

New Zealand sea lion Auckland Islands 2022/23

CSP POP 2022-09

09 May 2023



New Zealand Government



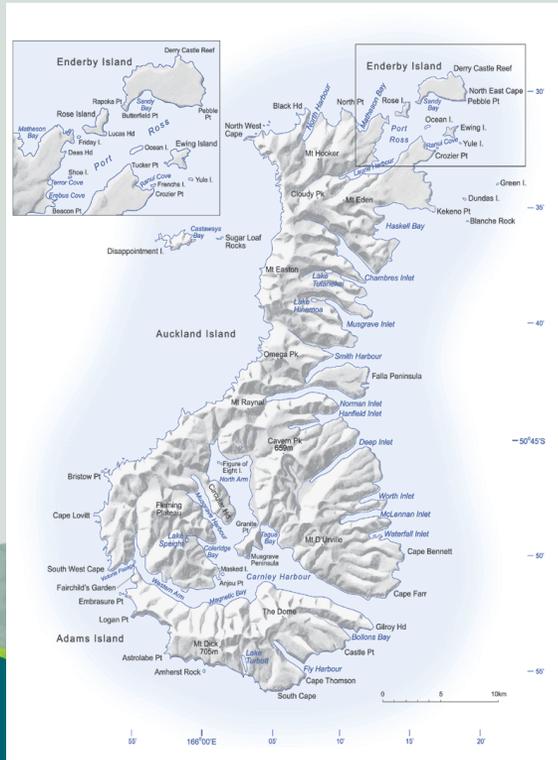
Trip logistics

2022/23

- **6 – 8 December 2022:** Bluff to Enderby Island.
- **9 December 2022 – 18 January 2023:** Daily direct counts of all sexes and age classes, tag resights, weekly round-the-island surveys, and terrain trap mitigation at Sandy Bay, Enderby Island.
- **12 – 15 January:** Pup double-flipper tagging and microchip insertion, Sandy Bay, Enderby Island.
- **16 – 18 January 2023:** Direct counts of pups, double-flipper tagging, and mark-recapture, Dundas Island.
- **19 January 2023:** Direct counts of pups, Figure of Eight Island.
- **20 – 21 January 2023:** Double-flipper tagging and microchip insertion, and tag resights, Sandy Bay, Enderby Island.
- **21 – 23 January 2023:** Enderby Island to Bluff.

