

**Australian Marine Mammal Centre**  
**Final Report**  
**(subclause 9 and Schedule Item 5 of the Funding Agreement)**

---

- **Project No.** – 11/4
- **Title** - Maintaining the monitoring of pup production at key Australian sea lions at colonies in South Australia
- **Chief Investigator** – A/Prof Simon Goldsworthy
- **Organisation** – SARDI Aquatic Sciences

**Activity Period** – Nov 2011 to May 2013

**Table of contents**

1. Activity Summary
2. The Outcomes/Objectives
3. Appropriateness
4. Effectiveness
5. Financial Account of the Activity

**1. Activity Summary**

A clear summary of approximately 500 words outlining the work undertaken and any significant findings (for publication on the Department's web site)

This project maintained pup production monitoring of a number of key Australian sea lion breeding colonies within South Australia between late 2011 and early 2013. This included surveys at Seal Bay and the Seal Slide on Kangaroo Island, Lilliput and Blefuscu Islands in the Nuyts Archipelago, Olive and Jones Islands off the west Eyre Peninsula. The breeding status and pup production were also determined for Nuyts Reef and a number of islands off the western and lower Eyre Peninsula including Cap, Rocky (North), Rocky (South), Greenly, Four Hummocks, Little Hummock and Price Islands, and Curta Rocks. Opportunistic aerial surveys also permitted assessing breeding chronology for a number of Nuyts Archipelago and western Eyre Peninsula colonies.

Pup production for the 2011/12 breeding season at Seal Bay was estimated to be 251 (range 249-256), based principally on twice-weekly surveys of new pup births and deaths and Petersen estimates, as well as direct counts of pups in Pup Cove. This estimate is similar to those from the previous three breeding seasons (2010: 267-276; 2008/09: 268-275; 2007: 254-256).

Pup production at the Seal Slide was estimated to be 13 for the 2011/12 breeding season using cumulative mark and count procedures. Estimates of pup abundance with a high level of confidence at the Seal Slide are now available for the last seven breeding seasons (since 2002-03), and range between 9 and 16 over this period. No trends are apparent at this stage.

Pup production at Lilliput and Blefuscu Islands based on the Petersen method was 69 (95% CL, 64-78) and 67 (95% CL, 60-78), respectively. These are the fifth pup abundance surveys

undertaken at these colonies, and the third using the Petersen method. Petersen estimates for the three seasons are similar for Lilliput Island (64, 66 and 69; 2007/08, 2010, 2012 seasons respectively); but suggest a decline for the 2012 season at Blefuscu Island (99, 108 and 67; 2007/08, 2010, 2012 seasons respectively).

At Olive Island, Petersen methods undertaken in January and February 2012, estimated pup production was 129 (95% CL 126 – 132). Petersen estimates have been made at Olive Island over five consecutive breeding seasons. These data show the pattern of alternate high and low pup production seasons for the 2006, 2007, 2008/9, and 2010 seasons, respectively, but a further decline for the 2011/12 breeding season.

A single ground survey was undertaken on Jones Island 12 March 2012 when a total of 12 brown pups were sighted. The estimate for the 2011/12 season is consistent with previous surveys between 2001/02 and 2008/09 which have ranges between 7 and 15 pups.

Three helicopter surveys (19-21 November 2011; 22 March 2012; 27 February 2013) were undertaken providing new information on breeding status, timing of breeding and pup production for a number of islands in the Great Australian Bight and off the western and southern Eyre Peninsula. Two surveys of Nuyts Reef were undertaken at the beginning and about 4 months into the breeding season when a total of 44 pups were counted. Two surveys were also undertaken of Rocky (North) Island in consecutive (2011 and 2012/13) breeding seasons with 44 and 47 pups being counted, respectively.

Three new breeding colonies were identified, Cap Island (38 pups), Rocky (South) Island (12 pups) and Little Hummock Island (10 pups). Pup numbers were also surveyed at Four Hummock (middle island, 10 pups) and Price Island (17 pups). Surveys undertaken on 27 February 2013, identified that the breeding season had just commences on Olive and Nicolas Baudin Islands (1 and 4 pups, respectively), but had not commenced on Lilliput and Blefuscu Islands, and Pearson, Dorothee and West Waldegrave Islands. This information will help inform the timing of surveys proposed at these colonies during 2013.

