WCRL area-disaggregated OMP output: Task Group results

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Introduction

These results are for the "OMP2" presented in WG/04/07/WCRL1. Results have been updated using the "observed" 2005 somatic growth data provided by James Gaylard. (Note: 2005 refers to the 2005/06 season.)

The previous program also had an "error" in that it added "noise" to all (1993+) trap and hoop CPUE input data into the OMP, instead of treating the 1993-2004 values as "observed" and only adding noise to the 2005+ generated data.

The OMPs presented here are meant to be tuned so that the average commercial TAC over the 10-year period is either 2000 MT, 2200 MT or 2400 MT. Due to lack of time, the current tuning is approximate in these values being 2028 MT, 2244 MT and 2395 MT.

New summary statistics

Some new summary statistics have been added (see Table 1). These are:

B_m(16/10) = the biomass of male lobsters above 75mm at the end of the projection period (2016) relative to the biomass at the start of the assessment period (1910) when the resource is considered close to pristine.

B_m(16/80) = the biomass of male lobsters above 75mm at the end of the projection period (2016) relative to the biomass at the start of the 1980 season.

Effort(15/06) = the trap effort in the last year of the projection period (2015) relative to that in 2006. Here Effort(y) is calculated as the total trap catch in season y, divided by the trap CPUE from super-areas A7 and A8 (weighted according to the method described on pg 6 in WG/04/07/WCRL2)

Recreational take rule - a reminder of how the OMP deals with the recreational take calculation.

The OMP allocates a certain tonnage "globally", i.e. for all areas combined, for the recreational take each year. The following algorithm is applied:

$C_t^{rec} = 320$ MT initially

If $C_t^{rec} / TAC_t^G > 0.12 TAC_t^G$ then $C_t^{rec} = 0.10 TAC_t^G$ (when TAC_t^G below 2667 MT)
If $C_t^{rec} / TAC_t^G < 0.08 TAC_t^G$ then $C_t^{rec} = 0.10 TAC_t^G$ (when TAC_t^G above 4000 MT)

If $C_t^{rec} > 450$ MT then $C_t^{rec} = 450$ MT

where C_t^{rec} is the overall recreational take for year *t*, and TAC_t^G is the "total" or "global" (commercial plus recreational) TAC for year *t* as output by the OMP.

The following % breakdown of the overall recreational take (C_t^{rec}) by super-area is assumed; these %'s remain unchanged over time:
Area 1-2 = 2%
Area 3-4 = 12.5%
Area 5-6 = 12.5%
Area 7 = 4%
Area 8 = 69%

Discussion

OMP rule regarding TAC transfer from A8 to A34 and A7
The OMPs presented here include a rule for transferring some of the TAC from A8 (which shows low depletion especially at the lower 5%ile) to A34 and A7. The OMPs here assume 2% is transferred from A8 to these other 2 areas. From the results presented in Table 1, it is clear that the A8 depletion statistics are still very low (at the 5%ile level) and that increasing the amount to be transferred out of A8 would be beneficial. For the tuning of average commercial TAC = 2244 MT, the OMP was rerun where 5% of the A8 TAC is transferred equally between A34 and A7. The results of the *B*(16/06) statistics are presented below.

	2% transfer from A8	**5% transfer from A8**
A12	0.79 [0.50; 1.32]	0.79 [0.50; 1.32]
A34	0.93 [0.48; 2.42]	0.88 [0.44; 2.36]
A56	1.77 [0.61; 11.30]	1.77 [0.61; 11.29]
A7	1.81 [0.93; 3.94]	1.47 [0.58; 3.53]
A8	0.84 [**0.23**; 2.60]	1.02 [**0.40**; 2.84]
T	1.24 [0.61; 2.99]	1.24 [0.61; 2.99]

The lower 5%ile for A8 increases from 0.23 to 0.40. Further work will be conducted along this approach to attempt to optimise these biomass recovery statistics across super-areas.

