

Updating the Dassen Island and Robben Island penguin moult series with data from the 2011/2012 season

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1 Introduction

The moult count time-series for Dassen Island and Robben Island, historically the two most important African penguin colonies in the Western Cape, are updated with data collected during the 2011/2012 season (1 July 2011 to 30 June 2012). The counts made over this period have been converted to aggregates for the season using the technique of fitting the sum of two Gaussian curves and calculating the area under the function (Robinson 2012).

2 Data and results

The counts (made approximately every two weeks) at both colonies are listed in Table 1. The time-series have been updated for Dassen Island (Table 2) and Robben Island (Table 3). These tables include coefficients of variation for each estimate. Each is calculated by dividing the corresponding Hessian-based standard deviation by its estimate and multiplying this by the median overdispersion coefficient for the series. There are no estimates for Dassen Island for the 2010/2011 season because there are no data for the second half of 2010 for that colony.

The new estimates for the 2011/2012 season are 1 280 adults and 428 juveniles moulting at Dassen Island, and 2 496 adults and 636 juveniles moulting at Robben Island. Model fits to the count data are shown in Figure 1 and Figure 2. The updated time-series are plotted in Figure 3.

3 Discussion

At both Dassen Island and Robben Island, only one count was made in 2011 between 23 October and 20 December. This period typically spans the peak of the season. A consequence is that uncertainty is elevated in the estimates, especially for Robben Island adults which has a *CV* of 40.8%. This notwithstanding, the trend in adults moulting at Robben Island has continued its worrying decreasing trend (17% since the previous season). On the other hand, the estimate of the number of moulters at Dassen Island is the highest since 2007/2008.

References

Robinson W. 2012. *Modelling the impact of the South African small pelagic fishery on African penguin dynamics*. Unpublished scientific document, Fisheries/2012/JUL/SWG-PEL/35. Cape Town: DAFF, Branch: Fisheries Management.

Table 1: Counts of penguins moulting at Dassen Island and Robben Island in the 2011/2012 moult season.

Dassen Island			Robben Island		
Date	Adults	Juveniles	Date	Adults	Juveniles
2011/07/19	3	0	2011/07/06	1	0
2011/08/24	3	0	2011/07/14	1	0
2011/09/28	16	2	2011/08/03	3	2
2011/10/23	32	9	2011/08/10	1	2
2011/11/28	84	30	2011/08/30	3	1
2011/12/20	140	80	2011/09/08	5	3
2011/12/30	180	37	2011/10/11	39	8
2012/01/04	186	46	2011/10/20	60	7
2012/01/11	131	25	2011/11/10	219	68
2012/01/19	109	27	2011/12/21	307	97
2012/02/01	92	16	2012/01/11	175	35
2012/02/08	87	29	2012/01/27	102	16
2012/02/15	75	40	2012/02/13	142	17
2012/02/23	59	39	2012/03/05	90	33
2012/02/28	53	27	2012/03/13	5	18
2012/03/14	37	21	2012/03/22	9	28
2012/03/22	17	12	2012/04/10	4	9
2012/03/31	16	5	2012/04/19	6	11
2012/04/06	15	8	2012/05/08	3	7
2012/04/12	19	8	2012/05/16	2	3
2012/04/18	15	8	2012/06/06	3	3
2012/05/16	20	1	2012/06/14	0	1
2012/05/26	4	1			
2012/06/01	2	1			
2012/06/14	4	0			
2012/06/21	0	0			
2012/06/30	5	0			

Table 2: Updated time series of annual numbers of moulting penguins at Dassen Island. The number of counts made in each season is n . The last column gives the proportion of juveniles in the total number of moulters.

Season	n	Adults		Juveniles		Proportion
		M	CV (%)	M	CV (%)	
1995/1996	46	12 319	2.8	1 767	6.9	0.125
1996/1997	46	12 945	2.7	4 940	4.6	0.276
1997/1998	47	16 192	2.5	3 363	4.3	0.172
1998/1999	38	21 529	2.8	8 324	3.6	0.279
1999/2000	21	25 173	3.0	8 433	4.4	0.251
2000/2001	24	26 174	3.0	6 720	4.8	0.204
2001/2002	14	25 767	10.6	8 305	5.7	0.244
2002/2003	16	25 176	6.0	5 680	8.4	0.184
2003/2004	13	16 642	5.6	3 915	7.4	0.190
2004/2005	14	17 386	3.8	5 006	7.0	0.224
2005/2006	26	11 374	3.5	2 186	6.8	0.161
2006/2007	27	7 762	4.2	1 719	7.5	0.181
2007/2008	12	2 376	15.5	618	23.3	0.206
2008/2009	27	420	19.5	76	36.8	0.153
2009/2010	31	340	23.5	124	33.2	0.267
2010/2011						
2011/2012	27	1 280	11.8	428	17.8	0.250

Table 3: Updated time series of annual numbers of moulting penguins at Robben Island. The number of counts made in each season is n . The last column gives the proportion of juveniles in the total number of moulters.

