SC/58/SH19

Interim Report: IWC Research Contract 16, Antarctic Humpback Whale Catalogue

Contact author: Judith M. Allen

Judith M. Allen[1], Carole Carlson, Ph.D.[2] and Peter Stevick, Ph.D.[1,3]

[1]College of the Atlantic
105 Eden Street
Bar Harbor, ME 04609
Ph: (207) 288-5015
jallen@coa.edu

[2]PO Box 32
Provincetown, MA USA

[3]Hebridean Whale and Dolphin Trust
28 Main Street
Tobermory, Isle of Mull

Abstract

College of the Atlantic (COA) has maintained a collection of humpback whale (*Megaptera novaeangliae*) identification photographs from the Antarctic since 1987. In 1998 the International Whaling Commission (IWC) approved funding to support the expansion of this catalogue to members of the IWC, with an aim to substantially improve the accessibility and organization of the database. The collection has been internationally collaborative, with photographic contributions from 198 researchers and opportunistic sources.

During the contract period, the Antarctic Humpback Whale Catalogue (AHWC) catalogued 1182 photo-identification images representing 823 individual humpback whales from Antarctic and southern Hemisphere waters. These images were submitted by 28 individuals and research organizations. Photographic comparison of submitted photographs to the AHWC during the contract period yielded 127 previously known individuals. These submissions bring the total number of catalogued whales to 2925. This report details these findings, and other advances in the AHWC.

College of the Atlantic (COA) has maintained a collection of humpback whale (*Megaptera novaeangliae*) identification photographs from the Antarctic since 1987. Early matches confirmed migration of humpbacks between the Antarctic Peninsula and the western coast of South America (Ecuador and Colombia). In 1998, the Internaitonal Whaling Commission (IWC) approved funding to support the expansion of this catalogue to include dorsal fins and a searchable on-line database, with an aim to substantially improve the accessibility and scope of the project. The collection has been internationally collaborative, with photographic contributions from 198 researchers and opportunistic sources. This interim report summarizes progress to date on the various tasks assigned within the contract between COA and the IWC.

Task 1: Compile three collections of photographs of Antarctic Humpback Whales

1182 photographs were catalogued during the contract period, including the following (Table 1):

Projeto Baleias Antartico: 277 individuals, Antarctic Peninsula
Projeto Baleia Jubarte: 502 individuals, Brazil
Institute of Cetacean Research: 1 individual, Area V
Centro de Conservacion Cetacea: 7 individuals, Chile
Opportunistic: 32 individuals, Antarctic Peninsula; 4 individuals, Gabon; 2 individuals, W. Australia

	No. of photographs	No. of whales	No. of resightings	No. of new whales
Antarctic Peninsula	395	308	66	242
Antarctica	1	1	0	1
Gabon	5	4	0	4
Brazil	772	501	61	440
Chile	7	7	0	7
W. Australia	2	2	0	2
Total	1182	823	127	696

Table 1. Photographs catalogued during contract period.

Matches made during the contract period to previously sighted individuals include resightings between the Antarctic Peninsula and Colombia (4) and the Antarctic Peninsula and Ecuador (10). Matches to individuals seen previously in the same area include the Antarctic Peninsula (61) and Brazil (61).

The fluke photographic collection now consists of 4449 photographs of 2594 individual whales. Of these 183 were identified in more than one year. The right dorsal fin/flank collection consists of 515 photographs of 407 individuals. The left dorsal fin/flank collection consists of 497 photographs of 401 individuals. The longest interval between re-sightings was 18 years for

individual #0057, first identified in1986 and photographed again in 2003. There were 41 individuals with three or more sightings in different areas or years. Distribution of the photographs by region is shown in Table 2.

