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Southern Hemisphere Blue Whale Catalogue: preliminary results of IWC comparisons between Australia, New Zealand and Sri Lanka regions

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INTERNATIONAL WHALING COMMISSION

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Abstract

Blue whales are known to occur off Australia, New Zealand and Sri Lanka but little is known about their long-term movements. The Southern Hemisphere Blue Whale Catalogue is a platform to share individual photo-identification catalogues among blue whale research groups. Comparisons of 698 photo-identified blue whales from seven different research groups working in the Perth Canyon (western Australia), Geographe Bay (western Australia), Bonney Upwelling (southern Australia), around New Zealand, and Sri Lanka provided eighteen whales resighted between different areas. Matches were found within Australian catalogues and within New Zealand catalogues but no matches were found between regions. Some blue whales initially sighted in the Perth Canyon, Geographe Bay and the Bonney Upwelling were subsequently resighted in any of these three regions, representing a high level of connectivity among these sites and providing support that there is one distinct population of blue whales in Australia. Recaptures within New Zealand but not between Australia and New Zealand support the suggestion of New Zealand blue whales being a separate population. No matches to Sri Lanka suggest it is a separate population or, as indicated previously, a different subspecies. Further efforts are needed to compare photo-identification catalogues from these regions with other catalogues from the eastern South Pacific and Southern Ocean to better understand population structure.

Introduction

Three subspecies of blue whales are currently recognized in the Southern Hemisphere: the pygmy blue whale (*Balaenoptera musculus brevicauda*) in the Indian Ocean and western Pacific Ocean; the Antarctic blue whale (*B. m. intermedia*) that summers in the Antarctic Zone, and the yet unnamed Chilean blue whale (*B.m*. spp.) that has recently been accepted by the Taxonomy Committee of the Society for Marine Mammalogy[1]. These subspecies are morphologically (Branch *et al.* 2007; Olson *et al.* 2015), genetically (LeDuc *et al.* 2007; LeDuc *et al.* 2017), and acoustically (McDonald *et al.* 2006; Miller *et al.* 2014) distinct.

There are multiple populations within the pygmy blue whale subspecies. This is evident from genetic (Barlow *et al*. 2018) and acoustic (Samaran *et al*. 2013) differences between blue whales that migrate off Australia (Gill 2002; Rennie *et al*. 2009; Gavrilov *et al*. 2011; Salgado-Kent *et al.* 2012; Recalde-Salas *et al.* 2014) and New Zealand (Torres 2013; Olson *et al.* 2015; Barlow *et al*. 2018), and acoustic differences between those that feed off Australia, New Zealand, and Madagascar (Samaran *et al.* 2013).

Within Australia, genetic analyses indicate that the Perth Canyon (western Australia) and the Bonney Upwelling (southern Australia) feeding aggregations are part of the same population (Attard *et al.* 2010; Attard *et al.* 2018), as are the whales transiting through Geographe Bay (Western Australia) (Attard *et al.* 2012). This population is thought to migrate to waters around Indonesia for breeding (e.g. Double 2014).

Feeding aggregations of blue whales are also known to occur off Sri Lanka (de Vos *et al.* 2014), however blue whales in the northern Indian Ocean may be a separate population or subspecies (Ilangakoon *et al.* 2012).

Photo-identification data from long-term studies as well as a coordinated, multi-site effort is required so that the population abundance, trend and connectivity of pygmy blue whales can be assessed accurately (IWC 2017). Since 2008, the International Whaling Commission (IWC) Scientific Committee has

[1] https://www.marinemammalscience.org/species-information/list-marine-mammal-species-subspecies/

supported the collaborative Southern Hemisphere Blue Whale Catalogue (SHBWC) (IWC 2009) and the SHBWC represents the most important collection of regional blue whale catalogues in the Southern Hemisphere. Previous photo-identification comparisons from SHBWC catalogues of blue whales off the Eastern South Pacific, the Eastern Tropical Pacific and the Southern Ocean regions have been reported (Galletti Vernazzani and Cabrera 2011; Galletti Vernazzani and Olson 2012; Olson *et al*. 2016a). Here we present results of comparisons between catalogues of blue whales off Australia, New Zealand and Sri Lanka received at the SHBWC before January 2018, and they are discussed in the context of other photo-ID studies by individual research groups.

