Progress Report for New Zealand sea lion research ground component at the Auckland Islands 2014/15 CSP Project

Simon Childerhouse
(Compiler)

Blue Planet Marine
Nelson, New Zealand
www.blueplanetmarine.com

1.0 Introduction

- Presentation of progress report for New Zealand sea lion research ground component at the Auckland Islands 2014/15 CSP Project
- Summary of details provided in previous reports:
  - Childerhouse 2013[1]
  - Childerhouse et al. 2015[2]
  - Childerhouse 2015a[3], b[4]
  - Michael & Hamer 2015[5]
- Summary to 11 March 2015

[1] Childerhouse S (2013) Methodology for CSP Project 4522 New Zealand sea lion ground component 2013/14. Report for DOC CSP. 18 November 2013. 9 p.
[2] Childerhouse S, Hamer D, Maloney A, Michael S, Adams L, Cockburn S (2015) Preliminary Report for CSP Project New Zealand sea lion ground component 2014/15. 23 January 2105. 12 p.
[3] Childerhouse S (2015a) 2015 Update from Enderby Island NZSL research. 24 February 2015. Email to DOC. 2 p
[2] Childerhouse S (compiler) (2015b) Progress Report 2: CSP Project New Zealand sea lion ground component 2014/15. Report to DOC CSP. 16 March 2014. 12 p.
[5] Michael S Hamer D (2015) Interim Report – Sandy Bay (Enderby Island) New Zealand sea lion pup ramp summary. 2 February 2015. Report to DOC. 3 p.

1.1 Project objectives

- To estimate New Zealand sea lion pup production at Enderby, Figure of 8 and Dundas Islands.
- To mark New Zealand sea lion pups at Enderby and Dundas Islands following established techniques.
- To conduct a five week period of resighting previously marked animals at Enderby Island.
- To update the New Zealand sea lion database.

1.2 Project requirements

- A direct count of pup production, and other age classes, at Figure of 8 Island
- A Mark-Recapture estimate of pup production at Sandy Bay (Enderby Island) and Dundas Island
- A five week period of resighting marked animals at Enderby Island (including recording of PIT chips)
- Double flipper tag half the pups at Sandy Bay, 400 pups (300 female, 100 male) at Dundas Island (and determine sex and weigh a sample of 100 pups at each site), and attempt to tag pups as many as possible at Figure of 8 Island
- PIT (passive integrated transponder) tag half all the pups at Sandy Bay
- Daily counts of dead and live animals at Sandy Bay from arrival until 20 January 2015 at least
- Regular surveys of Enderby Island (including South-east Point) for signs of pup production and marked animals

1.3 Project outputs

- Completed data collection forms, photographs, and any other hard copy data.
- An electronic copy of data collected in a format suitable for upload into the New Zealand sea lion database.
- A technical report detailing the methods used, a summary of data collected and estimates of New Zealand sea lion pup production at the Auckland Islands.

2.0 Methodology

- As per the stated project requirements, "…using established techniques" and following Childerhouse (2013)[1]
- The research outlined here follows almost the same methods as undertaken previously by DOC and as described in Chilvers (2012)[2]

[1] Childerhouse S (2013) Methodology for CSP Project 4522 New Zealand sea lion ground component 2013/14. Report for DOC CSP. 18 November 2013. 9 p.
[2] Chilvers, BL (2012) Research to assess the demographic parameters of New Zealand sea lions, Auckland Islands 2011/12 Contract Number: POP 2011/01 Final Research Report, November 2012. Report prepared for the Conservation Services Programme, Department of Conservation. 11 p.

2.1 Researchers

The team for the Auckland Island NZ sea lion field work were:

- Andy Maloney
- Chris Pugsley
- Derek Hamer
- Lynn Adams
- Sarah Michael
- Simon Childerhouse
- Stuart Cockburn
- Tom Burns

Thanks to all the team for their dedication, commitment and delivery of excellent results

2.2 Changes from previous years

Survey methodologies the same as 2013/14 except for:

- While all pups born at Sandy Bay were microchipped, only half were flipper tagged to reduce impacts of research
- Original CSP field season extended from 27 February until 30 March for investigation of late season pup mortality. This addition was directly funded by DOC separate to CSP.
- A vet worked alongside the team undertaking autopsies for the full season and also undertook observations and mitigation of pups dying in holes. This addition was directly funded by DOC separate to CSP.

