

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

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- Project No. 2009/44
- Title - Status, Structure and Distribution of Southern-Right Whales in South-East Australia - Phase 1
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- Organisation – Department sustainability and Environment

Activity Period –

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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)

Opportunistic biopsy sampling and collection of photo-identifications (photo-IDs) of individual Southern Right whales (SRW) was undertaken in Victoria (Vic), New South Wales (NSW) and Tasmania (Tas) by the investigators during the 2010 whale season. A detailed summary of the work undertaken and the results of this work is provided below.

#### Photo-identification Effort:

In Victoria 7 photo-IDs were collected between June and October 2010 via 2 flights (funded by other sources) conducted by the Department Sustainability and Environment (DSE) during August and land-based photography efforts across Vic via the Victorian sightings network throughout the season.

In NSW 13 photo-IDs were collected during August via 3 flights conducted by the New South Wales National Parks and Wildlife Service (NSW NPWS). 3 photo-IDs were obtained from 3 whales during a flight on 5 August and 10 photo-IDs were obtained from a group of 17 whales photographed during a flight on 18 August 2010.

In Tas 17 photo-IDs were collected via 12 flights conducted under this project by the Department Primary Industries Parks Water and Environment (DPIPWE) between September 2009 and September 2010.

#### Photo-identification Results:

All photo-IDs collected from Vic, NSW and Tas during the period were compared against the South East Australian Southern Right Whale Photo Identification Catalogue (SEA SRW PIC)

with the following results:

- From 7 photo-IDs collected in Vic during the 2010 season, 7 different whales were identified. 6 of these were new to SEA SRW PIC and 1 was a match with a whale from Warrnambool previously identified in 2001.
- From 13 photo-IDs collected in NSW during the 2010 season, 11 different whales were identified. All of these were new to SEA SRW PIC and all were added to the catalogue.
- From 17 Photo-IDs collected in Tas during the period 13 different whales were identified. All of these were new to SEA SRW PIC. In addition 22 photo-IDs collected between 2006 – 2009 were included in a comparison of Tas whales against the SEA SRW PIC. No matches were found. All 35 new Tas whales from 2006 – 2010 were added to the SEA SRW PIC.
- Overall, from 17 flights conducted by the investigators during the period, 37 photo-IDs were collected and 30 new whales were added to SEA SRW PIC as direct outputs of the Activity.
- An additional 22 new whale IDs collected from Tasmania from 2006 – 2009 were added to SEA SRW PIC as an output of the Activity.
- The SEA SRW PIC catalogue increased by 52 new whales as an output of the Activity and now holds a total of 164 individual photo-IDs.

#### Biopsy Effort:

Efforts were made to collect biopsy samples from SRW sighted in Vic, NSW and Tas waters during the period as follows:

- Numbers of SRW recorded in Vic were low during the 2010 season with only one cow:calf pair in residence at Logans Beach. Scheduled biopsy trips to sample this female towards the end of the season when the calf was older were aborted on more than one occasion due to poor weather and the female left the area before sampling could be attempted. Other whales sighted in Victoria were observed in more remote locations and/or not observed for periods of longer than one day at each location making biopsy sampling of these animals logistically impossible when access and weather were factored in.
- Higher numbers of SRW were reported in Tas during the 2010 season but these whales were all highly mobile and sighted at remote locations that were difficult to access by boat. As a result no biopsy samples were obtained in Tas during the Activity Period.
- In NSW 7 whales were sampled during two trips conducted during August 2010. On 17 August the research team responded to reports of a cow/calf pair sighted in Jervis Bay NSW. The team travelled to Jervis Bay and a mother calf pair and another adult were sighted from the vessel but no biopsies taken, however, two whales were sampled the following morning (18/08/10) without incident. A second sampling trip was undertaken on 22 August 2010. 5 samples were collected from 11 animals sighted, 10 of which were near Moruya, the other (sampled) near South Broulee Beach. Sampling ceased prior to sampling all 11 animals due to low fuel.

#### Biopsy Results:

The skin samples collected for genetic analysis were obtained using the Paxarm biopsy gun with whale specific darts donated by the Royal Australian Navy. The skin biopsy samples

were stored in 70% ethanol in the freezer at Macquarie University with others from earlier years for later analysis. Analysis of earlier samples has suggested stock differentiation of the NSW population and a manuscript has been submitted for publication.