Methods

2022/23

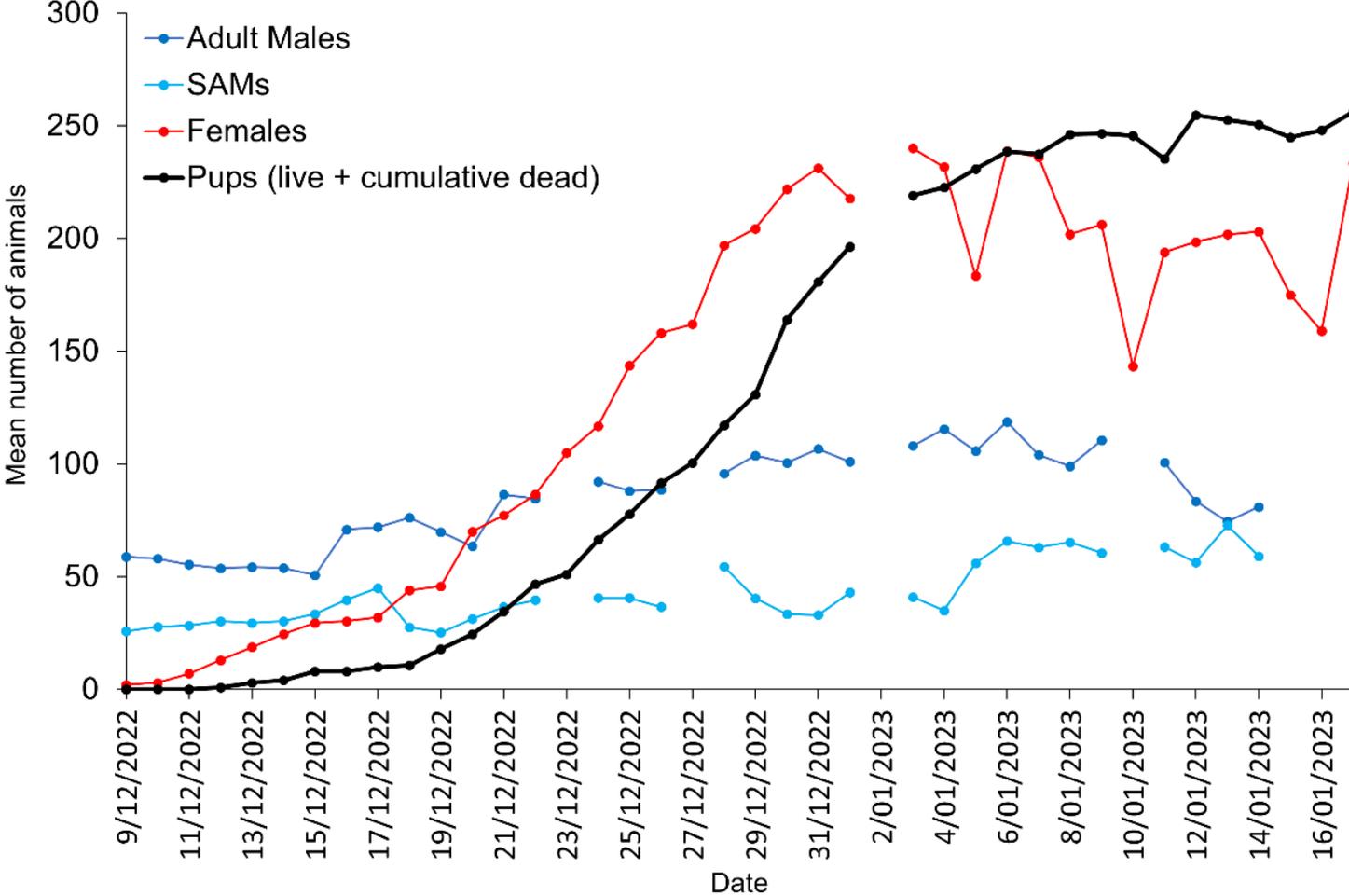


- ▶ Daily direct counts of pups (all colonies)
- ▶ Daily direct counts of other age/sex classes (Enderby)
- ▶ Flipper tagging & microchipping all pups (Enderby)
- ▶ Flipper tagging subset of pups (Dundas)
- ▶ Mark-recapture of pups (Dundas)
- ▶ Resights of tags & microchips (targeted at Enderby; opportunistic at Dundas and Figure of Eight Islands)