3.0 Results – timing 2014

- 6 January – departed Bluff aboard *RV Tiama* for the Auckland Islands
- 8 January – arrived Enderby Island
- 9 January – surveyed Figure of Eight Island
- 10 February – Team changeover

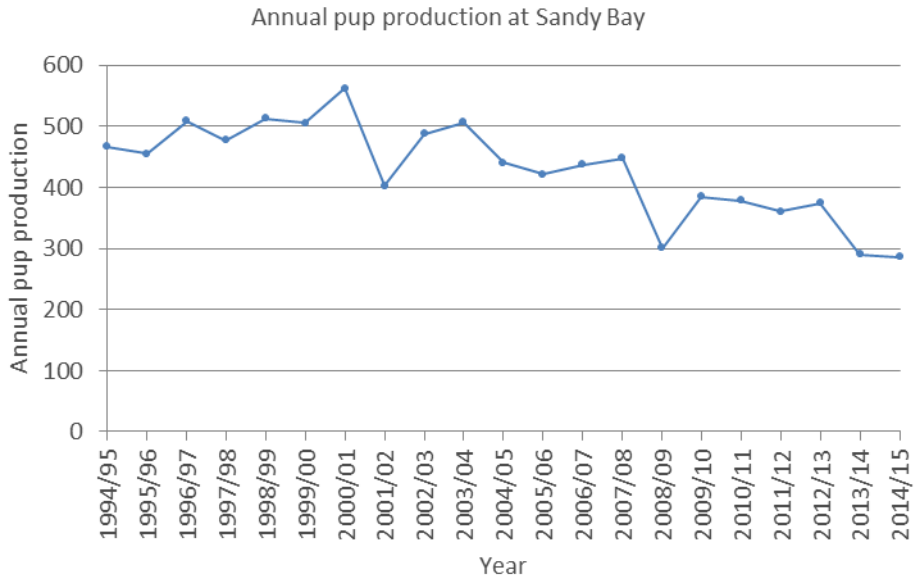
- 27 March – remainder of team scheduled to return home

- Enderby Is (n=77d[1]), Dundas Is (n=8d[2]), Figure of Eight Is (n=2d)

[1] Total days on Enderby will be 77 by the end of the season
[1] Total days on Dundas increased by using extra helicopter transport to get researchers out there for second monitoring period

3.1 Pup production – Sandy Bay

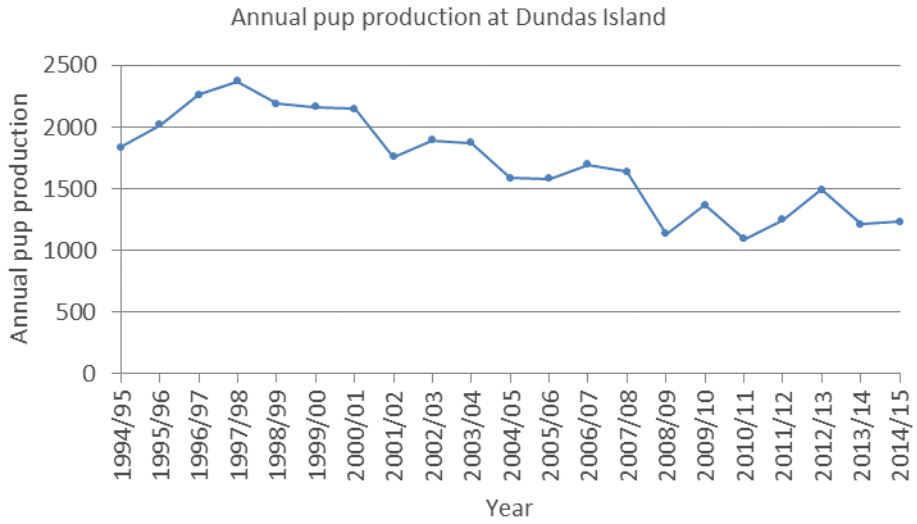
Method	Date	No. counts	Start/end time	Estimate (SE)
Mean direct live count	16 Jan 2015	10	09:10/10:45	277 (2.9)
Cumulative dead count to the day of the mark-recapture	16 Jan 2015	N/A	09:10/10:45	7
Mean mark-recapture estimate	16 Jan 2015	9	09:10/10:45	279 (3.2)
Total number pups individually marked	16-17 Jan 2015	N/A	N/A	287



