

# France. Progress report on cetacean research, January 2007 to December 2007, with statistical data for the calendar year 2007.

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**1. SPECIES AND STOCKS STUDIED**

IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Cetaceans	<i>Cetacea</i>	Northeast Atlantic, Mediterranean, Caribbean, South West Indian, New Caledonia, French Polynesia, Southern Ocean	2.1;2.2;4.3;4.4;8;9
Humpback whale	<i>Megaptera novaeangliae</i>	Caribbean, Mayotte et Réunion/stock C, New Caledonia/stock E2, French Polynesia/stock F	2.1;2.2;3.1;3.2;4.1;4.4;8;9
Blue whale	<i>Balaenoptera musculus</i>	Southern ocean	9
Fin whale	<i>Balaenoptera physalus</i>	Northeast Atlantic, Mediterranean	2.1;2.2;3.1;4.1;5;6.3;8;9
Common minke whale	<i>Balaenoptera acutorostrata</i>	Northeast Atlantic, New Caledonia, Caribbean	2.1;4.3;8
Sperm whale	<i>Physeter macrocephalus</i>	Northeast Atlantic, Mediterranean, Caribbean, Réunion	2.1;2.1;3.1;3.2;4.1;4.3;4.4;5;6.3;8;9
Pygmy sperm whale	<i>Kogia breviceps</i>	Northeast Atlantic, Caribbean, Mayotte, New Caledonia	2.1;4.3;8
Dwarf sperm whale	<i>Kogia sima</i>	Caribbean, Mayotte	2.1
Beaked whale	<i>Mesoplodon spp.</i>	Northeast Atlantic, Caribbean, Mayotte	2.1;2.2;3.1;4.4;8
Blainville's beaked w.	<i>Mesoplodon densirostris</i>	Mayotte	2.1
True's beaked whale	<i>Mesopodon mirus</i>	Réunion	4.3
Gervais's beaked whale	<i>Mesoplodon europaeus</i>	Caribbean	2.1;4.3
Sowerby's beaked whale	<i>Mesoplodon bidens</i>	Northeast Atlantic	2.1;4.3;8
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	Northeast Atlantic, Mediterranean, Caribbean	2.1;2.2;4.3;8
Delphinids	<i>Delphinidae</i>	Caribbean, Mediterranean, Mayotte, Réunion	2.1;2.2;3.1;3.2;4.1;4.4;5;8;9
Killer whale	<i>Orcinus orca</i>	Caribbean, Southern Ocean	3.1;3.2;5
False killer whale	<i>Pseudorca crassidens</i>	Caribbean	2.1;3.1
Pygmy killer whale	<i>Feresa attenuate</i>	Caribbean, New Caledonia	2.1;4.3;8
Long-finned pilot whale	<i>Globicephala melas</i>	Northeast Atlantic, Mediterranean	2.1;2.2;3.1;4.1;4.3;4.4;5;7.3;8;9
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Caribbean, Réunion, New Caledonia	2.1;3.1;4.3;9
Melon-headed whale	<i>Peponocephala electra</i>	Caribbean, Mayotte, Réunion	2.1;3.1;3.2
Risso's dolphin	<i>Grampus griseus</i>	Northeast Atlantic, Mediterranean, Caribbean, Mayotte	2.1;2.2;3.1;4.4;5;8
Common bottlenose dolphin	<i>Tursiops truncatus</i>	Northeast Atlantic, Mediterranean, Caribbean, Réunion	2.1;2.2;3.1;4.3;7.3;8
Indian Ocean bottlenose dolphin	<i>Tursiops aduncus</i>	Mayotte, Réunion, New Caledonia	2.1;2.2;3.2;4.4
Rough-toothed dolphin	<i>Steno bredanensis</i>	Caribbean, New Caledonia	3.1;9
Indo-Pacific humpback dolphin	<i>Sousa chinensis</i>	Mayotte	2.1,4.4
White-sided dolphin	<i>Lagenorhynchus acutus</i>	Northeast Atlantic	8
White-beaked dolphin	<i>Lagenorhynchus albirostris</i>	Northeast Atlantic	8
Fraser's dolphin	<i>Lagenodelphis hosei</i>	Caribbean, Mayotte, Réunion	2.1;3.1;4.3
Short-beaked common dolphin	<i>Delphinus delphis</i>	Northeast Atlantic, Mediterranean	2.1;2.2;4.2;4.3;4.4;7.3;8.9
Striped dolphin	<i>Stenella coeruleoalba</i>	Northeast Atlantic, Mediterranean, Caribbean	2.1;2.2;3.1;4.3;7.3;8;9
Pan-tropical spotted dolphin	<i>Stenella attenuate</i>	Caribbean, Mayotte, Réunion	2.1;2.2;3.1;8
Atlantic spotted dolphin	<i>Stenella frontalis</i>	Caribbean	2.1;4.3
Spinner dolphin	<i>Stenella longirostris</i>	Caribbean, Mayotte, Réunion, New Caledonia	2.1;2.2;3.1;4.3;8
Clymene dolphin	<i>Stenella clymene</i>	Caribbean	8
Harbour porpoise	<i>Phocoena phocoena</i>	Northeast Atlantic	2.1;4.2;4.3;4.4;7.3;8

