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A summary of photo-id information of blue, southern right and humpback whales collected by JARPA/JARPAII in the Indo-Pacific region of the Antarctic

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The IWC Scientific Committee (IWC SC) conducted assessments of Antarctic blue (*Balaenoptera musculus intermedia*), southern right (*Eubalaena australis*) and humpback (*Megaptera novaeangliae*) whales. One of the techniques used by the IWC SC to investigate distribution, movement and abundance is photo-identification (photo-id) of whales. Photo-id data obtained by JARPA and JARPAII surveys have the potential to contribute to the assessments of those species.

During the JARPA and JARPAII austral summer surveys in the Indo-Pacific region of the Antarctic, which include IWC Management Areas IIIE (35°E–70°E), IV (70°E–130°E), V (130°E–170°W) and VIW (170°W–145°W), photo-id experiments on blue, southern right and humpback whales were conducted on an opportunistic basis. Photo-id experiments were conducted in conjunction with biopsy experiments. The dedicated sighting (SV) and the sighting and sampling (SSV) vessels conducting line transect surveys under JARPA and JARPAII approached the whales for obtaining pictures of natural marks, which can be used for individual identification e.g. scars, shape of dorsal fin or mottled pigmentation pattern in the case of the blue whale (Figure 1); scars, head callosities pattern in the case of the southern right whale (Figure 2); scars, shape of dorsal fin, lateral marking and ventral fluke coloration in the case of the humpback whale (Figure 3).

Between the austral summer seasons 1992/93 and 2004/05 (JARPA), photographs were taken using 35 mm SLR databack cameras equipped with 70-up to 300 mm lenses and motor drive. Black and white 400 ASA films (*Ilford* HP5) were used. From the 2005/06 season (JARPAII), digital Nikon 70D cameras equipped with 100–300 mm lens were used.

After each austral summer season, the best pictures were selected (LAP for the pictures taken between 1989/90 and 2004/05 and KM for the pictures taken from 2005/06), and these pictures were entered into the Institute of Cetacean Research (ICR)'s catalogue.

Tables 1a, 1b and 1c summarize the number of pictures for blue, southern right and humpback whales, respectively, by survey. Table 2 shows the total number of pictures in the ICR catalogue. A total of 3,108 photographs (529 for blue, 914 for southern right and 1,665 for humpback whales) were collected and selected from 1989/90 to 2010/11 seasons (22 seasons). The number

Figure 1. Example of dorsal fin shape and mottled pigmentation as natural marks for photo-id of Antarctic blue whales.

Figure 2. Example of head callosities as natural marks for photo-id of southern right whales.

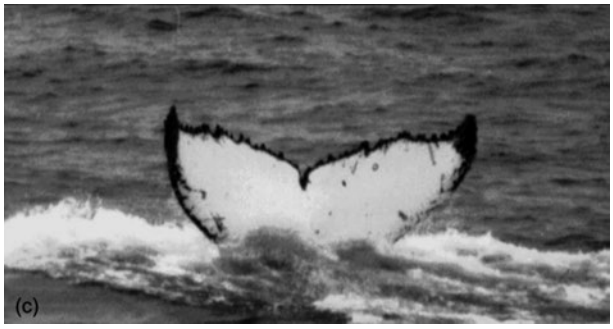

Figure 3. Example of ventral fluke pigmentation pattern as natural marks for photo-id of humpback whales.

Table 1a

Number of Antarctic blue whale photographs taken during JARPA and JARPAII surveys by IWC Management Areas and austral summer season.

Survey	Season	IWC Areas				Number of photographs
		IIIE	IV	V	VIW	
JARPA	1987/88	—	—	—	—	0
	1988/89	—	—	—	—	0
	1989/90	—	—	—	—	0
	1990/91	—	—	—	—	0
	1991/92	—	—	—	—	0
	1992/93	—	—	33	—	33
	1993/94	—	9	—	—	9
	1994/95	—	—	16	—	16
	1995/96	7	3	—	—	10
	1996/97	—	—	6	2	8
	1997/98	1	4	—	—	5
	1998/99	—	—	21	0	21
	1999/00	22	6	—	—	28
	2000/01	—	—	0	0	0
	2001/02	0	5	—	—	5
	2002/03	—	—	0	6	6
	2003/04	5	4	—	—	9
	2004/05	—	—	0	3	3
	Sub-total	**35**	**31**	**76**	**11**	**153**
JARPAII	2005/06	59	113	0	—	172
	2006/07	—	—	18	0	18
	2007/08	60	10	0	—	70
	2008/09	—	—	24	39	63
	2009/10	21	32	0	—	53
	2010/11	—	—	0	0	0
	Sub-total	**140**	**155**	**42**	**39**	**376**
	Total	**175**	**186**	**118**	**50**	**529**

Table 1b

Number of southern right whale photographs taken during JARPA and JARPAII surveys by IWC Management Areas and austral summer season.