Total pup production = 279 live + 7 dead = 286

3.2 Pup production – Dundas Is

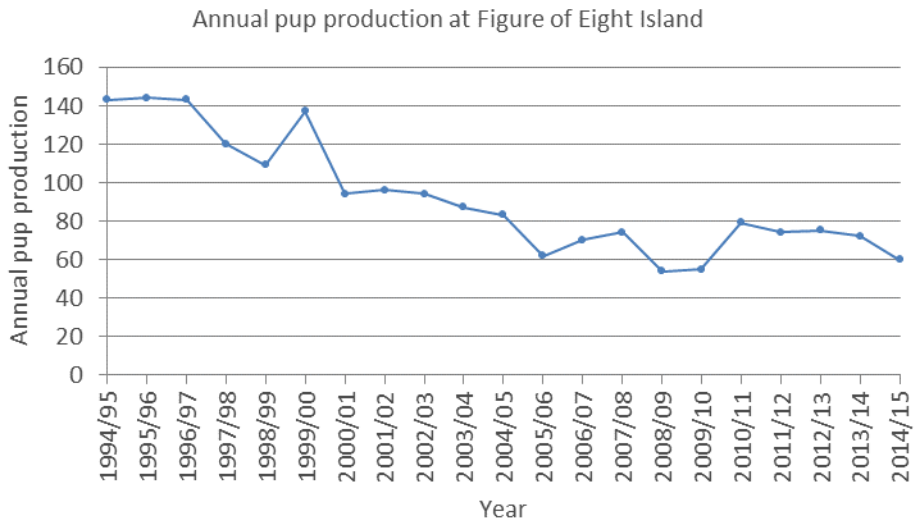
Method	Date	No. counts	Start/end time	Estimate (SE)
Mean direct live count	19 Jan 2015	3	07:40/11:05	1051 (13.3)
Mean direct dead count	19 Jan 2015	3	07:40/11:05	67 (0.0)
Mean mark-recapture estimate	19 Jan 2015	9	07:40/11:05	1163 (20.9)
Total number pups tagged	18-20 Jan 2015	N/A	N/A	402



Total pup production = 1163 live + 67 dead = 1230

3.3 Pup production – Figure of Eight Is

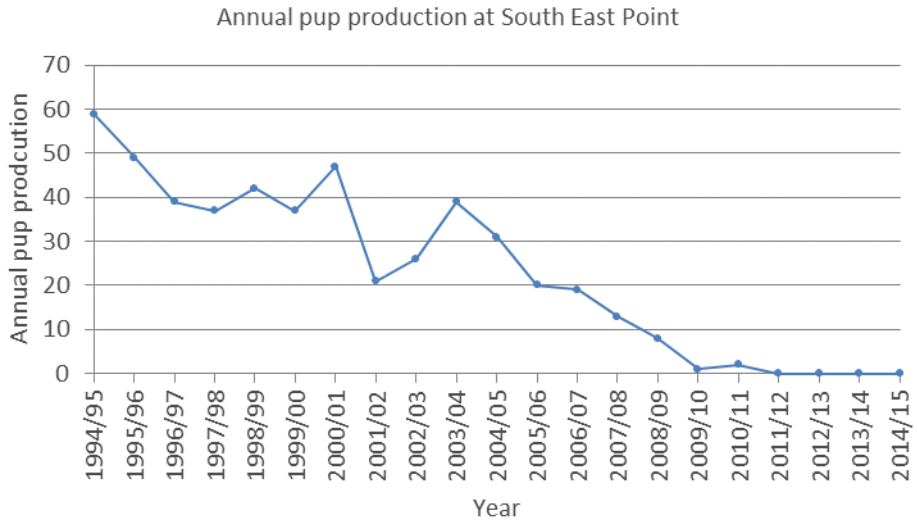
Method	Date	No. counts	Estimate (SE)
Mean direct live count	9 Jan 2015	3	47 (1.8)
Mean direct dead count	9 Jan 2015	3	13 (0.0)
Total number pups tagged	9 Jan 2015	N/A	40



