Abalone confiscation numbers and trends summary for Zones A-D in 2008

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SUMMARY

Poaching confiscation data have been updated using all data currently available up until the end of September 2008. The data have been reworked in terms of a standard Model year *y* that is taken to run from October of year *y*-1 to September of year *y*. This was necessary for reasons of internal consistency in the assessment process which uses a Model year as thus defined.

The revised data provided by A. Mackenzie have been reworked in the same way as previously and the "revised" trend and minimum numbers confiscated are given in this document. The revised trends differ to those assumed last year and hence the previous version is provided here for reasons of comparison.

Poaching trend assumptions

The poaching confiscation data are used to obtain base-case estimates of the trend in poaching over time in each of Zones A-D. A better measure of changes in the level of poaching in a Zone is not confiscation *per se*, but the Confiscations Per Unit of Policing Effort (CPUPE). Table 1 shows the poaching trend based only on the location-known zonal confiscation data. As in previous years, a linear increase in poaching (from zero in 1990 increasing up to the 1994 level) is assumed for Zone C and for Zone D (from zero in 1991 increasing up to the 1994 level) because confiscation data are available only from 1994 onwards. Poaching is thought to have started earlier in these Zones than in Zones A and B.

The policing efficiency levels shown in Table 2 represent the "best guess" of the increase in policing efficiency based on knowledge of police operations (as previously advised by Marcel Kroese, MCM and more recently by Pedro Goosen, MCM). Note that, for example, a policing level factor of 2 implies a 100% increase in policing efficiency so that the corresponding confiscation amounts are multiplied by a factor of 0.5 to make them comparable to the other values. This year a revised index was provided by Pedro Goosen and this index is shown in Table 2b. As the policing efficiency level in 2007 and 2008 is assumed to have been similar, the original index has been updated by similarly assuming that the 2008 value is the same as the 2007 value (see Table 2a).

The revised poaching trends for use as inputs (in terms of relative numbers poached) into the 2008 model runs are summarised in Table 2 and Figs. 2-3, with last year's trends given in Fig. 1 for comparison. The Figures also show a 3-point moving average superimposed on each plot. These smoothed plots are used as inputs to the model in preference to the unsmoothed CPUPE trends.

Figure 1 shows the old 2007 CPUPE plots, as a comparison with the updated 2008 base-case CPUPE plots shown in Fig. 2. The revision included updates to the old data on confiscations per zone, as well as new data for Model years 2007 and 2008. The base-case assumes the same policing efficiency in 2008 as for 2007 (Fig. 2), whereas the alternative "Pedro case" uses the policing efficiency index provided by Pedro Goosen (MCM).

Assumptions regarding numbers confiscated

Table 3 shows the total number of abalone confiscated per Zone per Model year. The Table shows the TOTAL number of abalone confiscations per Zone if the Zone "Unknown" confiscation component is assumed allocated to the various Zones in the same proportion as the relative number of confiscations per Zone. The values shown in Table 3 are also used as a diagnostic check in scenarios in which the poaching level is estimated within the model: they represent the minimum realistic poaching estimates (i.e. the actual amount poached must be greater than the corresponding confiscation estimates).

Acknowledgements

Data were provided by Angus MacKenzie, MCM and is gratefully acknowledged.

Table 1. Summary of “Zone-known” confiscations for each of Zones A-D, as updated from doc 12. The data include adjustments to account for takes from Betty’s Bay and Dyer Island. These data are used to compute the poaching trend scenarios given in the next table.