## 2. The Outcomes/Objectives

### List of the Project Objectives

The primary objective of this project is to gain a greater understanding of the status of the SRW population within SE Australia via on-going collection and analysis of genetic samples and photo-identification data.

The southern right whale (SRW) workshop held in Hobart March 19th & 20th 2009 identified a range of priority research needs for the species in Australia. Understanding the status of SRW in South-east (SE) Australia was identified as one of the highest priorities. Accurate assessment of population size, distribution, delineation of critical habitat and rates of genetic interchange, is essential for evaluation of impacts of anthropogenic threats (e.g. entanglement, vessel collision and noise disturbance) at important locations within the region and for future management of this endangered species.

A seven year study of genetic diversity in south eastern Australia to 2006 found significant differentiation between the remnant south east coast population (in particular Warnambool calving grounds) and animals from Western Australia and New Zealand (Patenaude and Harcourt 2006). However, sample sizes were low and only mtDNA markers were used. Estimating gene flow using mitochondrial DNA (mtDNA) as a genetic marker to reflect female mediated gene flow and microsatellite analysis to reflect male mediated gene flow can only be ascertained with confidence if the sample size is large enough to reflect the haplotype frequencies and allelic diversity of the population. For southern right whales the sample size must include multiple years, since with a three year breeding cycle, only approximately 1/3 of the female population are accessible at breeding grounds in any one season, and there is a high likelihood of temporal as well as geographic differentiation. Only sustained efforts over several years will yield sufficient samples to be able to determine, with certainty, the nature or location of southern right whale stock division within Australia.

A two-phased approach to this project was proposed. The aim of Phase 1 was to facilitate the collection of data during the 2010 season. The aim of Phase 2 is to continue to collect data across the 2011 and 2012 seasons and to provide a comprehensive analysis of all data collected across both phases (3 years). The total photo-identification and genetic data will form a comprehensive study of the number of stocks present in Australian waters, the relationship of this stock(s) to others in the Southern Hemisphere, an estimation of effective population size(s) for each stock, and will assess whether there is sufficient protection for individual stocks.

The specific objective of Phase 1 was collection of genetic samples and photo-identification data from free-ranging SRW wintering along the coast of Tasmania, Victoria and NSW during 2009/10.

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

The Activity has exceeded expectations regarding photo-ID data collection from Vic, NSW and Tas in 2010 with a total of 37 photo-IDs collected and compared against the SEA SRW PIC and 30 new whales added to the catalogue. In addition as a result of the Activity a further 22 whales from 2006 – 2009 from Tas were compared against the SEA SRW PIC and added to the data bank.

The Activity achieved the objective of opportunistically collecting biopsy material from SRW wintering along the coast of Tas, Vic and NSW during 2009/10 with a total of 7 samples collected from 2 biopsy trips conducted within the region. Given the low numbers of whales observed during 2010 in some areas, the short residency period of most whales and the difficulty of accessing whales by boat in other areas, the investigators consider that this is a good outcome.

### 3. Appropriateness

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

Due to the low number of whales wintering in SE Australia there is inherent uncertainty around the location and duration of visits within this region. Therefore the most efficient method for ensuring on-going data collection is to take a multi-agency approach in order to sample opportunistically using skilled local investigators in each jurisdiction. This approach has proved to be extremely effective with a maximum possible return for effort on photo-ID and biopsy work during 2010.

### 4. Effectiveness

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

The multi-agency arrangements in place for this research have greatly facilitated the ability of investigators to sample opportunistically (using local agency staff able to mobilise aircraft and vessels) when whales are present. This was particularly evidenced during 2010 by the high return for effort on photo-ID and biopsy data collection. A total of 17 flights funded by the Activity returned 37 photo-IDs and 2 biopsy sampling trips returned 7 samples. Biopsy effort was inhibited by natural factors (low numbers of whales, remote access and poor weather) limiting the opportunity for any greater return of biopsy samples during the 2010 season. However year to year variation is to be expected given the inherent uncertainty around the location and duration of SRW visits to this SE Australian region.

The multi-agency approach has maximised the opportunity for other efficiencies such as the ongoing up-skilling of local agency staff in photo-ID and biopsy sampling techniques which will lead to continued increasing return for effort over the life of the project.