Methods

Major catalogues from different research groups have been contributed to the SHBWC that now comprises more than 1,586 individual blue whales (Table 1). These whales have been geographically separated into four major areas from waters off 1) Antarctica region, 2) Australia/New Zealand/Indonesia region, 3) Southern Africa/Madagascar region and 4) Gulf of California/Eastern Tropical Pacific/South America region (Galletti Vernazzani 2019).

By 2017, the Indonesia/Australia/New Zealand sub-catalogue of the SHBWC included photographs of 698 individuals comprising 510 left side IDs, 493 right side IDs, and 60 photo-IDs from flukes (Table 2).

The regional catalogues from the Indonesia/Australia/New Zealand area were contributed by Blue Whale Study Inc. (BWS) from the Bonney Upwelling, Western Whale Research (WWR) from Geographe Bay & Timor Leste, Centre for Whale Research (CWR) from the Perth Canyon, Flinders University from the Bonney Upwelling, Australian Antarctic Division (AAD) with individuals from the Bonney Upwelling and New Zealand (AAD, Olson *et al*. 2015), Oregon State University (OSU) from New Zealand (Torres *et al.* 2017), and Asha de Vos from Sri Lanka.

Blue whales are individually identifiable from the unique pattern of mottling on both sides of the body near the dorsal fin (Sears *et al.* 1990), and from the highly variable dorsal fin shape (Gendron and Ugalde de la Cruz 2012). Separate photographic collections for left sides, right sides and flukes are maintained under the SHBWC. Left side, right side, and fluke photographs of individual blue whales were compared between each group to determine the number of individuals re-sighted in different study sites.

For this report only whales received before January 2018 from Australia, New Zealand, and Sri Lanka are compared (n=698 IDs).

Results

Comparisons of left sides were fully completed among photo-ID collections contributed before January 2018, from the SHBWC Australian/New Zealand/Indonesia area. Almost all right side comparisons have been completed with the exception of those between the groups Asha de Vos (Sri Lanka) and CWR (Western Australia), and AAD Australia (the Bonney Upwelling) and CWR (Western Australia), which are soon to be completed.

Eighteen matches have been found between the different groups (Table 3). Sixteen of them corresponded to whales photographed off Australia, and two of the matches corresponded to whales photographed off New Zealand. Matches of Australian whales have been found between all three sub-areas: Geographe Bay, the Perth Canyon and the Bonney Upwelling. Matches off New Zealand have been found between the northwest coast and the northeast coast of the Southern Island. No match was found between whales off Australia and New Zealand, or between whales off Sri Lanka and Australia or New Zealand.

Two Australian whales have been seen in three different years. One whale (ID 6 and 7, Table 3) has been seen six times by three different groups in the Bonney Upwelling in 2005, 2006, 2010 and 2012. The other

whale (ID 16, Table 3) has been seen four times. The first sighting occurred in Geographe Bay in 2003 and the resightings occurred in the Perth Canyon in 2004 and 2009.

The longest resighting period is 12 years and corresponds to a whale that was first seen in 2003 in the Perth Canyon and then was resighted in 2015 in the Bonney Upwelling (ID 11, Table 3).

Discussion and conclusions

Our analyses found no matches between Australia, New Zealand and Sri Lanka, reinforcing the hypothesis of separate populations (McDonald *et al*. 2006; Miller *et al.* 2014; Balcazar *et al*. 2015; Olson *et al.* 2015; Barlow *et al*. 2018) or, for Sri Lanka, a different subspecies (Illangakoon *et al.* 2012). The lack of matches between New Zealand and Australia is consistent with Barlow *et al.* (2018), which found no matches between the New Zealand whales and individuals from Australia. The lack of matches between New Zealand and Australia represent a level of site fidelity to feeding grounds that is consistent with those reported for other populations (Galletti Vernazzani *et al.* 2012, 2017).

Within Australia, there were sixteen matches between blue whales from the Perth Canyon, the Bonney Upwelling and Geographe Bay. This is consistent with Jenner *et al.* (2008), which reported one match between the Bonney Upwelling and the Perth Canyon and three matches between Geographe Bay and the Perth Canyon.

