Final area-disaggregated assessment results for west coast rock lobster

S.J. Johnston and D.S. Butterworth

MARAM
Department of Mathematics and Applied Mathematics
University of Cape Town
Rondebosch, 7701

MARAM/OLRAC averaged results

MARAM (Marine Resource Assessment and Management Group, University of Cape Town) and OLRAC (Ocean and Land Resource Assessment Consultants) both individually fitted their (identical algebraically, though small differences in coding effect various evaluations) size-structured models to the available data to obtain best fit parameter values for each of the super-areas. For the final models to be used for OMP testing purposes, the average of the MARAM and OLRAC best fit parameter values were used. In most cases the MARAM and OLRAC estimates were found to be very similar. Table 1 reports the area-disaggregated model results (as calculated by MARAM) using these final MARAM/OLRAC averaged parameter values. Figure 1 plots the estimated B_{75} trajectories for each super-area.

Table 1: Final MARAM/OLRAC averaged super-area and area-aggregated assessment results.

	A1-2	**A3-4**	**A5-6**	**A7**	**A8**
Female survivorship	0.88	0.89	0.89	0.89	0.89
R_{1910}	4.18×10^7	2.40×10^8	2.06×10^8	1.24×10^8	3.31×10^8
R_{1920}	4.3	0.90	1.15	0.64	0.29
R_{1950}	0.01	0.08	0.14	0.07	0.07
R_{1970}	0.06	0.12	0.15	0.11	0.12
R_{1975}	0.01	0.19	0.23	0.14	0.28
R_{1980}	0.03	0.05	0.07	0.06	0.21
R_{1985}	0.03	0.11	0.04	0.05	0.65
R_{1990}	0.02	0.16	0.02	0.07	0.48
R_{1995}	0.02	0.03	0.01	0.16	0.40
R_{2000}	0.02	0.08	0.05	0.09	0.40
Trap CPUE σ	-	0.542	0.410	0.293	0.184
Hoop CPUE σ	0.296	0.478	0.418	0.150	0.237
FIMS CPUE σ	-	1.594	1.073	0.785	0.181
Male Trap Size σ	-	0.229	0.188	0.278	0.303
Female Trap Size σ	-	0.150	0.263	0.166	0.267
Male Hoop Size σ	0.635	0.204	0.203	0.547	0.165
Female Hoop Size σ	0.267	0.159	0.266	0.794	0.345
Male FIMS Size σ	-	0.224	0.288	0.198	0.150
Female FIMS Size σ	-	0.397	0.247	0.193	0.150
Male Sublegal size σ	-	-	-	-	0.158
Female Sublegal size σ	-	-	-	-	0.181
Trap F% σ	-	0.150	0.150	0.150	0.150
Hoop F% σ	0.295	0.150	0.150	0.150	0.150
FIMS F% σ	-	0.150	0.181	0.150	0.150
Total $-lnL$	510.34	31.95	161.30	21.27	-53.60
B_{75}(2005) (MT)	**721**	**3875**	**399**	**5906**	**10302**
B_{75}(2005)/B_{75}(1910)	**0.01**	**0.03**	**0.003**	**0.03**	**0.06**
Egg (2005)/Egg (1910)	**0.01**	**0.03**	**0.01**	**0.08**	**0.25**

Note:
R_{1910} is the absolute recruitment in 1910.
$R_{1920} - R_{2000}$ are the recruitment values relative to R_{1910}.
σ is a measure of the variance associated with the residuals for that data source.
B_{75} here is the biomass of male and female lobsters above 75mm carapace length.
"Egg" is the egg production associated with female lobsters 65mm+ carapace length.

Figure 1: Model estimated *B*75 (biomass above 75mm carapace length) trajectories for each west coast rock lobster super-area. Bottom plot shows 1970+ only. [Note the increasing trend in recruitment for A12 over the 1910-1940 period is to allow for the large catches in the area over the 1950s and 1960s – see Figure 2].

