Preliminary Report for CSP Project 4522 New Zealand sea lion ground component 2013/14

BPM-14-Preliminary report for CSP project 4522 NZ sea lion ground component 2013-14 v1.1

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Prepared by: Dr Simon Childerhouse with Derek Hamer, Andy Maloney, Sarah Michael, David Donnelly and Natalie Schmitt
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1. Executive Summary

Blue Planet Marine (BPM) was contracted by the Conservation Services Programme (CSP) of the Department of Conservation (DOC) to provide services for CSP project 4522 - New Zealand sea lion ground component for 2013/14. The field component of the work is presently underway in the Auckland Islands. A major element of this field work (estimating pup production) has been completed. This is a preliminary report that only reports on estimates of pup production for the Auckland Islands for 2013/14. A more complete report will be available once the field season is completed.

In summary:

- Pup production was estimated for New Zealand sea lion colonies at Sandy Bay (n=290), Dundas Island (n=1,213), Figure of Eight Island (n=72) and South East Point (n=0) with total pup production for the Auckland Islands in 2013/14 estimated as **1575**. This total represents an 18% decline on the estimate from 2013 and is the third lowest total pup production recorded for the Auckland Islands;
- Preliminary estimates of pup mortality to the date of the mark recapture are comparable to previous 'non-epidemic' years with the caveat that these figures do not represent full season surveys as in previous years and so should be viewed as a minimum. Pup mortality estimates are: Sandy Bay 2%, Dundas Island 6% and Figure of Eight Island 14%;
- Mean pup weights at Sandy Bay were 5% lower than 2012/13 for both males and females. Mean pup weights at Dundas Island were 8% and 5% lower than 2012/13 for males and females respectively; and
- Seven hundred and eleven pups were double flipper tagged at Sandy Bay (n=287), Dundas Island (n=400), Figure of Eight Island (n=24) and South East Point (n=0) up until 20th January 2014.

2. Methods

A full description of methods used in this field study are available in Childerhouse (2013), which is available from the CSP website and the author upon request. The research outlined here follows almost exactly the same methods as undertaken previously by DOC and as described in Chilvers (2012) and with reference to the aerial survey methods in Baker *et al*. (2012). The only major difference with previous surveys is that the mark-recpature estimate on Dundas Island was undertaken two days earlier than previous years (i.e. 19th January rather than the 21St January) at the request of DOC and agreed by the CSP Technical Working Group. Also, dead pups were removed at Sandy Bay in order to allow for autopsy, consistent with previous years' methods with the exception of 2012/13.

A team of four sea lion researchers and one wildlife vet (position supported by Massey University and DeepWater Group Ltd) will remain on Enderby Island to collect resight information on marked animals for a five week period up to approximately 23rd February 2014. All dead sea lions found at Enderby Island will be necropsied and assessed for cause of death.

A complete report on all data collected will be presented to the CSP Technical Working Group for review in March or April 2014.

3. Results

3.1 Estimates of pup production

Annual estimates of pup production for each colony and for total Auckland Islands pup production from 1994/95 until 2013/14 are shown in Appendix 1. Figures showing annual estimates for pup production by colony are shown in Appendix 2.

3.1.1 Sandy Bay, Enderby Island

Table 1: Summary of pup production estimates for Sandy Bay for 2013/14.

Method	Date	Start/end time	Estimate (SE)
Mean direct live count	16th Jan	09:23/10:43	273 (5.0)
Cumulative dead count to the day of the mark-recapture	16th Jan	09:23/10:43	6
Mean mark-recapture estimate	16th Jan	09:23/10:43	284 (7.0)
Total number pups tagged	16-17th Jan	N/A	287

Total pup production for Sandy Bay is estimated at **290** (284 live plus 6 dead pups) for 2013/14. This is the lowest estimate recorded for this colony.

3.1.2 Dundas Island

Table 2: Summary of pup production estimates for Dundas Island for 2013/14.

Method	Date	Start/end time	Estimate (SE)
Mean direct live count	19th January	08:10/12:25	1078 (11.1)
Mean direct dead count	19th January	08:10/12:25	72 (0.0)
Mean mark-recapture estimate	19th January	08:10/12:25	1141 (12.0)
Total number pups tagged	18-20th January	N/A	400

Total pup production for Dundas Island is estimated at **1213** (1141 live plus 72 dead pups).

3.1.3 Figure of Eight Island

Table 3: Summary of pup production estimates for Figure of Eight Island for 2013/14.

