



Modified breakpoint for the 2008 Tier 1 harvest control rule

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1. ESTIMATING A COMMON BREAKPOINT FOR THE 20:?:48 RULE

A comprehensive harvest strategy framework (HSF) was introduced into the SESSF in 2005 (Smith et al., 2007), prior to the Ministerial Direction and to development of the Commonwealth Harvest Strategy Policy, and is now in its third year of application. The framework adopts a tier-based system of assessments and associated harvest control rules. The HSF uses harvest control rules to determine a recommended biological catch (RBC) for each stock in the SESSF quota management system. Each stock is assigned to one of four Tier levels depending on the basis used for assessing stock status or exploitation level for that stock.

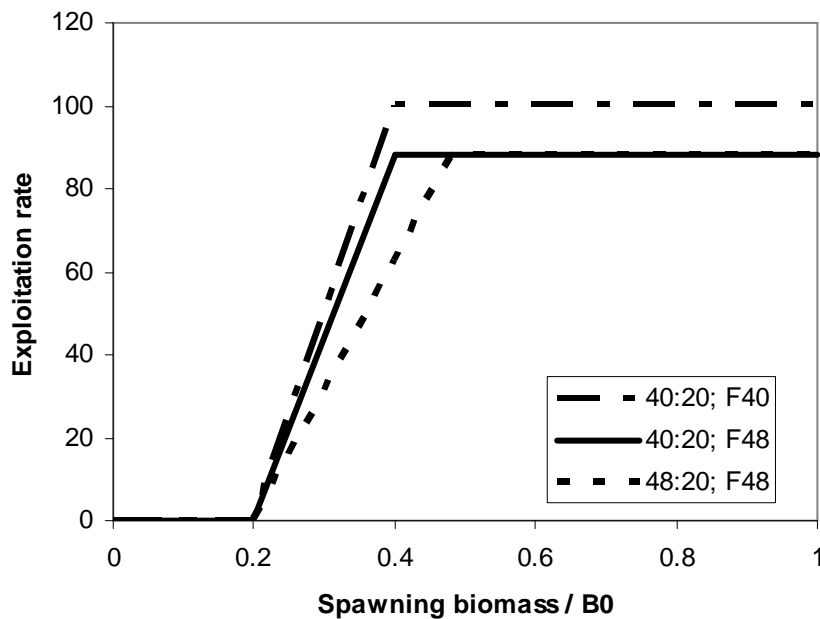


Figure 1.1 Alternative Tier 1 harvest control rules under the Commonwealth Harvest Strategy Policy in 2006, with alternative target biomass at B_{40} and B_{48} corresponding to B_{MSY} and B_{MEY} . Exploitation rate is expressed relative to F_{40} .

The Tier 1 harvest control rule specifies a target and a limit biomass reference point, as well as a target fishing mortality rate. Since 2005 various values have been suggested and used for the target and the breakpoint in the rule (Figure 1.1). The initial default value of the breakpoint was set at B_{40} , as an initial proxy for B_{MSY} , resulting in the 20:40:40 ($B_{LIM}:B_{MSY}:F_{TARG}$) form of the rule and later B_{48} was suggested as a breakpoint as a proxy for B_{MEY} , leading to 20:48:48 and 20:40:48 versions of this rule. In 2007 assessments in the SESSF, the 20:40:40 rule was used with the results reported for the 20:40:48 rule as well, with the suggestion that management would move towards this latter form of the rule at some stage in the future.

For the 2009 TACs AFMA has directed that the initial trajectory of the 20:40:40 ($B_{LIM}:B_{MSY}:F_{TARG}$) form of the rule will be used up until fishing mortality reaches F_{48} . Once this fishing mortality is reached, it is fixed at F_{48} (Figure 1.2, bold line). To implement this rule requires calculation of the breakpoint, the value of the biomass between B_{20} and B_{40} where the F value from the 20:40:40 rule is equal to F_{48} . This exact value for this breakpoint varies from species to species, depending on the relative values of F_{40} and F_{48} . Calculating this breakpoint for a species with multiple fleets is not straightforward as this requires an overall value of fishing mortality F , rather than fleet by fleet fishing mortalities. To calculate this overall value of F requires synthesizing the different values of fishing mortality for each fleet and the proportion of the catch caught by each fleet. These values could also change from year to year if the proportion of catch taken by each fleet changes. To simplify the

implementation of this rule, the values for F_{40} and F_{48} were obtained for a number of species as calculated for use in the Tier 3 rule (Klaer 2008) and the breakpoint was calculated for each of these species (Figure 1.3, Table 1.1)