Remote field cameras were trialled as a means to monitor breeding chronology, to optimise survey timing and quality, and improve logistic planning and resourcing. Two camera systems were tested over 133 days at Dangerous Reef, providing images on most days. Pups were clearly identifiable in many images, as was their pelage patterns proving a means to estimate pup age and therefore the stage of the breeding seasons. This technique could be used to monitor breeding chronology of key ASL monitoring sites, and newly developed Next G network capable cameras will trialled in the near future to asses if this technology can successfully transmit images from the key ALS monitoring sites.

## **2. The Outcomes/Objectives**

### **List of the Project Objectives**

The objectives of this study were to continue to provide data on the status and trends in abundance of Australian sea lions by:

1. Undertaking pup production surveys at key monitoring sites for the 2011/12 period, including: Olive and Jones Island, Lilliput and Blefuscu Islands; Seal Bay and Seal Slide, and West Waldegrave Island.
2. Undertaking single surveys at sites where pup numbers have not been surveyed since

1996, and where breeding status remains uncertain (Four Hummocks, Price and Rocky North Island); and

3. Trialling of use of remote camera systems to monitor breeding chronology so that surveys can be optimally timed and resourced.

**The degree to which the Activity has achieved each of the objectives**

Pup production surveys were completed at all the key monitoring sites. Some changes to the work plan were required. A survey to West Waldegrave Island (April 2012) indicated that the ASL breeding sea had finished some months earlier, preventing a survey from taking place and was planned for early 2013, but an aerial survey in March 2013 indicated that breeding had not started, so this survey has been moved into the next AMMC supported surveys for 2013/14. However, additional surveys for a number of offshore islands were made possible by extending helicopter surveys. These included surveys of Rocky (South), Greenly, Little Hummock, Cap and Rocky (North) Islands, Curta Rocks, and Nuyts Reef. Three of these islands were identified as new breeding colonies for the species

### 3. Appropriateness

**The appropriateness of the approaches used in the development and implementation of the Activity**

A range of survey methods were used to achieve pup production estimates. These varied relative to the size of populations and the number of repeat surveys undertaken. A full report of the methods and results of surveys will be provided to the AMMC shortly. This will be a fully peer reviewed SARDI report – as has been provided to the AMMC in previous years.

### 4. Effectiveness

**The degree to which the Activity has effectively met its stated objectives**

The project has met all its stated objectives (with the exception of completing surveys at West Waldegrave Island). This study has provided additional estimates of pup abundance and production for a number of key Australian sea lion monitoring sites in South Australia between November 2011 and February 2013 period. It also provides confirmation of breeding, information on breeding season chronology and estimates of pup abundance at a number of sites in Great Australian Bight and off the western and southern Eyre Peninsula that have not been surveyed since the early to mid 1990s.

Key findings include the discovery of three previously unrecorded breeding sites for ASL, Cap Island, Rocky (South) Island and Little Hummock Island off the lower Eyre Peninsula. This has already important management implications for the Commonwealth managed Gillnet, Hook and Trap Fishery (GHAT). The Australian Fisheries Management Authority (AFMA) were notified of the new ASL colonies, and on 22 May 2013, they implemented new 4 nm gillnet closure around Cap and Rocky (South) Islands as part of Southern and Eastern Scalefish and Shark Fishery Closure Direction No. 7 2013 (AFMA 2013). No new closures were implemented around Little Hummock Island because it already lies within a gillnet closure established for Four Hummock and Price Islands.

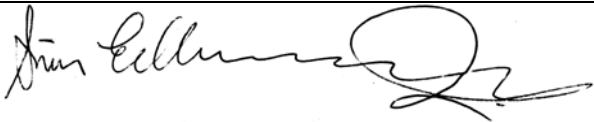
The remote field camera trials were successful, despite only being able to test 3G network cameras. As part of the 2013 ASL surveys, we will test newly available Next G mobile network cameras that should be able to relay images through MMS to email. If this is successful we will have a useful tool that will enable us to better monitor breeding chronology, optimise

survey timing and quality, and improve logistic planning and resourcing for future ASL surveys.

A full SARDI peer reviewed report detailing on the results and outcomes of this project is currently in review, and will be provided to the AMMC shortly.

## 5. Financial Account of the Activity

All grant moneys have been spent – a Statement of Income and Expenditure is presented below for the period November 2011 to May 2013. A fully audited statement is currently being arranged but will not be available until late June.

Signature of Chief Investigator	
Name	A/Prof Simon Goldsworthy
Date	4 June 2013
Signature of Organisation Representative	
Name	
Date	

Please forward 4 hard copies, and one electronic Word document of this report to:

Coordinator  
Australian Marine Mammal Centre  
Australian Antarctic Division  
203 Channel Highway  
KINGSTON TAS 7050  
ammccordinator@aad.gov.au