SOUTH AFRICA. PROGRESS REPORT ON CETACEAN RESEARCH, JANUARY 2003TO DECEMBER 2003, WITH STATISTICAL DATA FOR THE CALENDER YEAR 2003

Compiled by W.H. Oosthuizen

Branch: Marine and Coastal Management, Department of Environmental Affairs and Tourism, Private Bag X2, Roggebaai, 8012, South Africa

This report summarizes information obtained from: Natal Sharks Board (**NSB**); University of KwaZulu-Natal (Westville) (**UKZNW**) ; Centre for Dolphin Studies (**CDS**); Department of Mathematics and Applied Mathematics, University of Cape Town (**UCT**); Port Elizabeth Museum (**PEM**); Branch Marine and Coastal Management, Department of Environmental Affairs and Tourism (**DEAT**) and Richards Bay Humpback Dolphin Project, Endangered Wildlife Trust (**EWT**).

1. Species and stocks studied

Common name	Scientific name	Area/stock(s)	Items referred to
Atlantic Ocean bottlenose dolphin	*Tursiops truncatus*	South Africa	2.1.1; 2.1.2; 4.2; 4.3; 10; 11
Blue whale	*Balaenoptera musculus*	South Africa	2.1.1; 4.4; 11
Bryde's whale	*Balaenoptera edeni*	South Africa	2.1.1; 2.1.2; 3.1.1; 4.3
Common dolphin	*Delphinus spp.*	South Africa	2.1.1; 4.3; 4.4
Dusky dolphin	*Lagenorhynchus obscurus*	South Africa	4.3; 4.4; 11
Dwarf sperm whale	*Kogia simus*	South Africa	4.3; 4.4
False killer whale	*Pseudorca crassidens*	South Africa	2.1.1
Fin whale	*Balaenoptera physalus*	Central North Atlantic Ocean, West Greenland	9
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	9
Humpback whale	*Megaptera novaeangliae*	Western Indian Ocean and Southern Atlantic	2.1.1; 2.2; 3.1.1; 4.1; 4.3; 4.4; 6.1; 9
Indian Ocean bottlenose dolphin	*Tursiops aduncus*	South Africa	2.1.1; 2.1.2; 3.1.1; 3.2; 4.2; 4.3; 4.4; 7.1; 9; 11
Indo-pacific humpback dolphin	*Sousa chinensis*	Southeast and East coasts	2.1.1; 2.1.2; 3.1.1; 3.2; 4.2; 4.4; 5; 7.1; 9; 11
Killer whale	*Orcinus orca*	South Africa	2.1.1; 2.1.2; 3.1.1
Layard's beaked whale	*Mesoplodon layardii*	South Africa	4.3
Long-beaked common dolphin	*Delphinus capensis*	South Africa	2.1.1; 2.1.2; 4.2; 4.3; 4.4; 5; 7.1
Longman's	*Indopacetus*	Global	11

beaked whale	*pacificus*		
Northern Hemisphere minke whale	*Balaenoptera acutorostrata*	Central North Atlantic Ocean, West Greenland	9
Pan-tropical spotted dolphin	*Stenella attenuata*	South Africa	4.3; 4.4
Pygmy right whale	*Caperea marginata*	South Africa	4.3
Pygmy sperm whale	*Kogia breviceps*	South Africa	4.3
Risso's dolphin	*Grampus griseus*	South Africa	2.1.1; 4.3
Southern right whale	*Eubalaena australis*	South Africa and Namibia	2.1.1; 2.1.2; 3.1.1; 3.2; 4.1; 4.3; 4.4; 6.1; 10; 11
Sperm whale	*Physeter macrocephalus*	South Africa	4.3
Spinner dolphin	*Stenella longirostris*	South Africa	2.1.1
True's beaked whale	*Mesoplodon mirus*	South Africa	4.3

2. Sightings data

2.1 Field work

2.1.1 Systematic

MRIWU

Between 1 January and 15 February 2003, the MRIWU maintained a shore-based watch for migrating humpback and southern right whales from North Head, Saldanha Bay. In 124.43 hours of watch, 41 sightings of 74 humpback whales, 54 sightings of 80 southern right whales, one sighting of 1 blue whale, one sighting of 4 killer whales and 27 sightings of 41 unidentified whales were made. Over the same period, the Unit's 6 m inflatable *Balaena* spent 12 sea-days off Saldanha Bay, in which a total of 26 groups of 54 humpback whales, 34 groups of 56 southern right whales, one sighting of 5 killer whales and 1 blue whale were intercepted for photo-identification, biopsy and confirmation of group size.