Table 1: Median and 5th and 95th percentile values for three candidate OMPs tuned so that average commercial TAC =2028 MT, 2244 MT and 2395 MT, as well as for a constant catch CC=2200 MT option. Results are for the full stochastic integration.

		CC = 2200 MT	**OMP Tuning 2028 MT**	**OMP Tuning 2244 MT**	**OMP Tuning 2395 MT**
10-yr Ave commercial TAC	A1-2	30 [30; 30]	30 [30; 30]	30 [30; 30]	30 [30; 30]
	A3-4	230 [230; 230]	232 [178; 296]	264 [201; 329]	287 [219; 352]
	A5-6	40 [40; 40]	40 [40; 40]	40 [40; 40]	40 [40; 40]
	A7	590 [590; 590]	359 [301; 436]	389 [320; 475]	412 [332; 506]
	A8	1310 [1310; 1310]	1363 [1116; 1629]	1500 [1217; 1779]	1618 [1292; 1889]
	T	2200 [2200; 2200]	2028 [1670; 2402]	2244 [1828; 2593]	2395 [1950; 2765]
2007-2009 Ave commercial TAC	T	2200 [2200; 2200]	2043 [202; 2146]	2100 [2021; 2229]	2151 [2021; 2229]
10-yr Ave offshore TAC	A1-2	0 [0; 0]	0 [0; 0]	0 [0; 0]	0 [0; 0]
	A3-4	140 [140; 140]	143 [88; 206]	174 [111; 240]	198 [129; 262]
	A5-6	0 [0; 0]	0 [0; 0]	0 [0; 0]	0 [0; 0]
	A7	590 [590; 590]	359 [301; 436]	389 [320; 475]	412 [332; 506]
	A8	910 [910; 910]	963 [716; 1228]	1100 [816; 1379]	1218 [892; 1488]
	T	164 [1640; 1640]	1438 [1080; 1812]	1654 [1238; 2003]	1804 [1360; 2175]
Ave Total Recreational Take	T		228 [188; 279]	262 [202; 294]	281 [214; 308]
Ave V commercial	A1-2	0 [0; 0]	0 [0; 0]	0 [0; 0]	0 [0; 0]
	A3-4	0 [0; 0]	17 [13; 21]	18 [14; 22]	19 [16; 23]
	A5-6	0 [0; 0]	0 [0; 0]	0 [0; 0]	0 [0; 0]
	A7	0 [0; 0]	16 [13; 21]	16 [12; 20]	16 [13; 20]
	A8	0 [0; 0]	7 [5; 10]	6 [4; 9]	6 [4; 9]
	T	0 [0; 0]	9 [7; 11]	9 [6; 11]	9 [6; 11]
B_m**(16/06)**	A1-2	0.77 [0.48; 1.31]	0.80 [0.51; 1.33]	0.79 [0.50; 1.32]	0.78 [0.50; 1.31]
	A3-4	1.00 [0.55; 2.56]	0.99 [0.54; 2.47]	0.93 [0.48; 2.42]	0.88 [0.44; 2.37]
	A5-6	1.75 [0.58; 11.26]	1.79 [0.62; 11.31]	1.77 [0.61; 11.30]	1.77 [0.60; 11.28]
	A7	1.29 [0.42; 3.44]	1.88 [0.98; 4.03]	1.81 [0.93; 3.94]	1.75 [0.87; 3.87]
	A8	0.96 [0.21; 2.86]	1.01 [0.40; 2.79]	0.84 [0.23; 2.60]	0.70 [0.10; 2.47]
	T	1.24 [0.53; 2.98]	1.35 [0.72; 3.10]	1.24 [0.61; 2.99]	1.15 [0.52; 2.91]
B_m**(16/80)**	A1-2		0.25 [0.16; 0.42]	0.25 [0.16; 0.42]	0.25 [0.15; 0.42]
	A3-4		0.67 [0.37; 1.71]	0.63 [0.33; 1.67]	0.60 [0.30; 1.65]
	A5-6		0.39 [0.13; 2.45]	0.39 [0.13; 2.45]	0.39 [0.13; 2.45]
	A7		0.81 [0.42; 1.70]	0.78 [0.39; 1.66]	0.76 [0.37; 1.63]
	A8		1.16 [0.45; 3.19]	0.95 [0.26; 2.98]	0.81 [0.11; 2.84]
	T		0.78 [0.41; 1.82]	0.72 [0.35; 1.75]	0.66 [0.29; 1.70]
B_m**(16/1910)**	A1-2		0.01 [0.01; 0.02]	0.01 [0.01; 0.02]	0.01 [0.01; 0.02]
	A3-4		0.03 [0.02; 0.08]	0.03 [0.02; 0.08]	0.03 [0.01; 0.08]
	A5-6		0.02 [0.01; 0.15]	0.02 [0.01; 0.15]	0.02 [0.01; 0.15]
	A7		0.04 [0.02; 0.08]	0.03 [0.02; 0.07]	0.04 [0.02; 0.07]
	A8		0.06 [0.02; 0.16]	0.05 [0.01; 0.15]	0.04 [0.01; 0.15]
	T		0.04 [0.02; 0.09]	0.04 [0.02; 0.09]	0.30 [0.01; 0.09]
Effort(15/06)	T		0.65 [0.32; 1.25]	0.84 [0.41; 1.78]	1.03 [0.47; 2.46]