Total pup production = 47 live + 13 dead = 60

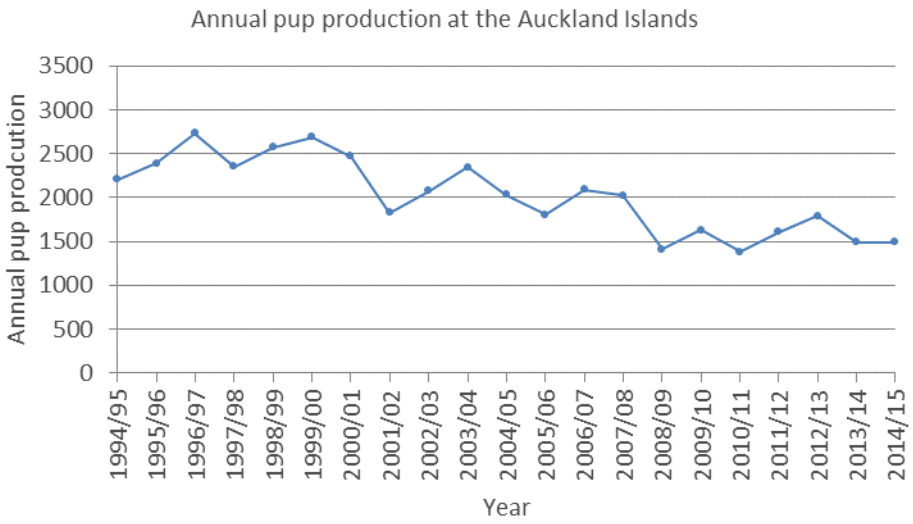
3.4 Pup production – South-East Pt

- 10+ visits to South-East Point
- No live or dead pups observed



3.5 Pup production – Auckland Is

Location	Live pups	Dead pups	Total estimate
Sandy Bay	279	7	286
Dundas Island	1163	67	1230
Figure of Eight Island	47	13	60
South east Point	0	0	0
Total for Auckland Islands	1489	87	1576



3.6 Pup tagging

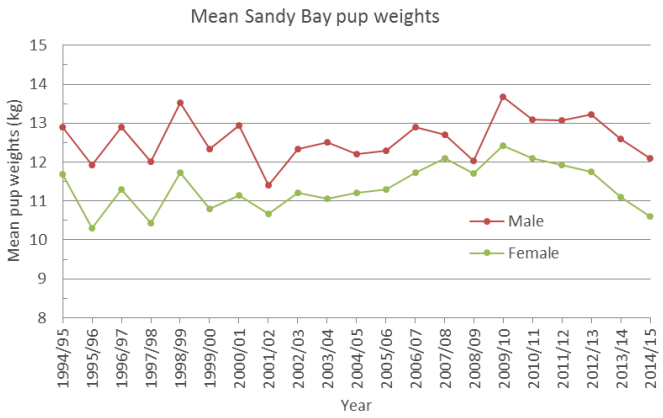
Location	Pups tagged	Pups microchipped
Sandy Bay	147	287
Dundas Island	402	0
Figure of Eight Island	40	0
South-East Point	0	0
Total for Auckland Islands	**589**	**287**

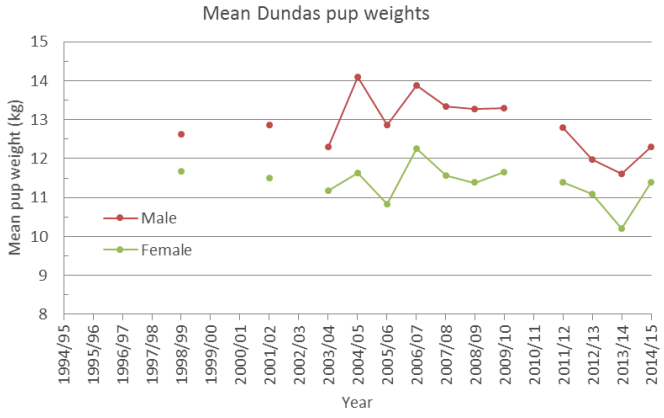
- All pups at Sandy Bay were micro-chipped but only approximately half were flipper tagged