Between 12 and 22 October 2003, the MRIWU undertook a photo-identification survey for southern right whales along the south coast from Nature's Valley to Muizenberg, and up the west coast from Muizenberg to 32^{o}S, using a chartered Jet Ranger helicopter. This was a continuation of the annual survey series started in 1979. In 32 hours 26 minutes of flying, 827 southern right whales (including 259 calves) were encountered, and approximately 3 000 frames were exposed from an altitude of 100 m for individual identification purposes. These field counts should be ignored as they contained a larger than usual number of duplicates owing to a severely disrupted survey. After matching, the photographs revealed a total of 182 individual cow-calf pairs, of which 3 occurred on the west coast.

Between 28 September 2003 and 31 December 2003, 326 right and 21 humpback whales were encountered in 30 sea-days in the St Helena/Saldanha Bay area in a new project studying an apparent feeding ground for right whales on the west coast. A total of 1,449 frames was exposed for photo-identification purposes of both species, and a series of 42 oceanographic stations was carried out, including 6 next to feeding whales.

In a cooperative project as part of the Benguela Environment Fisheries Interaction and Training Programme (BENEFIT), aerial surveys of the Namibian and Northern Cape sections of the South African coast were flown by the Namibian Ministry of Fisheries and Marine Resources and Ministry of Environment and Tourism. From 15–19 September 2003, 11 right whales were seen, including 3 cow-calf pairs, and from 21-22 October 2003, 26 right whales were seen: 1 adult and 1 cow-calf pair in September and 9 adults in October were considered duplicate sightings. A total of 112 frames were exposed of 16 non-calf individuals.

DEAT (In conjunction with Oceanography Department, UCT)

A line - transect survey (of 951.81 n. miles of search effort) of all cetacean species in coastal waters of Mozambique was carried out between Cabo Inhaca (26° 00' S; 33° 05' E) and to the north of Mozambique Island (14° 26' S; 40° 53' E) and between the 20 and 200 m isobaths, over the period 26 August to 7 September 2003. A total of 884 groups of an estimated 2187 individuals of at least five cetacean species were recorded during the survey effort. The distribution of 691 sightings of an estimated 1130 individual humpback whales and 132 sightings of an estimated 154 large unidentified whales show individuals to occur throughout the survey region. Twenty sightings of an estimated 203 dolphins could not be identified to species, while 21 groups of an estimated 579 spinner and 17 groups of an estimated 117 Atlantic Ocean bottlenose dolphin were recorded throughout the study area. One sighting of two Risso's dolphin was recorded at 16° 42.87' S; 39° 43.37' E.

Preliminary analyses of unstratified data result in a total abundance estimate of 6153 (CV 0.34) humpback whales in the 14029.49 square nautical mile area surveyed. As a result of the difference in width of the coastal shelf area along the coast of Mozambique, the line transect survey data were assigned to four strata. Pooling of estimates over the four strata resulted in a total abundance of 6210 whales (CV 0.31), with highest densities in the southernmost stratum and the lowest densities in the narrow shelf region between between Ponta Zavora and Cabo Bazaruto. This was a collaborative research project between SA and Mozambique and included capacity building and skills training. Additionally a training video was produced for the IWC to prepare future participants for sighting and sampling surveys.