Figure 1a: OMP results for the tuning of average commercial **TAC = 2028 MT**. **Plot A** is the commercial TAC showing the median, with 50%-iles (black), 75-iles (dark-grey) and 90-iles (light grey). **Plot B** is the commercial TAC annual variation, showing the median, with 50-iles, 765-iles and 90%iles (shading as for plot A).
Plot C shows the total recreational take showing the median with the 5th and 95th percentiles. **Plot D** indicates the male biomass above 75mm trend showing the median with 5th and 95th percentiles. In each plot, the vertical hashed line indicates the start of the projection period.

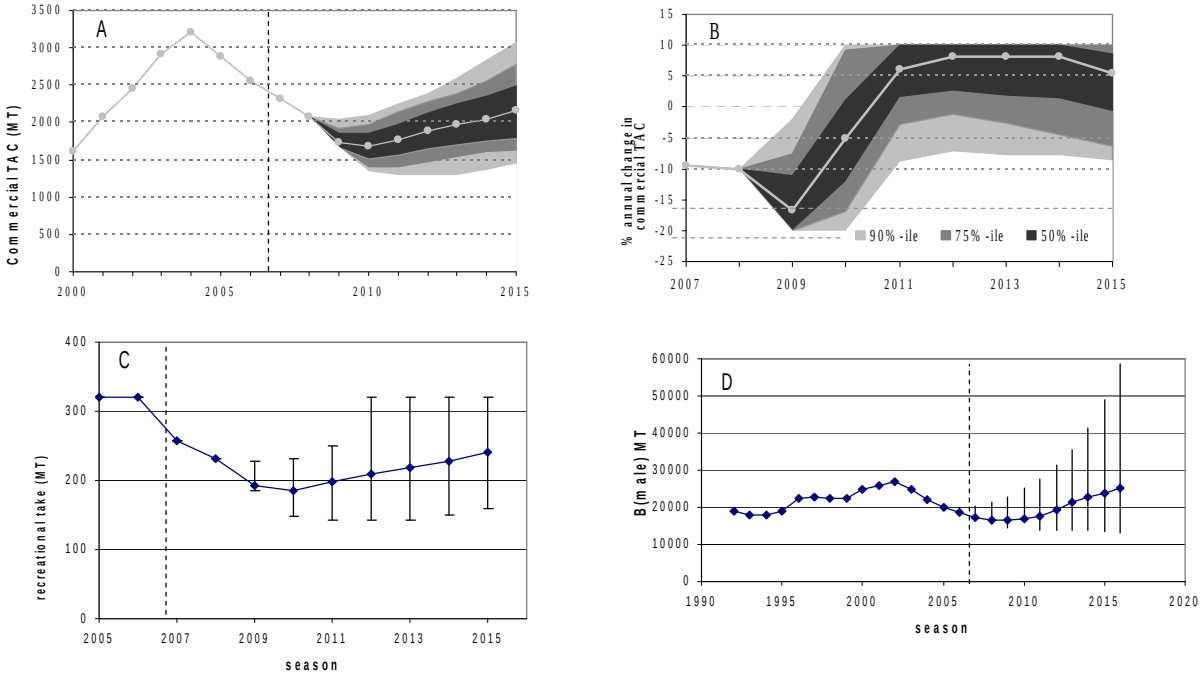

Figure 1b: OMP results for the tuning of average commercial **TAC = 2244 MT**. **Plot A** is the commercial TAC showing the median, with 50%-iles (black), 75-iles (dark-grey) and 90-iles (light grey). **Plot B** is the commercial TAC annual variation, showing the median, with 50-iles, 765-iles and 90%iles (shading as for plot A).
Plot C shows the total recreational take showing the median with the 5th and 95th percentiles. **Plot D** indicates the male biomass above 75mm trend showing the median with 5th and 95th percentiles. In each plot, the vertical hashed line indicates the start of the projection period.