3.7 Pup weights

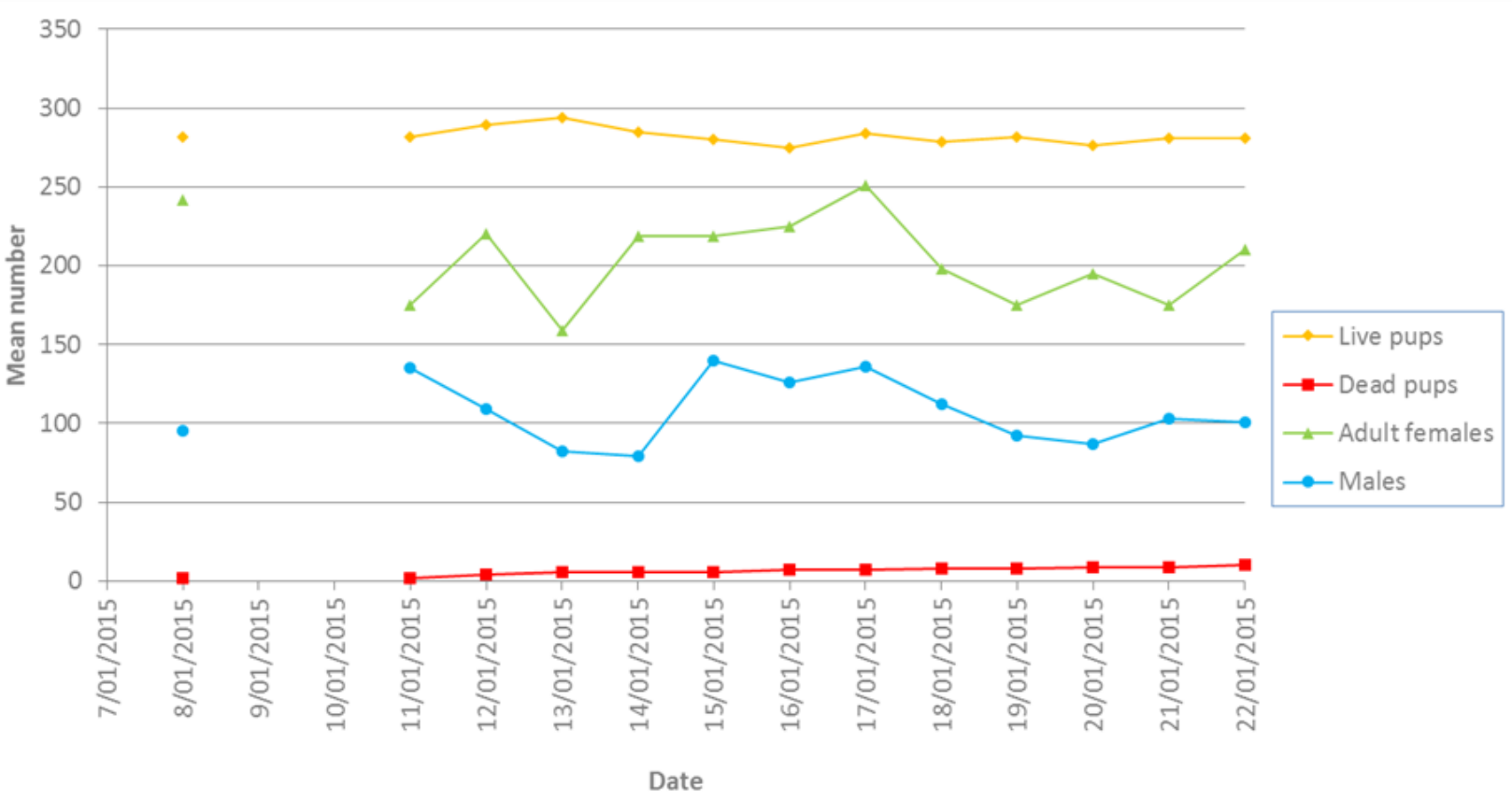
Location	Female		Male	
	n	Mean weight (kg; SE)	n	Mean weight (kg; SE)
Sandy Bay	50	10.6 (0.3)	50	11.1 (0.3)
Dundas Island	50	11.4 (0.3)	50	12.3 (0.4)
Figure of Eight Island	18	10.4 (0.3)	22	11.7 (0.3)

