Marine Biodiversity Hub

National Environmental Science Programme

Monitoring Population Dynamics of 'Western' Right Whales off Southern Australia 2018-2021

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Project A7 - Progress Report on activities for 2019

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Milestone 10 – Research Plan v4 (2018)

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Important Disclaimer

Contents

List of Tables

EXECUTIVE SUMMARY

Aerial surveys of southern right whales have been undertaken annually off the southern Australian coast (between Cape Leeuwin (W.A.) and Ceduna (S.A.)) since 1993, to monitor the recovery of this species following commercial whaling. We conducted an aerial survey of southern right whales in August 2019 (18th – 24th) to continue these annual series of surveys and inform the long-term population trend. In total, observers sighted 1111 whales during the survey, including 426 calves; these include double counts given each flying leg is covered twice ('outward' and 'inward'). To determine the long-term trend in abundance, maximum counts for each leg are used. In 2019, the comparable count is 577 individuals of which 221 were cows accompanied by calves of the year, which is less than the 789 individuals and 279 cow/calf pairs sighted in 2018. From 6149 photographic images obtained, 299 images of individual whales were selected for computer-assisted 'matching' with those images already available in the catalogue.

Full details, including trend analysis since 1993, current population size, and distribution information, will be included in the Final Report for the 2019 activities due on 29th April 2020.

1. INTRODUCTION

Southern right whale (*Eubalaena australis*) numbers were reduced almost to extinction by 19th Century whaling throughout the southern hemisphere, including off Australia. Since the cessation of whaling of the species (mid 1970's), there have been signs of recovery for that part of the population that migrates to the southern Australian coast each year – particularly cows to give birth at approximately three-year intervals off West Australia (W.A.) and western South Australia (S.A.); the 'western subpopulation'. Since 1976, aerial surveys have been undertaken annually to determine numbers and population trend and obtain individual identifying photographs, at first along the WA south coast (from Cape Leeuwin east as far as Twilight Cove) and then from 1993 extending into SA waters (to as far as Ceduna). This has provided evidence of intra- and inter-seasonal coastal movement. Further east around the Australian coast there has been little sign of recovery in numbers; a working hypothesis assumes separation between two subpopulations – 'western' and 'eastern'. This report summarises the results so far of the aerial survey of the 'western' subpopulation between Cape Leeuwin and Ceduna in August 2019, the fifth in a series of six funded since 2015 through the National Environmental Science Program. A final report is due in April 2020.

2. PROJECT SUMMARY

Now classified as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), unsustainable whaling during the 19th and 20th centuries reduced southern right whales to a few hundred animals in Australia. There is evidence of a slow recovery of the population in most areas within their range. Since 1993, annual aerial surveys between Cape Leeuwin (WA) and Ceduna (SA) have provided whale counts and photo-identification data for Australia's south western population aggregating close inshore during calving and nursing. Counts are a near-census of the population and allow estimation of abundance and trend together with life history information. Collection of these data is a 'high priority' in the species Recovery Plan (Conservation Management Plan). An aerial survey between Cape Leeuwin to Ceduna (with an additional leg between Augusta and Perth) was undertaken between 18th – 24th August 2019 to add to this long-term dataset.

Extraction of count data was undertaken, as planned, by the 30th October. Trend analysis has been undertaken and will be reported in detail in the final report due in April 2020.

3. AIMS

In order to provide information that assists an assessment of the conservation status of Australia's south-west population of endangered southern right whales through the Conservation Management Plan, the project has the following aims:

a) Continue annual aerial surveys to collect data (i.e. counts and photographs) on southern right whales from the 'western' Australian subpopulation

b) Determine estimates of population trend since 1993 and current population size

c) Maintain and incorporate individual photo-identification data into existing national photo-identification catalogue.

d) Obtain information on current and past distribution and relevant biological parameters (e.g. age at first parturition and calving rate)

e) Maintain the sightings database of the 'western' population of southern right whales.

4. APPROACH

As in previous years, an aerial survey was undertaken within *ca* one nautical mile of the coast, from a high wing, single engine aircraft over *ca* 39 hours and six flying days. When whales are sighted, the number and location (GPS latitude, longitude) of whales are recorded and individuals are circled for photography. For individual identification, clear photographic images of the head callosity pattern and/or other identifying characteristics are required.

As in previous years, direct counts were obtained of animals observed within the search area. Photographs were obtained of as many animals as possible but with emphasis on cows with calves. The search area includes virtually all the area to which 'western' right whales occur in winter/spring, which is close to the coast, in particular for females to give birth generally at three-year intervals.