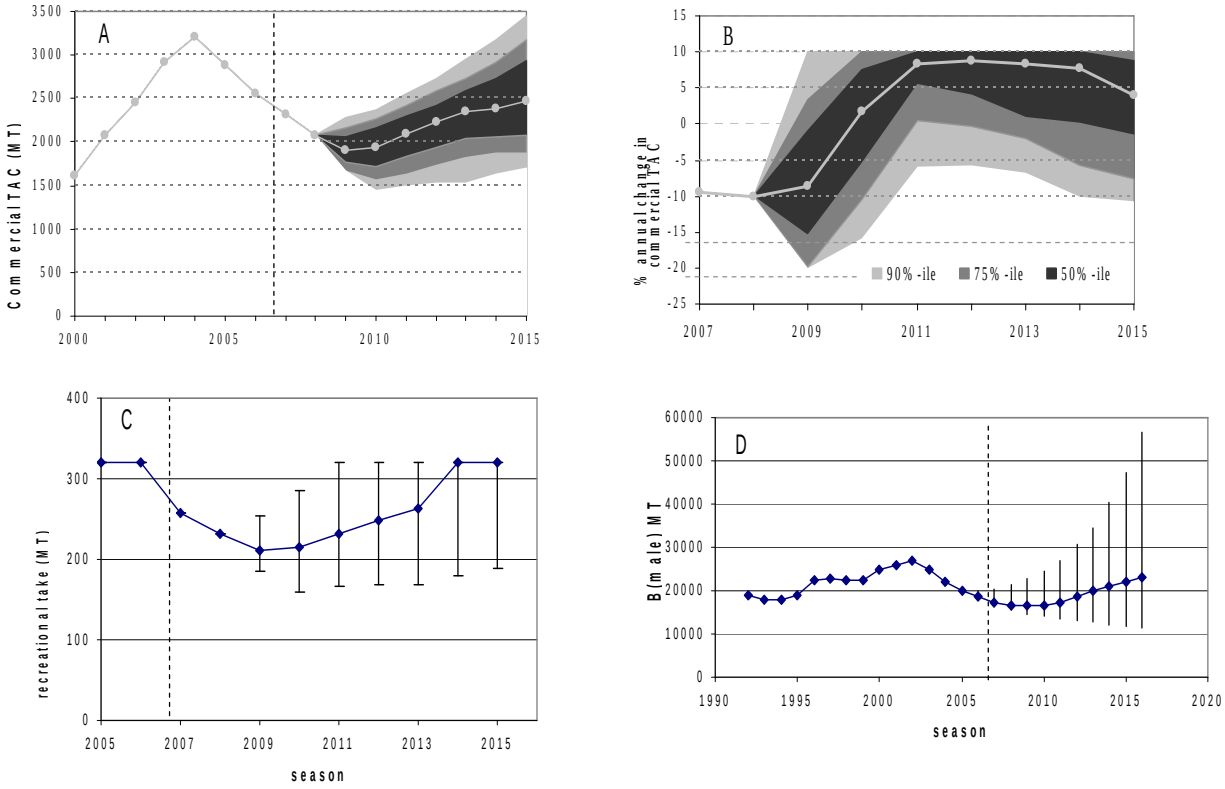

Figure 1c: OMP results for the tuning of average commercial **TAC = 2400 MT**. **Plot A** is the commercial TAC showing the median, with 50%-iles (black), 75-iles (dark-grey) and 90-iles (light grey). **Plot B** is the commercial TAC annual variation, showing the median, with 50-iles, 765-iles and 90%iles (shading as for plot A).
