



NZ sea lion research methodology in the Subantarctic 2019/2020

Tom Brough
Oct 2019



Overview

- Background
- Auckland Islands
 - Past year's projects
 - Changes for 2019/20 season
- Campbell Island
 - Previous year's projects
 - Changes for 2019/20 season



New Zealand sea lion TMP



- Nationally vulnerable
- Restricted Breeding
- Decline

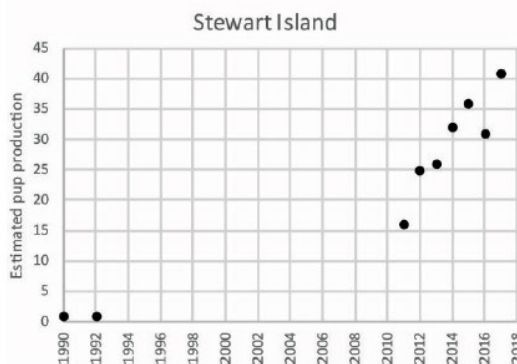
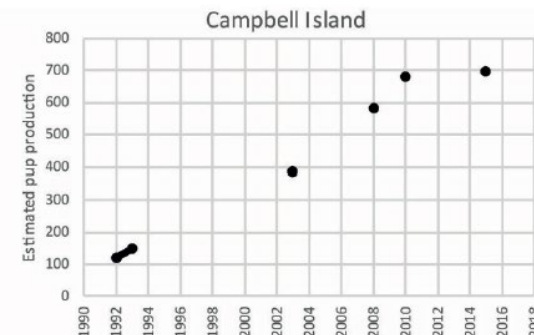
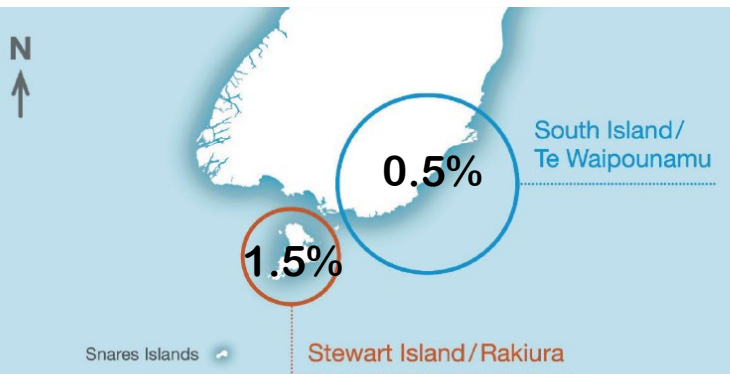


Figure 2: Annual sea lion pup count estimates from breeding sites. Note that the scale for each figure is different (adapted from Roberts and Doonan 2016, and updated with the most recent pup counts from 2016 and 2017).



The subantarctic projects

- Auckland Islands
 - Traditional CSP project
 - Additional TMP funded work
- Campbell Island
 - Population monitoring work
 - Pup mortality
 - Disease prevalence
- What has been done
- Changes
- Type of data expecting