This represents a high level of connectivity between all three areas and documents blue whale movements around Australia, strengthening the hypothesis of one distinct population. This is consistent with Attard *et al.* (2010, 2012, 2018), who found that blue whales from the Perth Canyon, the Bonney Upwelling and Geographe Bay are genetically part of the same population. It also is consistent with Garcia-Rojas (2018) which describes satellite tracks of pygmy blue whales and feeding grounds linking the Bonney Upwelling, the Sub tropical Convergence and the Perth Canyon.

Within New Zealand, one of the two the resightings found here is previously unreported. It suggests the re-occurrence of individuals within New Zealand waters across years. This is consistent with Barlow *et al.* (2018), which found nine matches of whales within New Zealand from a total of 151 individuals, including one match also reported here (ID 18, Table 3). Olson *et al*. (2016b) also reported an additional two matches within New Zealand from 38 individuals.

The results presented here highlight the value of collaborative efforts to better understand spatial and temporal patterns and provides evidence of a level of site fidelity to Australia and New Zealand feeding areas. This broad regional photo identification analysis will also provide the necessary baseline data to estimate abundance and conduct an IWC assessment of pygmy blue whale populations.

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References

Attard C.R.M., Beheregaray L.B., Jenner C., Gill P., Jenner M., Morrice M., Bannister J., LeDuc R., Möller L.M. 2010. Genetic diversity and structure of blue whales (*Balaenoptera musculus*) in Australian feeding aggregations. *Conservation Genetics* 11:2437-2441.

Attard C.R.M., Beheregaray L.B., Burton C.L.K., Jenner K.C.S., Gill P.C., Jenner M.N., Morrice M.G., Möller L.M. 2012. Genetic identity of blue whales (*Balaenoptera musculus*) in Geographe Bay, Western Australia: Progress report. Paper SC/64/SH27 presented to the IWC Scientific Committee.

Attard C. R. M., Beheregaray L. B., Sandoval-Castillo J., Jenner K.C.S, Gill P. C., Jenner M.N., Morrice M. G., Möller L.M. 2018. From conservation genetics to conservation genomics: a genome-wide assessment of blue whales (*Balaenoptera musculus*) in Australian feeding aggregations. *Royal Society Open Science* 5:170925

Balcazar N. E., Tripovich J. S., Klinck H., Nieukirk S.L., Mellinger D.K., Dziak R.P, Rogers T.L. 2015. Calls reveal population structure of blue whales across the southeast Indian Ocean and southwest Pacific Ocean. *Journal of Mammalogy* 96:1184–1193.

Barlow D.R., Torres L.G., Hodge K., Steel D., Baker C.S., Chandler T.E., Bott N., Constantine R., Double M.C., Gill P.C., *et al*. 2018. Documentation of a New Zealand blue whale population based on multiple lines of evidence. *Endang Species Res.* 36:27-40.

De Vos A., Pattiaratchi C.B., Harcourt R.G. 2014. Inter-annual variability in blue whale distribution off southern Sri Lanka between 2011 and 2012. *Journal of Marine Science and Engineering* 2:534-550.

Double M. C., Andrews-Goff V., Jenner K. C. S., Jenner M.-N., Laverick S., Branch T. A., Gales N. 2014. Migratory movements of pygmy blue whales (*Balaenoptera musculus brevicauda*) between Australia and Indonesia as revealed by satellite telemetry. *PLOS ONE* 9: e93578.

Galletti Vernazzani. 2019. Progress on Southern Hemisphere Blue Whale Catalogue: Period May2018-April2019. Paper SC/68a/SHxx presented to the IWC Scientific Committee.

Galletti Vernazzani B., Cabrera E. 2011. Long term mark-recapture of blue whales in Chilean Waters. Paper SC/63/SH8 presented to the IWC Scientific Committee.

Galletti Vernazzani B., Olson P. 2012. Progress of between region comparison under Southern Hemisphere Blue Whale Catalogue (SHBWC). Paper SC/64/SH20 presented to the IWC Scientific Committee.