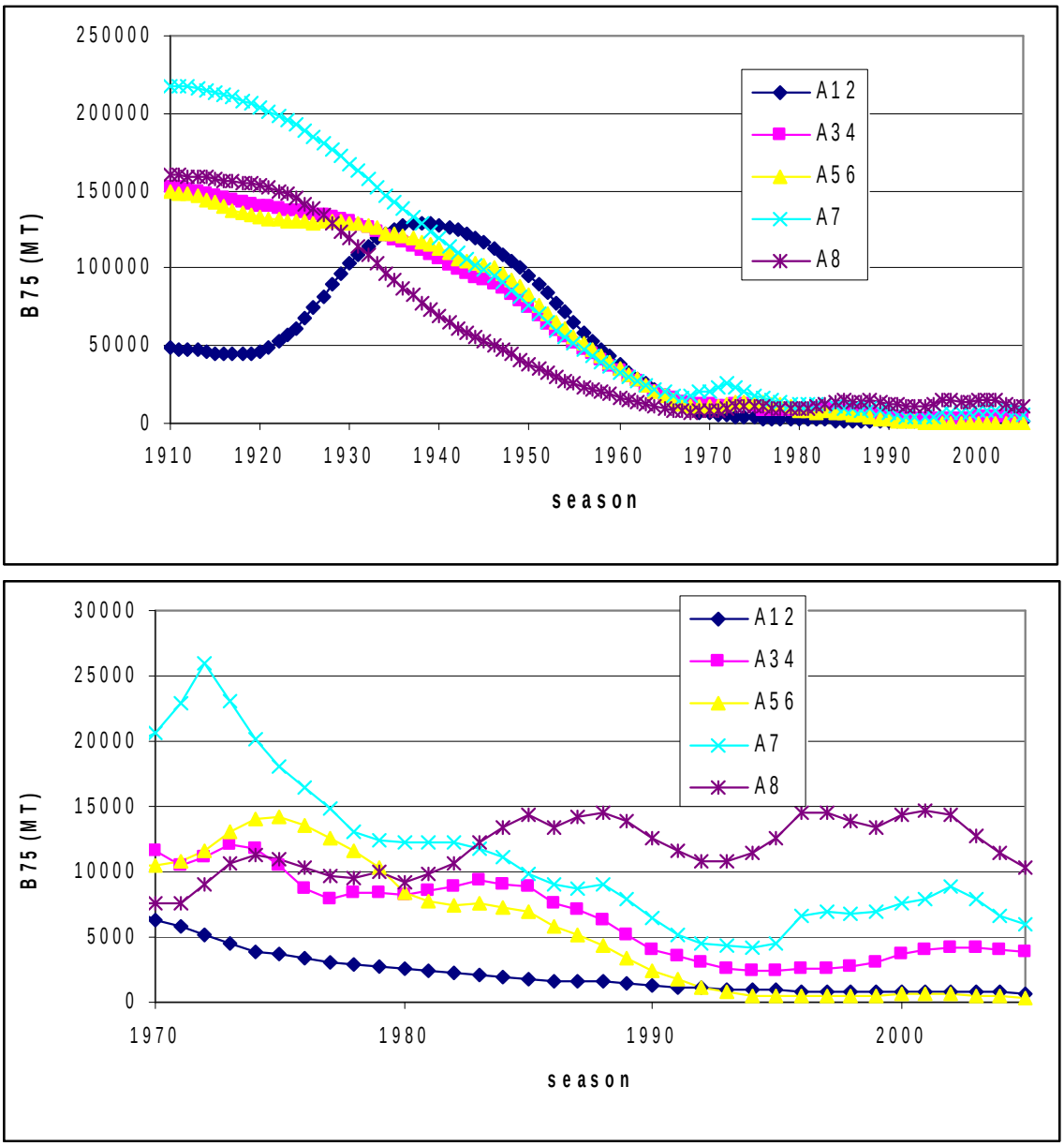

Figure 2: A12 commercial catch.