



# Research Planning for POP2013-01 Sea lions Auckland Islands

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Department of  
Conservation  
*Te Papa Atawhai*

# Overall Objective

To estimate New Zealand sea lion pup production in the Auckland Islands and collect data to allow the estimation of key demographic parameters

## Specific Objectives

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



# Planning process

1. Refine scope and objectives (including logistical considerations in relation to synergies with other research)
2. Identify data requirements and variables relevant to protocol design
3. Other matters?



# Refining scope and objectives



# **SO1: To estimate New Zealand sea lion pup production at Enderby, Figure of 8 and Dundas Islands.**

1. Ground and/or aerial
2. Ground methods: M-R, direct counts, by colony
3. Timing (e.g. Dundas M-R 2-3 days earlier?)
4. Transport logistics – including synergies with other research projects (white-capped and Gibson's albatross)
5. How to count dead pups at Sandy Bay
6. Search for pups outside colonies – Enderby Island and remaining Auckland Islands



# **SO2: To mark New Zealand sea lion pups at Enderby and Dundas Islands following established techniques.**

1. Flipper tags, chips
2. Enderby/Dundas/Fig 8 – number/proportion
2. Transport logistics to Dundas (aerial and/or boat)
3. Other data collection (e.g. pup weight)



# **SO3: To conduct a three to five week period of resighting previously marked animals at Enderby Island.**

1. Length/timing of resight period (additional to other tasks)
2. Trial changes to chip/tag resight methods?



# SO4: To update the New Zealand sea lion database.

1. Develop as primary data input method in field?
2. Include pup weight and any other data?
3. Continue web hosting?





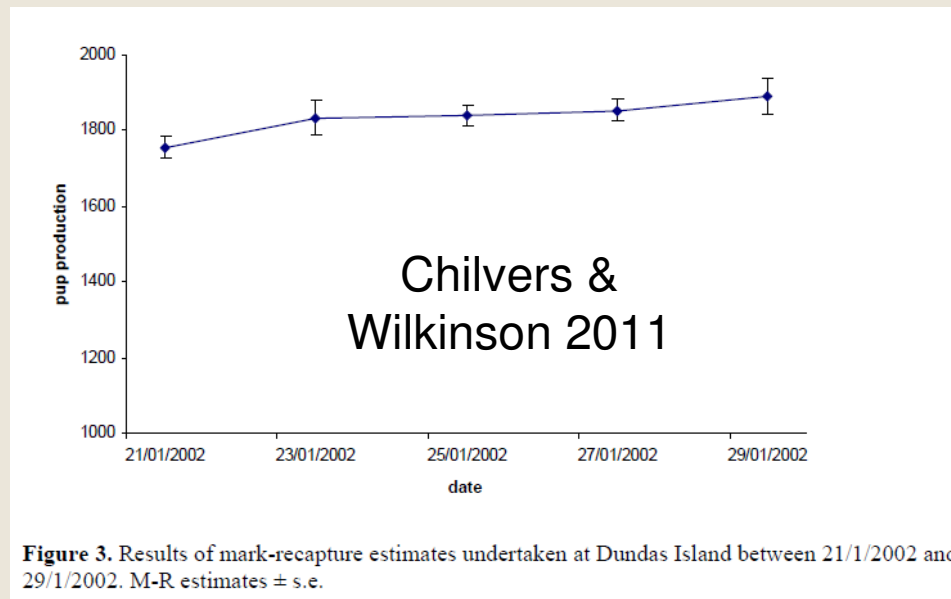
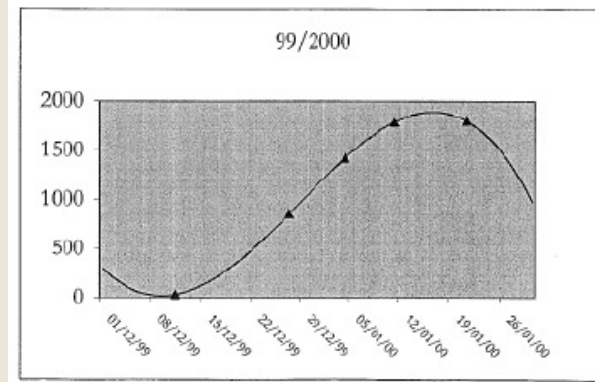
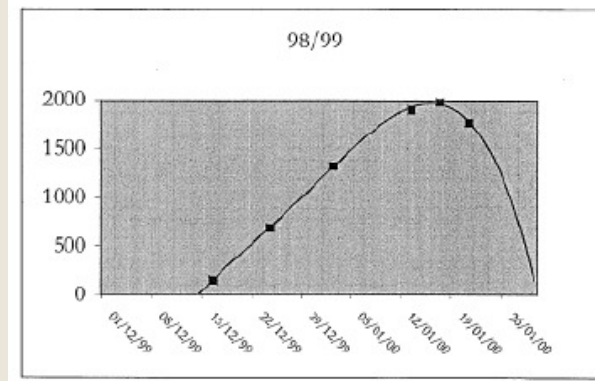
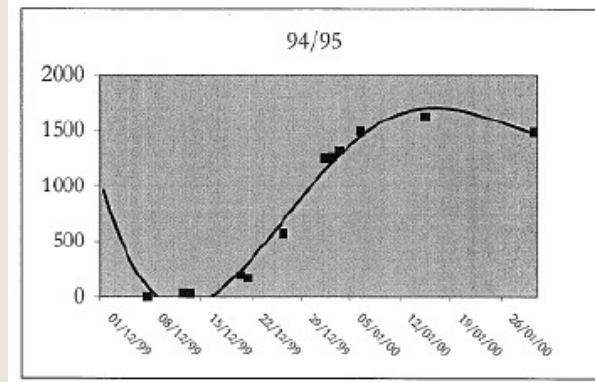
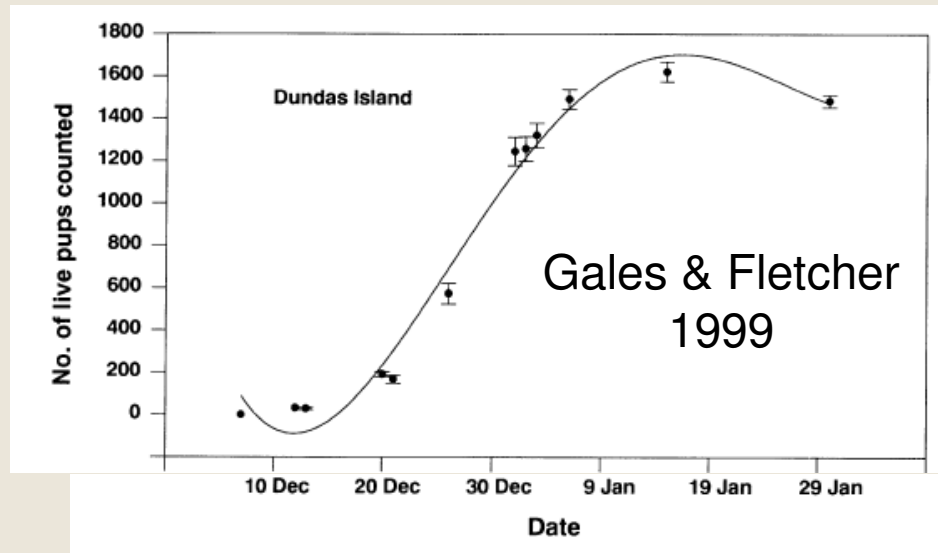
# Additional tasks



# **SO1: To estimate New Zealand sea lion pup production at Enderby, Figure of 8 and Dundas Islands.**

1. Ground and/or aerial
2. Ground methods: M-R, direct counts, by colony
3. Timing (e.g. Dundas M-R 2-3 days earlier?)
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5. How to count dead pups at Sandy Bay
6. Search for pups outside colonies – Enderby Island and remaining Auckland Islands





Wilkinson 2000

## Other research

White-capped albatross: optimal timing December, last two years mid-January – requires correction for floaters

Gibson's albatross: transport to Auckland Islands can be shared, field season 5-6 weeks (potential for sharing return)



# **SO2: To mark New Zealand sea lion pups at Enderby and Dundas Islands following established techniques.**

1. Flipper tags, chips
2. Enderby/Dundas/Fig 8 – number/proportion
2. Transport logistics to Dundas: aerial and/or boat
3. Other data collection: pup weight