Model Year	Zone A	Zone B	Zone C	Zone D
1994	0	415	9852	1081
1995	0	2633	15145	2654
1996	0	1502	12658	1560
1997	5843	4470	15961	2969
1998	24673	7663	10674	3521
1999	13470	3656	6843	2393
2000	8316	22756	7373	5811
2001	9289	42086	4746	8733
2002	47927	171046	10521	16982
2003	31222	89826	6819	12640
2004	56496	123257	9148	3757
2005	40731	66267	3307	3871
2006	66358	72922	2826	3783
2007	74849	42364	1471	1919
2008	52306	34039	3622	3086

Table 2. Summary of a) updated base- case and b) revised trend based on Pedro's policing efficiency index revision, for each of the abalone fishery Zones A-D. Note that the proportions in each column represent the poaching intensity in that Zone relative to the maximum poaching level observed for that Zone. The "policing efficiency levels" shown in the last columns were proposed by the Abalone Working Group and have been used to derive modified time series representing confiscations-per-unit-policing. For all Zones A-D, all years from 1980 to 1993 are set to 10% of the 1997 value; and for Zone A , years from 1994 to 1996 are similarly set to 10% of the 1997 Zone A value.

a) Updated base-case

(a) Base-case	Zone A	Zone B	Zone C	Zone D	Policing efficiency level
Pre-1980	0	0	0	0	
1980-1989	0.007	0.003	0.096	0.020	
1990	0.007	0.003	0.096	0.020	
1991	0.007	0.003	0.096	0.020	
1992	0.007	0.003	0.096	0.020	
1993	0.007	0.003	0.096	0.020	
1994	0.007	0.003	0.65	0.08	1
1995	0.007	0.019	1.00	0.20	1
1996	0.007	0.011	0.84	0.11	1
1997	0.07	0.03	0.96	0.20	1.1
1998	0.30	0.05	0.64	0.24	1.1
1999	0.14	0.02	0.36	0.14	1.25
2000	0.09	0.13	0.39	0.34	1.25
2001	0.10	0.25	0.25	0.51	1.25
2002	0.51	1.00	0.56	1.00	1.25
2003	0.33	0.53	0.36	0.74	1.25
2004	0.75	0.90	0.60	0.28	1
2005	0.54	0.48	0.22	0.28	1
2006	0.89	0.53	0.19	0.28	1
2007	1.00	0.31	0.10	0.14	1
2008	0.70	0.25	0.24	0.23	1

b) Revised "Pedro" case

(b) Alternative update	Zone A	Zone B	Zone C	Zone D	Policing efficiency level
Pre-1980	0	0	0	0	
1980-1989	0.012	0.003	0.100	0.017	
1990	0.012	0.003	0.100	0.017	
1991	0.012	0.003	0.100	0.017	
1992	0.012	0.003	0.100	0.017	
1993	0.012	0.003	0.100	0.017	
1994	0.012	0.003	0.62	0.06	1
1995	0.012	0.019	0.95	0.16	1
1996	0.012	0.011	0.79	0.09	1
1997	0.12	0.03	1.00	0.17	1
1998	0.49	0.04	0.67	0.21	1
1999	0.27	0.02	0.43	0.14	1
2000	0.17	0.13	0.46	0.34	1
2001	0.19	0.25	0.30	0.51	1
2002	0.96	1.00	0.66	1.00	1
2003	0.63	0.53	0.43	0.74	1
2004	0.75	0.48	0.38	0.15	1.5
2005	0.47	0.22	0.12	0.13	1.75
2006	0.76	0.24	0.10	0.13	1.75
2007	1.00	0.17	0.06	0.08	1.5
2008	0.70	0.13	0.15	0.12	1.5

Table 3. Total confiscation estimates per Zone after adding contribution from "Undefined zone" category. Confiscations per zone have been adjusted to account for takes from Betty's Bay and Dyer Island. Values in this table are used to set the minimum number of poached animals that must have been taken from a particular zone in a particular year.

