Satellite-linked Instrument Deployments on Southern Elephant Seals at Marion Island

[1]Tosh, C.A., [1]Bester, M., [2]Bornemann, H., [3]Burton, H., [1]Pistorius, P., [2]Plötz, J., [2]Ramdohr, S., [4]Stewart, B. & [3]Van den Hoff, J.

[1]*Mammal Research Institute, Department of Zoology & Entomology, University of Pretoria, Pretoria, South Africa*

[2]*Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany*

[3]*Australian Antarctic Division, Kingston, Tasmania, Australia*

[4]*Hubbs-Sea World Research Institute, San Diego, California, USA*

Introduction

- Marion Island: 46°54′ S, 37°45′ E
  - 1770 km south-east of South Africa
  - 2300 km north of Antarctica's Lutzow-Holm Bay
  - closest landfall, apart from proximate (19 km) Prince Edward Island, is Ile aux Cochons of the Crozet Island group, 950 km to the east
- Deployments from 1999 – 2005
- 60 individuals: 19 females & 41 males
- Transmitters: *Wildlife Computers, Sea-Mammal Research Unit, Sirtrack*

Fig. 1. OO086, a sub-adult male, that was tracked for ± 8 months. The device was successfully recovered.

Materials and methods

- Immobilization: Ketamine administered according to estimated body weight.
- Attachment: Quick drying epoxy resin
- Data collection: ARGOS data collection system
- Data storage: PANGAEA (Publishing Network for Geoscientific & Environmental Data)
- Meta–analysis: collate information about previous deployments and investigate the following parameters.
  - Duration of track, fate of the device
  - Fate of the animal and subsequent history.

Fig. 2. BB 335, a sub-adult that carried a SMRU device for about a month onshore. The device was recovered after it became dislodged.

Fig. 3. The flipper tags used to monitor the population of southern elephant seals on Marion Island. Each tag acts as a unique identifier.

Results

- More male (mostly sub-adults) than female animals were instrumented on Marion Island (Fig. 4).

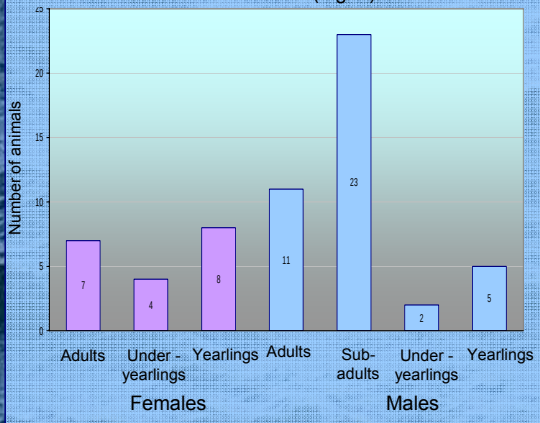

Fig. 4. Number of animals instrumented on Marion Island.

Duration

- 33% of tracking lasted less than 2 months.
- 25% and 24% of tracking lasted between 2 - 4 months and 6 – 8 months respectively (Fig. 5)

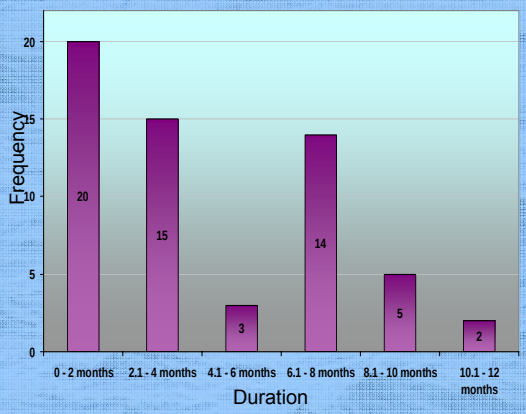

Fig. 5. Frequency histogram of tracking durations for instruments deployed on Marion Island

- Tracking took place in all seasons; but data for summer tracking is sparse (Fig. 6).

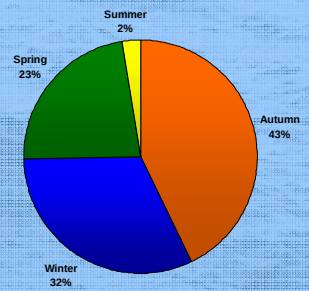

Fig. 6. Seasonal representation of tracking of instruments deployed on Marion Island

Mark-Recapture Program

- 37 of the instrumented animals were tagged at weaning.
- Possible to accurately identify individuals when they return to Marion Island.

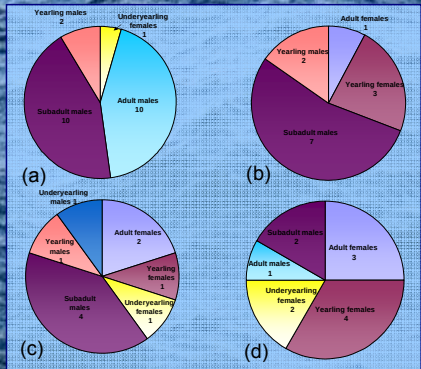

Fig. 7. The number of (a) untagged instrumented animals; (b) tagged animals that returned without transmitters, (c) tagged animals that returned with transmitters, and (d) tagged instrumented animals that were never recorded again on Marion Island.

- 62% of the instrumented tagged seals were resighted again at Marion Island
- 44% of the tagged animals returned with their instruments intact
- 56% of the instrumented tagged seals returned without devices

Conclusions

- Experimental design is constrained by various factors
  - timing of relief voyages
  - timing of annual cycle of southern elephant seals
- Duration of tracking and retrieval of devices are not related to the sex or age of the instrumented seals
- The Pangaea Data Storage System facilitates the retrieval and analysis of data collected by different types of devices.
- Long term collection of such data will facilitate the expansion of the use of living animals as oceanographic platforms.

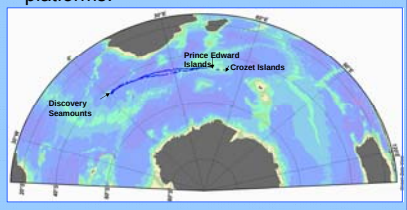

Fig. 8. At surface behaviour of southern elephant seal: MAR2002_sel_a_m_05

References

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