Simulation results for final candidate MPs for the new OMP 2011 for West Coast Rock Lobster

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Introduction

At a meeting on 18 Oct 2011, the SWG reviewed a number of alternate CMPs (Candidate Management Procedures) for the future management of the west coast rock lobster resource (see Fisheries/2011/OCT/SWG-WCRL/58_rev and Fisheries/2011/OCT/SWG-WCRL/59_rev).

A final CMP was selected by the SWG to put forward to management as the new OMP 2011. This CMP (CMP1 in this document) would aim for a 35% biomass recovery by 2021, i.e. the projected median B75m(2021/2006) is 1.35.

Subsequently a modification to this CMP was made by management, whereby the 35% recovery target would remain, but the 2011 TAC for the Offshore sector would be fixed at that associated with a 30% recovery target (1540.65 MT). This forms CMP2 in this document (which has been retuned so that the overall 35% biomass recovery is maintained).

Lastly, there has been a request from the Interim Relief sector that the minimum legal carapace length for their sector be reduced from the current 80mm CL to 75mm CL (in line with the rest of the commercial fishery). CMP3 here thus retunes CMP2 yet again to achieve the same 35% biomass recovery target. So to summarise the three CMPs presented here:

CMP1: Original 35% biomass recovery OMP (IR min size 80mm)

CMP2: Adjusted 35% biomass recovery OMP whereby 2011 Offshore TAC fixed at 1540.65 MT (IR min size 80mm)

CMP3: Adjusted 35% biomass recovery OMP whereby 2011 Offshore TAC fixed at 1540.65 MT and IR min size reduced to 75mm.

Results

Stochastic simulations to test the performance of the alternate CMPs

Table 1 reports detailed simulated output statistics (from 1000 simulations) for the various sector catches/takes per area as well as biomass recovery values. Medians, 5^{th}, 25^{th} and 95^{th} percentiles are reported. These results are shown for the CMP1, CMP2 and CMP3 (all for the "alternative" sector split, which we understand has now been accepted to apply for the future).

Table 2a reports the number of times (expressed also as percentages) one can expect the EC rule to be invoked for the three CMPs reported in Table 1. Table 2b reports the number of times (and percentages) that one can expect the same rule to be invoked in the first four years (i.e. period 2011-2014).

Figure 1a shows the Total Global TAC and B75m(y/2006) trajectories for CMP 1 and CMP 3 Median, 5th, 25th and 95th percentiles are shown. Figure 1b shows the Total Global Offshore, Nearshore, Subsistence and Recreational allocations for each for the two CMPs. In these two figures, CMP1 results are shown in black, and CMP3 results shown in gray. Solid lines indicate the median values, whereas the dashed lines show the 5th, 25th and 95th percentiles (either black or gray).

TAC values for the 2011/12 season

Table 3 reports the resultant TAC values for each sector and super-area for the 2011/12 season that result from the implementation of the three different CMPs.

Discussion

Effectively we would understand that it is now CMP3 that is to apply for the next four seasons.

Note that compared to CMP1, this is projected to achieve about 4% more catch on average over the next 10 years, with a marginal reduction in some of the percentiles for projected rsource recovery (see Table1). Though higher for the first two years the median for future TACs thereafter is lower under CMP3 (see Fig. 1a). Furthermore possible increases in subsistence (interim relif) allocations may be delayed (Fig. 1b). Table 2a shows a slight increase (about 0.5%) in the probability that Exceptional Circumstances may be declared in the next 10 years.

Table 3 shows allocations by sector and by super-area under CMP3 for the 2011/12 season.

The WCRL Working Group needs to confirm the above so that work can proceed to complete the full documentation associated withOMP 2011 and its implementation.

Table 1: Comparison between three CMPs (for the "alternative" sector splits). Medians with 5th, 25th and 95th percentile values shown in parentheses. [Results for 1000 simulations.]