Galletti Vernazzani B., Carlson C., Cabrera E., Brownell Jr. R.L. 2012. Chilean blue whales off Isla Grande de Chiloe, 2004-2010: distribution, site-fidelity and behaviour. *J. Cetacean Res. Manage.* 12(3):353–360.

Galletti Vernazzani B., Jackson J.A., Cabrera E., Carlson C.A., Brownell Jr. R.L. 2017. Estimates of Abundance and Trend of Chilean blue whales off Isla de Chiloé, Chile. *PLoS ONE 12(1):* e0168646.

Garcia-Rojas M.I., Jenner K.C.S., Gill P.C., Jenner M-N.M., Sutton A.L., Mccauley R.D. 2018. Environmental evidence for a pygmy blue whale aggregation area in the Subtropical Convergence Zone south of Australia. *Marine Mammal Science* 34(4):901-923.

Gavrilov A.N., McCauley R.D., Salgado-Kent C., Tripovich J. & Burton C. 2011. Vocal characteristics of pygmy blue whales and their change over time. *J Acoust Soc Am* 130:3651-60.

Gendron, D. and A. Ugalde de la Cruz. 2012. A new classification method to simplify blue whale photo-identification technique. *Journal of Cetacean Research and Management* 12(1):79–84

Gill P.C. 2002. A blue whale (*Balaenoptera musculus*) feeding ground in a southern Australia coastal upwelling zone. *Journal of Cetacean Research and Management* 4:179-184.

Ilangakoon A. D., Sathasivam K. 2012. The need for taxonomic investigations on northern Indian Ocean blue whales (*Balaenoptera musculus*): implications of year-round occurrence off Sri Lanka and India. *Journal of Cetacean Research and Management* 12:195-202.

International Whaling Commission. 2009. Report of the Scientific Committee. Annex H Other Southern Hemisphere Whale Stocks. *Journal of Cetacean Research and Management (Supp.)*

International Whaling Commission. 2017. Annex H: Report of the Sub-Committee on Other Southern Hemisphere Whale Stocks. *Journal of Cetacean Research and Management (Supp.)* 18:230-263.

Jenner C., Jenner M., Burton C., Sturrock V., Salgado Kent C., Morrice M., Attard C., Möller L., Double M. 2008. Mark recapture analysis of Pygmy Blue Whales from the Perth Canyon, Western Australia 2000-2005. Paper SC/60/SH16 presented to the IWC Scientific Committee.

LeDuc R.G., Dizon A.E., Goto M., Pastene L.A., Kato H., Nishiwaki S., LeDuc C., Brownell Jr. R.L. 2007. Patterns of genetic variation in Southern Hemisphere blue whales and the use of assignment test to detect mixing on the feeding grounds. *Journal of Cetacean Research and Management* 9:73-80.

LeDuc R. G., Archer F. I., Lang A. R., Martien K. K., Hancock-Hanser B., Torres-Florez J. P., Hucke-Gaete R., Rosenbaum H. C., Van Waerebeek K., Brownell R. L., Taylor B. L. 2017. Genetic variation in blue whales in the eastern Pacific: implication for taxonomy and use of common wintering grounds. *Molecular Ecology* 26:740-751.

McDonald M.A., Mesnick S.L., Hildebrand J.A. 2006. Biogeographic characterisation of blue whale song worldwide: using song to identify populations. *Journal of Cetacean Research and Management* 8:55-65.

Miller B.S., Collins K., Barlow J., Calderan S., Leaper R., McDonald M., Ensor P., Olson P.A., Olavarria C., Double, M.C. 2014. Blue whale songs recorded around New Zealand: 1964-2013. *Journal of the Acoustical Society of America* 135:1616-1623.

Olson P.A., Ensor P., Olavarria C., Bott N., Constantine R., Weir J., Childerhouse S., van der Linde M., Schmitt N., Miller B.S., Double M.C. 2015. New Zealand blue whales: residency, morphology, and feeding behavior of a little-known population. *Pacific Science* 69(4):477–485.

Olson P.A., Double M.C., Matsuoka K., Pastene L.A. 2016a. Photo-identification of Antarctic blue whales 1991-2016. Paper SC/66b/SH11 presented to the IWC Scientific Committee.