Daily counts, all age classes

Sandy Bay, Enderby Island

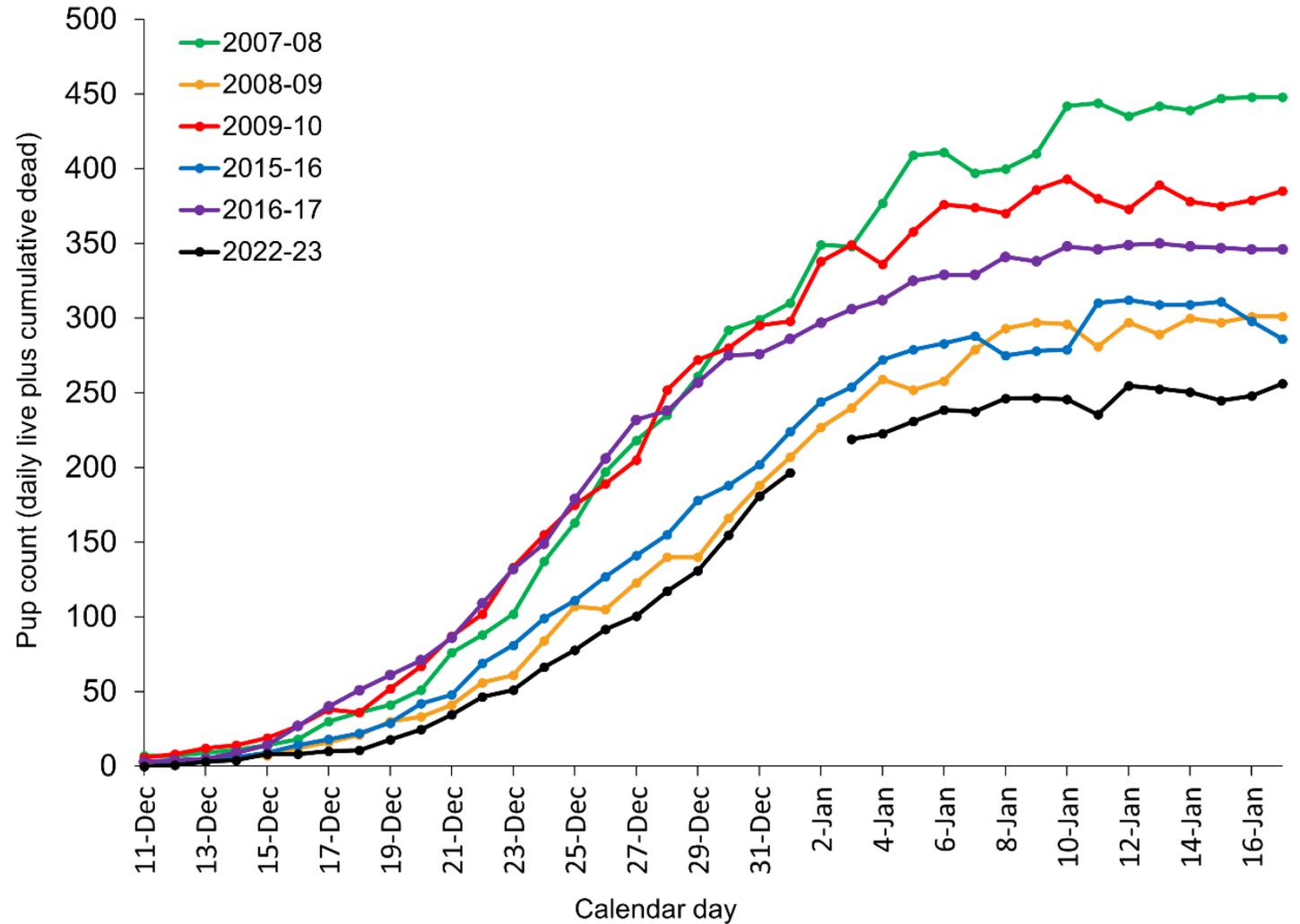
2022/23



Mean daily counts of each age and sex class of New Zealand sea lions at Sandy Bay, Enderby Island, in 2022/23.

Daily pup counts - historic comparison

Sandy Bay, Enderby
Island



Daily mean count of New Zealand sea lion pups (live plus cumulative dead) at Sandy Bay, Enderby Island, in 2007/08, 2008/09, 2009/10, 2015/16, 2016/17 and 2022/23.

Enderby Island

Pup production
estimate 2022-23



Photo: Kat Manno

- ▶ Daily Sandy Bay pup counts yielded estimate of 251 ± 2 live pups
- ▶ Total 10 untagged dead pups (cumulative)
- ▶ Direct count estimate: 261 ± 2 pups
- ▶ Pup tagging: **268 pups** total (258 tagged plus 10 dead untagged)
- ▶ No pups found outside of Sandy Bay on weekly round-the-island surveys
- ▶ No mark-recapture at Sandy Bay due to weather concerns for landing at Dundas Island



Photo: Kat Manno

Dundas Island

Dundas Island

1. Direct counts
2. Mark-recapture (MR) estimate



- ▶ Poor weather and poor infrastructure reduced time on island and shifted dates slightly
- ▶ Altered methods to optimise time available: reduced number of pups tagged from 400 to 200, reduced MR caps to 300, capped the first 200 MR pups at the time of tagging, did direct counts prior to MR counts
- ▶ 16-17 January: pup tagging and mark-recapture cap deployment
- ▶ 18 January: mark-recapture counts
- ▶ Direct counts yielded estimate of 794 ± 9 pups (incl 49 dead)
- ▶ MR yielded estimate of 960 ± 23 pups (incl 49 dead)