		CMP1	**CMP2**	**CMP3**
		Original 35% recovery	**CMP1 but offshore commercial TAC 2011 as if 30% recovery**	**CMP2 but IR min size reduced to 75mm**
	α	**2700**	**2595**	**2700**
	J_{min}	**0.2**	**0.2**	**0.2**
10-yr (2011-2020) Ave Global TAC	A1-2	34 [21; 29; 43]	34 [21; 29; 43]	36 [22; 30; 44]
	A3-4	392 [215; 327; 571]	394 [215; 330; 589]	411 [225; 346; 611]
	A5-6	133 [92; 116; 159]	133 [91; 118; 158]	135 [97; 121; 160]
	A7	512 [0; 210; 937]	510 [0; 196; 931]	539 [0; 202; 977]
	A8	1093 [844; 979; 1410]	1109 [851; 1005; 1394]	1145 [903; 1043; 1436]
	T	2120 [1380; 1781; 2939]	2150 [1425; 1817; 2913]	2213 [1516; 1890; 3012]
10-yr (2011-2020) Ave offshore TAC	A1-2	0 [0; 0; 0]	0 [0; 0; 0; 0]	0 [0; 0; 0]
	A3-4	250 [124; 198; 421]	251 [123; 199; 431]	265 [131; 211; 448]
	A5-6	20 [20; 20; 20]	20 [20; 20; 20]	20 [20; 20; 20]
	A7	506 [0; 207; 928]	504 [0; 193; 923]	533 [0; 198; 968]
	A8	546 [415; 487; 750]	561 [436; 503; 758]	582 [454; 522; 784]
	T	1300 [821; 1063; 1868]	1313 [856; 1082; 1864]	1364 [915; 1124; 1938]
10-yr (2011-2020) Ave near shore TAC	A1-2	23 [14; 19; 29]	23 [14; 19; 29]	24 [15; 20; 30]
	A3-4	68 [41; 58; 89]	68 [41; 59; 87]	72 [43; 61; 89]
	A5-6	31 [20; 26; 39]	31 [20; 27; 39]	32 [22; 28; 40]
	A7	0 [0; 0; 0]	0 [0; 0; 0]	0 [0; 0; 0]
	A8	306 [205; 265; 394]	306 [202; 269; 388]	322 [219; 280; 397]
	T	425 [285; 367; 550]	426 [282; 373; 543]	451 [306; 389; 555]
10-yr (2011-2020) Ave subsistence TAC	A1-2	8 [5; 6; 10]	8 [5; 7; 10]	8 [5; 7; 10]
	A3-4	51 [29; 42; 62]	52 [30; 42; 61]	51 [31; 43; 62]
	A5-6	61 [39; 51; 73]	62 [38; 51; 73]	62 [41; 53; 73]
	A7	0 [0; 0; 0]	0 [0; 0; 0]	0 [0; 0; 0]
	A8	128 [82; 106; 153]	128 [82; 108; 152]	128 [88; 111; 153]
	T	245 [158; 204; 297]	245 [157; 208; 295]	250 [168; 214; 297]
10 yr (2011-2020) Ave Total Recreational Take	T	174 [103; 146; 226]	173 [102; 149; 218]	180 [111; 153; 233]
***B75*$_m$(21/06)**	A1-2	1.33 (0.66; 0.96; 3.30)	1.34 (0.67; 0.97; 3.30)	1.33 (0.67; 0.96; 3.29)
	A3-4	1.24 (0.41; 0.80; 3.53)	1.23 (0.43; 0.80; 3.53)	1.21 (0.40; 0.78; 3.52)
	A5-6	1.72 (1.23; 1.45; 3.45)	1.73 (1.24; 1.45; 3.45)	1.74 (1.24; 1.47; 3.48)
	A7	1.94 (0.36; 0.94; 8.70)	1.94 (0.37; 0.96; 8.74)	1.88 (0.36; 0.91; 8.62)
	A8	1.01 (0.40; 0.71; 2.30)	0.99 (0.39; 0.70; 2.28)	1.01 (0.41; 0.71; 2.32)
	T	1.35 (0.72; 1.04; 3.09)	1.35 (0.72; 1.03; 3.05)	1.35 (0.72; 1.03; 3.06)

Table 2a: # times out of 10000 (1000 simulations and 10 years) that the EC rule is invoked in any one super-area for the different CMPs. The % chance of the EC occurring is given in parentheses.

