SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON REBUILDING PLAN REVISION RULES

A total of 23 groundfish stock assessments will be conducted during 2005. Eight of the groundfish species are currently designated to be in an overfished state, and rebuilding plans have been developed for them. These rebuilding plans for each species include the maximum possible time to rebuild to the proxy for B_{MSY}, T_{MAX}, and the probability of rebuilding by T_{MAX} originally selected by the Council; P_0. Table 1 lists the values of P_0 for each of the overfished species.

The Council is required to periodically review the adequacy of progress in rebuilding. Such review can occur at any time, but must occur at least every two years and could lead to changes in harvest rates and values for rebuilding parameters such as T_{MAX}, and T_{MIN}. Assessment authors for stocks currently under rebuilding plans will conduct revised rebuilding analyses, which will be presented to the Council in November 2005. These authors require guidance regarding standards for defining progress towards rebuilding and on the calculations that need to be conducted if progress is deemed to be adequate or inadequate. This guidance depends on policy decisions by the Council and is not simply a technical matter.

A joint meeting between the Council, Scientific and Statistical Committee (SSC), Groundfish Advisory Subpanel (GAP), and Groundfish Management Team (GMT) led by Dr Steve Ralston was held on Monday, June 13, to clarify the need for and progress towards developing a framework and policy for revising rebuilding plans. The joint meeting highlighted a Management Strategy Evaluation approach, which could be used to contrast different standards for defining progress towards rebuilding and control rules that depend on whether progress is adequate or inadequate.

There are presently no formal rules to define whether progress is adequate and how rebuilding plans need to be modified given that progress is deemed to be adequate or inadequate, although there are many ways to define such formal rules given the standards in Amendment 16-1 of the groundfish fishery management plan (FMP). Rebuilding plans for several species (e.g., widow rockfish, Pacific ocean perch) have been updated in the past, but this has involved a largely *ad hoc* process, with each species treated separately on a case-by-case basis.

The SSC identifies the following standard for defining adequacy of progress and rules for modifying rebuilding plans, which it considers the simplest that is consistent with National Standard 1 and involves a small number of decision points (see Attached Figure). The steps below also reflect the intent underlying Amendment 16-1 to the groundfish FMP, that revisions to rebuilding plans be based on changes to the harvest control rule (or harvest rate) rather than to rebuilding parameters such as T_{MAX}.

1. Progress is deemed to be adequate if the probability of rebuilding under the current harvest rule, $P_{current}$, exceeds 0.5. This value is selected because it is the lowest probability such that rebuilding is more likely than not a standard included in Amendment 16-1 to the Groundfish FMP.

2. The current harvest rate is maintained to calculate future OYs if progress is deemed to be adequate.
3. If progress is deemed inadequate, a new, lower, harvest rate is calculated, such that rebuilding under the new rate is expected to occur with probability P_0. If even a zero harvest will not allow rebuilding, then a new rebuilding plan, wherein T_{MAX} is recalculated, and a new T_{TARGET} is chosen, should be used to determine the harvest rate used to calculate future OYs.

The above specifications do not represent the SSC's recommendation on this matter, nor do these specifications necessarily represent the default; rather they represent the simplest set of specifications that can be modified in several ways based on policy trade-off considerations, as outlined below.

i) Should the probability at which progress is deemed to be inadequate be larger than the minimum of 0.5? Increasing this probability from 0.5 would be more conservative, in that harvest rates would be reduced before the probability of recovery drops as low as 0.5. However, this may increase the number of changes in harvest rate during the rebuild period.
ii) Should the harvest rate be increased if the probability of recovery is estimated to be much larger than P_0? Increasing the harvest rate would increase the OY beyond that which would occur simply due to larger stock biomass. This could be used to share accelerated population growth, when it occurs, between reducing rebuild time and increasing the OY. However, increasing the harvest rate will lengthen the rebuild time compared to maintaining the current harvest rate.
iii) When progress is deemed inadequate, should a standard other than P_0 be used to revise the harvest rate? A lower probability may be appropriate, for example, if a high P_0 was chosen initially to account for uncertainty, but will result in longer rebuild times.
iv) Should updates to rebuilding plans be suspended if the stock is predicted to reach the target level soon? The simple rule could result in very large changes in harvest rate if recruitments at the end of the rebuilding period are low.
v) Should a major revision to rebuilding parameters occur if a very substantial reduction in harvest rate is needed to rebuild with probability P_0? The simple rule could lead to cases in which rebuilding to P_0 is possible, but only if the harvest rates are reduced to near-zero levels.
vi) Should the rules be species-specific to some extent? For example, the probability at which progress is deemed to be inadequate could be different for constraining and non-constraining species

The SSC notes that any proposed rules could be evaluated using the Management Strategy Evaluation framework. The SSC Groundfish Subcommittee is willing to work with members of the Council, GAP, and GMP between the June and September meetings to discuss policy issues and the trade-offs implied by different policy choices. However, the SSC cautions that it may not be possible to define and fully evaluate alternative rules adequately by the September Council meeting, given the complex nature of this problem. Finally, the SSC cautions that revisions to the National Standard 1 guidelines will include aspects related to progress to rebuilding. These revisions are not yet finalized, but could constrain the options available to the Council.

