New Zealand sea lion research Summer 2010/20111

Dr. B L Chilvers & Dr. I Wilkinson

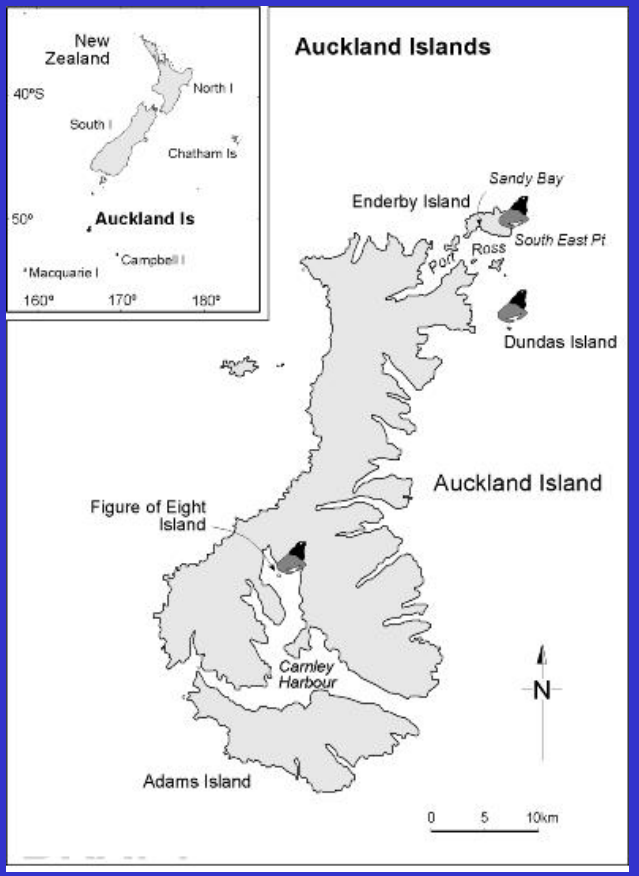
NZ sea lion research objectives Auckland Islands

- Measure Auckland Islands pup production
- Tag pups produced during 2010/11
- Data to estimate survival and reproduction of previously marked female NZ sea lions
- Maintain and update the NZ sea lion database

Pup production - methods and date of estimate

- Sandy Bay (Enderby Island) - Mark/Recapture estimate (16/1/11)
- Dundas Island - Mark/Recapture estimate (6/2/11) *
- S.E. Point (Enderby Island) - Direct count -daily counts
- Figure of 8 Island - Single direct count - (10/1/11)