	CMP1	**CMP2**	**CMP3**
	Original 35% recovery	**CMP1 but offshore commercial TAC 2011 as if 30% recovery**	**CMP2 but IR min size reduced to 75mm**
α	**2700**	**2595**	**2700**
A1+2	119 (1.19%)	122 (1.22%)	123 (1.23%)
A3+4	142 (1.42%)	143 (1.43 %)	144 (1.44%)
A5+6	39 (0.39%)	40 (0.40%)	37 (0.37%)
A7	399 (3.99%)	396 (3.96%)	409 (4.09%)
A8+	375 (3.75%)	378 (3.78%)	372 (3.72%)
T	1044 (10.44%)	1079 (10.79%)	1085 (10.85%)

Table 2b: # times out of 4000 (1000 simulations and 4 years) that the EC rule is invoked in any one super-area **during the first four years** for the different CMPs.

	CMP 1	**CMP 2**	**CMP 3**
	Original 35% recovery	**CMP1 but offshore commercial TAC 2011 as if 30% recovery**	**CMP2 but IR min size reduced to 75mm**
α	**2400**	**3000**	**3500**
A1+2	0 (0%)	0 (0%)	0 (0%)
A3+4	10 (0.10%)	10 (0.10%)	10 (0.10%)
A5+6	7 (0.07%)	7 (0.07%)	6 (0.06%)
A7	210 (2.1%)	212 (2.12%)	212 (2.12%)
A8+	1 (0.01%)	1 (0.01%)	1 (0.01%)
T	228 (2.28%)	230 (2.30%)	229 (2.29%)

Table 3: The TAC values (all MT) for the 2011/12 season associated with the various candidate OMPs. The first column reports the 2010/11 season values.

		CMP1	CMP2	CMP3
	2010/11 season	**Original 35% recovery** (α=2700)	**CMP1 but offshore commercial TAC 2011 as if 30% recovery** (α=2595)	**CMP2 but IR min size reduced to 75mm** (α=2700)
Global T	**2286.20**	**2260.53 (-1.12%)**	**2425.78 (6.11%)**	**2425.78 (6.11%)**
Global A1+2	37.67	36.13	36.13	36.13
Global A3+4	208.26	213.67	222.36	222.36
Global A5+6	125.93	136.93	136.93	136.93
Global A7	394.27	310.04	348.10	348.10
Global A8+	1720.09	1563.75	1682.26	1682.26
Offshore T	**1528.22**	**1375.40[+] (-10.0%)**	**1540.65 (0.81%)**	**1540.65 (0.81%)**
Offshore A1+2	0	0	0	0
Offshore A3+4	51.9	66.28	74.96	74.96
Offshore A5+6	0	20	20	20
Offshore A7	383.99	302.73	340.78	340.78
Offshore A8+	1092.33	986.39	1104.91	1104.91
Nearshore T	**451**	**451**	**451**	**451**
Nearshore A1+2	24.17	24.17	24.17	24.17
Nearshore A3+4	72.48	72.48	72.48	72.48
Nearshore A5+6	32.2	32.20	32.20	32.20
Nearshore A7	0	0	0	0
Nearshore A8+	322.15	322.15	322.15	322.15
Subsistence T	**200***	**251**	**251**	**251**
Subsistence A1+2	6.6	8.30	8.30	8.30
Subsistence A3+4	41.4	52.06	52.06	52.06
Subsistence A5+6	49.2	61.86	61.86	61.86
Subsistence A7	0	0	0	0
Subsistence A8+	102.6107	129.00	129.00	129.00
Recreational T	**107**	**183**	**183**	**183**

*This was the allocation made, not the actual catch estimated to have been taken (which is ~270 MT)

[++] OMP gives 1255.2 MT: 10% max decrease constraint comes into play

Figure 1a: B75m(y/2006) and Total Global TAC trajectories for CMP1 (black) and CMP3 (gray). Median (solid line), 5th, 25th and 95th percentiles shown.