Season	n	Adults		Juveniles		Proportion
		M	CV (%)	M	CV (%)	
1988/1989	18	3466	7.8	800	10.5	0.188
1989/1990	25	3397	7.3	851	10.5	0.200
1990/1991	24	4724	6.1	915	10.0	0.162
1991/1992	26	4939	6.0	1603	7.4	0.245
1992/1993	26	6544	5.2	1631	7.5	0.199
1993/1994	24	7915	4.7	1574	7.5	0.166
1994/1995	25	7932	4.7	1368	8.2	0.147
1995/1996	25	6674	5.3	1406	8.1	0.174
1996/1997	26	7300	7.9	2292	9.4	0.239
1997/1998	25	8556	4.4	2381	6.0	0.218
1998/1999	20	9125	4.3	2738	5.9	0.231
1999/2000	21	11694	3.9	2811	5.7	0.194
2000/2001	15	12883	3.7	2417	8.4	0.158
2001/2002	9	12361	8.6	2712	8.4	0.180
2002/2003	16	14521	3.8	3430	6.3	0.191
2003/2004	14	16975	3.6	3326	5.7	0.164
2004/2005	15	12442	3.9	2508	6.7	0.168
2005/2006	20	7660	4.9	2614	6.0	0.254
2006/2007	17	6453	6.0	1889	8.8	0.226
2007/2008	19	5157	6.4	1393	10.6	0.213
2008/2009	26	3745	7.1	1799	7.1	0.325
2009/2010	26	4209	19.0	1730	8.0	0.291
2010/2011	20	3000	9.8	1199	13.7	0.286
2011/2012	22	2496	40.8	636	16.1	0.203