NSB & UKZNW

Fifteen long-shore aerial surveys took place along the coast of KwaZulu-Natal south from Durban to Port St. Johns in the Eastern Cape, using the Natal Sharks Board aeroplane. These investigations into Indian Ocean bottlenose and long-beaked common dolphin distribution and abundance patterns associated with the winter migrations of sardines (*Sardinops sagax*) were part of an NRF-supported project. Two long-shore aerial surveys were undertaken along the coast of KwaZulu-Natal north of Durban to Kosi Bay (Mozambique border) recording cetacean sightings during a whale shark survey.

EWT

Forty boat-based searches were undertaken, 30 of which were successful. EWT followed 40 different groups of Indo-pacific humpback dolphins and collected population, spatial and behavioural data. Photo-id data were collected with a digital video camera; 2671 images were captured and 171 positive identifications were made of 53 individuals.

CDS

CDS were responsible for four main research projects. This include photo-identification studies of Indo-pacific humpback dolphins, Indian Ocean bottlenose dolphins, Bryde's whales and humpback whales.

Research students undertook boat-based surveys in search of cetaceans and species observed during these research trips included Indian Ocean bottlenose dolphins Indo-pacific humpback dolphins, common dolphins, false killer whales, Atlantic Ocean bottlenose dolphins, killer whales, Bryde's whales, southern right whales and humpback whales.

CDS attended five cetacean strandings.

2.1.2 Opportunistic, platforms of opportunity

UKZNW and NSB

Sighting records were collected from NSB net meshing boats (see Cockcroft, V.G., Ross, G.J.B. and V.M. Peddemors.1990b. Bottlenose dolphin *Tursiops truncatus* distribution in Natal's coastal waters. *S. Afr. J. mar. Sci*., **9**:1-10). Students collected sighting data during 13 field trips from the Natal Sharks Board tourist boat.

EWT

22 sighting records including spatial and temporal data of Indo-pacific humpback dolphins were received from the general public and National Sea Rescue Institute.

CDS

The commercial whale and dolphin watching company Ocean Safaris sponsored research undertaken by CDS. Photographs of southern right whales, Indo-pacific humpback dolphins, Indian Ocean bottlenose dolphins, Bryde's whales and killer whales have been taken aboard Ocean Safaris boats.

2.2 Analyses/development of techniques

DEAT

A five–day land based survey during the northward migration of humpback whales was carried out from two platforms at Cape Vidal (28º 07' S; 32º 33' E) between 20 and 24 July 2003, to assess the feasibility of utilising video time space imagery to track humpback whales from the shore. Initial results suggest the technique to be viable, with immediate computation of migration speeds and headings, and distance offshore. The technique also shows considerable effort - saving over theodolite tracking, allowing observers to concentrate effort on searching.

During the 2003 season a BBWW operator from St Lucia photographed 113 dorsal fins and 179 flukes of humpback whales migrating through his permit area. Additionally 31 samples of sloughed skin was collected for DEAT by the operator. These photographs have been scanned but not catalogued.

NSB and UKZNW

Aerial surveys were used to estimate the abundance and distribution of cetaceans in association with the movement of sardines into KwaZulu-Natal during the austral winter months. The time-area closure of the shark net fishery relies on this data. Future cetacean and prey data will be examined through GIS technology using satellite images of SST & Chlorophyl a (Phytoplankton), plus oceanographic data collected *in situ*.

Aerial surveys for whale sharks were used to collect data suitable to estimate abundance and seasonal changes in nearshore distribution of cetaceans in the previously under-researched northern KwaZulu-Natal region.