# **SO3: To conduct a three to five week period of resighting previously marked animals at Enderby Island.**

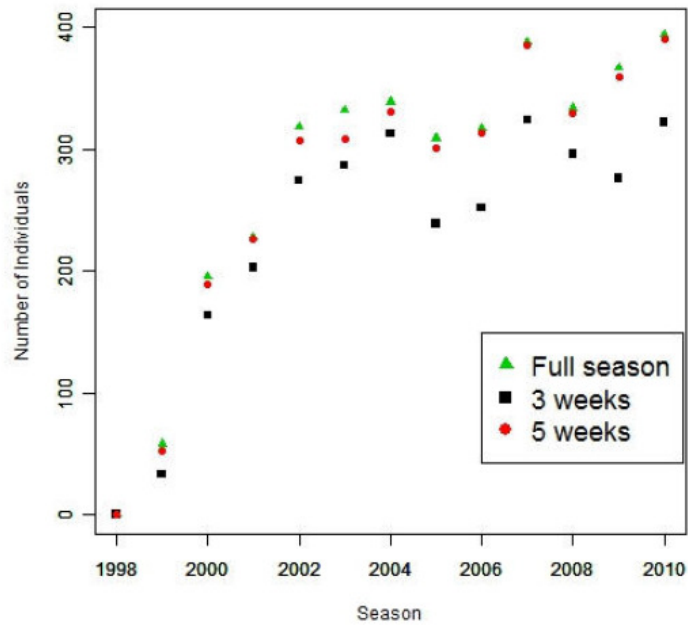
1. Length/timing of resight period (additional to other tasks)
2. Trial changes to chip/tag resight methods?



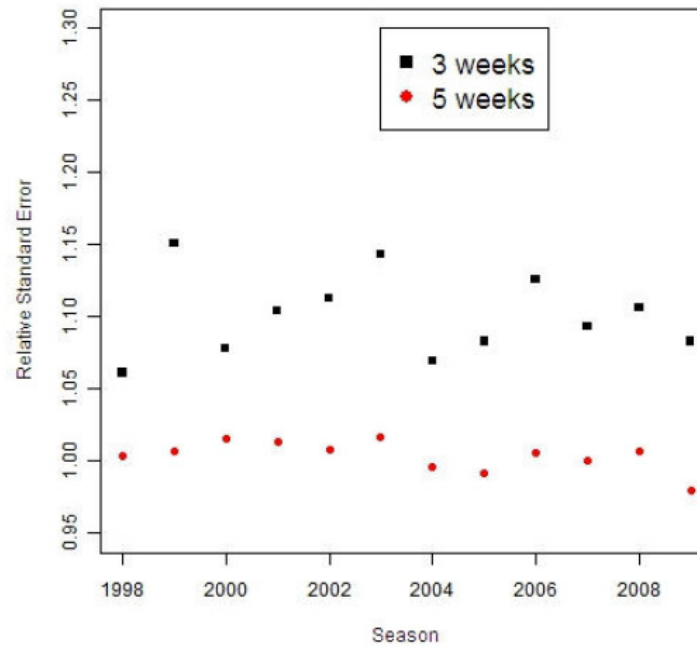
# MacKenzie 2012



**Figure 1:** Number of individuals with 3 or more sightings each year from the full data and the shortened 3-week and 5-week periods.



**Figure 7:** Standard errors for the shortened 3-week and 5-week field seasons relative to the full data for juvenile survival estimates.



# SO4: To update the New Zealand sea lion database.

1. Develop as primary data input method in field?
2. Include pup weight and any other data?
3. Continue web hosting?





# Additional tasks

1. Contingency for permit requirements
2. Field necropsies (pups and/or adults)
3. Other health status information?
4. Diet sample collection
5. Direct counts at Sandy Bay by sex and age class
6. Searches for pups away from colonies
7. Female age structure investigation?
8. Hut maintenance
8. Census southern royal albatross (ground or aerial)
9. Yellow-eyed penguin counts



# Data requirements and variables relevant to protocol design



# Key tasks

1. Pup M-R estimate
  2. Pup marking
  3. Direct counts – pups, subadults and adults, live and dead
  4. Resighting marked animals
  5. Dead animals/health status?
- Delineating breeding areas/search areas: map on aerial photograph with key points recorded by GPS?
  - Describing clumping of pups: photos for post-hoc analysis?