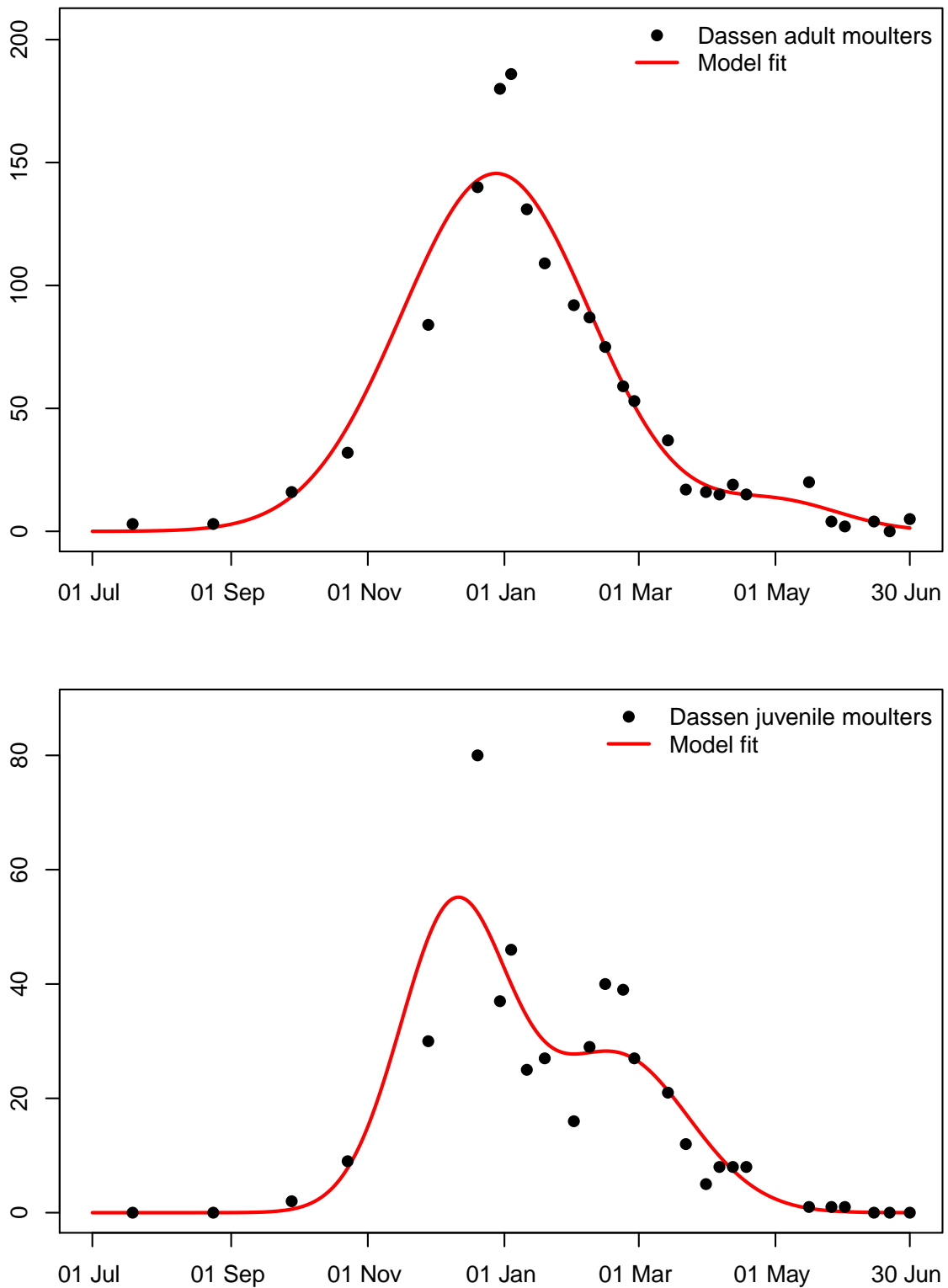


Figure 1: Expected numbers of adult penguins (top) and juveniles (bottom) moulting at Dassen Island during the 2011/2012 season fitted to the counts made.

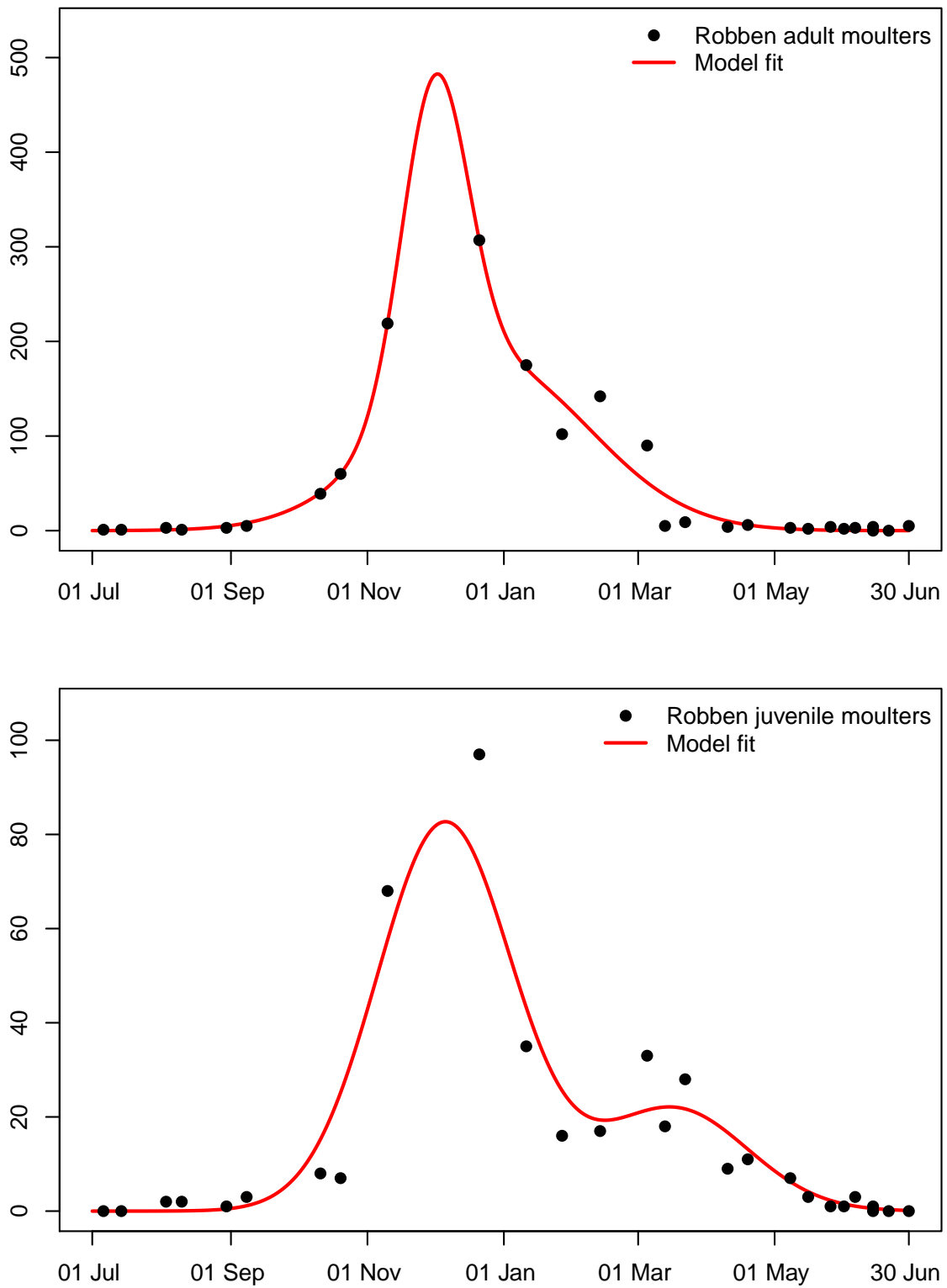


Figure 2: Expected numbers of adult penguins (top) and juveniles (bottom) moulting at Robben Island during the 2011/2012 season fitted to the counts made.

