

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

- Project No. – 09/40
- Title - Southern right whales - 2009 census and photo identification at Head of Bight, South Australia
- Chief Investigator – Dr. Stephen Burnell
- Organisation – South Australian Museum

Activity Period – 26 February 2009 – 24 April 2011

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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)

Shore based photo identification studies and population census of southern right whales were undertaken at the Head of Bight, South Australia in 2009. The Head of Bight is a major calving ground and aggregation site for the Australian population of southern right whales and is located within the Great Australian Bight Marine Park. 2009 represented the 19th year of consecutive research on this population and the study continues to provide information on population dynamics and recovery parameters that are used for conservation and management of the species (Burnell and Bryden 1997, Burnell 2001).

Fieldwork in 2009 was undertaken over 14 days between August 15th and 29th and was timed to coincide with the peak number of whales using the site and to allow ongoing comparisons against the long-term dataset for inter-annual and intra/inter-cohort comparability of results.

One hundred and thirty three (133) individual right whales were counted within the study site on August 25th and 30th, with a mean of 119 individuals sighted each day of the census. The total number of individuals counted in 2009 is 17% lower than the previous year, when 161 individuals were counted in 2008, and is 26% greater than the previous cohort year, 2006, when a maximum daily census of 98 individual whales was recorded at Head of Bight. The number of female-calf pairs recorded in 2009 was the second highest number ever recorded at the Head of Bight calving ground. Fifty-five female-calf pairs were counted at the site in 2009 only exceeded by the 63 female-calf pairs counted at the site in 2008. The total number of female-calf pairs at the Head of Bight in 2009 was 13% less than the previous year and 22%

greater than its previous cohort year, when a maximum of 43 female-calf pairs were recorded in 2006. Southern right whale breeding is highly cohort structured due to a typical three year calving cycle. The presence in the population of some females routinely calving on four year cycles and shifts of reproductive females between cohorts or interchange between calving grounds influences apparent calf production patterns and complicate interpretation of trends (Burnell 2001).

Over 2000 identification photographs were taken in the 2009 field season providing individual identification photographs for 49 of the 55 females that calved at the site in 2009 and 51 additional unaccompanied adult right whales. The Head of Bight photo identification database now includes life history data on over 1100 individual southern right whales.

Incidental observations

No injured, entangled, stranded or dead right whales were observed in 2009. Other marine mammal sightings within the study area included two Humpback Whales travelling east to west about 1km offshore, multiple pods of bottlenose dolphins ranging in size from 3-26 individuals and 1 New Zealand Fur Seal. A fixed wing Chinta Air plane was undertaking scenic flights on most days, up to three times a day. No direct disturbance behaviour was noted and this aircraft appeared to adhere to overflight regulations.

2. The Outcomes/Objectives

The degree to which the Activity has achieved the objectives

Objectives as per the funding agreement:

Objective 1: Maintain the existing value in the long-term Head of Bight data set by ensuring its currency and applicability for future directed research, comparative studies and population monitoring.

The photo identification and population census completed in the 2009 field season contributes the 19th year of consecutive time series data on the Head of Bight southern right whale population. Inter-annual comparability of core elements of the existing dataset has been maintained to allow rapid assessment of changes in any of the population trends. The principal objective of the 2009 funding has been met which was to continue unbroken this valuable long-term dataset.

Objective 2: Provide quantitative and qualitative information on aspects of population dynamics, breeding and migration patterns to improve confidence in applying methodologies for and interpreting outcomes of abundance estimates and population trend surveys and to assist the development of stock assessment models.

Inter-annual comparability of core elements of the existing dataset has been maintained to allow rapid assessment of changes in any of the population trends. An update of the increase rates observed in the number of female-calf pairs observed at the site each year is showing an exponential rate of increase of 4.99% p.a. over the period 1992-2009 (Fig. 1). This improves slightly the most recent prior analysis which

showed a corresponding increase of 3.6% p.a. through 2007 due primarily to the anomalously low calf production at the site in 2007 (Burnell 2008). Figure 2 shows the corresponding increase rate for all animals combined at Head of Bight over the same period, 5.27% p.a.

Fig 1.