Plot C shows the total recreational take showing the median with the 5th and 95th percentiles. **Plot D** indicates the male biomass above 75mm trend showing the median with 5th and 95th percentiles. In each plot, the vertical hashed line indicates the start of the projection period.

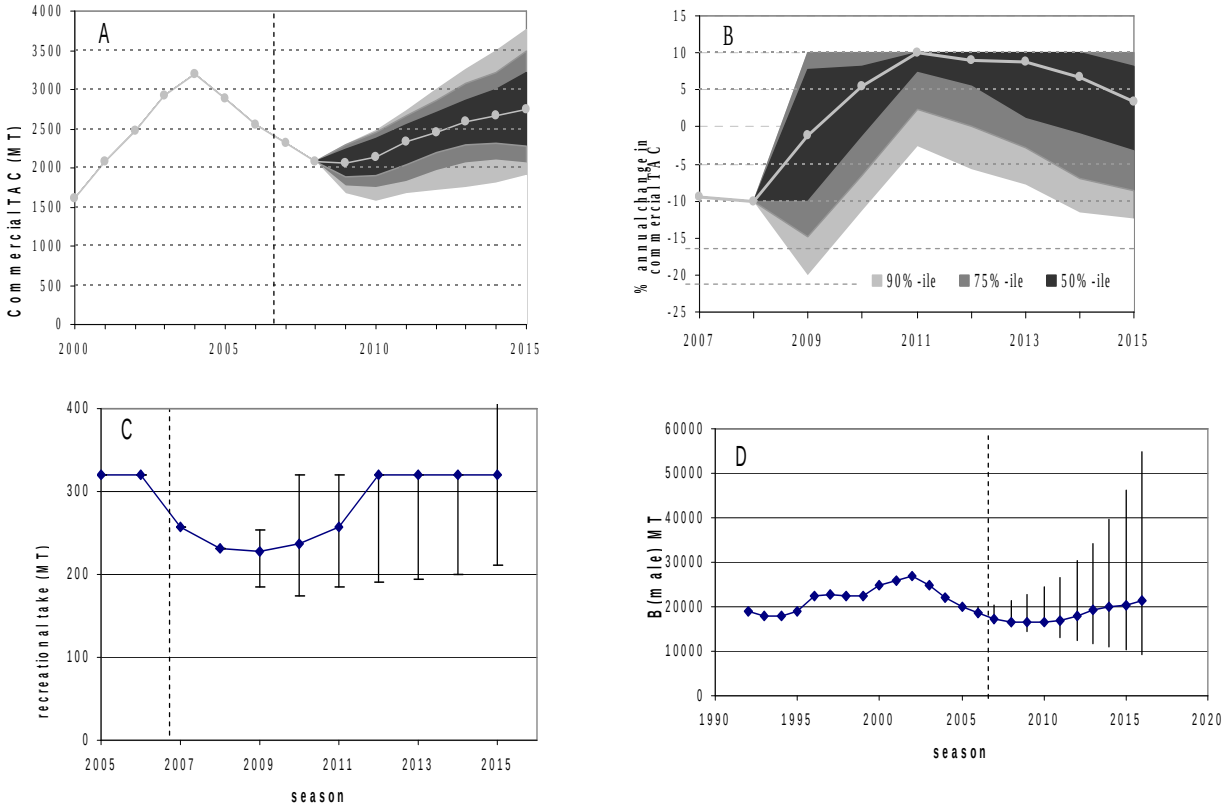

Figure 1d: Comparative plots of commercial TAC for the three OMPs presented. Only medians are indicated. The vertical hashed line indicates the start of the projection period.

