

Robustness test ranking scores and assessment results for “Category A” robustness tests

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Ranking of robustness tests for OMP testing

Table 1 lists the full range of robustness tests being considered for OMP testing. Responses from OLRAC, MCM and MARAM for each robustness test with respect to whether the test should be included in the final set (Yes/Maybe/No) and the associated “*a priori*” plausibility weighting (H/M/L) are reported. The authors have then attempted to provide an “overall” set of “scores” for each test.

Note that in WG/04/07/WCRL2, a suggestion was made that rather than simply treat robustness tests as tick tests, the working group considers moving to a more formal incorporation of these results by an approach along the following lines:

- a) agree a resource-wide target $B(16/06)$ level (in either median or lower 5%ile terms);
- b) rank the robustness tests as of high/medium/low (H/M/L) plausibility; and
- c) require that all H tests meet the agreed criterion in a), and that all M tests meet a similar criterion with the $B(16/06)$ level set somewhat lower (by an extent to be agreed); L tests (if any) would purely be inspected to check that performance was not “outrageously” poor.

An initial suggestion is for a resource-wide (male) median target $B(16/06)$ value of 1.20 to be met by the RC and all H robustness tests, with M (including M+ and M-) robustness tests (but excluding test E3) required to meet a target of 1.1.

It is further suggested that an additional robustness test be included which accords 100% weighting to the no somatic growth increase scenario, and assigns this a plausibility weighting of M.

“Category A” robustness test assessment model output compared with the reference case assessment model.

A number of “Category A” robustness tests have been identified for use in examining the robustness of the new area-disaggregated OMP being developed for the west coast rock lobster. These “A” robustness tests require re-fitting of the size-structured operating model for all five super-areas to input data. Table 2 reports the $-lnL$ and the $B75(2005)$ estimates for each of these robustness test re-fits to data. These are compared with those for the reference case (RC, as estimated by MARAM). The column headed “T-RC” gives the [(robustness test $-lnL$ total) – (RC $-lnL$ total value)]. Negative values thus indicate an improved fit compared to the RC, and positive values a worse fit.

Suggested Priority for robustness tests

The final column in Table 1 lists a suggested priority for each test – “I” being highest priority, with “III” being the lowest. Initial priorities were assigned on the following lines:

Priority “I”: overall plausibility H or M+

Priority “II”: overall plausibility M

Priority “III”: overall plausibility M-

Robustness tests with an overall plausibility ranking of “L” are suggested to be excluded from the final set.

Final priorities take account of the overall “inclusion” score (excluding the test if this is N) and the likelihood compared to the RC. Only in the case SG4 is there broad indication of a poor fit of the model to the data, so that this is the only test excluded on the basis of the likelihood value.

Note that category C tests, though high plausibility, are accorded priority III because previous experience indicates that they are unlikely to give rise to difficulties in achieving targets so that they are considered less urgent to complete.

The reason for this prioritisation is that the time constraints may preclude carrying out computations for all tests.

Table 1: Possible list of robustness and other tests for evaluation in 2007. MARAM, MCM and OLRAC responses as well as a suggested “integrated” response for each test are given, together with a “priority” rating (see text) for the order in which these are computed. “EX” indicates “exclude”.

CATEGORY A TESTS	Description	Inclusion Yes/Maybe/No				Plausibility weighting H/M/L				Priority	
		MARAM	MCM	OLRAC	OVERALL	MARAM	MCM	OLRAC	OVERALL	Initial	Final
NS1	Male natural survivorship = 0.88	Y	Y	Y	Y	H	H	M	H	I	I
NS2	Male natural survivorship = 0.92	Y	Y	Y	Y	H	H	M	H	I	I
D2	Discard mortality = 0.2	M		N	M	H	M		M+	I	I
D3	Discard mortality increases 5 yrs prior to min size change	M	Y	N	M	L	H		M	II	II
SG1	Adult growth is 0.5mm more than thought	Y	Y	Y	Y	L	H	M	M	II	II
SG2	1910-1967 growth = 68-88 average	M	M	N	M	H	M		M+	I	I
SG3	Pre-1990 growth shifted down to 1990+ average level	M	M	M	M	M	M		M	II	II
SG4	1990+ growth shifted up to pre-1990 average level	Y	Y	M	Y	L	M-H		M	II	EX
W1	1990+ 225 MT walkout each yr* (but not in future)	M	Y	N	M	M	L		M-	III	III
W2	Once every decade 1910-1990 500 MT walkout	M	M	N	M	M	L		M-	III	III
B4	Hoop and trap CPUE 99-04 negatively biased by a factor of 1.3	Y	Y	Y	Y	L			L	EX	EX
CATEGORY B TESTS											
E1	R drops 50% for 3 years, once in 1998-2006	Y	Y	Y	Y	M	H	M/L	M	II	II

