

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON HARVEST SPECIFICATIONS FOR 2011-2012 FISHERIES

Mr John DeVore briefed the Scientific and Statistical Committee (SSC) on the proposed list of overfishing limits (OFLs) and acceptable biological catch (ABCs) developed by the Groundfish Management Team (GMT). Drs E.J. Dick and Jason Cope outlined a proposed approach for calculating buffers for category 2 and 3 stocks. The SSC also reviewed the outcomes from a conference call among members of the SSC Groundfish Subcommittee, the Groundfish Management Team (GMT), and Council staff on March 17, 2010, which discussed how species can be assigned to categories, as well as control rules and approaches to determining OFLs for category 2 and 3 species.

Assigning stocks to categories

The SSC endorsed the recommendations of the Groundfish Subcommittee regarding species categories. These categories are category 1: data-rich stocks; category 2: data-moderate stocks; and category 3: data-poor stocks (Table 1). The SSC noted that the Council has decided not to use the Ecosystem Component (EC) category at this time.

The categories are divided into several subcategories that reflect various approaches to estimate OFLs. The SSC notes that the categories and subcategories reflect differences in data availability, analytical techniques, and the robustness of assessment outcomes, factors which all relate to the amount of scientific uncertainty and hence the size of the scientific uncertainty buffer to offset ABCs from OFLs. The SSC expects to refine the list of categories and subcategories along with their definitions when new methods for conducting assessments and computing OFLs become available.

The SSC agreed that stocks whose OFLs are estimated using DCAC and DB-SRA methods should be placed into categories 3c and 3d respectively because these methods do not utilize trend data, but are rather based on historical catch information (coupled with a basic understanding of life history parameters, such as natural mortality and age at maturity). The SSC also agreed that stocks assessed using age/size-based models that were endorsed by a Council Stock Assessment Review (STAR) panel and the SSC would generally be assigned to category 1. However, stocks with category 1 assessment models whose input data and/or model results are highly uncertain should be assigned to category 2d.

The SSC agreed that, in the future, stocks should be assigned to categories and subcategories during the SSC review of assessments endorsed by STAR panels. However, since this is not possible for the present cycle, the SSC reviewed the proposed species categorization. Each stock in the Fishery Management Plan (FMP) was therefore assigned to a category and, where appropriate, a subcategory in Table 2-1a of Attachment 1 of Agenda Item I.2.a.

Review of the proposed OFLs

The SSC recognized the considerable work undertaken this year by the GMT to provide more objective bases for the OFLs. The current list of OFLs is much more clearly linked to an analytical (and replicable) basis which makes technical review of the work much more straightforward. While work still remains, the GMT should be acknowledged for their efforts.

The SSC reviewed the proposed OFLs for each stock in Table 2-1a of Attachment 1 of Agenda Item I.2.a, in particular whether stocks should be assigned to category 1 (data-rich stock) or category 2d (a stock with an age-structured stock assessment that is highly uncertain). The SSC made the following changes to the table.

- (1) Lingcod south of 42°N. This stock is assigned to category 2d because the assessment for this area was based on data sets (length distributions and indices) that are in conflict.
- (2) Shortbelly. The SSC agrees that shortbelly is in category 2d because the stock assessment for this species was not reviewed by a Council STAR panel, unlike those for all of the species in category 1. The value for the OFL for this species is currently 50 percent of the ABC/optimum yield (OY). The GMT should contact Dr John Field and attempt to obtain the correct value for the 2011 & 2012 OFLs.
- (3) Cowcod. There are separate entries for cowcod in the Conception and the Monterey areas. Cowcod in the Conception area is in category 2c and not category 2d because the assessment for this area did not estimate annual recruitments. The OFL for the component of the population in Monterey will be based on DCAC or DB-SRA and it will be placed in categories 3c / 3d.
- (4) Greenstriped. This stock is moved from category 1 to category 2d owing to considerable uncertainty regarding the estimate of B_0 and current biomass and extreme sensitivity to assumptions about discard.
- (5) Longspine thornyhead. This stock is moved from category 1 to category 2d because the stock assessment was highly uncertain, a substantial fraction of the stock occurs outside of the survey area, and because there were no survey data for the area south of 34°30'N when the assessment was conducted in 2005.
- (6) Blue rockfish. There are separate entries for blue rockfish off California and Oregon. The population off California is in category 2d, while the OFL for the population off Oregon will have to be determined using historical catches and will be in category 3.
- (7) Gopher rockfish. The population in the south is further sub-divided at Point Conception. The component of the population north of Point Conception is assigned to category 1, while an OFL for the component south of Point Conception will be based on the application of DCAC or DB-SRA and this component placed in category 3c / 3d.
- (8) Arrowtooth flounder. This stock is moved from category 1 to category 2d owing to the sensitivity of the estimate of OFL to changes to assumptions of the assessment.
- (9) Kelp greenling. Separate entries are provided for kelp greenling off Oregon and Washington. An OFL for the Oregon component of the population will be based on the most recent assessment.