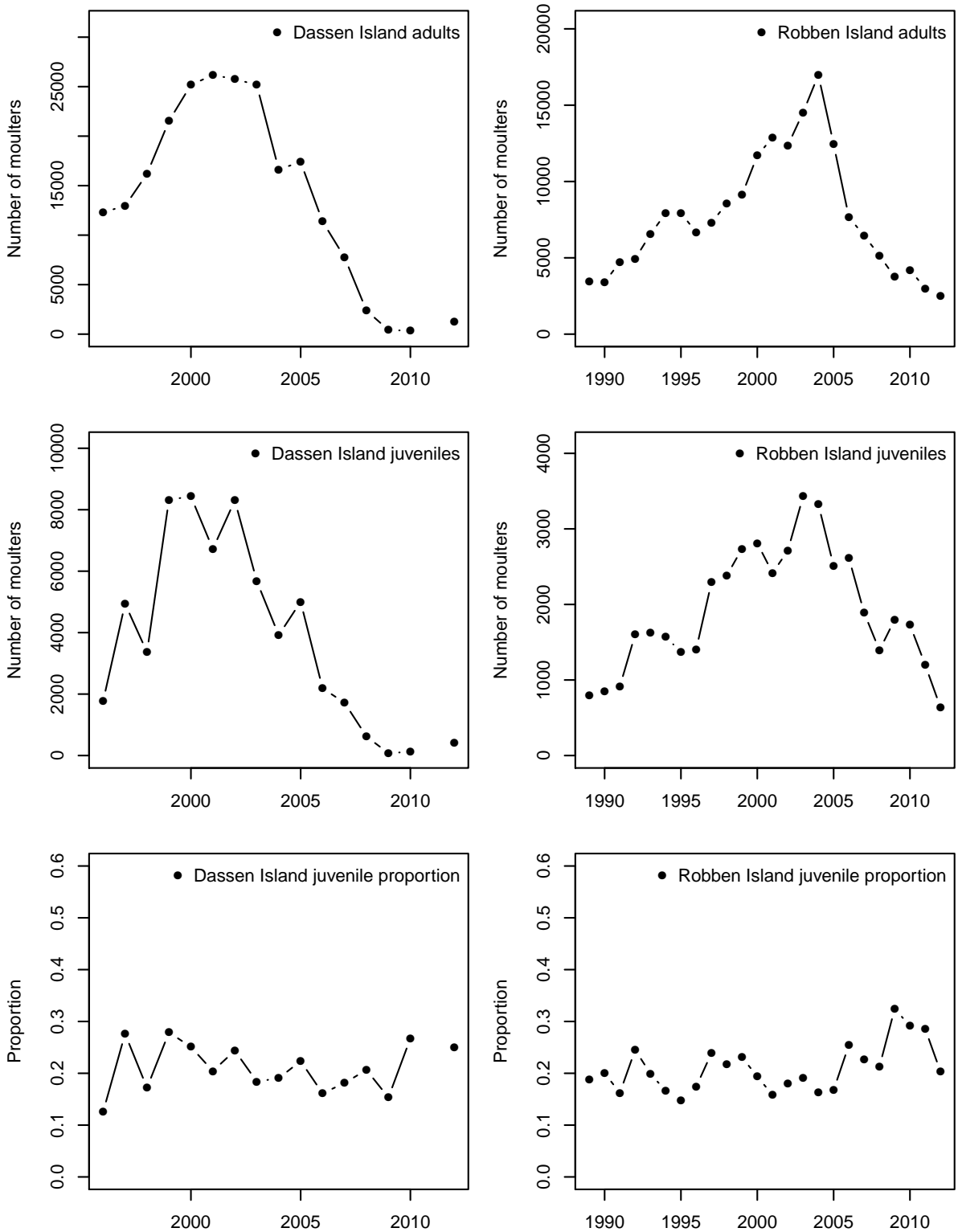


Figure 3: Time-series of estimates of the number of adult penguins and penguins in immature plumage moulting at Dassen Island (left) and Robben Island (right). The bottom row is the time-series of the proportion of juveniles in the total number of moulters.