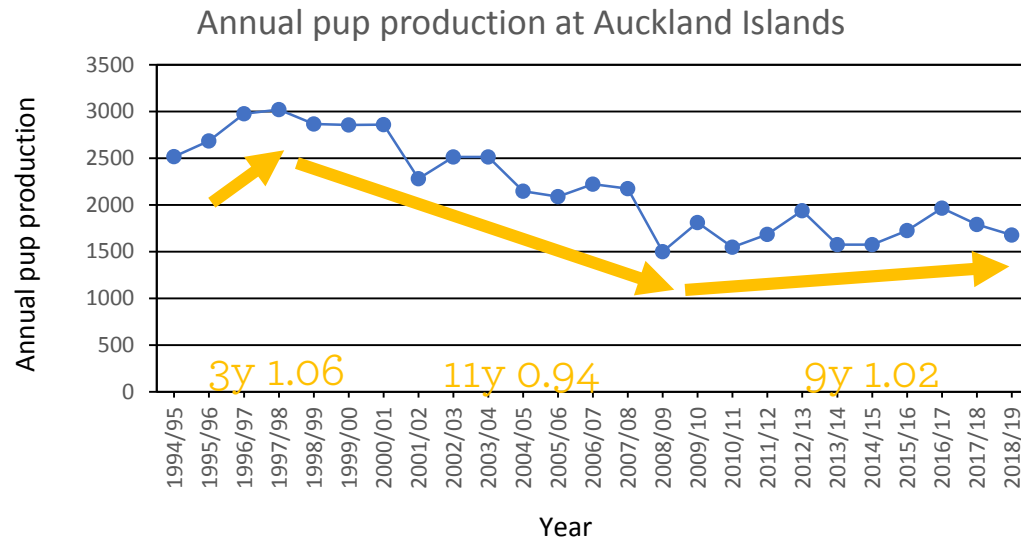


New Zealand sea lion research Auckland Islands 2019/20

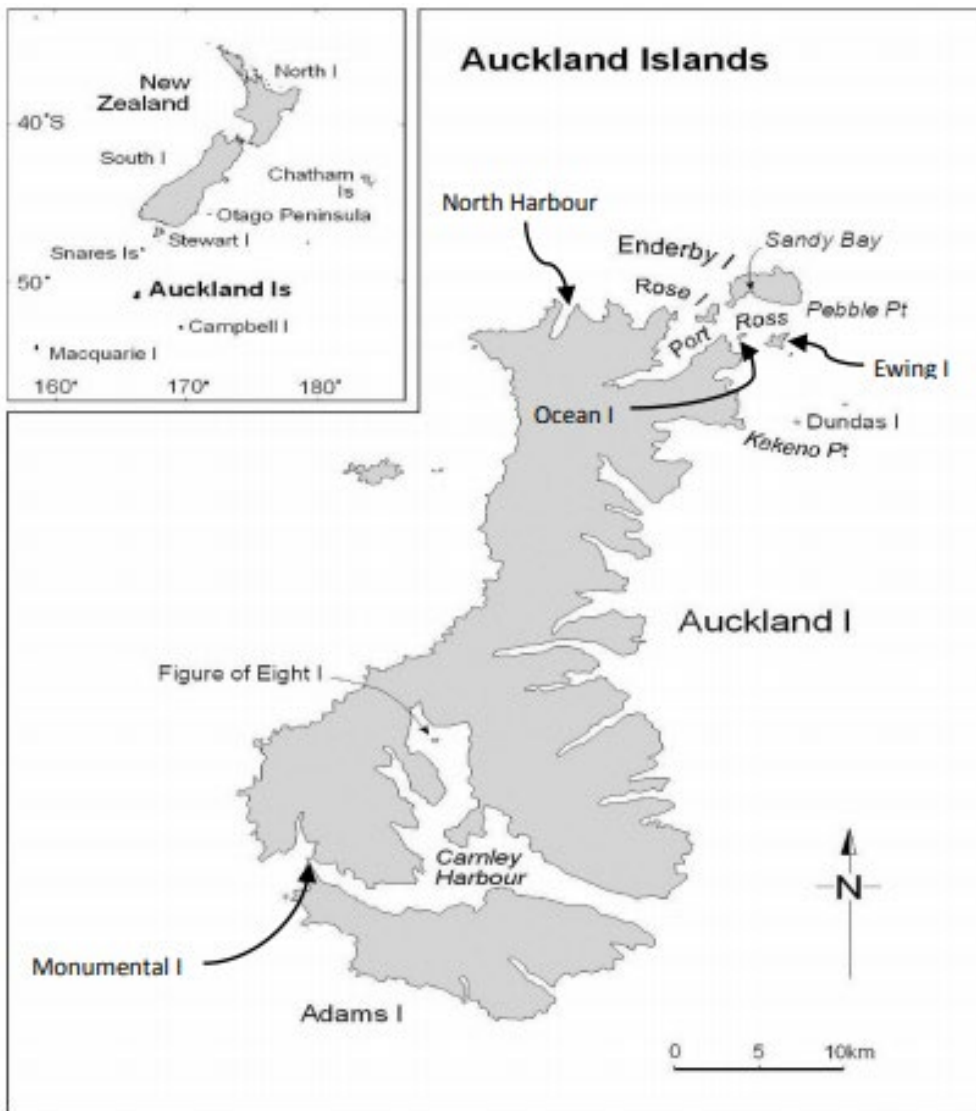


Pup production – Auckland Is

Location	Total	Live	Dead
Sandy Bay	319	312	7
South East Point	0	0	0
Dundas	1295	1240	55
Figure of Eight	65	60	5
Total Auckland Islands	1679	1612	67



Total pup production = 1612 live + 67 dead = 1679
(1792 2016/17)



- Sandy Bay (n=319), Dundas Island (n=1295), Figure of Eight Island (n=65), South East Point (n=0)
- Total pup production for the Auckland Islands in 2017/18 estimated as **1679**
- 286 (15%) pup decrease from 2016/17
- 11% higher than lowest count in 2008/09