3. Marking data

3.1 *Field work*

3.1.1 Natural marking data

Species	Feature	Area/ Stock	Number photographed	Catalogued (Y/N)	Cat. Total	Contact person/institute
Humpback whale	Left dorsal	Western Indian Ocean	86	N		DEAT
Humpback whale	Right dorsal	Western Indian Ocean	76	N		DEAT
Humpback whale	Dorsal fin	Western Indian Ocean	113	N		DEAT
Humpback whale	Tail fluke	Western Indian Ocean	235	N		DEAT
Humpback whale	Dorsal Fin &/or Fluke	South Africa	42			CDS
Killer whales	Dorsal Fin & Saddle	South Africa	8			CDS
Bryde's whales	Dorsal Fin	South Africa	77			CDS
Indian Ocean bottlenose dolphins	Dorsal Fin	South Africa	900			CDS
Indo-pacific humpback dolphin	Dorsal Fin	South Africa	296			CDS
Indo-pacific humpback dolphin	Dorsal fin and hump	South Africa	53	Y	111	EWT
Southern right whale (aerial)	Callosities/dorsal col.	South Africa (Western Province)	182 cow-calf pairs	N	745 adult females, 95 other non-calves	MRIWU
Southern right whale (aerial)	Callosities/dorsal col.	Namibia/ South Africa (Northern Cape)	2 cow-calf pairs, 14 adults	Y	2 cow-calf pairs, 14 adults	MRIWU

Southern right whale (boat)	Callosities/dorsal col.	South Africa (West Coast)	313	N	?	MRIWU
Humpback whale	Flukes/ dorsal fin	South Africa (West Coast -incl Angola)	69	Y	305 flukes 456 right d 449 left d [245 ind]	MRIWU

- Number of frames exposed : 374 frames of left dorsal aspects of humpback whales, 288 frames of right dorsal aspects and 215 frames of tail flukes of humpback whales were exposed during the Mozambique cruise.

3.1.2 Artificial marking data
None

3.1.3 Telemetry data

Species	Tag type	No. successfully deployed	Maximum time transmitting	Contact person/institute
None				

3.2 Analyses/development of techniques

MRIWU

The conversion of the right whale aerial catalogue to digital format commenced. Voucher pictures of each non-calf photographed on the 1981-2001 (excluding 1989) surveys have been digitised. Construction of an Access-based database and associated catalogue has also begun, and completed for the 2000 and 2001 surveys. The database and catalogue are linked to the automatic matching algorithm originally developed by Hiby and Lovell (2001).

NSB and UKZNW

Photo-ID studies of Indian Ocean bottlenose dolphins and Indo-pacific humpback dolphins in the Durban and Richards Bay regions, respectively, are being used to establish population size and dynamics, with particular reference to determining impact of bycatch in shark nets.

4. Tissue/biological samples collected

4.1 Biopsy samples

Species	Area/stock	Number collected	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Humpback whale	Western Indian Ocean C1	68 biopsies	N	68	149	DEAT/AMNH
Humpback whale	Western Indian Ocean C1	33 sloughed skin	N	33	33	DEAT/AMNH

Humpback whale	South Africa (W Coast)	35	Y	?	154	MRIWU/AMNH
Southern right whale	South Africa	2	N	2 (cell culture)	621	MRIWU/ U.California (Berkeley)

4.2 Samples from directed catches or bycatches

Species	Area/stock	Calendar year / Season total	Archived	Tissue types	Contact person
Atlantic Ocean bottlenose dolphin	South coast	2	Y	T,G,K,ST	PEM
Indian Ocean bottlenose dolphin	KwaZulu-Natal	36	Y	S, B, G, T, ST	UKZN & NSB
Indo-pacific humpback dolphin	KwaZulu-Natal	3	Y	S, B, G, T, ST, K	UKZN & NSB
Long-beaked common dolphin	KwaZulu-Natal	31	Y	S, B, G, T, ST	UKZN & NSB

S=skin, B=blubber, T=teeth, W=baleen, G=gonads, C=ext parasites, P=internal parasites, K=skeletal remains, A=pathology samples, CV=cardiovascular systems, ST=Stomach