Figure of Eight Island

Direct counts



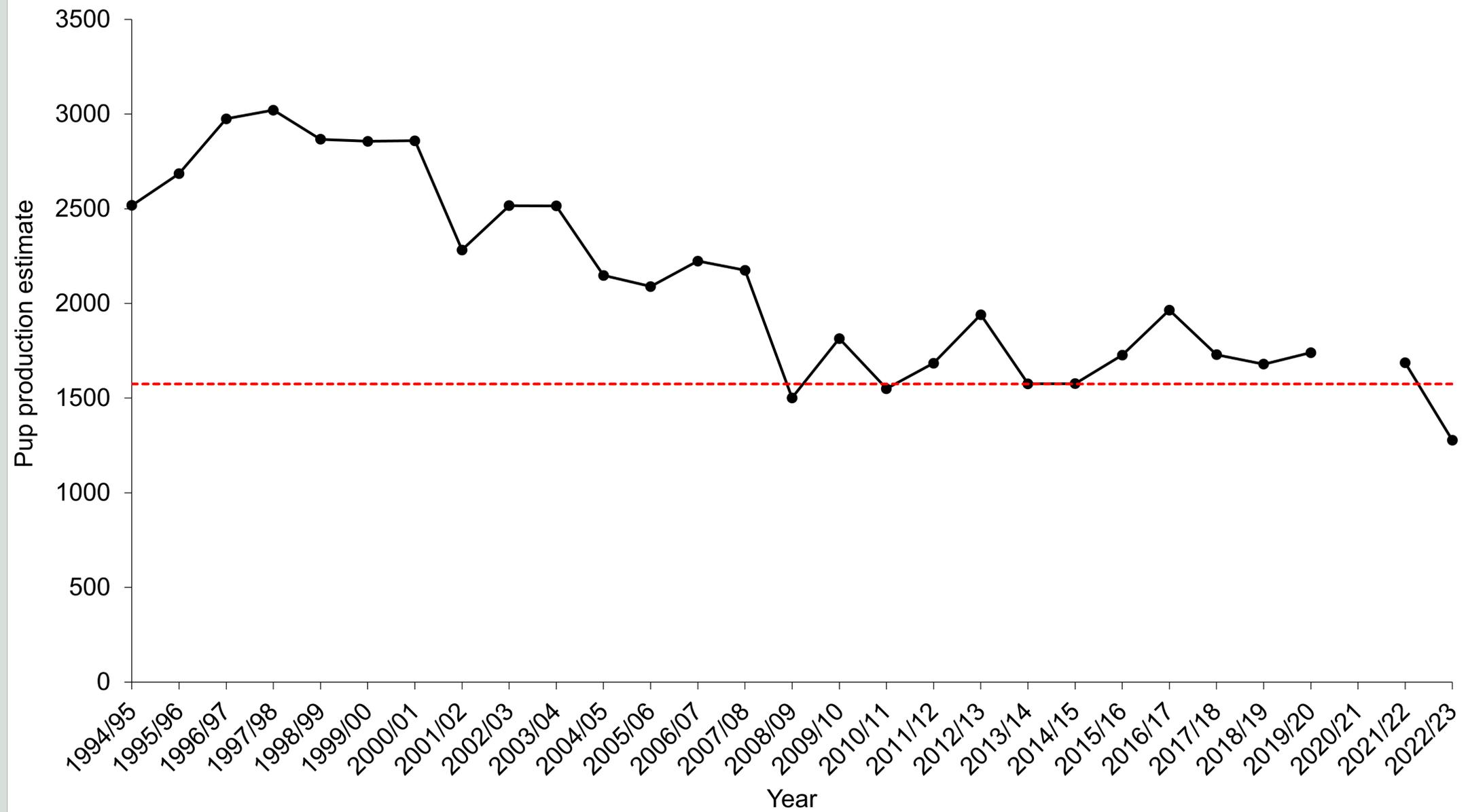
- ▶ Visited on 19 January 2023
- ▶ Very dry underfoot. No bog.
- ▶ Colony located uphill in the trees at the time of our visit
- ▶ Direct counts yielded **50 ± 1 pups** (including two dead)