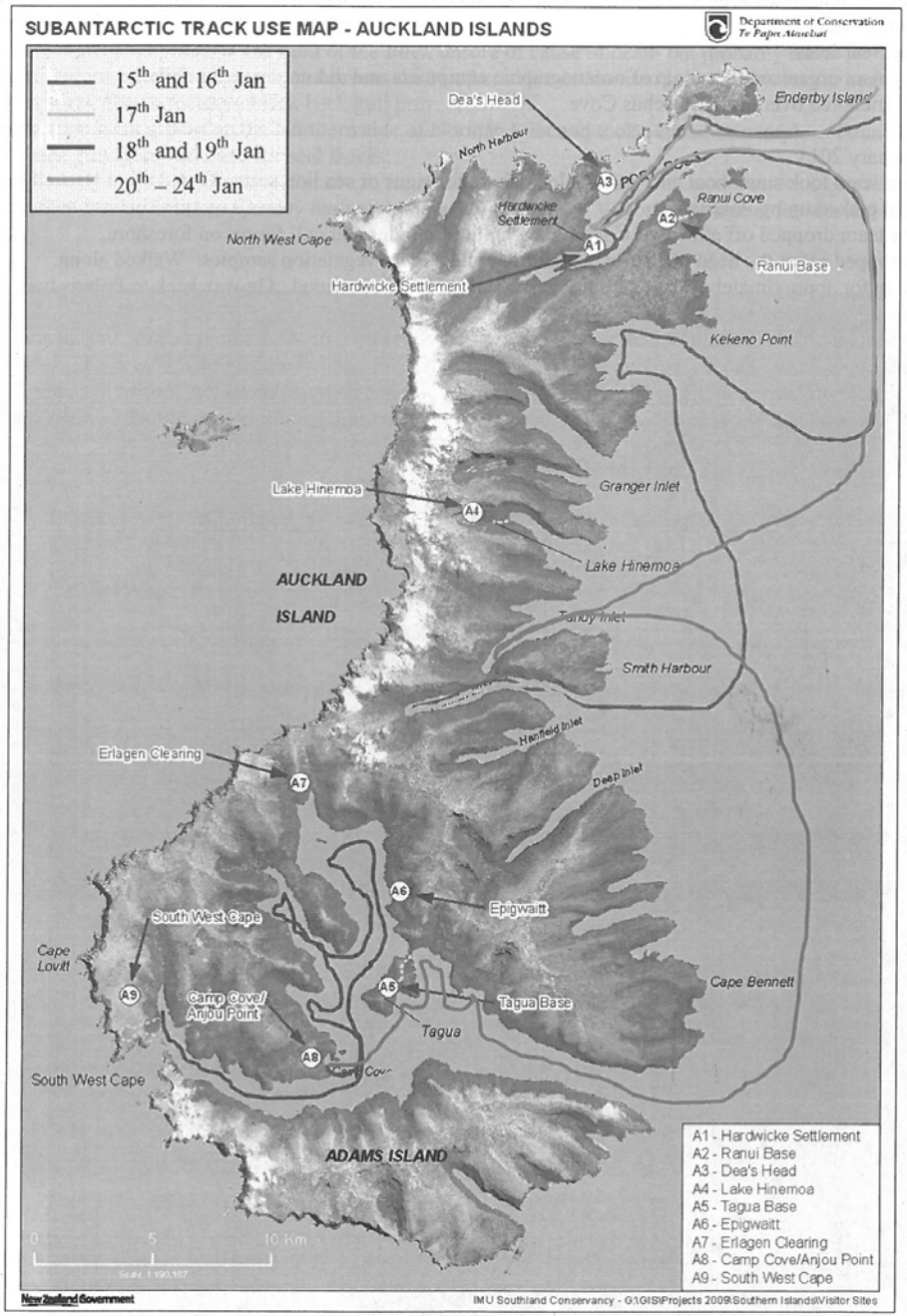
* Differences in M-R methods for Dundas outline in later slide



Marking & resighting

- 391 pups were double tagged for population studies. All Enderby Is pups (360) were also PIT tagged.
- Enderby, Dundas, Fig. of 8, Adams, Campbell, Main Auckland Island, Ross and Carnley Harbours searched or reports obtained.
- Over 7530 resights made on 1125 animals (including 278 identified from a PIT) collected from Enderby Island.
- One day trip to Dundas Is. with five resights
- One day trip to Figure of Eight Is with three resights.

Overview of Entire trips route



Otago University Auckland Island Trip

13 – 26 January

"…Sites on the main Auckland Islands were predominantly sub-adult males (NZ sea lions). We did encounter some adult males and a handful of female animals but the numbers were small. None of the females that were spotted …. (outside of Enderby) had pups with them or any sign that pups were present. …it suggests that there is little or no breeding outside of the historical centres of Dundas, Enderby and Figurte of Eight Island."

Pup production 2010/11 - Results

- Sandy Bay = 378
  - 359+/-7 live pups
  - 19 dead pups
- South East Point = 4
  - 2 unknown pups
  - 2 dead pups
- Figure of 8 = 79
  - 71 live pups
  - 8 dead pups