## 2. SIGHTINGS DATA

### 2.1 Field work

#### 2.1.1 Systematic

*North-east Atlantic* - Cetacean distributions were surveyed over the shelf of the Bay of Biscay (May) and English Channel (January) by CRMM/ULR and LIENSs/ULR in order to determine relative abundances, preferential habitats and relationships with distribution of small pelagic fish as determined by simultaneous acoustic survey carried out by *Ifremer/ Instituto Español de Oceanografía* (IEO) research vessel *Thalassa*. This survey followed a standardized protocol in use since 2003 in Bay of Biscay area (PELGAS survey) and since 2007 in the English Channel (IBTS survey). In 2007, collaboration between CRMM/ULR and the *Centro Oceanográfico de Vigo* (IEO) allowed data on cetacean distribution to be collected by using standardized protocol and same research vessel during April and September pelagic fish survey in the south of the Bay of Biscay (PELACUS survey).

CRMM/ULR took part in the CODA project (Cetacean Offshore Distribution and Abundance) supervised by Sea Mammal Research Unit (University of St Andrews – Scotland).

Cetaceans at sea were recorded under standardized conditions of line transects in the Bay of Biscay year round (MNHN /CMCB). This monitoring is a long-term study (since 1976) of abundance and distribution at sea of seabirds and cetaceans made from vessels of *Douanes Françaises* and *Affaires Maritimes* (Custom and Coast Guard vessels).

Systematic summer and winter surveys of coastal bottlenose dolphins were carried out along the coast of western Brittany (LEMM), along the Normandy coast (GECC, GMN).

*Mediterranean* - Systematic summer and winter surveys of coastal common bottlenose dolphins were carried out along the coast of Corsica (GCEM). The same species was also studied in three Natura 2000 protected areas by a year-round survey (66 trips, 67 sightings, 4515 km), and in the Hyères archipelago, Provence (opportunistic data collected from the ferries and the wardens of Port-Cros National Park).

Striped dolphins off the coastal area close to Antibes were studied during 25 surveys (983km, 37 sightings) conducted for focal sampling (CRC).

Two summer surveys were conducted in June and September (2344 km 136 sightings) in the NW Mediterranean Sea to collect biopsies of sperm whales, Risso's dolphins and pilot whales. Before any sightings of target species, classic linear transect with visual observers and acoustic sampling were conducted.

Fin whales and common bottlenose dolphins were surveyed around Corsica, NW Mediterranean, in July 2007, with transect lines and photo-identification being performed (BREACH and GCEM). Fin whales and common bottlenose dolphins were surveyed around *Golfe du Lion*, NW Mediterranean, in April 2007 to determine abundance and distribution by using transect lines and photo-ID (BREACH and EPHE).

Both boat-based and aerial surveys have been conducted off the French Mediterranean coasts from early January to December 2007 (écoOcéan Institut). These surveys were dedicated to studying the distribution of cetaceans in relation to environmental variables, and also to study the maritime traffic distribution, commercial vessels and leisure boats, in cetacean habitats.

Sperm whales were surveyed in the Ligurian and Tyrrhenian Seas from March-November 2007 and Cuvier's beaked whales in June-July 2007 NW Mediterranean Sea, with a focus on behaviour and acoustics (GREC).

*Caribbean* - Sperm whales, humpback whales and other cetaceans were surveyed along the leeward coast of Guadeloupe year-round from a research sailing boat (AET). Data from a whale watch motor boat and off Dominica were also collected. In February 2007 and December 2007, a cetacean abundance and distribution study surveyed off Guadeloupe by using transect lines and acoustics (BREACH).

In 2007, delphinids, beaked whales and sperm whales were surveyed in territorial waters off Martinique, during the hurricane season, from late August to early September (SEPANMAR). Linear sampling legs were conducted both leeward and windward around this island by using a catamaran sailing boat. A particular focus was done on foraging and mating habitats used by sperm whales and local delphinids also considering major man-induced threats. Many photographs were undertaken to identify individuals that inhabit coastal waters where two large hurricanes (Dean and Félix) enhanced local blooms.

*South-west Indian* - Both boat-based and aerial surveys have been conducted in the water surrounding the island of Mayotte (lagonal water and adjacent oceanic waters from May to December 2007) by OMM. Targeted species were mostly delphinids, but other toothed whales were also recorded (Kogiidae, Ziphiidae). Boat-based surveys were dedicated to studying the distribution of delphinids in relation to environmental variables. Focal-follows looking at habitat use and social organisation were conducted on spinner, pantropical spotted and Indian Ocean bottlenose dolphins (OMM). Aerial surveys were conducted over the lagoon of Mayotte from August to November with a focus on humpback whales and in February and October targeting delphinids (OMM).