Pup production estimates

Auckland Islands
2022/23



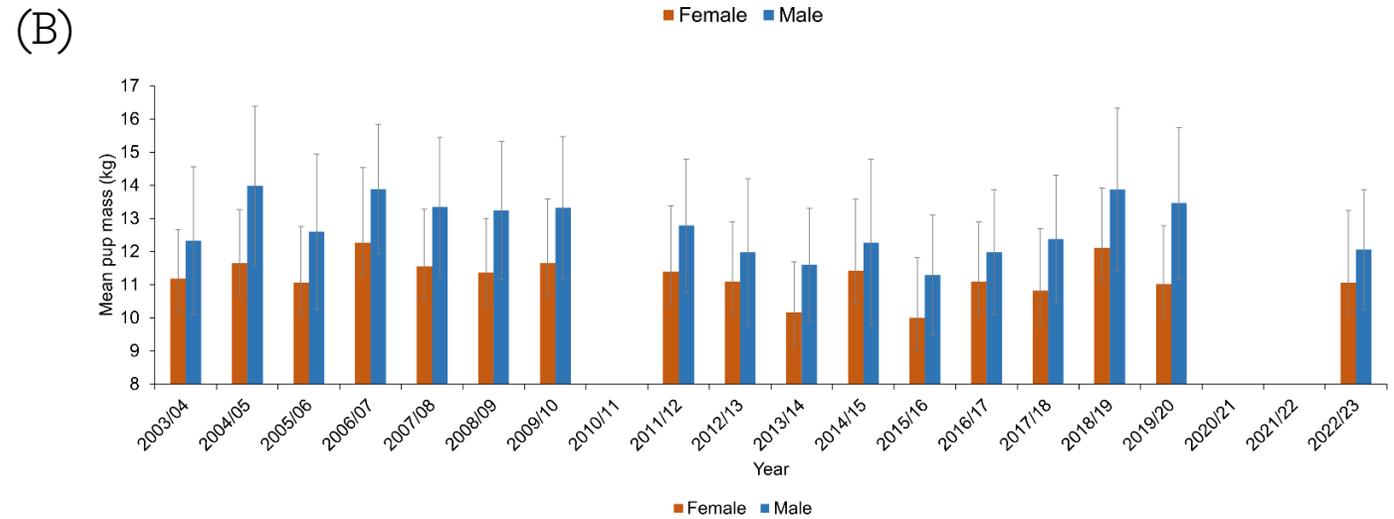
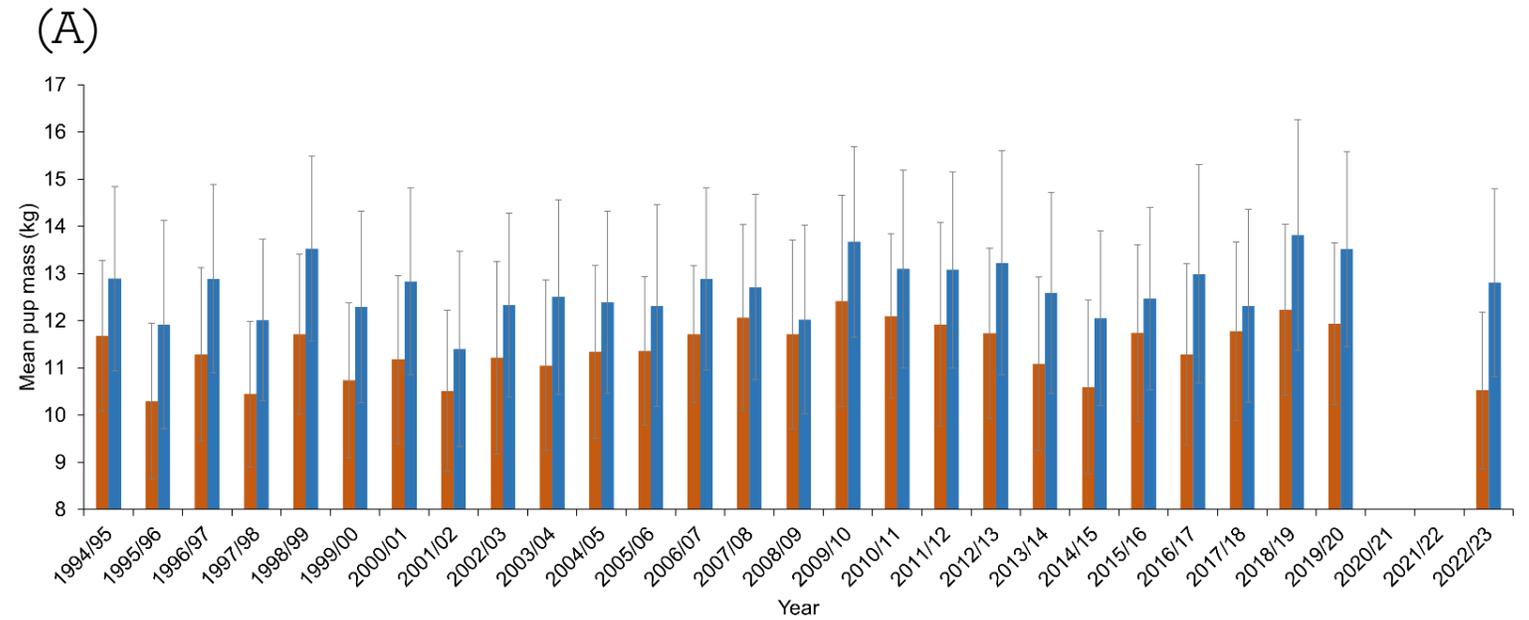
Location	Method	Date	Number of counts (observers)	Cumulative dead pups	Pup production estimate \pm 1SE
Sandy Bay, Enderby Island	Total pups tagged	12-21 Jan	1 (6)	10	268
Enderby Island (other)	Round-the-island surveys	9 Dec - 6 Jan	5 (2)	0	0
Dundas Island	Mean Mark-Recapture	18 Jan	12 (4)	49	960 \pm 23
Figure of Eight Island	Mean direct count	19 Jan	3 (3)	2	50 \pm 1
Total pups				61	1278 \pm 23