The Storm

The Result

Differences in M-R methodology for Dundas

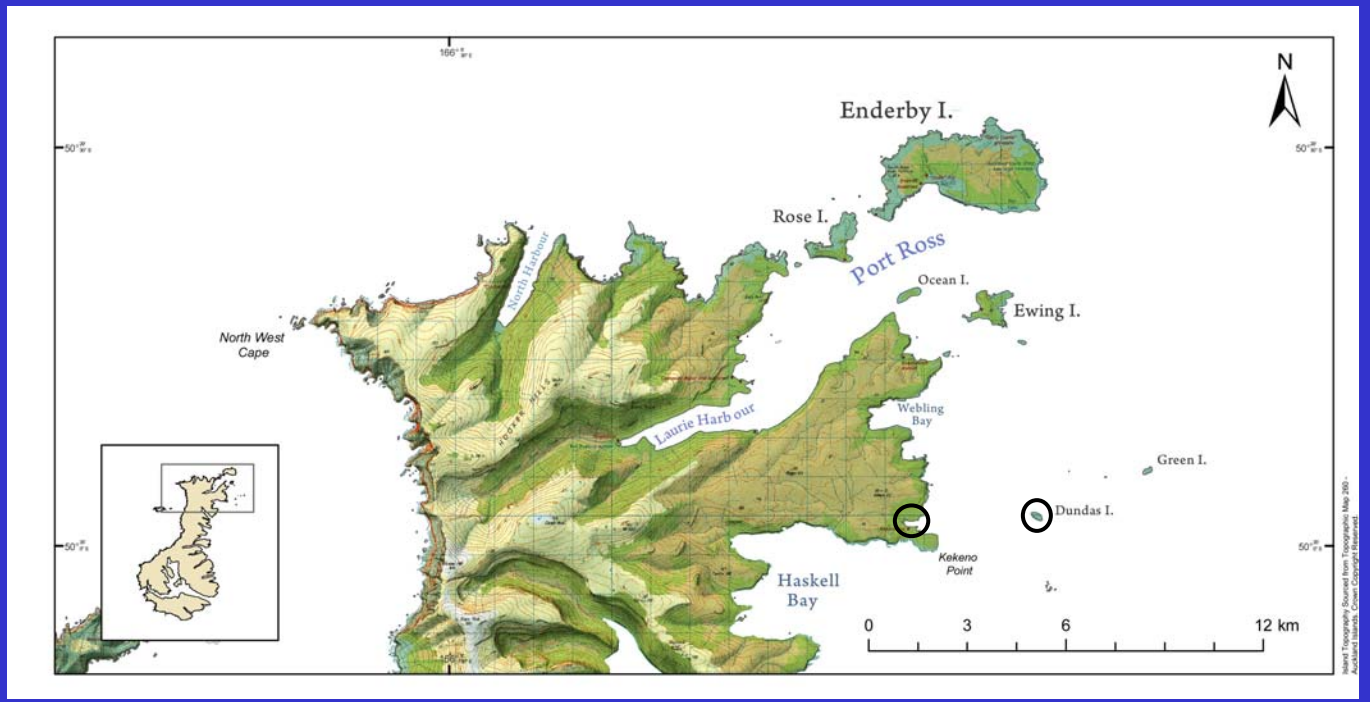
- Because the ability to launch and retrieve the large boat was severely impaired from the 17th Jan for the rest of the season – no team could be left on Dundas Island over night
- Therefore the mark-recapture conducted on the 6th of February was undertaken on a single day
- Due to time restrictions and worsen weather 200 caps were placed out on pups rather than 400
- Similarly three people did only two M-R counts each rather than three
- Simultaneous search of Kekeno conducted
- However all M-R assumption were met

1. All pups were born by mark-recapture dates;
2. All pups were accessible for marking
3. All pups were mobile and mixed well after being marked;
4. Marks were not lost before M-R counts; and
5. Mortality was negligible in the time between marking and recapturing.

- Dundas Island M-R estimated 6th February 2011

  944 live pups ± 40 + 137 dead pups = 1081 ± 40 pups

- On the same day Kekeno (area closest to Dundas Island where females and pups are known to swim to as pups get old enough) was visited and 8 pups recorded, therefore these pups were added to the Dundas Island count, 1089 ± 40.



Data relevant to determining if a correction factor to allow for direct comparisons to time series data was needed.

1) The number of dead pups on Dundas Is similar proportion of estimated pup production to the percentage of dead pups counted relative to the pup production estimate for Dundas in 2009/10 (11% dead 2010 vs 12.7% dead 16 days later in 2011). This indicates there was no mass dispersal of live pups from Dundas in 2011 which would have resulted in a higher ratio of dead to remaining live pups.

2) The area closest to Dundas Island – Kekeno had only 8 pups found on the same day, showing mother pup movements away from Dundas Island had been very low or only just begun.

3) Comparing two M-R at Dundas in 2010, on 13th Jan 2010 (1207 + 130 dead = 1337 ± 19) and 21st Jan 2010 (1212 + 151 dead = 1363 ± 35) showed no significant difference in estimated pup production.

4) Similarly, in 2002, four extra M-R between 21 & 29 Jan, show no downward trend.

These two mark-recapture comparisons indicate that mother and pup movements from Dundas Island do not occur in any significant numbers between 13th to 29th January.

This is backed by observational data as the NZ sea lion team has had team members living out on Dundas Island during the 01/02, 04/05, 05/06 and 06/07 season up until the 2nd of February, and observed females and pups do leave Dundas Island but only in ones or twos a day (which would result in the 8 pups being recorded at Kekeno this season).

None of the data investigated here supports the need to apply a correction factor in order to allow for direct comparisons with pup production time series data.