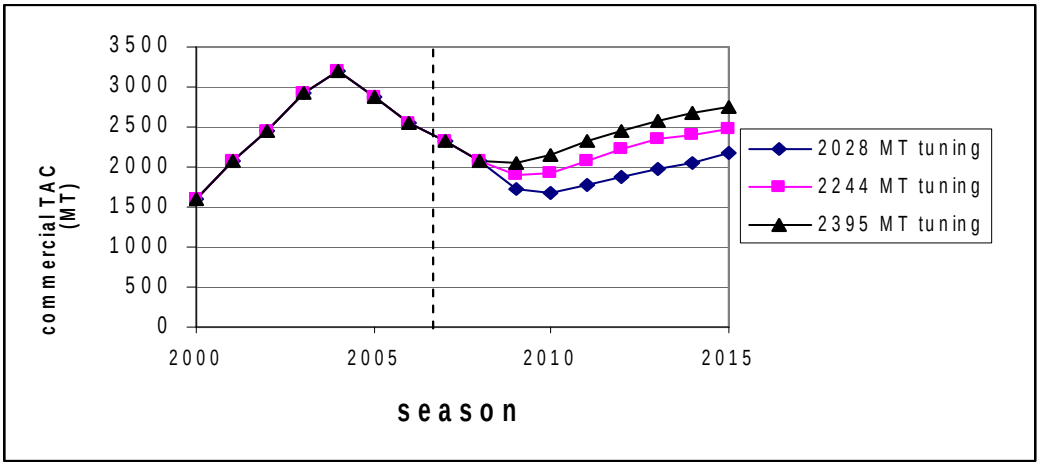

Figure 1e: Comparative plots of male biomass above 75mm for the three OMPs presented, as well as for a zero future harvest. Only medians are indicated. The vertical hashed line indicates the start of the projection period.

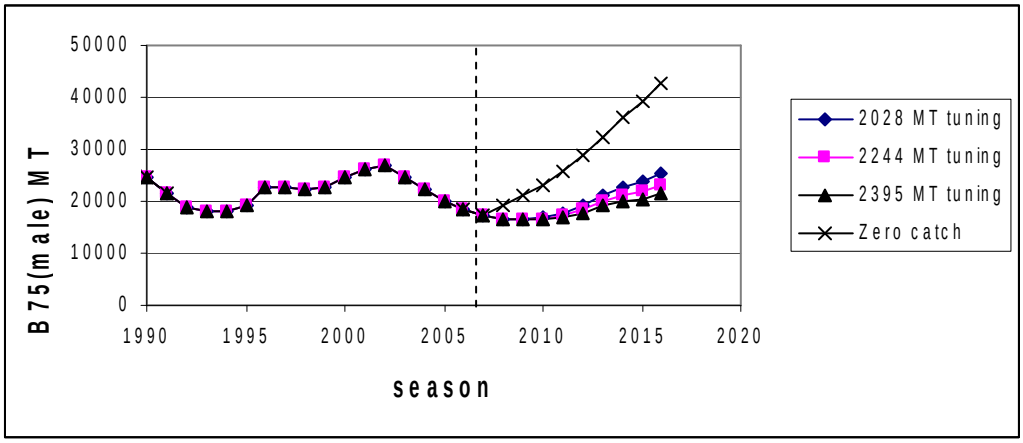

Figure 1f: Male biomass (above 75mm) trend from 1910-2016.