- 767 pups marked: Sandy Bay (n=312 tagged & chipped), Dundas Island (n=400), Figure of Eight Island (n=55), South-East Point (n=0)

Auckland Islands (CSP) past project objectives

1. A mark-recapture estimate of pup production at Sandy Bay (Enderby Island), Dundas Island.
2. Double flipper tag all pups at Sandy Bay, 400 pups at Dundas Island and determine sex and weigh and measure (i.e. dorsal straight length and axillary girth) a sample of 100 pups (50 males, 50 females) at each site.
3. PIT (passive inductive transponder) tag all pups at Sandy Bay.
4. Daily counts of dead and live animals at Sandy Bay.
5. Resighting of marked animals at Enderby Island (including recording of PIT tags), to be conducted when time allows.
6. Surveys of Enderby Island (including South-east Point) for signs of pup production and marked animals, when time allows.





Changes to methodology for 2018/19

Survey methodologies generally the same as past years except for:

- All work contracted/ lead internally
- Microchipping at Dundas
- TMP extension for resighting and necropsy
- Need to put equal emphasis on:
 - Counts / tagging
 - Resightings
 - Necropsy
 - Additional around the island surveys

Changes for 2019/20 season

- Dundas Island – desire to increase resighting effort. BUT H&S issues
- Earlier, longer season – Enderby
 - 16 Dec – End of Feb
- Precise recording of ‘planks for pups’





Field tasks/methods

- Direct counts and 'dead runs' (all locations)
 - Daily counts – two counters
 - Counts around MR estimate
- MR estimates (Enderby/Dundas)
 - Predefined dates
 - 40% Mark rate
 - Peterson estimate
- Pup tagging (all locations)
 - Standard protocol. Dalton superflexi

Field tasks/methods

- Weigh and measure pups (Enderby/Dundas)
 - 50 of each m/f.
- Post mortem work (Enderby)
 - Gross post mortems of as many pups as possible
 - Samples taken for pathology
- Resighting surveys
 - Daily, dedicated 2-3 people
 - Throughout season
 - Dundas Island
 - Record behaviour/photograph tag
- Monitoring of planks for pups (Enderby)
- Shark scar photographic database





Important dates

- The date pup counts are undertaken on is critical
 - Sandy Bay 14-17th of January
 - Dundas 17-20th of January
 - Figure of 8 (less critical – after 20th of Jan)
 - Variability in team deployment dates
 - Figure of 8 survey undertaken during Campbell team extraction.