Survey	Season	IWC Areas				Number of photographs
		IIIE	IV	V	VIW	
JARPA	1987/88	—	—	—	—	0
	1988/89	—	—	—	—	0
	1989/90	—	—	—	—	0
	1990/91	—	—	—	—	0
	1991/92	—	39	—	—	39
	1992/93	—	—	24	—	24
	1993/94	—	9	—	—	9
	1994/95	—	—	0	—	0
	1995/96	—	12	—	—	12
	1996/97	—	—	0	—	0
	1997/98	—	94	—	—	94
	1998/99	—	—	0	—	0
	1999/00	—	9	—	—	9
	2000/01	—	—	2	—	2
	2001/02	—	33	—	—	33
	2002/03	—	—	10	—	10
	2003/04	—	6	—	—	6
	2004/05	—	—	5	—	5
	Sub-total	**0**	**202**	**41**	**0**	**243**
JARPAII	2005/06	—	495	—	—	495
	2006/07	—	—	0	—	0
	2007/08	—	144	18	—	162
	2008/09	—	—	0	—	0
	2009/10	—	14	—	—	14
	2010/11	—	—	0	—	0
	Sub-total	**0**	**653**	**18**	**0**	**671**
	Total	**0**	**855**	**59**	**0**	**914**

of photographs for blue whales were 140, 155, 42 and 39 in Areas IIIE, IV, V and VIW, respectively. The numbers of photographs for southern right whales were 653 and 18 in Areas IV and V, respectively. The numbers of photographs for humpback whales were 12, 903, 235 and 51 in Areas IIIE, IV, V and VIW, respectively.

Analyses of photographs collected during the JARPA/JARPAII have the potential to contribute to a better understanding of the pattern of movement and residence of these species in the feeding grounds. It could assist the interpretation of abundance trends and quantitative distribution studies south of 60°S.

Table 1c

Number of humpback whale photographs taken during JARPA and JARPAII surveys by IWC Management Areas and austral summer season.

Survey	Season	IWC Areas				Number of photographs
		IIIE	IV	V	VIW	
JARPA	1987/88	—	—	—	—	0
	1988/89	—	—	—	—	0
	1989/90	—	19	—	—	19
	1990/91	—	—	8	—	8
	1991/92	—	26	—	—	26
	1992/93	—	—	69	—	69
	1993/94	—	51	—	—	51
	1994/95	—	—	43	—	43
	1995/96	3	31	—	—	34
	1996/97	—	—	4	15	19
	1997/98	7	52	—	—	59
	1998/99	—	—	—	—	0
	1999/00	14	37	—	—	51
	2000/01	—	—	13	17	30
	2001/02	3	14	—	—	17
	2002/03	—	—	7	0	7
	2003/04	9	11	—	—	20
	2004/05	—	—	11	—	11
	Sub-total	**36**	**241**	**155**	**32**	**464**
JARPAII	2005/06	0	328	—	—	328
	2006/07	—	—	62	34	96
	2007/08	12	78	—	—	90
	2008/09	—	—	165	17	182
	2009/10	—	497	—	—	497
	2010/11	—	—	8	—	8
	Sub-total	**12**	**903**	**235**	**51**	**1201**
	Total	**48**	**1,144**	**390**	**83**	**1,665**

Table 2

Summary of the number of pictures for each species during JARPA and JARPAII surveys (1987/88–2010/11).

Species	JARPA	JARPAII	Total
Blue whale	153	376	529
Southern right whale	243	671	914
Humpback whale	464	1,201	1,665
Total	860	2,248	3,108

Further information on movement and distribution can be optimized if these photographs are examined in conjunction with photographs from other surveys and regions. In fact, scientists from the ICR have conducted research collaboration with several foreign scientists and several photo-id matches between different regions have been reported (e.g. Bannister *et al.*, 1999; Rock *et al.*, 2006). Further collaboration is being conducted with members of the IWC SC (e.g. Olson *et al.*, 2018).

Pictures are available for cooperative studies under established ICR protocols for data access and collaboration. See details in the home page of the ICR.

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