In relation to the “Other Fish” complex, the SSC notes that this complex consists of species with different life history characteristics and depth distribution, many with poor information on historical catches. It was noted that finescale codling in the “Other fish” complex does not have any record of landings on the west coast. It was also noted that there are species of grenadiers and skates that are not included in the Groundfish FMP, but are landed in groundfish fisheries. The GMT has assigned OFLs to some of the species in this complex, but was unable to do so for all of them, including some species which are caught in significant quantities. The SSC recommends re-evaluating the logic for the formation of this complex for the next management cycle and that the OFL for the 2011-2012 management cycle be set to 11,150 (the current OFL for this complex minus the OFL for cabezon off Oregon, which should be removed from the complex).

ABC Control rules for category 2 and 3 (data moderate and data poor) stocks

The buffer defines the difference between the OFL and the ABC. The size of the buffer is determined by two factors, the extent of scientific uncertainty and the Council's level of risk. Higher levels of stock assessment uncertainty (σ) or greater levels of risk avoidance (P^*) lead to larger buffers between the OFL and the ABC.

The extent of scientific uncertainty for each stock is determined by the SSC while the level of risk (quantified by P^* , the probability of overfishing occurring) is a policy decision which will be made by the Council. Previously, the Council decided that P^* would not be greater than 0.45 and the SSC recommended that the extent of scientific uncertainty for each category 1 (data-rich) stock be quantified using a value for σ which is the greater of 0.36 (the result of a meta-analysis) and the coefficient of variation of the most recent estimate of abundance. The SSC notes that this approach divides the scientific aspects related to setting the ABC (specifying the extent of scientific uncertainty, σ) from the policy decision (specifying the value of P^*). It also notes that $\sigma=0.36$ is the current best estimate of scientific uncertainty, but that it likely underestimates the true extent of uncertainty by an unknown amount. The SSC will continue to refine this estimate.

The SSC agrees that ideally the approach recommended for setting ABCs for category 1 stocks should also be applied to category 2 and 3 stocks. However, there is at present no analysis available for determining the appropriate value of σ to represent scientific uncertainty for stocks in these categories, unlike the situation for category 1 stocks. In the absence of an analysis for category 2 and 3 stocks, the SSC suggests two interim approaches for computing ABCs from OFLs.

- (1) Continue to apply a buffer of 0.25 for category 2 stocks and of 0.5 for category 3 stocks for consistency with current practice until the SSC has developed and applied an appropriate analytical framework. Use of this approach means that the SSC does not specify a value for σ and the Council does not express its view on risk aversion.
- (2) Set the value of σ for category 2 and 3 stocks to 0.72 and 1.44 respectively, i.e. two and four times the CV for category 1 stocks. The difference between 0.72 and 1.44 corresponds fairly closely to the difference between the current buffers for category 2 and 3 stocks (0.25 versus 0.5) when P^* is in the range 0.3 ~ 0.35. Table 2 shows the relationship between the proposed values for σ and the buffer for a range of values for P^* . Exploration of the results from decision tables for some of the stocks in category 2d also indicates values for σ of approximately 0.72. However, the specific values of 0.72 and 1.44 are not based on a formal analysis of assessment outcomes and could change substantially when the SSC reviews additional analyses.

Irrespective of how ABCs are determined from OFL for 2011-2012, the SSC intends to further examine this issue for the next management cycle.