Olson P.A., Bott N., Olavarria C., Andrews A., Constantine R., Schmitt N., Ensor P., Miller B.S., Weir J., Childerhouse S., van der Linde M., Double, M.C. 2016b. New Zealand blue whales: and update on residency and behavior. Paper SC/66b/SH08 presented to the IWC Scientific Committee.

Recalde-Salas, A. et al., 2014. Non-song vocalizations of pygmy blue whales in Geographe Bay, Western Australia. *The Journal of the Acoustical Society of America* 135(5): p.EL213-EL218.

Rennie S., Hanson C.E., McCauley R.D., Pattiaratchi C., Burton C., Bannister J., Jenner C., Jenner M.N. 2009. Physical properties and processes in the Perth Canyon, Western Australia: links to water column production and seasonal pygmy blue whale abundance. *Journal of Marine Systems* 77:21-44.

Salgado Kent C.P., Gavrilov A.N., Recalde-Salas A., Burton C.L.K., McCauley R.D., Marley S. Passive acoustic monitoring of baleen whales in Geographe Bay, Western Australia. *In:* Acoustics 2012, Acoustics, Development and the Environment, Proceedings of the Annual Conference of the Australian Acoustical Society, Fremantle, Australia (November 21–23, 2012), http://www.acoustics.asn.au/conference_proceedings/AAS2012/papers/p148.pdf.

Samaran F., Stafford K.M., Branch T.A., Gedamke J., Royer J.-Y., Dziak R.P., Guinet C. 2013. Seasonal and geographic variation of southern blue whale subspecies in the Indian Ocean. *Plos One* 8(8).

Sears R., Williamson J.M., Wenzel F.W., Bérubé M., Gendron D., Jones, P. 1990. Photographic identification of the blue whale (*Balaenoptera musculus*) in the Gulf of St. Lawrence, Canada. *Rep. int. Whal.Commn (special issue)* 12:335-42.

Torres, L.G. 2013. Evidence for an unrecognised blue whale foraging ground in New Zealand. *New Zealand Journal of Marine and Freshwater Research* 47: 235-248

Torres, L.G., Barlow, D. *et al.* 2017. New Zealand blue whales: Recent findings and Research progress. Paper SC/67a/SH2 presented to the IWC Scientific Committee.

Table 1 – Summary of photographic collection within blue whale catalogues in the SHBWC until April 2019

Region	Group	Fluke	Left Side	Right Side	Area
Gulf of California-ETP-South America	CCC	0	288	299	Chile
	SWFSC	0	60	53	Peru, Ecuador, ETP
	IWC Chile	0	14	9	Chile
	MERI	9	48	45	Chile
	CBA-UACH	0	0	0	Chile
	EUTROPIA	0	0	0	Chile
	PANTHALASSA	0	0	0	Chile
	Sub-total	***9***	***410***	***406***	
Indonesia-Australian-New Zealand	BWS	5	85	84	Australia
	WWR	0	30	23	Australia
	Asha de Vos	0	89	79	Sri Lanka
	CWR	50	204	212	Australia
	CMST	0	0	0	Australia
	MARVEL	0	15	12	Australia
	OSU	5	40	36	New Zealand
	AAD-Australia	0	35	36	Australia
	AAD-NewZealand	0	12	11	Australia
	NIWA	1	7	2	New Zealand
	BF	0	0	0	Sri Lanka
	KWA	0	0	0	Australia
	Sub-total	***61***	***517***	***495***	
Southern Ocean	IWC SOWER	0	158	157	Antarctica
	MRI-SO	0	19	13	Antarctica
	AAD-Antarctica	0	67	77	Antarctica
	KWA-SO	0	0	0	Antarctica
	Sub-total	**0**	**244**	**247**	Antarctica
West and Central Indian Ocean	MRI-SA	0	0	0	South Africa, Madagascar
	Gardline	0	0	0	South Africa, Madagascar
	Sub-total	***0***	***0***	***0***	
	TOTAL	**70**	**1171**	**1148**	

Table 2 – Summary of photographic collection of blue whale photo-identifications under the Indonesia/Australian/New Zealand sub-catalogue of the SHBWC as of December 2017

