can be discussed under Agenda Item I.4 and I.6:

Option 1 – Status quo methodology where minor nearshore rockfish north of 40°10' N lat is shared between the states (including blue rockfish contributions)

Option 2 –Blue rockfish contributions north and south of 42 degrees are not shared (other minor nearshore species will still be shared).

Option 3 – Minor nearshore rockfish north component species P*s are set at the maximum (0.45) resulting in a less severe reduction in the harvest level for that complex.

Managing Stocks within Complexes

Splitnose rockfish, greenstriped rockfish, and the cabezon (OR) stocks were newly assessed this cycle. Splitnose is currently managed as part of the minor slope rockfish complex; greenstriped as part of the minor shelf rockfish, and cabezon (OR) as part of the other fish. The Council should consider whether to continue managing these stocks as part of their respective stock complexes.

Based on the following reasoning, the GMT recommends removing the cabezon (OR) stock from the Other Fish complex; yet recommends keeping splitnose and greenstriped in their respective stock complexes for this management cycle.

First, we would like to highlight the risks associated with managing stocks within a complex. Stock complex management works if stocks are caught in proportion to their component harvest specifications (OFLs and ABCs). If stocks are not caught in such proportions, then it is possible

that the catch of certain component species could exceed their respective OFL/ABCs, even when catch is kept within the aggregate stock complex ACL. This is more likely to occur with stocks that only contribute a small proportion of the overall OFL.

Splitnose rockfish and the minor slope rockfish north complex provide an example. This complex consists of nine species with a proposed 2011 OFL of 1,462 mt. The proposed contribution of splitnose rockfish to that OFL is 852 mt or 58 percent of the total. In contrast, blackgill rockfish contributes only 4.7 mt (0.3 percent), aurora 17.3 mt (1.2 percent), and shortraker 21.8 mt (1.5 percent). The remaining stocks contribute between 3.5 percent–12.6 percent of the stock complex OFL. To look at extremes, there is a 182:1 ratio between splitnose and blackgill.

Rougheye and shortraker are species for which the recent DB-SRA analysis has flagged overfishing as a potential concern. The situation is similar with splitnose and minor slope rockfish south, with blackgill and aurora being the stocks where overfishing is of most concern.

The GMT fully expects that catch does deviate from the proportional OFL contributions. For one, the OFL contributions are based on estimates of allowable harvest, not on estimates of actual catch. Actual catch depends on the susceptibility of the stocks to the groundfish fisheries, which include such things as marketability and the portion of the stock protected by the RCAs. Susceptibility undoubtedly differs among species in these complexes. Initial looks at reports on total catch have confirmed as much.⁵

Greenstriped and the minor shelf rockfish north complex would present a similar example. Yet, instead, we use it here to illustrate the other set of considerations involved when removing a stock from a complex: complications for the management system. These complications range from sorting requirements for industry to additional monitoring and reporting requirements for the states and the NWFSC. The major complication here, however, is the pending implementation of the trawl rationalization program. Species pulled out of complex must be converted into an IFQ management unit. An initial allocation of quota share for greenstriped would be less than straightforward given the unreliable catch history.

The same management complexities are not present for cabezon (OR) stock. Cabezon will not be part of the rationalized trawl fishery, but are part of the nearshore fishery. It is also currently managed via harvest caps and species specific trip limits set by the state of Oregon. In addition, as we have pointed out multiple times, the Other Fish complex has no quantitative basis for its harvest specification. The species in the Other Fish are also very dissimilar in their vulnerability to the fishery and there seems little reason to keep the cabezon (OR) stock lumped in with such species as finescale codling and the skate species.

⁵ Marketability is one factor of susceptibility, and splitnose have much different susceptibility than some species in the complex. Splitnose rockfish are caught and discarded at sea because sizes are too small to market, whereas almost all rougheye, blackgill, shortraker, and yellowmouth caught by trawl are retained and sold. Splitnose also differs in its life history characteristics from the other species in the complex, the other side of the “vulnerability” equation.

Another option for the Council to consider is to set P* at exceptionally low values for greenstriped and splitnose. This could be done such that it accommodates recent catch, but is low enough to reduce the contributions of these species to the stock complex and reduce the risk to more vulnerable stocks. While the analysis is not available now, P* values that accomplish this could be provided by the June 2010 meeting for final action.

As stated in March in our report on Amendment 23, the team would like to begin a thorough examination of all the groundfish stock complexes under the revised NS1 guidelines as soon as necessary for implementation in the 2013-14 management cycle.⁶ We are concerned about the impact of leaving splitnose and greenstriped rockfish in their current complexes long term. We have discussed methods for better tracking of catch of component stocks in the 2011-12 cycle that could inform our deliberations for 2013-14 implementation. Currently, total mortality is reported only at the stock complex level.

GMT Recommendations:

1. Establish the ACL as equal to the OY for all stocks and complexes for 2011-2012.
2. Use a default P* for category 1 species unless circumstances call for reduced risk of overfishing.
3. Consider using the P* approach for category 2 and 3 species.
4. Set the ACL equal to ABC for healthy stocks unless otherwise noted.
5. For the preliminary preferred alternative, apply the 40-10 reduction for sablefish using the option anticipated under Amendment 23.
6. Consider sablefish ACL options based on apportionment north and south of 36° N. lat and consider applying a 50% reduction to the southern area ACL.
7. Adopt a preliminary preferred alternative that continues managing this chilipepper within the minor shelf rockfish complex north of 40° 10' N. lat. and with OFLs of 2,073 mt for 2011 and 1,872 mt for 2012 south of 40° 10' N. lat.
8. For shortspine thornyhead adopt area specific ACLs with a 50% precautionary reduction in the south as the preliminary preferred alternative.
9. For longspine thornyhead use area specific ACLs where the area north of Pt. Conception is set equal to a 25% reduction from the proportional OFL (i.e. equal to the proportion of the ABC for the area) while the southern area is reduced further due to greater scientific uncertainty (i.e. reduced 25 % from the proportion of the ABC south of Pt. Conception).
10. Use the status quo harvest decision to set an ACL for black rockfish off Oregon and Washington at 1,000 mt.
11. Blue rockfish consider applying the 40-10 reduction to the assessed portion of the stock to reduce the risk of overfishing.

⁶ Again, the NS1 guidelines recommend that managing multiple species with a complex requires (a) that species within the complex demonstrate similar life history traits (e.g., age/growth, longevity), (b) species within the complex exhibit similar vulnerabilities to fishing mortality (i.e., selectivity to fishing gears) and (c) species within the complex can withstand similar levels of harvest. See...

- 12.** Include an ACL alternative of 17,739 mt for Dover sole to approximate the MSY proxy harvest level.
- 13.** Use the status quo methodology for determining longnose skate harvest to set ACL.
- 14.** Reduce the maximum ACL alternatives to be equal to ABC for lingcod, sablefish, chilipepper, yellowtail, shortspine and longspine thornyhead, black rockfish in Washington, California scorpionfish, Dover sole, and petrale sole (both with and without a winter fishery).
- 15.** Consider choosing a higher P^* value for component species in the minor nearshore rockfish north complex to prevent short term disruption to the fishing community.
- 16.** Remove Cabezon in Oregon from the other fish complex.
- 17.** Continue to manage greenstriped in the minor shelf rockfish north complex and splitnose in the minor slope rockfish north complex.
- 18.** Consider setting P^* lower for greenstriped and splitnose rockfish to prevent overfishing of vulnerable stocks within the same complex.

PFMC
04/13/10