Region	Total # whales	Fluke		R. dorsal		L. dorsal	
		Photos	# whales	Photos	# whales	Photos	# whales
Antarctic Peninsula	882	1634	855	47	31	40	32
Antarctic II-VI total	319	193	114	145	110	169	125
Sector II*	9	14	9				
Sector III	36	19	13	16	13	26	15
Sector IV	156	85	49	82	59	70	63
Sector V	88	64	37	30	26	55	39
Sector VI	30	10	6	17	12	18	12
Gabon	78	94	78	-	-	-	-
St. Helena	2	3	2	-	-	-	-
Brazil	831	1451	829	2	2	5	5
Peru	2	2	2				
Chile	48	53	48	-	-	-	-
Ecuador/Colombia/ Costa Rica	476	613	445	70	28	61	23
American Samoa	44	75	44	-	-	-	-
Tahiti	1	1	1	-	-	-	-
New Zealand	1	2	1	-	-	-	-
E. Australia	7	9	7	1	1	2	1
W. Australia	308	317	242	251	236	221	213
TOTALS	2925	4449	2594	515	407	497	401

Table 2. Fluke and dorsal photographic collections, by region. Antarctic Peninsula includes individuals identified along the coast of the AP and South Shetland Islands as far east as Elephant Island (~55°W). Area II includes individuals identified east of Elephant Island to 0° (see SC/57/SH2).

Current catalogues from FEMM, PBJ and PBA have been submitted to the AHWC. Cataloguing of the PBA catalogue has been completed, and analysis is included in this report. Analysis of the PBJ catalogue is in progress, with approximately 735 individuals remaining to be catalogued. The FEMM catalogue is awaiting analysis. Photos from the 1999/2000 IWC SOWER cruises were received recently, and are also awaiting analysis.

Progress continues in efforts to stimulate submission of opportunistic data from eco-tourism cruise ships in the Southern Ocean and from research organizations and expeditions working throughout this region and the Southern Hemisphere. For the period 1981 through 2006, 1197 photos representing 568 individuals have been submitted from ecotourism and other opportunistic sources, as detailed in Table 3 below. Opportunistic data represents a significant portion of the AHWC. In the Antarctic Peninsula, approximately 50% of the catalogued individuals were contributed by opportunistic sources. The availability of this data has broadened our understanding of the exchange between areas and in some cases provided information that was previously not available. The submission of photos from a cruise ship off South Georgia in 2004 of an animal previously seen off Brazil resulted in the first long-distance resighting of an individual from these areas. The AHWC provides a unique clearing house for opportunistic data, making the photographs and analysis available to other researchers.

	Directed Humpback Research	Eco-tourism	Other Opportunistic
Antarctic Peninsula	474	396	79
Areas II-VI	265	22	34
Gabon	74	–	4
St. Helena	–	–	2
Brazil	822	12	–
Peru	–	–	2
Chile	48	–	–
Ecuador/Colombia/	471	4	6
American Samoa	44	–	–
Tahiti	–	1	–
New Zealand	–	–	1
E. Australia	5	2	1
W. Australia	305	3	–
AHWC Total	2473	439	129

Table 3. Numbers of individual humpback whales in the AHWC contributed from directed research, ecotourism and other opportunistic sources, by area.

Task 2. Scan and archive all images and link to databases in Task 3.

All of the catalogued photographs have been digitized. Images are scanned at 300 dpi and stored in TIFF format. Images to be included on the web page are additionally stored at 90dpi in JPG format, and are stored in a FileMaker Pro database which serves the images to the web page. The image management software iMatch© is used for image analysis. The best images of each individual are stored in the iMatch© database, and assigned categories including pattern type and geographic area. Other relevant data can be stored in the database as well, making it a very effective tool for catalogue management. Comparison using iMatch© is proving both more effective and efficient, reducing the time required for image analysis by as much as 75%.

Task 3. Create relational databases for associated field data.

Data is stored in FoxPro relational databases. The fluke and dorsal/flank collections are combined in a single data file but distinguished by use of a data field indicating fluke or dorsal type, to facilitate analysis of the collections independently or collectively. Digital images and data are backed up daily and kept in a separate location.

Task 4. Report to contributors on completion of photo comparison.

A standardized data report is issued to all contributors on completion of cataloguing of submissions. The report includes the catalogue number assigned, the data recorded in the file, and the contributor and region for any previous sighting history.

Task 5. Provide on-line access to the photographic collection.

The AHWC is available on-line at http://www.coa.edu/antarctic. Only those photographs which we have received permission to publish electronically are included in the on-line collection. The database is searchable by fluke pigmentation pattern, geographic area, or catalogue number. Dorsal fin/flank collections are also available on line, although a search criteria allowing the user to specify dorsal fin/flank has not yet been added. Images displayed are identified by catalogue number and the contact organization for the contributor. No additional data is available on-line, and the images displayed are low resolution (90dpi - suitable for display but not for print).