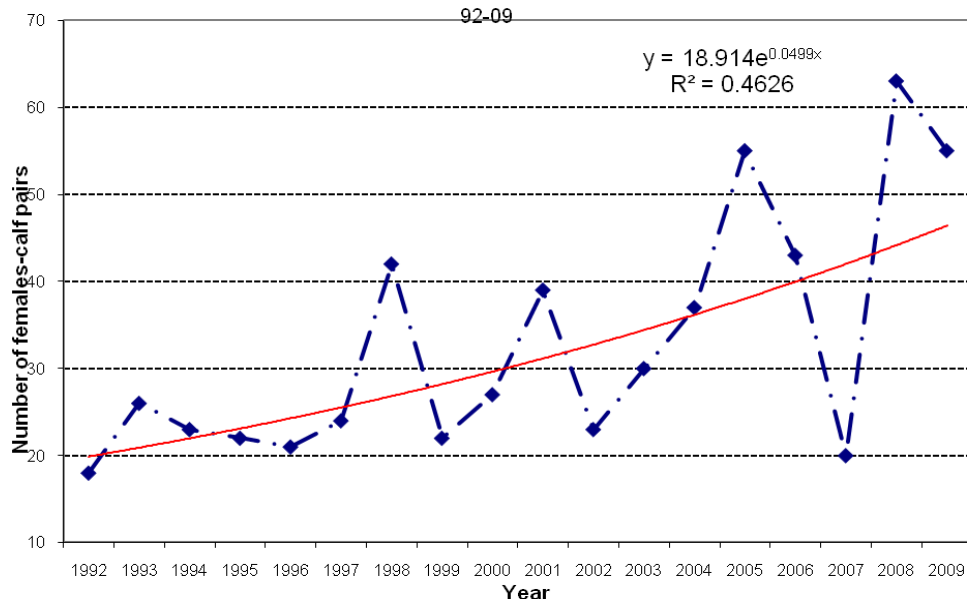
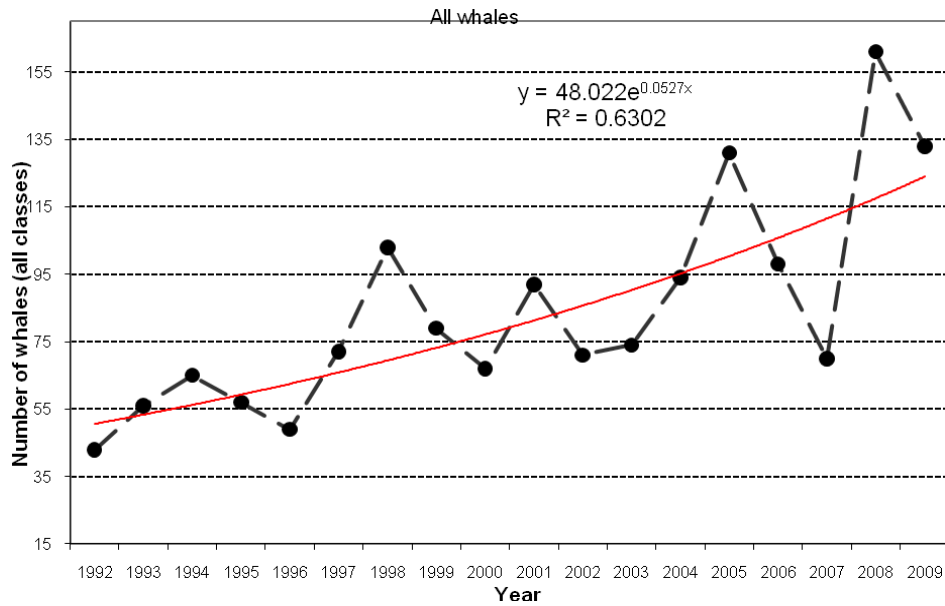


Fig 2.



3. Appropriateness

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

Survey protocols remained unchanged with the shore based photo identification and census techniques well suited to the study site and designed for low impact, non-intrusive and cost effective data collection. Observations and photography were carried out from cliff top vantage points 37m to 60m above sea level.

The photo-identification and daily census methods undertaken in 2009 were consistent with earlier years of the study and allow for valid inter-annual analyses. The methods used have proved highly successful at the site providing high quality, low impact and cost effective data collection for 19 years. This long term population study is the only one of its kind for this population and continuity of the data series is critical. Due to the slow reproductive cycles and breeding cohort structure of the population it is necessary to monitor the population annually to allow assessment of changes in population trends within meaningful time frames. The high degree of between year variability in calf production has resulted at least in part from cohort shifts by a significant number of females and it has been suggested that such atypical changes in calf production within this population may be connected to environmental variables, climate fluctuations and the availability of prey during the feeding season in the Southern Ocean (Burnell, 2000).

The continuation of this project was listed as one of the highest priorities for the Commonwealth at the Southern Right Whale workshop held in Hobart in 2008. With significant government funding being allocated to developing a national photo identification catalogue for right whales, maintaining rigorous and consistent studies such as the work presented here will be important. The Head of Bight datasets represent the largest repository of life-history information for Australian right whales, including known age and/or gender individuals and will form the basis of any Australasian catalogue.

4. Effectiveness

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

The research fully met the objectives for the project. It was recognised that funding was being provided at a reduced level to allow for continued collection of field data in the 2009 year and maintenance of the long-term dataset pending an analysis of the required survey frequency for right whales on the Australian coast (Hedley et al. 2009 AMMC grant).