As in previous years, the maximum count on the flight (obtained from the maximum count on each 'leg', 'outwards' or 'inwards') was to be compared with results since 1993 to obtain estimates of both population trend and current population size.

Population size is obtained using a simple model based on the numbers of cow/calf pairs sighted. Given the relative paucity of animals that visit the remainder of the southern Australian coast, the 'western' subpopulation recorded between C Leeuwin and Ceduna is considered to represent the majority of the 'Australian' population.

Photographs from the flights are included into the Australian catalogue for computer-assisted 'matching' with those already available from other areas, including the Antarctic. Sightings information is added to the existing sightings database, which relates detailed sightings information to individuals already identified photographically.

5. RESULTS

5.1 Aerial survey

Over six days (18th – 23rd August 2019) and 39.3 flying hours there were 1111 whale sightings (426 calves of the year) between Perth (WA) and Ceduna (SA). Table 1 shows the breakdown of whale sightings recorded for both the outward and inward flights combined, which therefore includes resights of individuals, and the additional 13 humpback whales recorded. For comparison with counts from previous years only the maximum counts for each leg, 'outwards' or 'inwards', are included; hence the relevant figures for 2019 are 577, including 135 'unaccompanied' adults and 221 cow/calf pairs (Table 2).

Trend analysis of the annual data since 1993, an estimate of current population size, and information on distribution, will be included in the Final Report due in April 2020.

5.2 Photography

From 6149 images obtained on the 2019 flight, there have been 299 selected to 'match' with those already available in the catalogue.

Table 1. Summary of results from the Right whale aerial survey (C. Leeuwin WA - Ceduna SA) undertaken in August 2019.

Flight	Date	Leg	Whale sightings								Weather[1]	Flying hrs
			Right whales				Other large whales[2]					
			A[3]	C	Y	T	A	C	Y	T		
Outward legs, From Albany	18-08-19	1. Perth-Albany	19	4	0	23	6	0	0	6	240/07	4.6
	19-08-19	2. Albany-Esperance	112	72	4	188	3	0	0	0	230/08	5.4
	20-08-19	3. Esperance-Caiguna*	139	64	0	203	3	0	0	0	350/10	5.4
	21-08-19	4. Caiguna-Nullarbor (excl. Head of Bight)	23	11	0	34	1	0	0	0	90/05	4.6
		5. Nullarbor-Ceduna* (incl Head of Bight)	78	66	0	144	0	0	0	0	90/08	2.2
Total Outward		**1-5. Albany-Ceduna**	**371**	**217**	**4**	**592**	**13**	**0**	**0**	**13**		**24.3**
Inward legs from Ceduna	22-08-19	6. Ceduna-Nullarbor (incl. Head of Bight)*	69	61	0	130	0	0	0	0	90/05	2.6
		7. Nullarbor-Caiguna* (excl. Head of Bight)	25	15	0	40	0	0	0	0	00/15	4.0
	24-08-19	8. Caiguna-Esperance	102	56	1	159	0	0	0	0	150/10	4.3
		9. Esperance-Albany*	114	76	0	190	0	0	0	0	130/09	4.1
Total Inward		**6-9. Ceduna-Augusta**	**310**	**208**	**1**	**519**	**0**	**0**	**0**	**0**		**15**
Total	**6 days**	**9 legs**	**681**	**425**	**5**	**1111**	**13**	**0**	**0**	**13**		**39.3**

[1] direction of wind and wind speed (knots)
[2] all humpbacks; no other large whales recorded
[3] A=adult, C=calf, Y='yearling', T=total
* legs with maximum numbers used in mapping and calculating trend, i.e. in Table 2

Table 2. Comparable sightings since 1993 from the annual Right whale aerial survey, C. Leeuwin (WA) to Ceduna (SA).

Year	a. All animals	b. Unaccompanied animals	c. Cow/calf pairs
1993	167	47	60
1994	191	95	48
1995	267	139	64
1996	233	123	55
1997	254	148	53
1998	342	120	111
1999	325	157	84
2000	259	113	73
2001	447	163	142
2002	377	163	107
2003	273	85	94
2004	356	142	107
2005	591	237	177
2006	427	127	150
2007	286	172	57
2008	702	230	236
2009	782	294	244
2010	519	251	134
2011	657	185	236
2012	715	275	220
2013	706	214	246
2014	623	159	232
2015	462	268	97
2016	628	172	228
2017	847	241	303
2018	789	231	279
2019	577	135	221

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