

Southern sea lion research at the Falkland Islands 2013

Shackleton Scholarship Fund Report

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Picture: Rachael Orben

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Introduction

The Falkland Islands population of southern sea lions (*Otaria flavescens*) has declined by 97%, from the largest population in the world in the 1930's (pup production of ~ 80,000) to now the smallest population (less than 3000 pups p.a.) (Hamilton 1939, Thompson et al. 2005). The most recent sea lion population census in 2003 indicated that while some colonies had increased, others remained stable or had declined (Thompson et al. 2005). Despite this dramatic decline and failure to recover, the Falkland Islands population of sea lions remains virtually unstudied. In particular, knowledge of their foraging ecology is limited to only four adult females equipped with satellite tags in 1992 (Thompson et al. 1998).

To better understand potential impediments to population recovery, we initiated a unique and ambitious project to assess genetic diversity, health status and foraging ecology of sea lions breeding at the Falkland Islands. In 2011, we deployed satellite tags on 10 adult females and 6 juveniles. In 2012 we deployed five archival GPS tags on adult females. This report reviews southern sea lion fieldwork conducted in 2013, made possible by a grant from the Shackleton Scholarship Fund.

The 2013 aims were:

- (i) Increase both the number of animals and breeding colonies GPS tracked.
- (ii) Deploy two satellite tags.
- (iii) Initiate a population genetics study (collaboration with Dr Joe Hoffman, University of Bielefeld).

Methods

GPS tags were deployed on adult females breeding at Big Shag Island and satellite tags deployed at Turn Island. Adult female sea lions were captured using the

anaesthetic drug Zoletil (a combination of the dissociative anaesthetic tiletamine and the sedative zolazepam) administered via dart. Chemical immobilisation by darting is an established method for the capture of some pinniped species where size or behaviour precludes capture by manual restraint (Higgins *et al.* 2002, McKenzie *et al.* 2012). The capture of sea lions using chemical immobilization by darting has several benefits including (i) minimizes capture stress and permits a smooth induction (ii) minimizes the chance of injury to the animal during capture (iii) reduces disturbance to surrounding animals (iv) safe method of capture for handlers.

GPS and satellite tags (Sirtrack) were attached to the guard hairs along the mid-dorsal line, approximately 3 inches below the shoulder blades, by using a flexible 2-part epoxy (Devcon® 5-minute epoxy). Skin tissue samples were collected from the hindflipper and placed in 1.5 mm vials containing 97% ETOH. Once in Stanley, skin samples were stored frozen at -20°C.

Initial results and discussion

In total 10 GPS/TDR units were deployed in February at Big Shag Island on lactating adult females. In March satellite tags were deployed on two adult females at Turn Island. GPS deployment duration lasted on average 2 days, with the shortest and longest deployment period for adult females being 1 and 4 days, respectively. All females carrying GPS units were recaptured. As in previous years, females generally foraged 100 km to the north of Big Shag Island (Fig 1). At Turn Island females foraged locally, within Low Bay (Fig 1). Satellite tags at Turn Island will remain active through May and June with the aim of capturing any seasonal changes in foraging locations.

Turn Island is the fourth breeding site at which tags have been deployed (Fig. 2). Sea lions from different colonies generally foraged in discrete areas (i.e. colony specific foraging areas). This implies any potential threats to the Falklands sea lion population will vary in relation to colony location. Tracking should ideally be expanded to West Falklands to better assess the need for multiple sea lion management units.

Finally, a total of 90 skin samples were collected from adults and pups for genetic analysis. Further skin samples are required in order to undertake robust population analysis. Pending funding, we hope to return to the Falkland Islands in 2014 to (i) deploy tags at West Falklands (ii) complete skin sampling for genetic analysis (iii)

undertake an archipelago-wide census of sea lions to assess the current population status.