Table 1.

Species	P_0
Bocaccio	70%
Canary Rockfish	60%
Widow Rockfish	60%
Pacific Ocean Perch	70%
Darkblotched Rockfish	>90%
Yelloweye Rockfish	92%
Cowcod	60%
Lingcod	60%

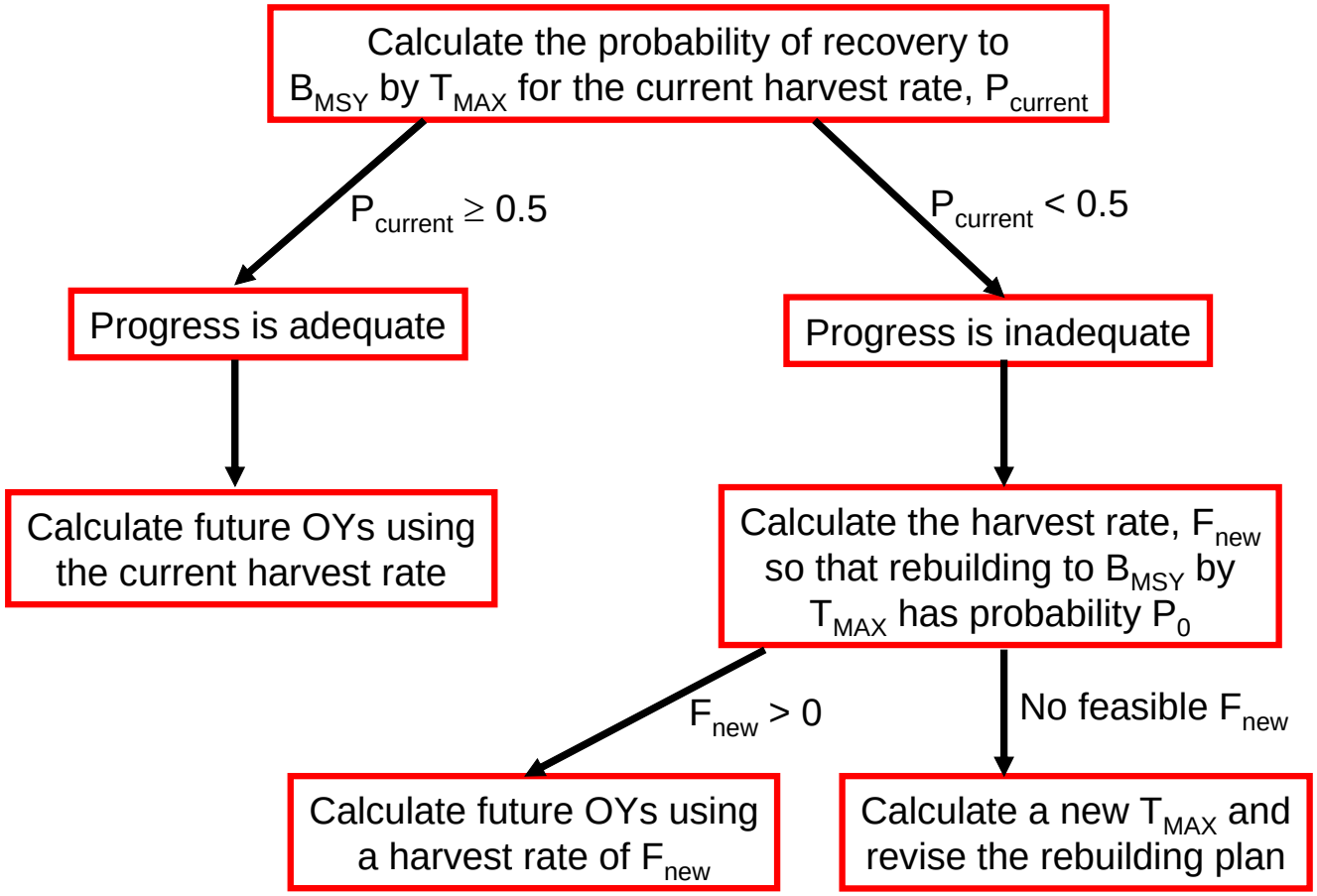

Figure – The simple standard for defining adequacy of progress and rules for modifying rebuilding plans.