# 1. Pup M-R estimate

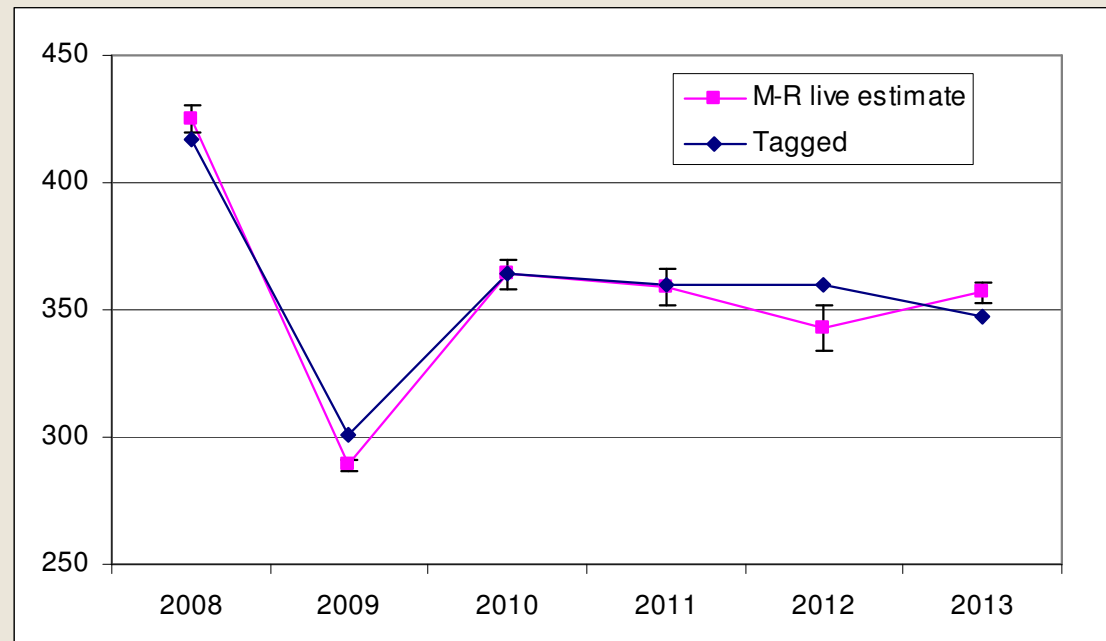
## Applying marks:

- Record date, time start, time finish
- Spread throughout defined colony area: map approximate spread
- Apply a fixed number of marks to achieve standard proportion (marking every  $x^{\text{th}}$  animal logistically difficult – comparison of M-R live estimate with tagged total at Sandy Bay illustrates mixing is not an issue)
- Investigate biodegradable marks?

## Recapture:

- Record date, observer ID, time start, time finish
- 3 observers x 3 counts
- Colony area systematically searched
- Hand-held tally counters
- Weather?





## 2. Pup marking

- Timing/integration with other tasks (following M-R)
- All pups Enderby, 400 Dundas?
- Selection of pups at Dundas (100 male, 300 female, sampling strategy?)
- Continue use of current tag type and numbering/colour sequence?
- PIT chipping? – all pups Enderby?
- Weigh 100 animals per site, 50 each sex, first 100 tagged

Data to record, per animal:

- Researcher ID
- Date, location, tag, chip
- Sex
- Weight



### 3. Direct counts – pups and adults, live and dead

- Daily at Sandy Bay?
- By sex and age class
- Observer ID, colony, (beach/sward?), date, time start, time finish
- Weather/tide?
- Comments?



## 4. Resighting marked animals

- Trial use of high resolution cameras to aid tag reading and create archive record?
- Trial use of new generation pole readers for PIT chips?
- Record individual non-identified animals? – effort could be substantial
- Recorder observer ID, site, date
- Presence of brand, tag, chip
- For tags: colour, shape, number, left, right
- Sex, age class
- Behaviour comment
- Pup tag details
- Other comments





## 5. Dead animals/health status?

Adults: Protocol developed by Massey University (necropsy all dead animals)

Pups: Protocol developed by Massey University (necropsy all, or sample if large numbers)

Requires vet, time, analysis of samples on return



**Next stage: draft  
protocols**

**Other matters?**