E3	25% all lobsters die once during 2006-2015	Y	Y	Y	Y	M	H	M/L	M	II	II
P1	Poaching reduced next 5 years to 200 MT	M	M	M	M	M	L		M-	III	III
TH1	Future trap:hoop changes? (see bottom for details)	N	N	N	N	M	L		M-	III	EX
B1	CPUE 2007+ stays constant	Y	M	Y	Y	M	M		M	II	II
B2	Future adult somatic growth 0.5mm than reported	Y	Y		Y	L	M		M-	III	III
B3	Future adult somatic growth 0.5mm less than reported	Y	Y		Y	L	H		M	II	II
W1 future	Future walkouts continue at 1990s rate	M	Y	N	M	M	H		M+	I	I
W3	W1 above, but 400 MT walk-out annually 2006+*	M		N	M	L	L		L	EX	EX
COMP	Hard combination of tests	Y	Y	N	Y	M	H		M+	I	I
RECR1	Future recreational take is ?	Y	N	N	N	M	L		M-	III	EX
CATEGORY C TESTS	(How to combine super-area data when some are not available)										
M1	FIMS index missing	Y	Y	N	Y				H	III	III
M2	Somatic growth index missing	Y	Y	N	Y				H	III	III
M3	Trap CPUE index is missing	Y	Y	N	Y				H	III	III
M4	Hoop cpue index is missing	Y	Y	N	Y				H	III	III
CATEGORY D TESTS	(How to split global TAC into super-area TACs)										
DD1	Split global TAC at current (2006) TAC proportions throughout the period	Y	Y	Y	Y			L	L	EX	EX

* Super-area division to be specified after discussion

For M1-M4: the OMP would assume the average of the previous 3 years' data

Table 2: Comparison of “Category A” robustness test results with those of the reference case (as estimated by MARAM). The “T-RC” column refers to the total robustness test $-lnL$ s less the total RC $-lnL$ values.

		<i>-lnL</i>						<i>B75(2005)</i>				
		T-RC	A12	A34	A56	A7	A8	A12	A34	A56	A7	A8
RC		0	-20.45	24.99	29.78	0.34	-55.23	526	3104	1326	4944	9386
NS1	Male natural survivorship = 0.88	-1.28	-20.86	25.45	28.17	0.27	-54.88	641	3345	1723	5612	11238
NS2	Male natural survivorship = 0.92	2.19	-19.91	25.55	26.91	4.76	-55.69	532	2903	1516	4412	8134
D2	Discard mortality = 0.2	3.68	-20.15	24.43	32.91	1.31	-55.39	544	3132	1321	5055	9494
D3	Discard mortality increases 5 yrs prior to min size change	-2.93	-20.23	24.39	26.69	0.71	-55.06	526	3063	1358	5178	9552
SG1	Adult growth is 0.5mm more than thought	-22.09	-17.06	30.29	9.66	-12.13	-53.42	337	2872	1588	4190	8390
SG2	1910-1967 growth = 68-88 average	-17.73	-19.91	28.00	15.94	-6.09	-56.24	532	2951	1266	5163	9214
SG3	Pre-1990 growth shifted down to 1990+ average level	17.6	-20.45	48.80	19.80	-6.58	-44.64	526	7587	1741	5916	16980
SG4	1990+ growth shifted up to pre-1990 average level	*	*	71.86	89.16	*	-30.03	*	3659	932	*	5184
W1	1990+ 225 MT walkout each yr* (but not in future)	-2.07	-20.45	23.34	29.36	0.34	-55.23	526	2815	975	4944	9386
W2	Once every decade 1910-1990 500 MT walkout	1.06	-20.45	25.12	30.71	0.34	-55.23	526	3180	1340	4944	9386
B4	Hoop and trap CPUE 99-04 negatively biased by a factor of 1.3	3.57	-23.01	22.29	33.23	2.10	-51.61	923	4182	1411	6485	13462

* convergence not attained