GROUP	No. of WHALE ID's	LEFT	RIGHT	FLUKE	REGION
BWS	132	85	84	5	Bonney Upwelling
WWR	40	30	23	0	Geographe Bay
Asha de Vos	151	89	79	0	Sri Lanka
CWR	250	204	212	50	Perth Canyon
FLINDERS	18	15	12	0	Bonney Upwelling
OSU	46	40	36	5	New Zealand
AAD-Australia	46	35	36	0	Bonney Upwelling
AAD-New Zealand	15	12	11	0	New Zealand
TOTAL	**698**	**510**	**493**	**60**	

Table 3 - Preliminary results from comparisons among SHBWC groups from Australia, New Zealand and Sri Lanka as of December 2017

ID	Groups	Whale ID	Date and Location 1	Date and Location 2	Date and Location 3	Date and Location 4	Date and Location 5	Date and Location 6
1	CWR & BWS[(1)]	WA0201 – BWS0055	05 April 2005 Bonney Upwelling					
2	CWR & BWS[(1,2)]	WA0202 /WA0203 - BWS0056	05 April 2005 Bonney Upwelling					
3	CWR & BWS[(1)]	WA0118 - BWS0058	09 February 2004 Perth Canyon	06 April 2005 Bonney Upwelling				
4	CWR & BWS[(1)]	WA0204 - BWS0057	06 April 2005 Bonney Upwelling					
5	CWR & BWS	WA0048 – BWS131	10 February 2002 Perth Canyon	24 March 2010 Bonney Upwelling				
6-7	CWR, BWS[(1)] & AAD Australia	WA0205 - BWS040 - AAD-AUS 122	30 March 2005 Bonney Upwelling	06 April 2005 Bonney Upwelling	26 January 2006 Bonney Upwelling	13 March 2010 Bonney Upwelling	28 March 2012 Bonney Upwelling	30 March 2012 Bonney Upwelling
8	BWS & AAD Australia	BWS109 - AAD-AUS017	13 March 2010 Bonney Upwelling	18 January 2012 Bonney Upwelling				
9	BWS & AAD Australia	BWS151 - AAD-AUS115	20 January 2009 Bonney Upwelling	25 March, 2012 Bonney Upwelling	27 March 2012 Bonney Upwelling			
10	BWS & AAD Australia	BWS026 - AAD-AUS024	21 February 2005 Bonney Upwelling	19 January 2012 Bonney Upwelling				
11	CWR & FLINDERS	WA0088 - FLBW016	30 March 2003 Perth Canyon	3 March 2015 Bonney Upwelling				
12	BWS & FLINDERS[(3)]	BWS112 - FLBW018 = FLBW017	24 March 2010 Bonney Upwelling	7 March 2015 Bonney Upwelling				
13	BWS & FLINDERS	BWS130 - FLBW013	24 March 2010 Bonney Upwelling	3 March 2015 Bonney Upwelling				
14	BWS & WWR	BWS002 – WAG0008	21 February 1999 Bonney Upwelling	18 November 2000 Geographe Bay				
15	WWR & CWR	WA0168 – WAG0009	18 November 2000 Geographe Bay	24 April 2004 Perth Canyon				
16	WWR & CWR	WA0111 – WAG0033	31 October 2003 Geographe Bay	08 February 2004 Perth Canyon	04 April 2009 Perth Canyon	08 April 2009 Perth Canyon		
17	AAD-New Zealand & OSU	AAD-NZ032 - NZBW009	10 March 2015 -41.867, 174.426	2 February 2016 -40.805, 171.811				
18	AAD-New Zealand & OSU	AAD-NZ008 - NZBW011	31 January 2013 -41.35, 170.47	2 February 2016 -40.724, 171.797				

[(1)] CWR and BWS conducted surveys together in April 2005 in the Bonney Upwelling and therefore they share the same photo-IDs in their catalogues

[(2)] WA0202 and WA0203 correspond to BWS0056 from left side and right side respectively. However, the opposite sides of these whales don't match.

[(3)] FLBW018 seems to correspond to FLBW017, which is consistent with a comment posted by the group on their catalogue "FLBW018 can potentially be the same whale as FLBW017 based on timing. Photograph is unclear whether it is the same whale".