4.3 Samples from stranded animals

Species	Area/stock	No.	Archived	Tissue type	Contact person/inst.
Bryde's whale	Eastern Cape	1	Y	W, K	CDS
Bryde's whale	West Coast	1	N	S	DEAT
Bryde's whale	East Coast	1	Y	S	PEM
Dwarf sperm whale	Eastern Cape	1	Y	T, K, ST	CDS
Dwarf sperm whale	West Coast	1	N	S, B, T, G, K, ST	DEAT
Humpback whale	Eastern Cape	1	Y	W, K, C	CDS
Humpback whale	West Coast	2	N	S, W, C	DEAT
Humpback whale (neonate)	KwaZulu-Natal	1	Y	S, B,	UKZN
Pygmy sperm whale	West coast	1	N	S, T, K, ST	DEAT
Southern right whale	East Coast	1	N	S, P	DEAT
Southern right whale	East Coast	1	N		PEM
Atlantic Ocean bottlenose dolphin	East Coast	4	N		PEM
Common dolphin	West Coast	1	N	S, *	DEAT
Dusky dolphin	West Coast	1	N	S, B, T, G, K, ST	DEAT
Indian Ocean bottlenose dolphin	KwaZulu-Natal	2	Y	S, B, G, T, ST	UKZN & NSB

Indian Ocean bottlenose dolphin	Eastern Cape	1	Y	T, K	CDS
Indian Ocean bottlenose dolphin	Eastern Cape	1			CDS
Pan-tropical spotted dolphin	KwaZulu-Natal	1	Y	S, B, G, T, ST, K	UKZN & NSB
Risso's dolphin	East Coast	1	N		PEM
Sperm whale	S Africa (W Coast)	1	Y	S,T,C	MRIWU
Pan-tropical spotted dolphin	S Africa (W Coast)	1	Y	S,T,G,P,K, ST	MRIWU
Dusky dolphin	S Africa (W Coast)	1	Y	S,T	MRIWU
Layard's beaked whale	S Africa (W Coast)	1	Y	T,ST	MRIWU
Pygmy right whale	S Africa (S Coast)	1	Y	S,W,G,P,K, ST	MRIWU
Layard's beaked whale	S Africa (W Coast)	1	Y	K,ST	MRIWU
True's beaked whale	S Africa (S Coast)	1	Y	S,T,G,P,ST	MRIWU
Pygmy sperm whale	S Africa (S Coast)	1	Y	S,T,K,ST	MRIWU
Humpback whale	S Africa (S Coast)	1	Y	S,C	MRIWU
Atlantic Ocean bottlenose dolphin	S Africa (S coast)	1	Y	S,T,G,P,K, ST	MRIWU
Common dolphin spp.	S Africa (S Coast)	1	Y	Frozen	MRIWU
Southern right whale	S Africa (S Coast)	1	Y	S	MRIWU
Humpback whale	Namibia	1	Y	S,C	MFMR, Namibia
Southern right whale	S Africa (S Coast)	1	Y	S,W	MRIWU
Southern right whale	S Africa (S Coast)	1	Y	S,W	MRIWU
Humpback whale	S Africa (W Coast)	1	Y	S,B,W,C	MRIWU

S=skin, B=blubber, T=teeth, W=baleen, G=gonads, C=ext parasites, P=internal parasites, K=skeletal remains, A=pathology samples, CV=cardiovascular systems, ST= stomach

4.4 ***Analyses/development of techniques***

MRIWU

A morphometric study of *Delphinus* in South African waters was completed in association with Dr T. Samaai, University of Durban-Westville

Tissue samples from 52 dusky dolphins were sent to Dr M.C. Milinkovitch, Free University of Brussels, in a cooperative study of dusky dolphin phylogenetics.

Tissue samples from 18 dwarf sperm whales were sent to Dr S. Chivers, National Marine Fisheries Service, USA, in a cooperative study of pygmy and dwarf sperm whale phylogenetics.

Tissue samples from 113 humpback whales and 1 blue whale (*Balaenoptera musculus)* were sent to Dr H. Rosenbaum, American Museum of Natural History, in a cooperative study of humpback whale population genetics.

DEAT
Tissue samples from 101 humpback whales were sent to Dr H. Rosenbaum, American Museum of Natural History, in a cooperative study of humpback whale population genetics.