- Mean pup weights at Sandy Bay were 4% and 5% lower than 2013/14 for both males and females
- Mean pup weights at Dundas Island were 6% and 12% higher than 2013/14 for males and females respectively





3.8 Counts at Sandy Bay

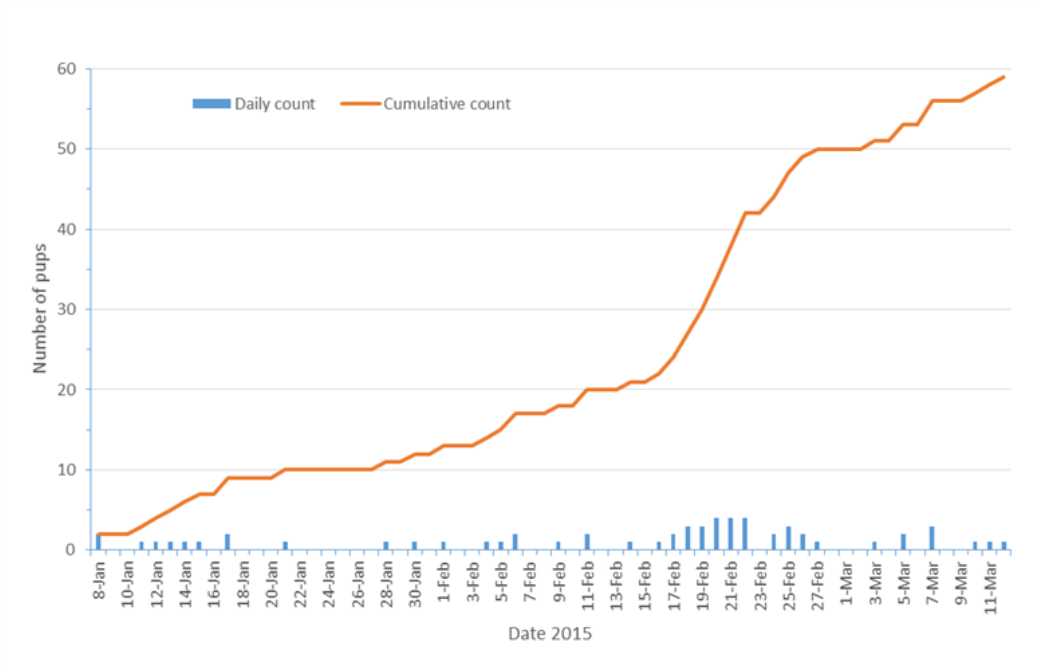


3.9 Resighting

- Provisional results to 10 March 2015
- 13,236 individual tag, brand and micro-chip resightings
  - 6,914 resights in 2011/12
  - 2,100 resights in 2012/13
  - 11,100 resights in 2013/14
- Of these:
  - 90% at Sandy Bay
  - 7% around Enderby Island
  - 3% at Dundas Island
  - <1% at Figure of Eight and Monument Island