Model Year	Zone A	Zone B	Zone C	Zone D
1994	0	415	9852	1081
1995	0	9792	56322	9870
1996	0	6756	56939	7017
1997	11597	8872	31679	5893
1998	70883	22015	30665	10115
1999	33748	9160	17145	5995
2000	51701	141474	45838	36127
2001	31550	142942	21721	24351
2002	123772	441729	35371	37037
2003	101757	292757	29812	33950
2004	146412	319427	30879	10897
2005	134233	218389	14638	14481
2006	252990	278015	14689	16487
2007	401601	227303	11056	11922
2008	217590	141601	20705	14730

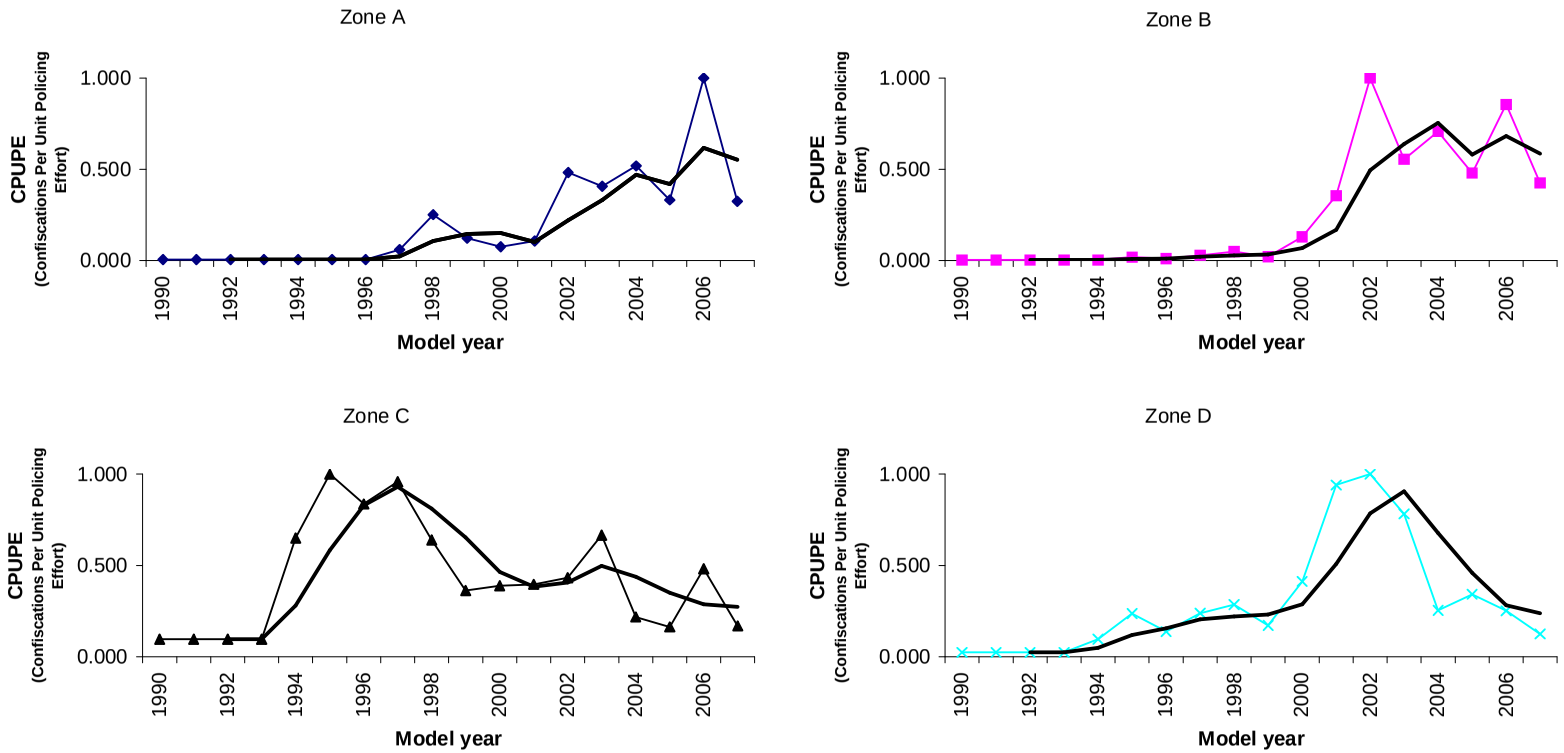

Fig. 1. Plots of 2007 CPUPE for each of Zones A-D. The solid black line shows a 3-point moving average.