NZSL population monitoring – Campbell Island

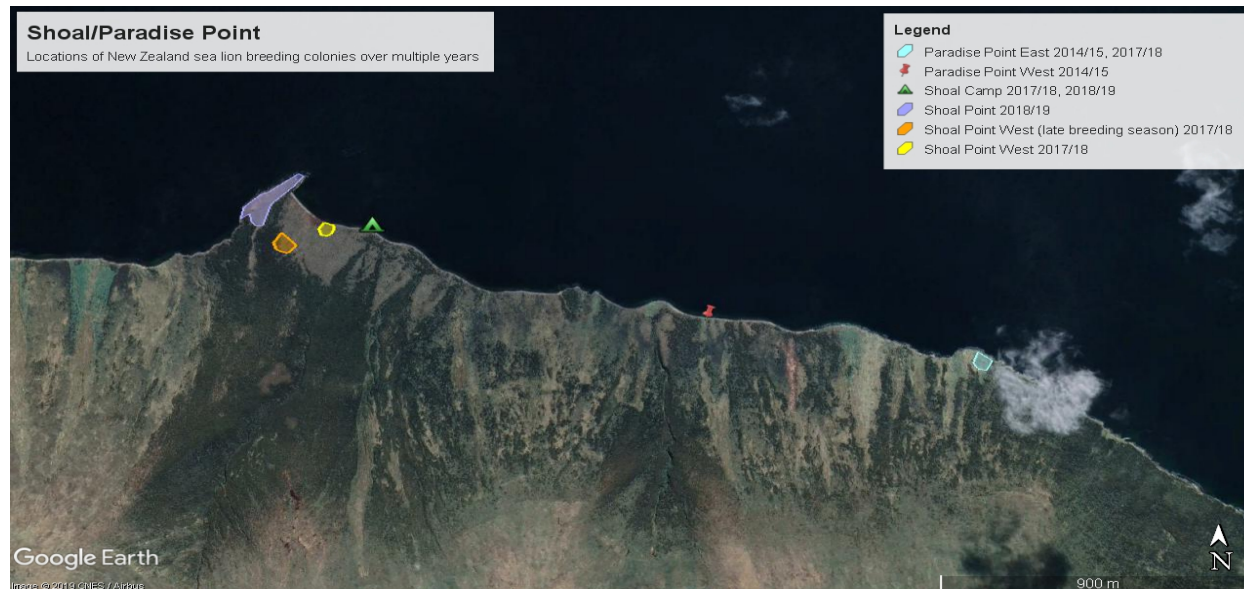


Objectives

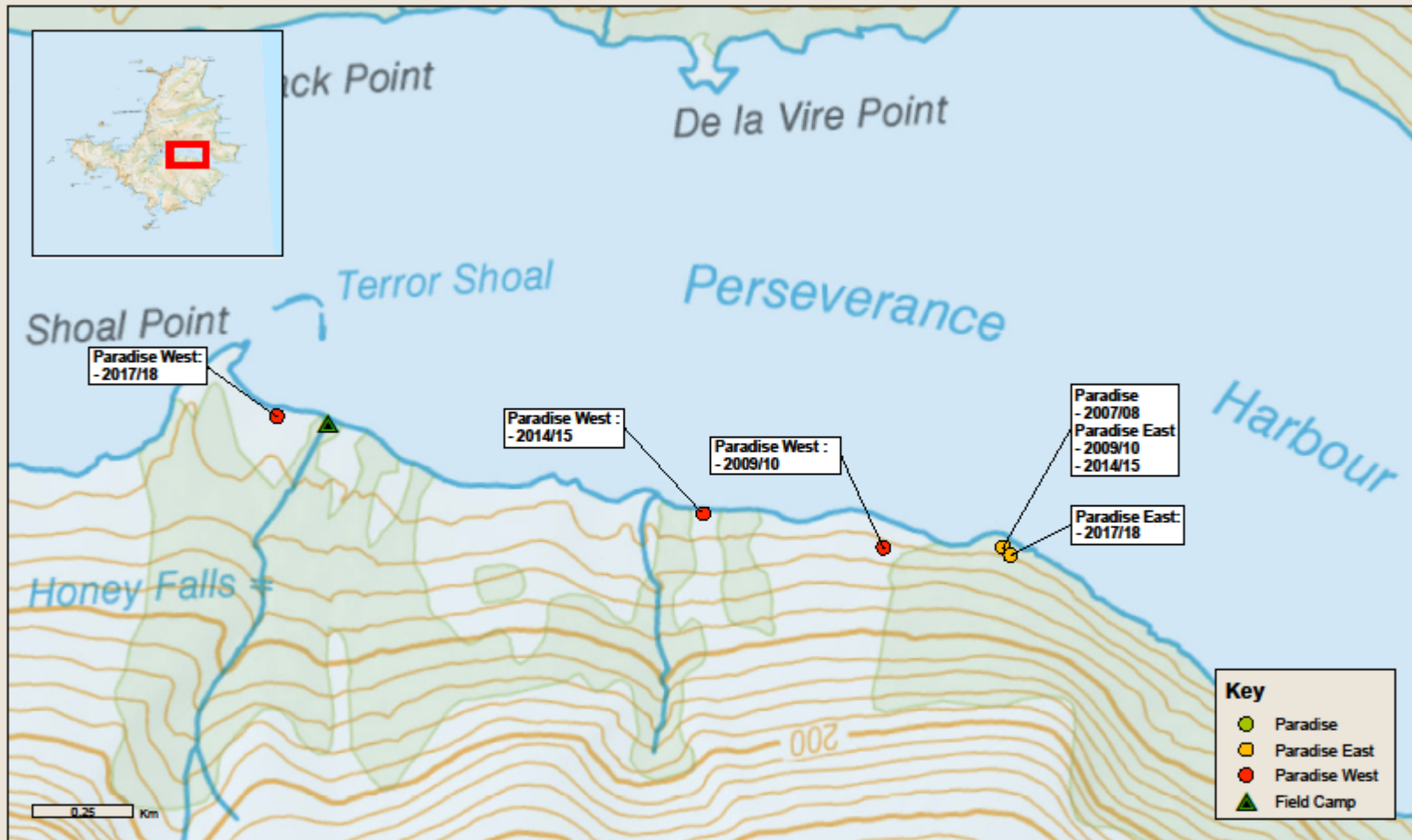
- Population monitoring
 - Pup numbers and mortality
 - Resighting
- Improve knowledge of pup **mortality**
 - Starvation
 - Holes
 - *Klebsiella*
- Improve **understanding** of factors affecting pup **mortality** in holes
- Develop potential **solutions** to reduce pup **mortality** in holes



