Methodology for CSP Project: New Zealand sea lion ground component 2014/15

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1.0 Introduction

- Presentation of methodology for CSP Project New Zealand sea lion ground component 2014/15
- Only reported briefly on Non-CSP funded NZSL research although this will be broadly similar to CSP component
  - See Sarah Michael's presentation for details of additional research
- Summary of details to be provided in CSP Report of the same name (draft available soon)

1.1 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 all the pups at Sandy Bay
- Daily counts of dead and live animals at Sandy Bay from arrival until 20th February 2015 at least with dead pups counts continuing until the team leaves
- Regular surveys of Enderby Island (including Southeast Point) for signs of pup production and marked animals

1.2 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.

1.3 Reporting timeframes

- 15 Dec – Operational Plan
- 1 Feb – Progress Report 1
- 5 Apr – Progress Report 2
- 30 Apr – Draft Final Report
- 15 June – Final Report

2.0 Methodology

- As per the stated project requirements using established techniques
- The Services consist of conducting field work at the Auckland Islands following established methods described by Childerhouse (2013[1]) and Chilvers (2012[2]).

1. Childerhouse, SJ (2013). BPM-13-Methodology for CSP project 4522 NZ sea lion ground component 2013-14 v1.0. Report prepared for the Conservation Services Programme, Department of Conservation. 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 Area of operation

- Auckland Islands (50°S, 166°E), New Zealand
  - Enderby Island (at least five weeks)
    - Sandy Bay
    - South East Point
  - Dundas Island (up to 3 days)
  - Figure of Eight Islands (2 days)
  - Other Islands around Port Ross area

2.2 Research timing

- Key research dates:
  - 10 January – pup count at Figure of Eight Island
  - 16 January – mark-recapture at Sandy Bay, Enderby Island
  - 19 January – mark-recapture at Dundas Island
- Different field components:
  - CSP: 10 Jan to 27 Feb
  - Non-CSP: 31 Dec – 10 Jan & 27 Feb to 27 Mar

2.3 Breeding colonies

- Enderby Island
  - Sandy Bay (290 ± 7 pups)
  - South East Point (0 pup)
- Dundas Island (1213 ± 12 pups)
- Figure of Eight Islands (62 ± 0 pups)
- The nature of each colony and logistics means that different colonies require different survey methodology

2.4 Assessment methods

- Live
  - One-off direct counts (multiple counters)
  - Daily direct counts (single counter)
  - Mark-recapture estimates (multiple counters)
- Dead
  - Direct dead counts (single or multiple counter)

2.5 Figure of Eight Island

- Single survey on 10th January 2013
- Estimate of live pups
  - One-off direct count
    - Three people count independently
- Estimate of dead pups
  - One-off direct count
    - Three people count independently
- Tagging and tag resighting
  - As time allows

2.6.1 Sandy Bay, Enderby Island

- Timing
  - Daily counts and tag resighting of pups, adult males and females from arrival until approximately 20 January
  - Daily counts of dead pups continue until team leaves
  - Mark-recapture on 15 (marking) and 16 (recapture) January
- Estimate of live pups (3 methods)
  - Daily direct live counts
    - Single person counts pups, adult males and females once at or as close to 09:30 am as possible

2.6.2 Sandy Bay, Enderby Island

- Estimate of live pups
  - One-off direct live counts
    - 16 January to coincide with mark-recapture
    - Three people count three times each independently
  - Mark-recapture
    - Marking on 15 January with 120-150 (~40%) pups marked with caps with recapture on 16 January
    - Three people count three times each independently
    - Estimates and standard errors will be developed using Peterson-Lincoln index for a closed population (Chapman 1952)[3] as per previous work by Chilvers (2012).

3. Chapman DG (1952) Inverse, multiple, and sequential sample censuses. Biometrics 8: 286–306.

2.6.3 Sandy Bay, Enderby Island

- Estimate of dead pups
  - Daily direct count
    - Single person counts dead pups every day
    - Pups removed from colony and placed in hole to avoid double counting
- Marking
  - All live pups micro-chipped on 16 January and subsequent days
  - Half of pups double flipper tagged (*change from previous years when all pups tagged*)

2.6.4 Sandy Bay, Enderby Island

- Tag resighting
  - Tag, brand and micro-chip resighting every day at Sandy Bay
  - Resightings around the rest of Enderby Island as frequently as possible, ideally every 2-3 days

2.7.1 Dundas Island

- Timing
  - Mark-recapture on 18 (marking) and 19 (recapture) January
- Estimate of live pups (2 methods)
  - One-off direct live counts
    - 19 January to coincide with mark-recapture
    - Three people count three times each independently
  - Mark-recapture
    - Marking on 18 January with 350-400 (~30%) pups marked with caps and recapture on 19 January
    - Three people count three times each independently
    - Estimates and standard errors as per Sandy Bay

2.7.2 Dundas Island

- Estimate of dead pups
  - Direct count
    - Three counts by whole team
- Tagging
  - 400 pups double flipper tagged on 18 and 19 January
  - Possible modification is to add extra day (17 or 20 January) on Dundas to allow for 3 days tagging subject to schedule of aerial survey team
- Tag resighting
  - Tag, brand and micro-chip resighting as time permits

2.8.1 South East Point, Enderby Island

- Estimate of live pups
  - Direct counts every 2-3 days
    - Single person counts pups, adult males and females once at or as close to 09:30 am as possible every 2-3 days
- Estimate of dead pups
  - Direct counts every 2-3 days
    - Pups removed from colony and placed in hole to avoid double counting
- Tagging
  - All live pups double flipper tagged

2.8.2 South East Point, Enderby Island

- Tag resighting
  - Tag, brand and micro-chip resighting every 2-3 days

3. Tag resighting

- As per previous survey work by Childerhouse (2013)
- Resighting of tags, brands and micro-chips

4. Management of tag data

- Data are collected in an accurate and robust fashion and these data are provided in an electronic format suitable for upload into the New Zealand sea lion database
- As per previous survey work by Childerhouse (2013)
- Working with Dragonfly to develop minor revisions to the New Zealand sea lion database for use this season
- Tablet direct entry data being trialled

5. Non-CSP NZSL research

- In addition to CSP funded research, non-CSP funded research is also being undertaken
  - CSP: 10 Jan to 27 Feb
  - Non-CSP: 31 Dec – 10 Jan & 27 Feb to 27 Mar
- Extension of field season earlier and later in the season to investigate & mitigate pup mortality and to extend resighting effort both temporally & spatially
- Further details in Sarah Michael's presentation

6. Comments?

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- Thanks to
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