Method	Date	Estimate (SE)
Mean direct live count	9th January	62 (0.6)
Mean direct dead count	9th January	10 (0.0)
Total number pups tagged	9th January	24

Total pup production for Figure of Eight Island is estimated at 72 (62 live plus 10 dead pups).

3.1.4 South East Point, Enderby Island

Table 4: Summary of pup production estimates for South East Point for 2013/14.

Method	Date	Estimate (SE)
Direct live count	12th January	0
Direct dead count	12th January	0
Total number pups tagged	12th January	0

Total pup production for South East Point is estimated at **0** (0 live plus 0 dead pups).

3.1.5 Total pup production for the Auckland Islands

Overall, total pup production for the Auckland Islands in 2013/14 was estimated to be **1575** pups (1487 live pups and 88 dead pups). This total represents an 18% decline on the estimate from 2012/13 and is the third lowest total pup production recorded from the Auckland Islands. Overall pup production for the Auckland Islands since 1994/95 is shown in Figure 1.

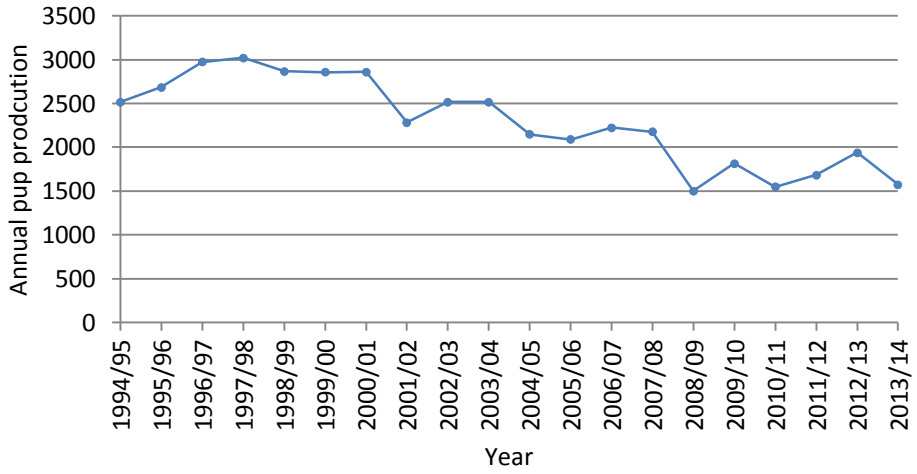

Figure 1: Total estimated pup production for New Zealand sea lions at the Auckland Islands 1994/95 – 2013/14. (Data prior to 2012/13 from Chilvers (2012)).

3.2 Tagging and micro-chipping

Flipper tagging and subcutaneous micro-chipping were also undertaken. Summary of pup tagging was:

- Dundas Island – 400 pups tagged (comprising 100 males and 300 females);
- Figure of Eight Island – 24 pups tagged (as many as could be tagged in the time available); and
- Sandy Bay – 287 pups tagged.

3.3 Pup weights

Table 5: Summary of mean pup weights for the Auckland Islands for 2013/14

Location	Mean female weight (kg)	Mean male weight (kg)
Sandy Bay	11.1	12.6
Dundas Island	10.2	11.6

100 pups (50 of each sex) were weighed at both Sandy Bay and Dundas Island on the same day of the mark-recapture count (16th and 19th January respectively). Mean pup weights at Sandy Bay were 5% lower than 2012/13 for both males and females. Mean pup weights at Dundas Island were 8% and 5% lower than 2012/13 for males and females respectively. Mean pup weights from previous surveys at Sandy Bay and Dundas Island are show in Figure 2 and Figure 3.