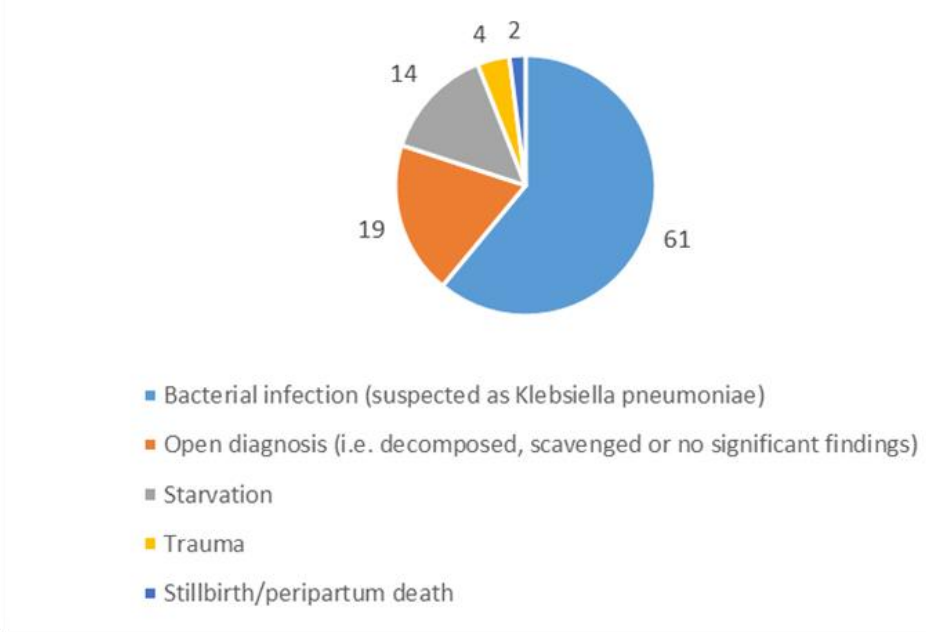
3.10 Pup mortality

- The field season was extended to investigate pup mortality later in the season
- Total estimated pup mortality at Sandy Bay was 58 pups up until 11 March 2014

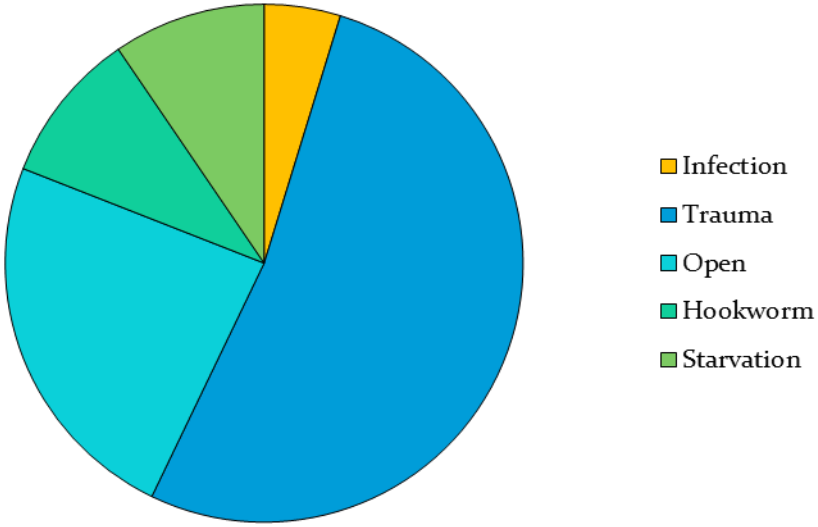


3.10 Pup mortality

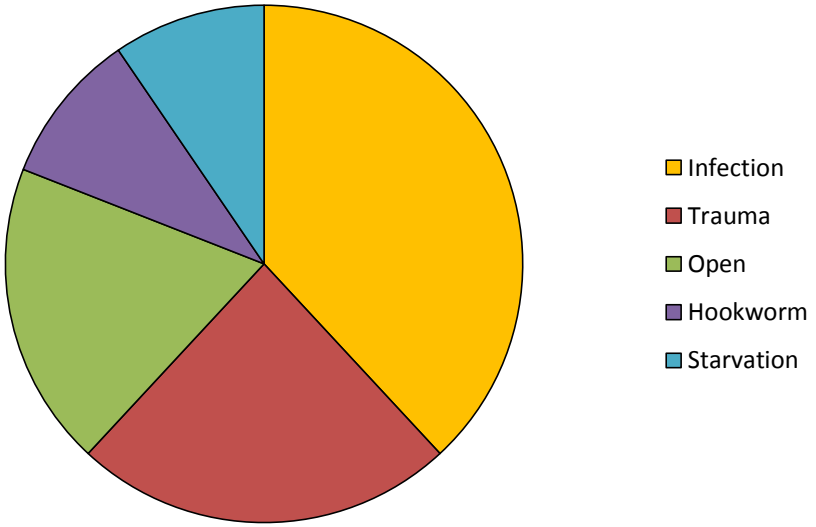
- Preliminary cause of death (%) for autopsied pups to 11 March 2015 (n=54)
- It is important to note that these diagnoses are provisional and will be refined and/or confirmed once full histopathology analysis has been completed at Massey University