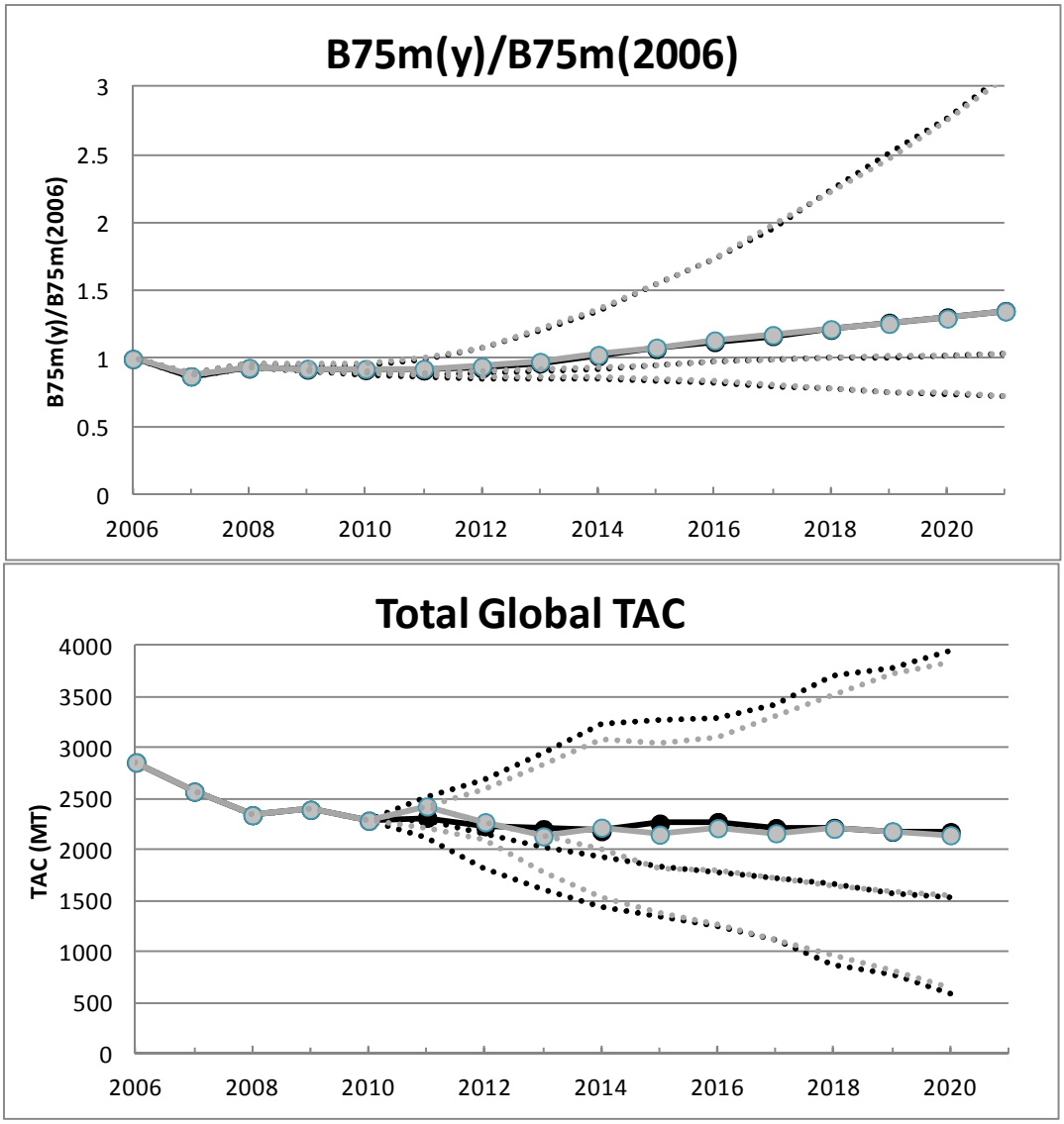

Figure 1b: Total Offshore, Nearshore, Subsistence and Recreational TACs for CMP1 (black) and CMP3 (gray). Median (solid line), 5th, 25th and 95th percentiles shown.