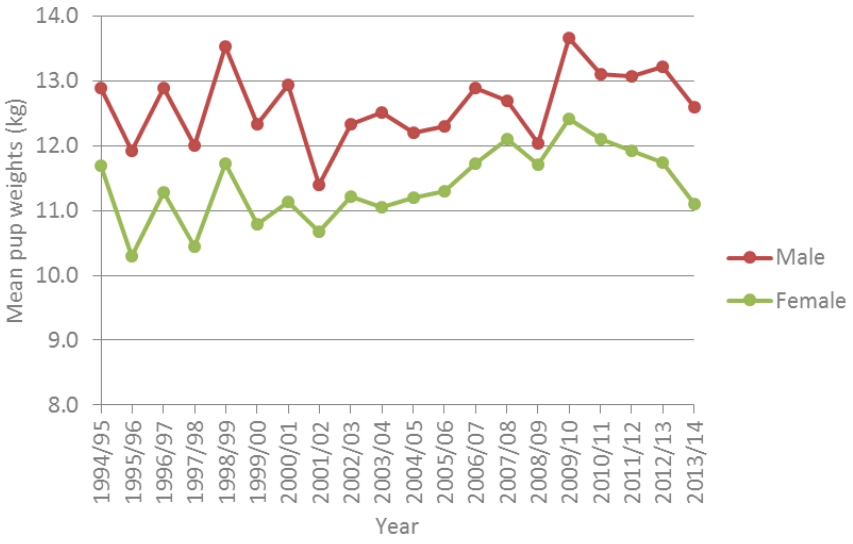

Figure 2 Mean pups weights for Sandy Bay colony by sex. (Data prior to 2012/13 kindly provided by Dr. Louise Chilvers)

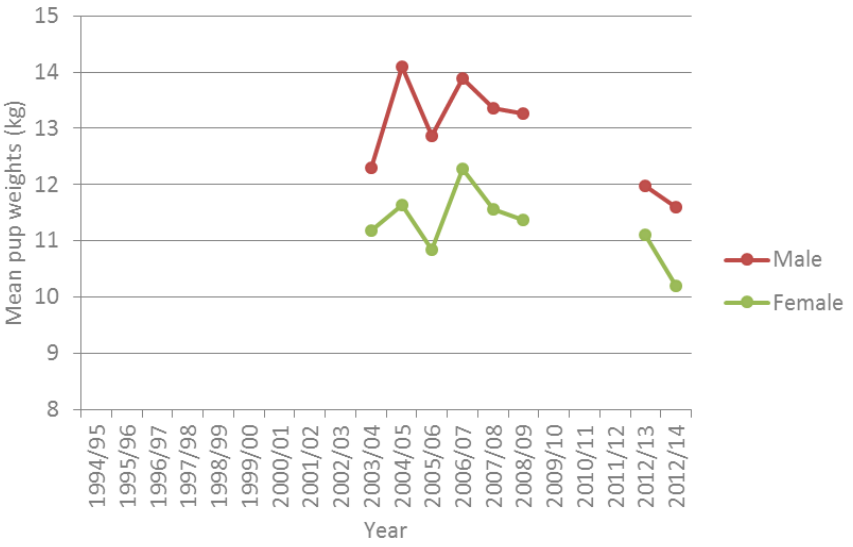

Figure 3 Mean pups weights for Dundas Island colony by sex. (Data prior to 2012/13 kindly provided by Dr. Louise Chilvers)

3.4 Counts at Sandy Bay

Direct counts of live and dead pups, adult females, adult and sub-adult males were made at Sandy Bay from 11-20th January 2014 (Figure 4).

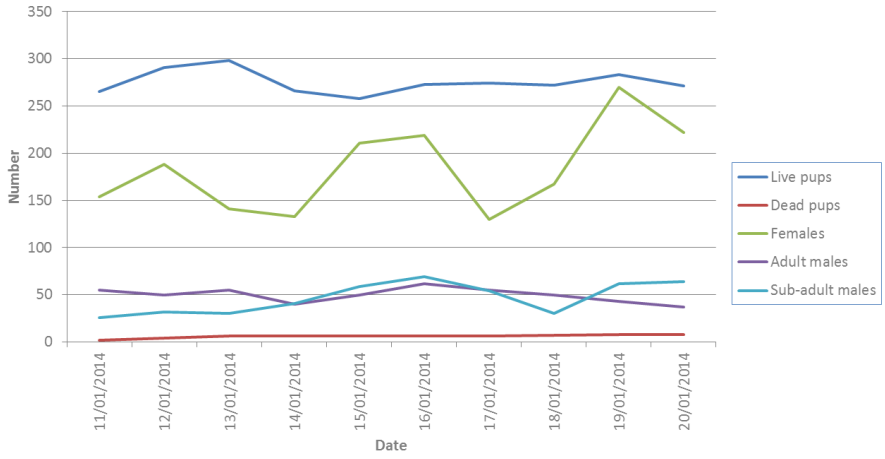

Figure 4 New Zealand sea lion counts at Sandy Bay, Enderby Island 2013/14

4. Acknowledgements

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- Henk Haazen, master of the *RV Tiama*, and his crew were extremely professional and accommodating and the *RV Tiama* was an excellent vessel for the work;
- DOC staff including Igor Debski, Kris Ramm, Sharon Trainor, Doug Veint, and in particular, Dr Louise Chilvers who was very helpful with the loan of equipment, advice and in sharing her wealth of experience about NZ sea lions and making previous data available for this report;
- Southern Lakes Helicopters and Mark Deaker for helicopter support;
- The Auckland Islands helicopter team of Barry Baker, Mark Holdsworth, Louise Chilvers and Mark Deaker for excellent company and support; and
- Members of the CSP Technical Working Group who provided useful feedback on this project.