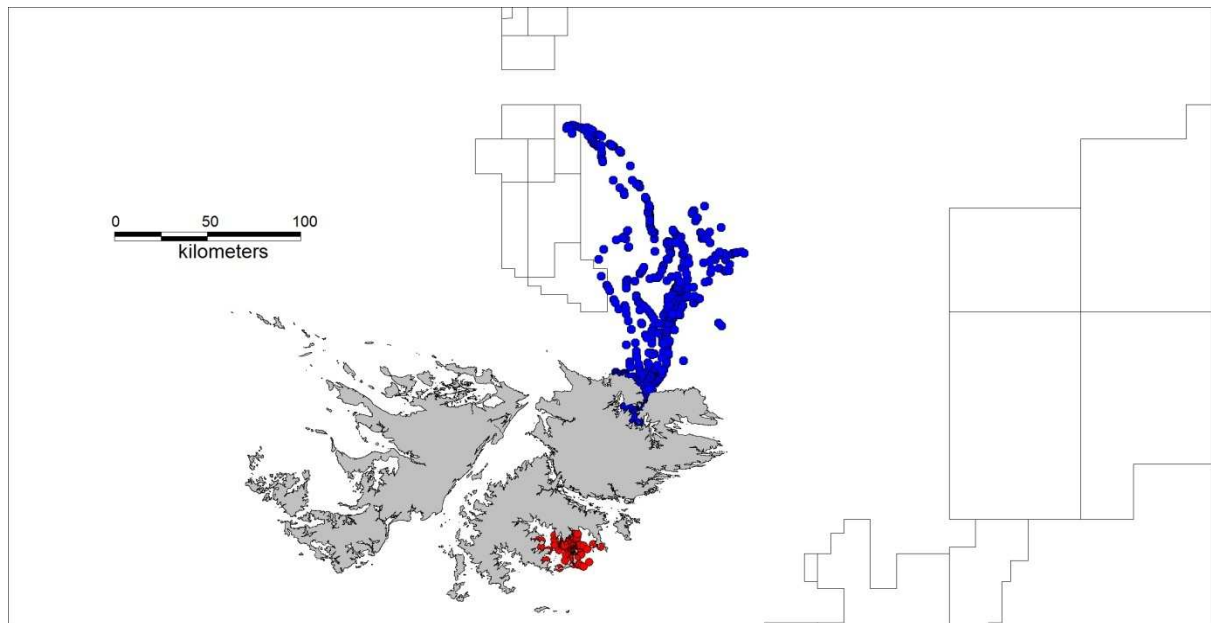


Fig 1: Foraging locations of 10 adult females from Big Shag Island in February 2013 (blue dots) and two adult females from Turn Island in March 2013 (red dots). Also presented are the North Falkland Basin and East Falkland Basin.

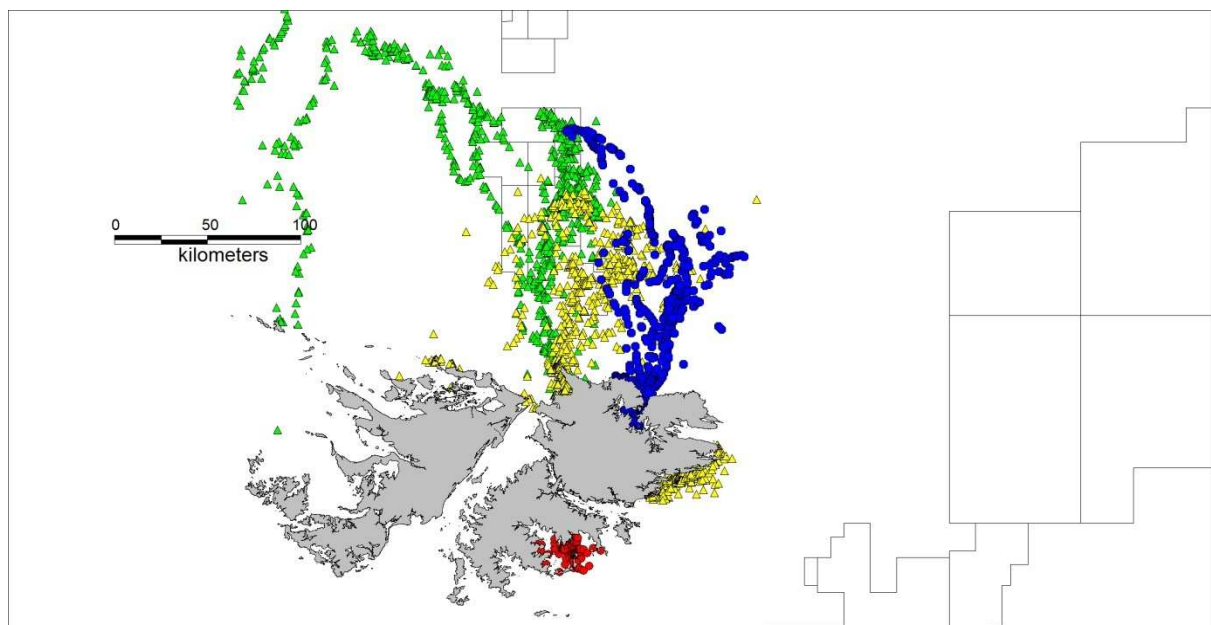


Fig 2: Colony differences in foraging areas and the need to deploy tags at multiple sites. Big Shag Island adult females 2013 (blue dots); Turn Island adult females 2013 (red dots); Cape Dolphin juveniles 2011 (green triangles) and 2012 (yellow triangles); Port Harriet juvenile 2012 (yellow triangles).

Time line

Date	Activity
Feb 2 nd	Arrive Falkland Islands
Feb 3 rd – 7 th	Stanley, preparations
Feb 8 th – 14 th	Deploy and recover GPS loggers, collect genetic samples
Feb 15 th	Stanley
Feb 16 th – 24 th	Deploy and recover GPS loggers, collect genetic samples
Feb 25 - 26 th	Stanley
Feb 27 th – 28 th	Drive to Motley Point, deploy zodiac to Motley Island
Feb 28 th – March 4 th	Alter plans due to small number of pups at Motley, and drive to Low Bay area. Deploy zodiac to Turn Island. Deploy Satellite tags, collect genetic samples
March 5 th	Return to Stanley
March 9 th	Depart Falkland Islands

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