Partitioning coastwide OFLs north and south of 40°10'N latitude

Dr. E.J. Dick and Mr. John Budrick presented results from different ways of partitioning coastwide OFLs north and south of 40°10' North latitude. Two basic approaches were outlined: (a) using the current split of the OYs and (b) using information on catch by area. There is no recorded basis for the current split of the OYs between areas so the SSC recommends the splits be based on historical catches north and south of 40°10'N. The SSC was presented with three options related to the years to be used to split OFLs: (a) 1983-89, (b) 1993-99, and (c) 1983-89 & 1993-99. There are concerns with all three of the choices given changes over time in fishing practices. For the current management cycle, the SSC

recommends using the longer time period. Although this is not the ideal approach (since catches do not necessarily reflect spatial distribution of species), it is considered a reasonable starting point and appropriate for the current management cycle. The use of survey data and/or Essential Fish Habitat suitability maps may provide more reliable information to partition coastwide OFLs. The SSC recommends exploring these approaches for the 2013-2014 management cycle.

Table 1. Proposed definitions of species categories

Category 3: Data poor. OFL derived from historical catch.

- Category 3a. No reliable catch history. No basis for establishing OFL.
- Category 3b. Reliable catches estimates only for recent years. OFL is average catch during a period when stock is considered to be stable and close to BMSY equilibrium on the basis of expert judgment.
- Category 3c. Reliable aggregate catches during period of fishery development and approximate values for natural mortality. Default analytical approach DCAC.
- Category 3d. Reliable annual historical catches and approximate values for natural mortality and age at 50 percent maturity. Default analytical approach DB-SRA.

Category 2: Data moderate. OFL derived from model output (or natural mortality).

- Category 2a. M^* survey biomass assessment (as in Rogers 1996).
- Category 2b. Historical catches, fishery-dependent trend information only. An aggregate population model is fit to the available information.
- Category 2c. Historical catches, survey trend information, or at least one absolute abundance estimate. An aggregate population model is fit to the available information.
- Category 2d. Full age-structured assessment, but results are substantially more uncertain than assessments used in the calculation of the P^* buffer. The SSC will provide a rationale for each stock placed in this category. Reasons could include that assessment results are very sensitive to model and data assumptions, or that the assessment has not been updated for many years.

Category 1: Data rich. OFL based on FMSY or FMSY proxy from model output. ABC based on P^* buffer.

- Category 1a. Reliable compositional (age and/or size) data sufficient to resolve year-class strength and growth characteristics. Only fishery-dependent trend information available. Age/size structured assessment model.
- Category 1b. As in 1a, but trend information also available from surveys. Age/size structured assessment model.
- Category 1c. Age/size structured assessment model with reliable estimation of the stock-recruit relationship.

Table 2. Relationship between P* and the proportion of OFL for category 1, 2, and 3 stocks based on σ values for 0.36, 0.72 and 1.44.

P*	0.36	0.72	1.44
0.45	95.6%	91.3%	83.4%
0.44	94.7%	89.7%	80.5%
0.43	93.8%	88.1%	77.6%
0.42	93.0%	86.5%	74.8%
0.41	92.1%	84.9%	72.1%
0.40	91.3%	83.3%	69.4%
0.39	90.4%	81.8%	66.9%
0.38	89.6%	80.3%	64.4%
0.37	88.7%	78.7%	62.0%
0.36	87.9%	77.3%	59.7%
0.35	87.0%	75.8%	57.4%
0.34	86.2%	74.3%	55.2%
0.33	85.4%	72.9%	53.1%
0.32	84.5%	71.4%	51.0%
0.31	83.7%	70.0%	49.0%
0.30	82.8%	68.6%	47.0%
0.29	81.9%	67.1%	45.1%
0.28	81.1%	65.7%	43.2%
0.27	80.2%	64.3%	41.4%
0.26	79.3%	62.9%	39.6%
0.25	78.4%	61.5%	37.9%
0.24	77.5%	60.1%	36.2%
0.23	76.6%	58.7%	34.5%
0.22	75.7%	57.4%	32.9%
0.21	74.8%	56.0%	31.3%
0.20	73.9%	54.6%	29.8%
0.19	72.9%	53.1%	28.2%
0.18	71.9%	51.7%	26.8%
0.17	70.9%	50.3%	25.3%
0.16	69.9%	48.9%	23.9%
0.15	68.9%	47.4%	22.5%
0.14	67.8%	45.9%	21.1%
0.13	66.7%	44.4%	19.8%
0.12	65.5%	42.9%	18.4%
0.11	64.3%	41.3%	17.1%
0.10	63.0%	39.7%	15.8%
0.09	61.7%	38.1%	14.5%
0.08	60.3%	36.4%	13.2%
0.07	58.8%	34.6%	11.9%
0.06	57.1%	32.6%	10.7%
0.05	55.3%	30.6%	9.4%