5. References

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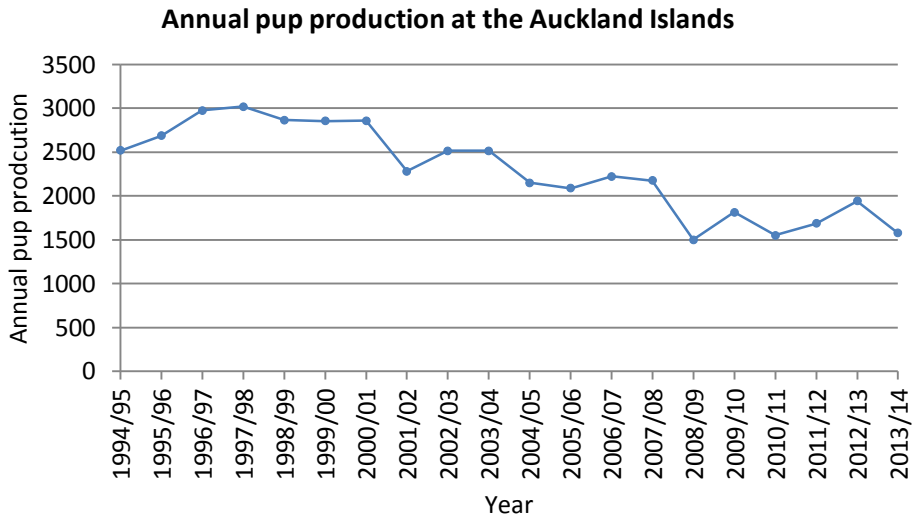
Appendix 1:

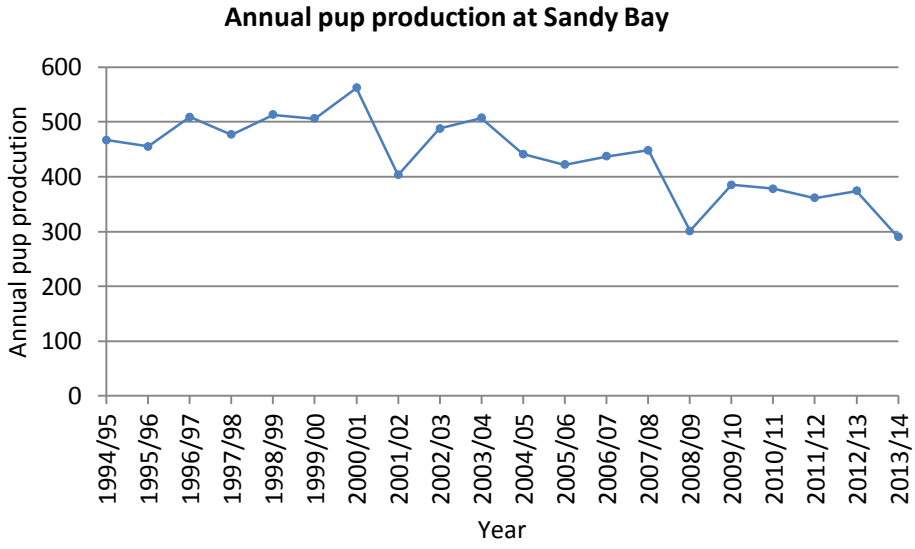
Annual estimates of live, dead and total pup production for each colony and for total Auckland Islands pup production 1994/95 – 2013/14 (NB. Data prior to 2012/13 from Chilvers (2012))