In accordance with guidelines from the 2002 Scientific Committee Meeting and IWC policy, access to images collected on the IWC-funded research cruises is available to everyone. In addition to IWC images, all photographs taken by COA researchers and all opportunistic photos have been included in the public access database. Users may choose to search the public database, or log in as a contributor and search the contributor-only database. All users, whether logging in to the public or contributor-only database, must agree to terms of use, which include not publishing or reproducing information without written consent.

Contributors are contacted to determine whether or not they wish to keep their photos in the secure database accessible only to fellow contributors, or include them in the public access database. All contributors are assigned a login and password which gives them access to the

secure database and are advised of the security protocol of the project, whereby users are not permitted to share their password with others, or reuse photographs or other information without permission.

Publications (* indicates that opportunistically collected data were included in the analysis):

*Allen, J.M., P.T. Stevick and C. Carlson. 2006. The Antarctic Humpback Whale Catalogue: Description and Summary. Document SC/A06/HW58 submitted to the Scientific Committee of the Intl Whal. Comm.

Rock, J., L.A. Pastene, G. Kaufman, P. Forestell, K. Matsuoka and J. Allen. In press. A note on East Australia Group V Stock humpback whale movement between feeding and breeding areas based on photo-identification. J. Cet. Res. Man.

*Stevick, P.T., A. Aguayo-Lobo, J.M. Allen, C. Castro, K. Chater, L. Dalla Rosa, F. Félix, B. Haase, M. Llano, C. Olavarría, K. Rasmussen and E. Secchi. 2006. Estimated Abundance of Humpback Whales off the West Coast of Central and South America (Group G). Document SC/A06/HW56 submitted to the Scientific Committee of the Intl Whal. Comm.

*Stevick, P.T., A. Aguayo-Lobo, J.M. Allen, K. Chater, L. Dalla Rosa, C. Olavarría and E. Secchi. Mark-recapture Abundance Estimates for Humpback Whales in the Antarctic Peninsula. Document SC/A06/HW54 submitted to the Scientific Committee of the Intl Whal. Comm.

*Stevick, P.T., L. Pacheco de Godoy, M. McOsker, M. Engel and J. Allen. In press. Movement of a humpback whale from Abrolhos Bank, Brazil to South Georgia. J. Cet. Res. Man.

Proposed budget: IWC Research Contract 16, Antarctic Humpback Whale Catalogue

Investigators:
Judith M. Allen [College of the Atlantic, 105 Eden Street, Bar Harbor, ME 04609 USA]
Peter T. Stevick [Hebridean Whale and Dolphin Trust, Tobermory, Isle of Mull]
Carole Carlson, Ph.D. [Provincetown, MA USA]

Budget 2006-2007: This proposal seeks **£6,600** to continue the cataloging of submitted photographs and further development and enhancement of the system for on-line access. Budgetary amounts are in GBP.

AHWC BUDGET

Salary:	
Project and database management	2,700
Photo comparison	8,000
Fringe @ 15%	1,600
Phone, fax and postage	100
Supplies	200
Total Budget	£12,600

Requested from IWC: **£6,600**

Budget narrative: We have made tremendous progress in the catalogue with funding support from the IWC. Increasing awareness of the project among research organizations, tour operators and other potential contributors has widened the scope of the collection; research efforts in areas that had not previously been sampled have extended the geographic coverage. The AHWC has grown by 30% in the last year alone, from 2238 to 2925 individuals. In spite of adopting more efficient analysis techniques, the recent submission of catalogues from the PBA, PBJ and FEMM projects has produced a backlog of photos to be analyzed. We have received the 99/00 IWC SOWER cruise data, and anticipate submission of data from additional years.

Recognizing the scope of work to be accomplished in the coming year and the importance of timely analysis to the contributing researchers and the scientific community, we are requesting a 25% increase in funding, **£6,600 GBP**. We will seek funding from other sources to provide the remaining funds required. Additional resources are provided by College of the Atlantic, including equipment and student assistants provided by College of the Atlantic, and time donated by Project Investigators Judith Allen and Carole Carlson.