Auckland Islands total New Zealand sea lion pup production estimates 1994/95 - 2022/23. The red dashed line represents the minimum count of 1575 pups set to trigger reviews of the New Zealand sea lion Threat Management Plan (DOC & MPI 2017) and Squid 6T Operational Plan (FNZ 2019).

Mean pup mass

Comparison with
historic
measurements



Mean pup mass at tagging (kg) for (A) Sandy Bay, Enderby Island and (B) Dundas Island female and male pups (1994/95 - 2022/23). Error bars represent the standard deviation of the mean.

Other notes

Auckland Islands 2022/23



Photo: Mel Young

- ▶ Unusually warm and dry at the Auckland Islands this summer; only one storm event, near the end of the trip
- ▶ Pup mortality appeared lower than usual (though difficult to compare)
- ▶ Average pup mass was slightly low, but well within the historic range. Male pups were significantly larger than female pups at Enderby Island, but not at Dundas Island
- ▶ Sex bias to male pups at Enderby Island (female: male ratio 0.83:1) and possibly also Dundas Island (0.77:1)
- ▶ Resights: 1467 individual sightings from 508 unique animals
- ▶ Starlink internet connection allowed confident verification of marked animals in-season

Summary

Auckland Islands
2022/23

- ▶ Estimate of $1278 \pm 23 \pm 23$ pups at the Auckland Islands colonies in 2022/23
- ▶ Significant and unexplained drop from the relatively stable trend over the past 15 years
- ▶ This estimate falls below the trigger of 1575 pups set for review of the NZ sea lion Threat Management Plan and the Squid 6T Operational Plan
- ▶ Recommendations: another year of data collection with a view to updating the demographic model, investigations into likely drivers (female fecundity, food availability, climate, disease)

Acknowledgements

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Photo: Andy Maloney