Year	Sandy Bay			Dundas Island			Figure of Eight Island			South East Point			Total Auckland Islands		
	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead	Total	Live	Dead
1994/95	467	421	46	1837	1603	234	143	123	20	71	59	12	2518	2206	312
1995/96	455	417	38	2017	1810	207	144	113	31	69	49	20	2685	2389	296
1996/97	509	473	36	2260	2083	177	143	134	9	63	39	24	2975	2729	246
1997/98	477	468	9	2373	1748	625	120	97	23	51	37	14	3021	2350	671
1998/99	513	473	40	2186	1957	229	109	100	9	59	42	17	2867	2572	295
1999/00	506	482	24	2163	2039	124	137	131	6	50	37	13	2856	2689	167
2000/01	562	527	35	2148	1802	346	94	92	2	55	47	8	2859	2468	391
2001/02	403	320	83	1756	1395	361	96	90	6	27	21	6	2282	1826	456
2002/03	488	408	80	1891	1555	336	94	89	5	43	26	17	2516	2078	438
2003/04	507	473	34	1869	1749	120	87	86	1	52	39	13	2515	2347	168
2004/05	441	411	30	1587	1513	74	83	79	4	37	31	6	2148	2034	114
2005/06	422	383	39	1581	1349	232	62	55	7	24	20	4	2089	1807	282
2006/07	437	414	23	1693	1587	106	70	67	3	24	19	5	2224	2087	137
2007/08	448	425	23	1635	1512	123	74	72	2	18	13	5	2175	2022	153
2008/09	301	289	12	1132	1065	67	54	48	6	14	8	6	1501	1410	91
2009/10	385	364	21	1369	1218	151	55	48	7	5	1	4	1814	1631	183
2010/11	378	359	19	1089	952	137	79	71	8	4	2	2	1550	1384	166
2011/12	361	343	18	1248	1189	59	74	72	2	1	0	1	1684	1604	80
2012/13	374	357	17	1491	1364	127	75	70	5	0	0	0	1940	1791	149
2013/14	**290**	**284**	**6**	**1213**	**1141**	**72**	**72**	**62**	**10**	**0**	**0**	**0**	**1575**	**1487**	**88**

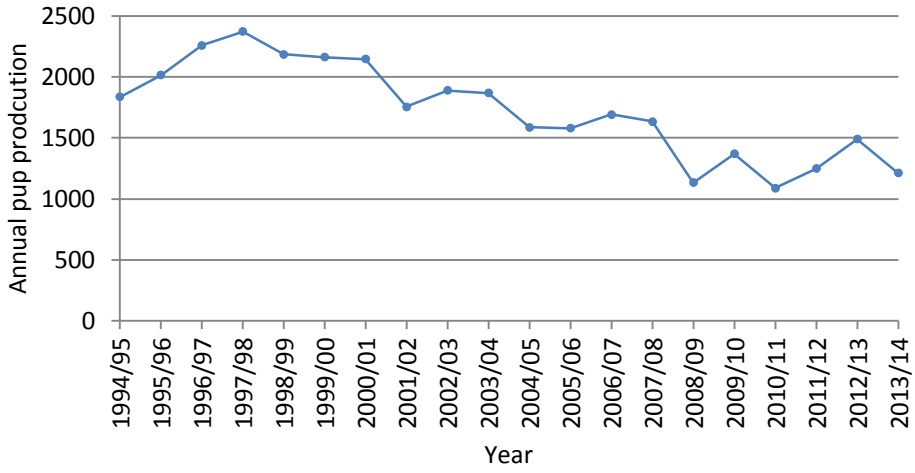
Appendix 2:

Annual estimates of total pup production for each colony and for total Auckland Islands pup production (NB. Data prior to 2012/13 from Chilvers (2012))

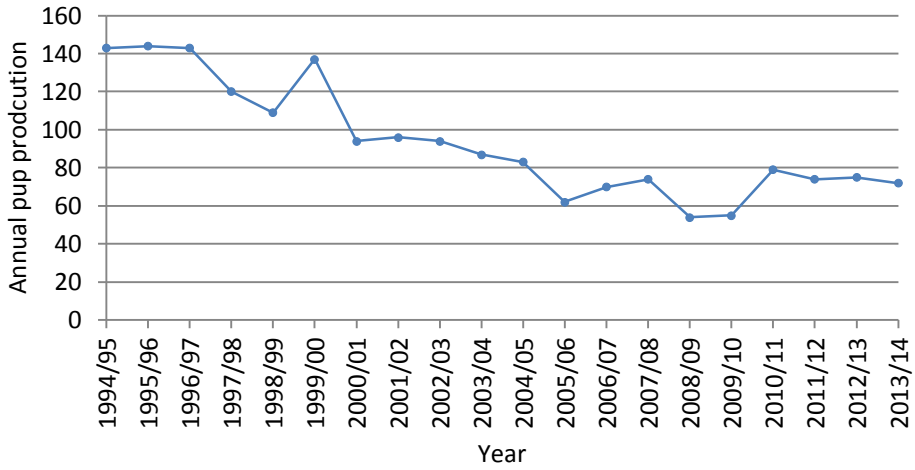




Annual pup production at Dundas Island



Annual pup production at Figure of Eight Island



Annual pup production at South East Point