3.10 Pup mortality (Roe & Michael 2014)



2011/12 Provisional diagnosis: post mortem findings interpreted by experienced observer



2011/12 Corrected provisional diagnosis: post mortem findings interpreted by pathologist with experience of Enderby lesions

Note: this interpretation does not include results of histology and culture, which are likely to identify a few more cases of infection

[1] Roe W, Michael S (2014) Causes of NZSL pup mortality. Presentation to DOC/MPI Working Group Meeting, 12 June 2014. 22 p.

Roe & Michael 2014

Early season

3.11 Tagging data management

- Recording of flipper tags, micro-chips and brands
- A centralised (via WIFI) version of the New Zealand sea lion database was used at the base for validation and data entry which included automatic back ups
- All tagging data entered in database
- All resighting data will be entered into excel spreadsheets and imported into the database
- Useful for searching and checking individual records

3.12 Helicopter survey work

- This was undertaken by Barry Baker (Latitude 42)
  - Separate report on this work
- Very successful for transport to Dundas
- Additional trip to Dundas Islands was provided by Southern Lakes helicopters allowing a second research period on Dundas Island

3.13 Dundas trip

- Extra, unscheduled trip to Dundas 13-18 February
- Resighting, live and dead pup counts and autopsies
- 8 autopsies completed – 5 showed lesions consistent with *Klebsiella*

3.14 Pup mortality in holes

- Issues with pups dying in holes in previous years
- Exploration of mortality in holes and mitigation options
- Funded by DOC, WWF and Deepwater Group
- 12 ramps put into holes in Sandy Bay sward
- Monitored by GoPro HD video
  - >140 hours collected plus further 142 hours motion activated camera footage
- To 11 March, only 2 pups dead in holes however 65 were physically rescued by researchers before ramps installed and 23 seen exiting ramps on GoPro footage after installation
- Very successful and lead to direct reduction in pup mortality

3.13 Pup mortality in holes

4.0 Conclusions

- Field component of the work 8 Jan to 27 Mar 2014 (ongoing)
- Pup production was estimated for New Zealand sea lion colonies at:
  - Sandy Bay (n=286), Dundas Island (n=1230), Figure of Eight Island (n=60), South East Point (n=0)
  - Total pup production for the Auckland Islands in 2013/14 estimated as **1576**
  - 1 pup increase from 2013/14
  - 5% higher than lowest count in 2008/09
- Fourth lowest total pup production and lowest recorded for Sandy Bay

4.1 Conclusions

- 729 pups were marked: Sandy Bay (n=147 tagged & chipped; n=140 tagged only), Dundas Island (n=402), Figure of Eight Island (n=40), South-East Point (n=0)
- Over 13,236 tag, brand and micro-chip resightings of individual sea lions. Most ever recorded.
- Helicopter worked well for transport to Dundas Island
- Installation of ramps saved many (e.g. >50) sea lion pups
- Overall, very successful trip

- Advice from CSP TWG on leaving or removing ramps at Sandy Bay

5.0 Issues for future consideration

- Autopsy samples
  - no funding for analysis of existing samples
  - Cause of death determination only provisional
- Consideration of moving to digital photos for resighting
- Full Auckland Island survey – helicopter?
  - Full range-wide survey
- Field accommodation – 2+ weeks with >10 people
- Field data collected electronically
- Investigation of population age structure
- Subantarctic debrief & planning meeting for all programmes
- Multi-year contracts

6.0 Acknowledgements

- 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 Ian Angus, Paul Crozier, Katie Clemens-Seely, Igor Debski, Kris Ramm, Sharon Trainor, Janice Kevern, Doug Veint;
- Southern Lakes Helicopters and pilots Mark Deaker and Richard Hayes for helicopter support;
- The Auckland Islands helicopter team of Barry Baker, Mark Holdsworth, Louise Chilvers and Mark Deaker for excellent company and support;
- Members of the CSP Technical Working Group who provided useful feedback on this project;
- DOC, WWF and Deepwater Group for funding research and mitigation on pup mortality