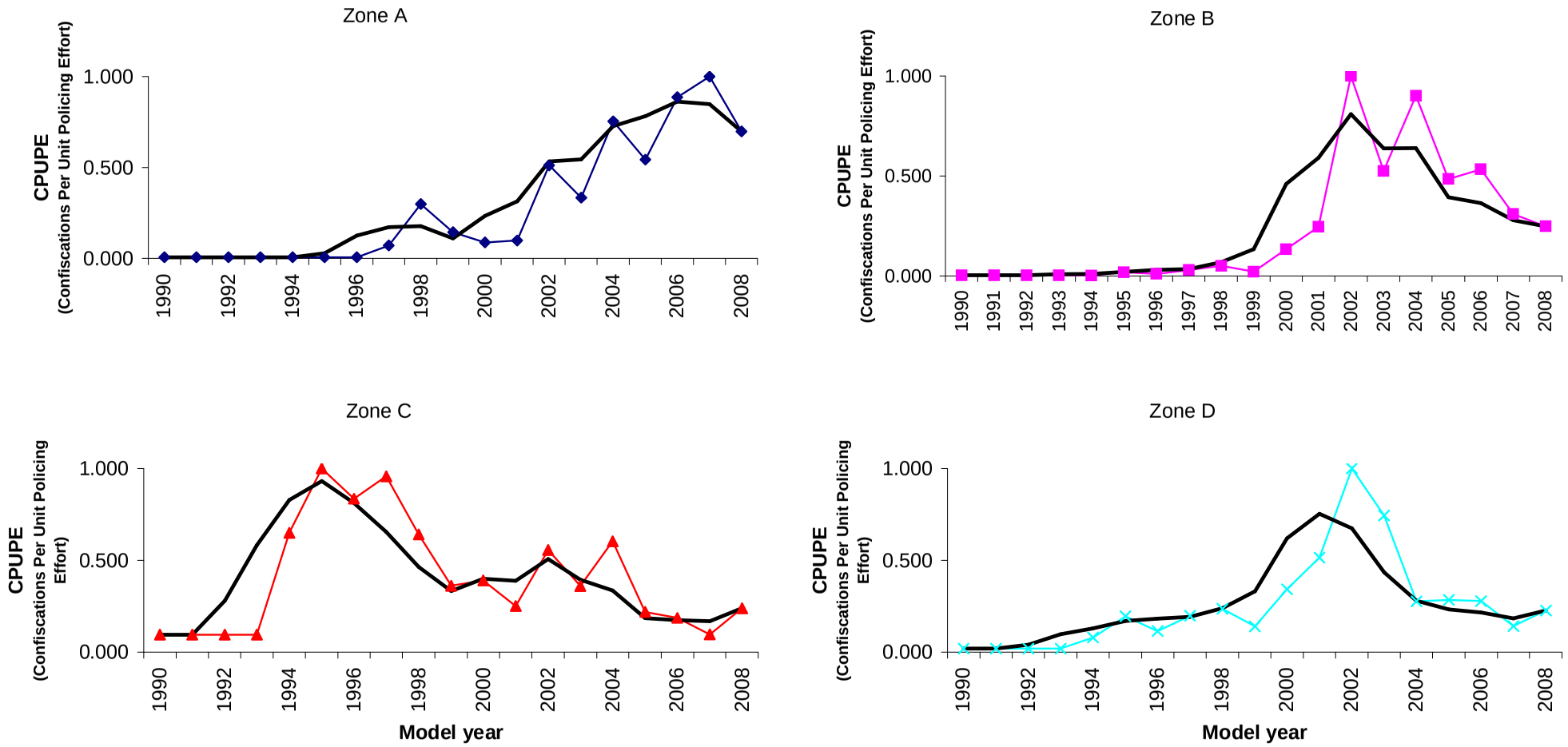

Fig. 2. Plots of 2008 updated base-case CPUPE for each of Zones A-D. The solid black line shows a 3-point moving average.