UKZNW
Skin samples of Indian Ocean bottlenose dolphins are being analysed for genetic studies at the University of Durham, U.K., by Dr. R. Hoelzel and A. Natoli. Skin samples of Indo-pacific humpback dolphins are being analysed as part of a worldwide genetic analysis of Sousa at the American Museum of Natural History, U.S.A., by Dr. H. Rosenbaum. Biological samples for all species have been accessioned into the marine mammal collection of the Port Elizabeth Museum.

5. Pollution studies
UKZNW
Samples of blubber from all bycatch and stranded animals are stored at UKZNW for pollution studies. A study analysing long-beaked common dolphin samples was completed as a post-doc study by Dr. D. Wagner (UKZN – Westville campus).

6. Statistics for large cetaceans
6.1 For the calendar year 2003

		Directed catch		Incidental catch			
Species	**Area/stock**	**Reported**	**Est. total**	**Reported**	**Est. total**	**Released alive**	**Source***
Humpback whale	KwaZulu-Natal	0		8	8	8	Shark nets
Southern right whale	KwaZulu-Natal	0		6	6	6	Shark nets
Suspected whale * (unknown species)	KwaZulu-Natal	0		42	42	42	Shark nets

* These data are for holes found in the shark nets that are attributed to possible whale damage.

6.2 Other non-natural mortality for the calendar year 2001
None

7. Statistics for small cetaceans
7.1 For the calendar year 2003

		Directed catch		Incidental mortality			Live-capture
Species	Area/stock	Reported	Est. total	Reported	Est. total	Source*	Reported
Indian Ocean bottlenose dolphin	KwaZulu-Natal	0		36	36	Shark nets	
Indo-Pacific humpback dolphin	KwaZulu-Natal	0		3	3	Shark nets	
Long-beaked common dolphin	KwaZulu-Natal	0		31	31	Shark nets	

8. Strandings

The MRI Whale Unit, c/o South African Museum, Box 61, Cape Town, and the Department of Environmental Affairs and Tourism, P. Bag X2, Cape Town, attend strandings in the Western and Northern Cape; the Port Elizabeth Museum and Centre for Dolphin Studies attend strandings in the Eastern Cape; and Natal Sharks Board, P. Bag 2, Umhlanga Rocks, and Durban Sea World, P.O. Box 10712, Marine Parade, attend strandings in Kwa-Zulu Natal.

9. Other studies and analyses

NSB and UKZNW

The Natal Sharks Board is experimenting with active acoustic devices (pingers), ellipsoidal air-filled floats (sonar reflectors), time-area closure of the fishery and drum-lines (baited hooks) as bycatch mitigation measures to reduce cetacean captures. Attempts have been made to obtain whale alarms to reduce large cetacean entanglements in the shark nets.

An anatomical study of dolphin dorsal fins is being conducted with Prof. T. Lingham-Soliar, University of KwaZulu-Natal (Westville).

UCT

Multi-species modelling approaches, in particular for application to interactions between major predators and krill in the Antarctic ecosystem - Mori, Butterworth, Plaganyi.

Estimating Southern Hemisphere humpback whale population dynamics - Johnston, Butterworth.

Contributing to the process of developing and running Implementation Simulation Trials for the Eastern North Pacific gray whale AWMP - Butterworth, Johnston.

Updating assessments for Central North Atlantic stocks of fin and minke whales - Cunningham, Butterworth.

Developing initial projections for simple population models with diffusive mixing between West Greenland and Central North Atlantic stocks of fin and minke whales. - Butterworth, Rademeyer, Cunningham

10. Literature cited

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11. Publications

11.1 Published or In press papers only

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Griffiths, C.L., van Sittert, L., Best, P.B., Brown, A.C., Clark, B.M., Cook, P.A., Crawford, R.J.M., David, J.H.M., Davies, B.R., Griffiths, M.H., Hutchings, K., Jerardino, A., Kruger, N., Lamberth, S., Leslie, R., Melville-Smith , R., Tarr, R., and van der Lingen, C.D. 2004. Impacts of human activities on marine animal life in the Benguela – an historical overview. *Oceanogr mar. Biol. Ann. Rev.*: 325-415.

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