Discussion

Gales and Fletcher (1999)

- Used count data of pups not mark-recapture estimates.
- The paper presented no evidence to show a significant drop in pup numbers at Dundas,
- And, no evidence to suggest the pattern described for Enderby should or does apply at Dundas.
- Gales and Fletcher (1999) specifically note that “Cows and pups moved into the surrounding rata forest and grasslands at the two Enderby Island colonies and those on Dundas Island moved more widely over the entire island”, i.e. they did not point to movement of pups off the island.

• If assumed Dundas Island pup production estimate had similar decreasing trend to Sandy Bay and SEP, it would mean between 29 January and 6 February >250 mother and pup pairs would have left Dundas Island.

• Such large movements are not supported by the data presented in 2010/11 report, and conclude that any error in pup production estimate due to changes in the methodology this season is **unlikely** to be significant, and thus the estimate presented here is directly comparable to previous time series data.

Pup production 2010/11 - Results

Total for Auckland Islands =

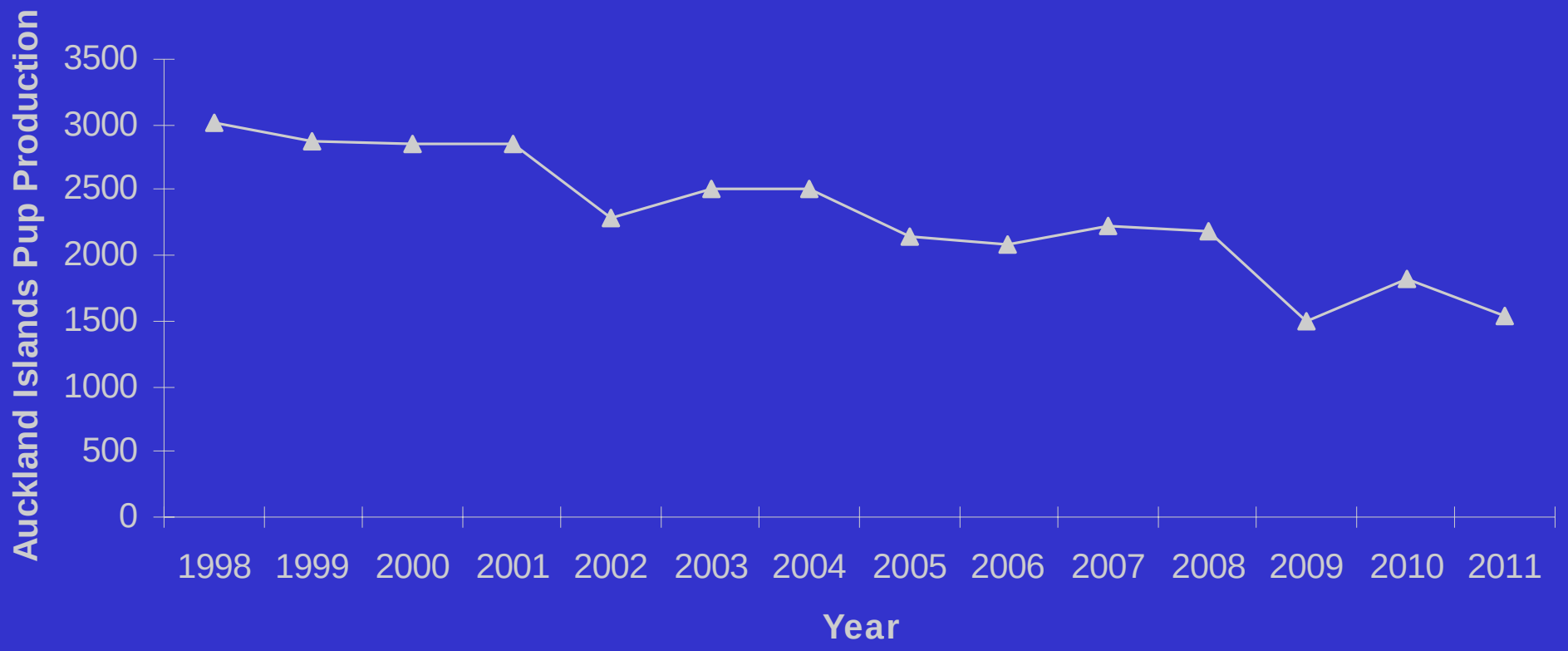
1550 +/- 41 10/11

1814 +/- 39 09/10

1501 +/- 18 08/09

2175 +/- 46 07/08

AUCKLAND ISLANDS PUP PRODUCTION 1997-2011



Pups were mobile and mixed well after being marked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