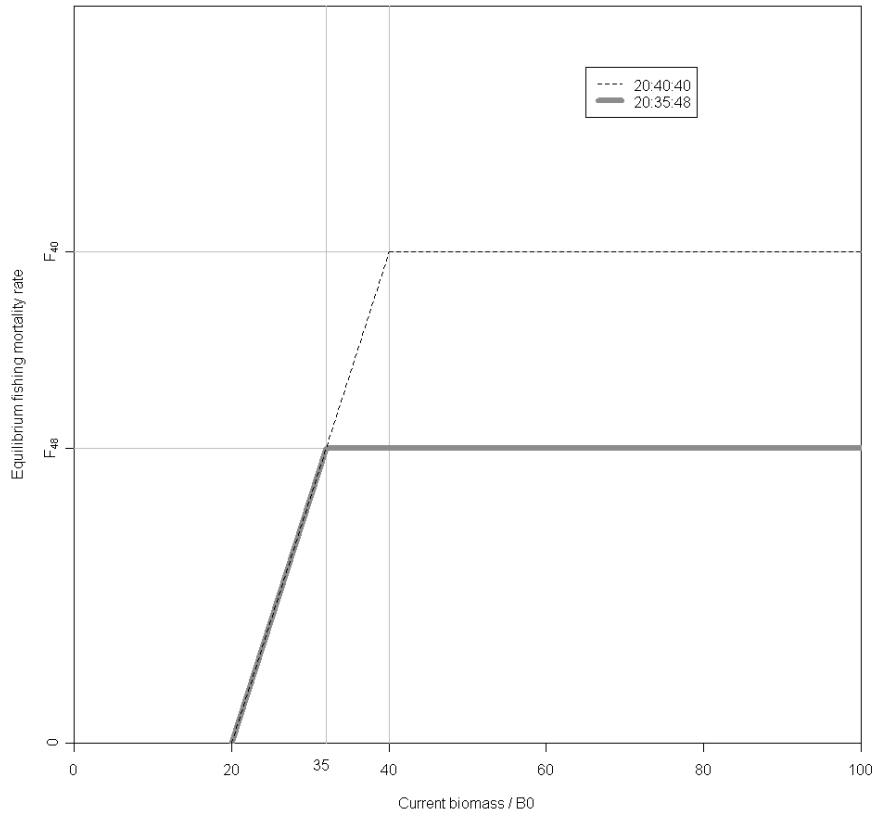


Figure 1.2 Alternative Tier 1 harvest control rules under the Commonwealth Harvest Strategy Policy in 2006, with alternative target biomass at B_{40} and B_{48} corresponding to B_{MSY} and B_{MEY} . Exploitation rate is expressed relative to F_{40} .

The values for the breakpoint range from 34.9 for Alfonsino to 36.09 for Blue-eye Trevalla with a mean value of 35.5. Given this tight range of values for the breakpoint, and the difficulties associated with calculating this value for a multi-fleet fishery, it is suggested that a breakpoint value of 35 be used for any species where B_{40} is used as the proxy for B_{MSY} and where B_{48} is used as the proxy for B_{MEY} for assessments in the SESSF conducted in 2008.

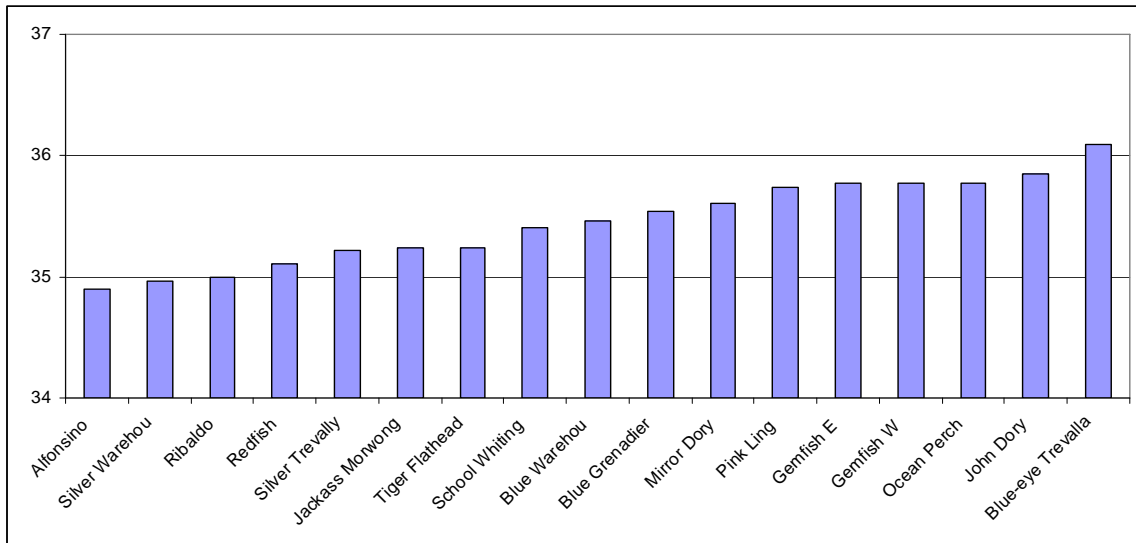


Figure 1.3 Breakpoint values plotted by species in ascending order.

Table 1.1. Breakpoint values by species.

Species	Breakpoint
Alfonsino	34.90
John Dory	35.85
Mirror Dory	35.60
Tiger Flathead	35.24
Gemfish E	35.77
Gemfish W	35.77
Blue Grenadier	35.54
Pink Ling	35.74
Jackass Morwong	35.24
Ribaldo	35.00
Redfish	35.10
Ocean Perch	35.77
Blue-eye Trevalla	36.09
Silver Trevally	35.22
Silver Warehou	34.97
Blue Warehou	35.46
School Whiting	35.40

2. REFERENCES

Klaer, N. 2008. Yield, and total mortality values and Tier 3 estimates for selected shelf and slope species in the SESSF 2008. Presented to the Shelf and Slope Assessment Groups, 2008.

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