

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

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- **Project No.** – 09/36
- **Title** - Maintaining the monitoring of pup production at key Australian sea lions at colonies in South Australia
- **Chief Investigator** – Associate Professor Simon Goldsworthy
- **Organisation** – South Australian Research and Development Institute (SARDI)

**Activity Period** – 25 May – 30 June 2010

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**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 assessed and maintained pup production monitoring of a number of Australian sea lion breeding colonies within South Australia between late 2008 and early 2010. The breeding season at Seal Bay commenced in October 2008 and finished in May 2009. Pup production at Seal Bay during the 2008/09 breeding season

was estimated to be 268 ( $\pm$  95% CL 268-269), based upon a range of methods including twice-weekly surveys of new pup births and deaths, the total number of tagged (micro-chipped) pups, mark-recapture methods using the Petersen estimate and direct counts of pups in Pup Cove. Based upon 17 years data of maximum counts of live pup from, pup abundance is still declining significantly in the colony.

Unfortunately the time series for pup production estimates (last five seasons) is too short to provide confidence in these rates of decline. Pup production for the 2008/09 breeding season at the Seal Slide was estimated at 12 using a capture, mark and count method. Based on pup production estimates for the last five breeding seasons (since 2002/03) at the Seal Slide, there has been no significant change in pup production.

Pup production at Olive Island during the 2008/09 breeding season was estimated to be 221 ( $\pm$  95% CL 195-247), based on mark-recapture methods, but only two surveys were undertaken. It is likely that most if not all pups had been by the time the first survey was undertaken (26 February 2008). A ground survey was undertaken at Jones Island on 28 February 2008, ten live and one dead pup were counted, giving a minimum estimate of eleven pups born during the 2007/08 breeding season.

Pup production was estimated for the Dangerous Reef and English Island populations during the 2009/10 breeding season. A combination of mark-recapture methods, counts of live and dead pups (including cumulative mortality) and a method to estimate cumulative production between surveys were used to estimate pup production at Dangerous Reef. The breeding season at Dangerous Reef commenced in June or July 2009 and continued through to March 2010, a period of eight to nine months. Four surveys were made, roughly corresponding to the third, sixth, seventh and ninth month of the breeding season. Using the cumulative pup production estimation method, pup production was estimated to be 715 (95% CL 672-755) for the 2009/10 breeding season. Only one survey of English Island was possible this

breeding season (5 December 2009) during which a minimum estimate of 39 pups was determined, representing the highest number of pups reported for this colony. A survey was undertaken on the same day at Blyth Island and although a number of Australian sea lions were counted, no pups or signs of breeding activity were observed, suggesting it is a haul-out site only.

Single ground surveys of pups were undertaken at Lounds, West, Purdie and Fenellon Islands in Nuyts Archipelago between 28 November and 1 October 2009. The presence of mostly moulted pups indicated that the breeding season had ended 2-3 month earlier, and that the timing of the survey was too late. Single ground surveys of pups were undertaken at North Rocky Island, Price and Albatross Island, and aerial surveys undertaken of Islands in the Four Hummock Islands Group (Whidbey Isles Conservation Park) off the southern Eyre Peninsula. Based on the number of female sea lions present at North Rocky Island, this breeding colony may be larger than previous surveys have indicated. The survey of pups at Albatross Island (69 in total post- breeding season), suggests this breeding colony may be much larger than suggested by the previous single ground survey undertaken 1982 when 12 pups were counted.

## 2. The Outcomes/Objectives

### The degree to which the Activity has achieved the objectives

1 Undertaking end of season pup production surveys at Seal Bay, the Seal Slide, Olive and Jones Island to maintain long-term monitoring continuity;

Pup production surveys were undertaken at these sites. See attached report for more details.

2 Undertake pup production surveys at other key monitoring sites including Dangerous Reef, English Is, Lilliput Is and Blefuscu Is;

Pup production surveys were undertaken at Dangerous Reef and English Island (see attached report for more details).

No surveys were undertaken at Lilliput and Blefuscu Island (as detailed in revised work plans to AMMC (14 December 2009). Lilliput Island was visited in June 2009 and breeding was well underway – weather constraints precluded the mark-recapture survey and attempts to get onto Blefuscu failed. Weather/sea conditions also prevented landing on both islands in August, and a visit to Lilliput Island in October indicated that breeding had well and truly finished, with very few pups remaining on the island. This suggests the breeding season occurred earlier than anticipated at both Lilliput and Blefuscu Islands.

3 Undertake single surveys at sites that have not been surveyed for long periods; including Albatross, Price/Golden, Four Hummocks, Rocky North Island (Southern Eyre Peninsula) and Lounds, Purdie, West, Fenelon Islands (Nuyts Archipelago). These surveys will establish the breeding status of islands, the timing of breeding schedules to facilitate future monitoring, and determine the number of pups present.

Ground surveys were undertaken at Albatross, Price and North Rocky Islands; aerial surveys undertaken of islands in the Four Hummocks group. Ground surveys were also conducted on Lounds, Purdie, West and Fenelon Island in the Nuyts Archipelago (see attached report for more details).

### **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 vary relative to the size of populations and the number of repeat surveys undertaken (see attached report for more details).

#### **4. Effectiveness**

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

Delays in funding notification impacted the work plan for this project, as most of the field work had to be undertaken before we were notified the project had been approved. With the exception of surveys at Lilliput and Blefuscu, all of the original stated objectives were met.