

Addendum to Fisheries/2010/MAY/SWG-SCRL/08

New Model 3 assessment results and CC projections

An updated version of Model 3 is presented here which has the following modifications from the version reported in the main text of Fisheries/2010/May/SWG-SCRL/08:

- 1) Somatic growth parameters estimated during fitting procedure to be used for all length-at-weight relationships.
- 2) Mean of recruit residuals over 1974-2000 period forced to zero
- 3) CPUE series variability (the σ parameter) be constrained to be at least 0.1 in the likelihood maximization process, because of potential problems of over-fitting given models with large numbers of estimable parameters

Note that in this case a constant catch of 345 tons more than meets the existing target of a 20% increase in the 2006 spawning biomass by 2025.

Table Add.1: Updated 2010 Model 3 estimated parameters and quantities of management interest. Biomass quantities are in MT.

Parameter/quantity	Global	Area 1	Area 2	Area 3
Total number of estimable parameters	226			
K^{sp} total female spawning biomass	3323			
h S/R steepness parameter	0.99			
λ^A proportion R to Area A		0.32	0.54	0.13
μ^A rel. female scaling parameter for Area A		1.05	0.76	1.00
$l_{50}^{m,A}$ length at 50% selectivity for male lobsters in Area A (mm)		69.75	65.88	86.68
$l_{95}^{m,A}$ length at 95% selectivity for male lobsters in Area A (mm)		78.63	73.20	108.52
$l_{50}^{f,A}$ length at 50% selectivity for female lobsters in Area A (mm)		67.42	63.48	81.91
$l_{95}^{f,A}$ length at 95% selectivity for male lobsters in Area A (mm)		74.86	70.07	97.65
β^* growth function parameter	0.110			
$L_{\infty}^{m,A}$ L_{∞} for male lobsters in Area A (mm)		110.11	101.32	128.82
$L_{\infty}^{f,A}$ L_{∞} for female lobsters in Area A (mm)		105.84	96.58	124.18
κ growth curve parameter (yr^{-1})	0.106			
t_0 growth curve parameter (yr^{-1})	-1.93			
l_m^*	65.91			
l_f^*	64.55			
$\bar{\omega}$	4.65			
λ	0.39			
$-\ln L$ (CPUE)	-132.56	-56.56	-34.59	-41.41
CPUE σ		0.104	0.206	0.167
$-\ln L$ (CAL)	-101.40	-9.05	0.201	-92.55
CAL σ		0.079	0.104	0.062
SR residual penalty	5.97			
Time varying selectivity penalty	12.54			
Growth parameters penalty	13.66			
Time varying recruitment penalty	14.62			
Total $-\ln L$ value	-187.840			
B_{06}^{sp} / K^{sp}	0.28			
B_{09}^{sp} / K^{sp}	0.28			
$B_{06}^{\text{exp},A} / K_{1973}^{\text{exp},A}$	0.29	0.23	0.33	0.18
$B_{06}^{\text{exp},A}$	2331	436	1434	460
$B_{09}^{\text{exp},A} / K_{1973}^{\text{exp},A}$	0.31	0.28	0.36	0.16
$B_{09}^{\text{exp},A}$	2503	529	1565	409

Table 2: Projection results for 2010 updated Model 3.

CC (MT)	360	345	330
B_{06}^{sp} / K^{sp}	0.28	0.28	0.28
B_{09}^{sp} / K^{sp}	0.28	0.28	0.28
B_{15}^{sp} / K^{sp}	0.33	0.34	0.34
B_{25}^{sp} / K^{sp}	0.37	0.40	0.42
$B_{25}^{sp} / B_{06}^{sp}$	1.36	1.44	1.53
B_{06}^{exp} / K^{exp}	0.27	0.27	0.27
B_{09}^{exp} / K^{exp}	0.29	0.29	0.29
B_{15}^{exp} / K^{exp}	0.32	0.33	0.34
B_{25}^{exp} / K^{exp}	0.37	0.39	0.42
$B_{25}^{exp} / B_{06}^{exp}$	1.38	1.48	1.58