Campbell Island – Two colonies



Colony location



NZGD 2000 New Zealand Transverse Mercator
Not for publication nor navigation
Crown Copyright Reserved
1:12,500
Produced: mgrose on 30/04/2018
DOC, Geospatial Services
NZTopo, © Crown

Locations of Paradise Point sea lion colony in Perseverance Harbour, Campbell Island over time



Department of Conservation
Te Papa Atawhai
New Zealand Government

Department of Conservation
Te Papa Atawhai

Previous seasons



Year	Departure	Return	Davis Visits	Paradise Visits	Whole Island	Method
2014/15	16 Dec	29 Jan	4	3	Yes	Direct counts
2017/18	16 Dec	3 Feb	1 (3 wks)	2 (1 wk each)	No	Direct counts, and MR (Bog colony)

- More focus at Davis Point
 - To minimise time lost in transit (5hrs PP-Bm, 8hrs Bm-DP)
 - Feedback from 2014/15 PP v dangerous to access until mid Jan
- More focus on pup mortality, and behaviour

Year	Departure	Return	Davis Visits	Shoal Visits	Whole Island	Method
2017/18	16 Dec	29 Jan	4	3	Yes	Direct counts, and MR(Bog colony)
2018/19	28 Dec	8 Mar	5 weeks	5 weeks	Yes	Direct counts

- A team at each site to improve data from Shoal Point
- 18 • Additional focus on Klebsiella

Changes for Campbell 2019/20

- Earlier season –16 Dec to 29 Jan.
- Prioritise mark-recapture
- Scaled back disease/mortality research
 - No postmortems. BUT contingency.
- No GPS tagging of pups
 - Behavioural data gathered as time allows
- Mortality intervention
 - Small fence at clifftop
 - Coir-logs, draining bogs





Field tasks/methods

- Locations of colonies and holes
 - GPS locations/photographs
- Pup production
 - Live and dead counts throughout season
 - MR estimates mid-January (same method as Auck Islands)
- Pup weights / measurements
 - 50 of each m/f.
- Mortality interventions
 - Install solar electric fence along cliff top
 - Install more coir logs and drain bogs where possible
 - Monitor success of interventions



Field tasks/methods

- Resighting surveys
 - Dedicated, daily surveys
- Disease monitoring
 - Collect faecal and oral swabs. Environmental samples.
 - record date, state of decomposition, blubber depth, girth, length, mass and sex.
 - Take photographs.
- Pup weights / measurements
 - 50 of each m/f.
- Tagging
 - Standard protocol. All pups, both colonies.
 - No microchips

Important dates for Campbell

- Counts undertaken over entire season
 - Especially around MR
- Mark recapture at both colonies
 - Mid January
- Weights (50m/50f @ each)
 - Davis Point 13-14th January
 - Shoal Point 15-20th January
- Begin tagging once pups are larger





Mitigation ideas for terrain traps

- ~~Steps for pups – locally sourced rock~~
- Hessian bag/jute matting bund
- ~~Timber ladder / trellis~~
- Coir log pathway
- Hand cut channels
- Fence – cliff only

Other key projects

- Island searches
- Campsite improvements



Kia ora !





- POP2017-05: New Zealand Sea Lion: Auckland Islands pup count - Tom Burns (Blue Planet Marine)
 - [Presentation \(PDF, 937K\) \(opens in new window\)](#)
- **TMP Technical Working Group Presentations:**
- TMP - Update on disease research at the Auckland Islands - Sarah Michael (Massey University)
 - [Presentation \(PDF, 6,822K\) \(opens in new window\)](#)
- TMP - Campbell Island pup count - Laura Boren (DOC)
 - [Presentation \(PDF, 1,336K\) \(opens in new window\)](#)
- TMP - Campbell Island - pup mortality - Micah Jensen (Wild Vet Care)
 - [Presentation \(PDF, 31,597K\) \(opens in new window\)](#)
- TMP - Campbell Island - pup behaviour - Dahlia Foo, Mark Hindell (University of Tasmania)
 - [Presentation \(PDF, 4,376K\) \(opens in new window\)](#)
- TMP - Campbell Island - Engineering solutions to pup mortality in holes - Reuben Saathoff (Fulton Hogan / CNC Alliance)
 - [Presentation \(PDF, 6,194K\) \(opens in new window\)](#)
- TMP - Stewart Island - Pup count update - Kevin Carter
 - [Report \(PDF, 709K\) \(opens in new window\)](#)
- TMP - Mainland - Pup count update - Jim Fyfe (DOC)
 - [Presentation \(PDF, 3,112K\) \(opens in new window\)](#)