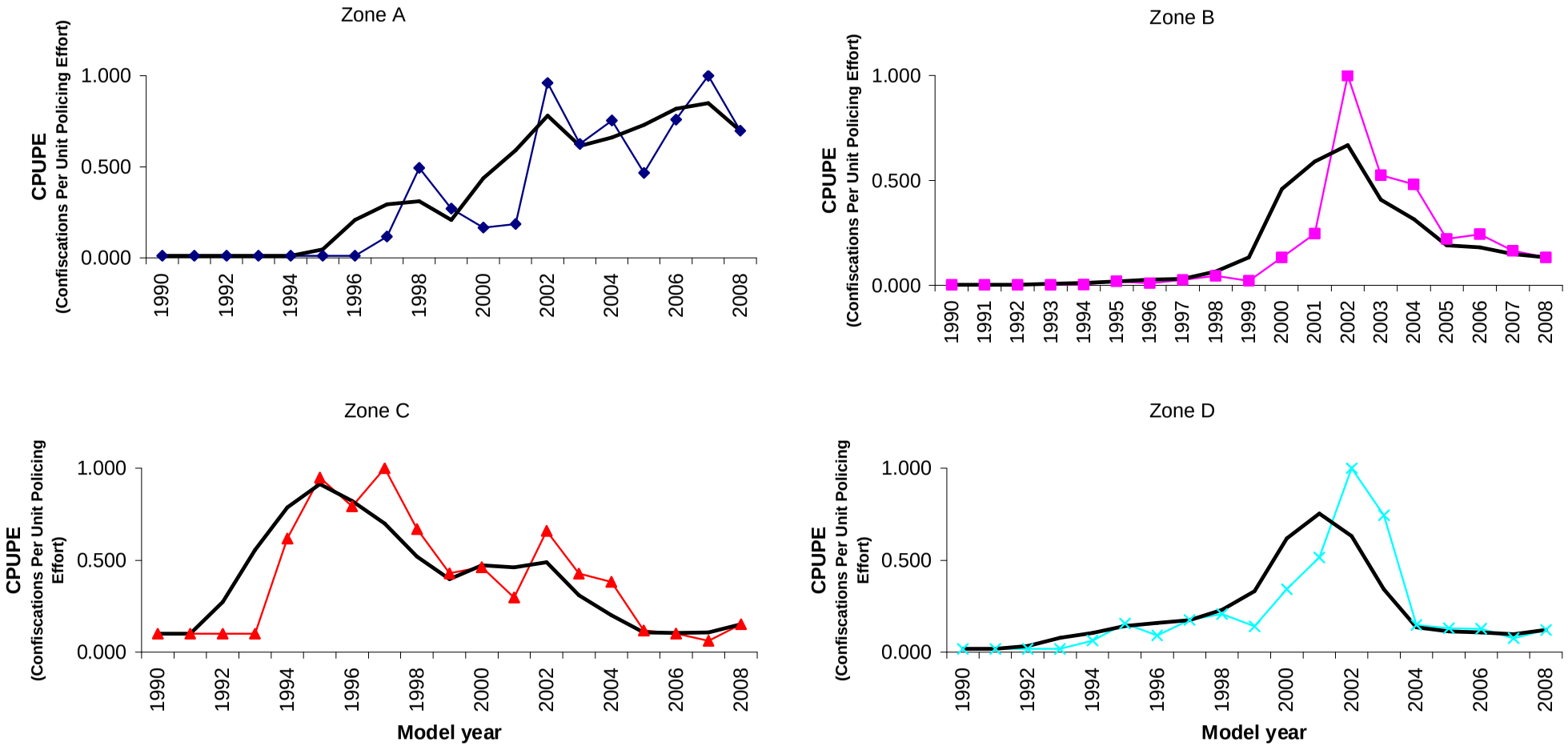

Fig. 3. Plots of 2008 updated “Pedro case” CPUPE for each of Zones A-D. The solid black line shows a 3-point moving average.