Boat based surveys have been conducted off the western and southern coast of Reunion all year round (GLOBICE), with focus on species diversity and distribution. Land based survey were conducted from Tromelin (Iles Eparses) in September-October 2007.

*New Caledonia* - Both boat based and land based surveys were conducted from July 12th - September 19th 2007, in the southern lagoon of New Caledonia (OCNC). Targeted species was mainly humpback whales (sub-stock E2). This reproductive ground was surveyed using a small motor boat. Land based surveys used a theodolite to collect data on interactions between whales and boats.

*Polynesia* - Humpback whales were surveyed in French Polynesia from September-November 2007 (songs recorded).

*Southern ocean* - All cetaceans were surveyed in the summer along the routes of the supply vessel *Marion-Dufresnes* between Réunion Island and the French research stations of the Southern Indian Ocean: Crozet, Kerguelen and Amsterdam (CEBC).

Target species	Date	Area	Methods / Effort	No. of sightings	Contact person /institute and references
Common bottlenose dolphin	summer	Normandy	Boat based surveys	In progress	G. Mauger (GECC)
Common bottlenose dolphin	Year round	Normandy	Boat based surveys	In progress	GMN
Cetaceans	January	English Channel	Standardized surveys	1 <sup>s</sup>	O.Van Canneyt (CRMM/ULR)
Cetaceans	April-May	Bay of Biscay	Standardized surveys	63 <sup>s</sup>	O.Van Canneyt (CRMM/ULR)
Cetaceans	September-October	Bay of Biscay	Standardized surveys	49 <sup>s</sup>	O.Van Canneyt (CRMM/ULR)
Cetaceans	Year round	Bay of Biscay	Standardized surveys	In progress	G. Hémerly & I. Castège (MNHN/CMCB)
Cuvier's beaked whale	July	Western Mediterranean	Sailboat	13	A.Gannier (GREC)
Odontocetes	March-November	NW Mediterranean	Sailboat	151	A.Gannier (GREC)
Sperm whale, long-finned pilot whale, Risso's dolphin	June and September	NW Mediterranean	Sailing boat / Linear transect survey	136	S. Laran (CRC)
Striped dolphin	January to December	Cap of Antibes-Cap Ferrat/ NW Mediterranean	Sailing boat/ Focal surveys	37	A.M. Meissner (CRC)
Common bottlenose dolphin	Year round	Corsica/ NW Mediterranean	Boat based surveys / 4515 km	67	F.Dhermain (GECEM)
Cetaceans	Year round	NW Mediterranean	Boat based and aerial surveys	In progress	L. David (écoOcéan Institut)
Cetaceans	July 2007	Corsica/ NW Mediterranean	Standardized survey	32 <sup>o</sup>	N. Gandilhon, (BREACH)
Cetaceans	April 2007	Golfe du Lion/ NW Mediterranean	Standardized survey/ 934 km <sup>2</sup>	14 <sup>o</sup>	N. Gandilhon, (BREACH)
Cetaceans	Year round	Guadeloupe/ Caribbean	Boat based survey	188 <sup>s</sup>	C. & R. Rinaldi (AET)
Cetaceans	February 2007, December 2007	Guadeloupe/ Caribbean	Standardized survey/ 2932 km <sup>2</sup>	15 <sup>o</sup>	N. Gandilhon, (BREACH)
Cetaceans	August September	Martinique/ Caribbean	Sailing boat survey / 815 km	22 <sup>o</sup>	S. Jérémie (SEPANMAR)
Delphinids	May to December 2007	Mayotte/ SW Indian	Boat-based surveys / 146 hours	87 <sup>#</sup>	J. Kiszka (OMM)
Delphinids	February and October 2007	Mayotte/ SW Indian	Aerial surveys	12 <sup>*</sup>	C. Pusineri (OMM)
Humpback whale	August to November 2007	Mayotte/ SW Indian	Aerial surveys	16 <sup>o</sup>	J. Wickel (OMM)
Cetaceans	Year round	Réunion/ SW Indian	Boat based surveys	80	V. Boucaud (GLOBICE)
Humpback whale	July to November 2007	New Caledonia	Boat based surveys/ 334 hours Land based surveys/ 308 hours	250 whales 187 pods	C. Garrigue (OCNC)

Humpback whale	Sept. to Nov. 2007	Society islands/ French Polynesia	Boat surveys	25	R. Holler (GREC/TPE)
Cetaceans	Austral summer	Southern Indian Ocean	Boat based	In progress	C. Guinet (CEBC)
Cetaceans	Year round	Crozet and Kerguelen Islands	Land and fishing-boat based	In progress	C. Guinet (CEBC)

§ constituted of 3 common minke w., 11 fin w., 1 unidentified w., 3 sperm w., 1 Sowerby's b. w., 13 long-finned pilot w., 1 harbour p., 46 short-beaked common d., 26 common bottlenose d., 1 striped d. and 5 unidentified d.

∞ constituted of 4 fin w., 1 sperm w., 8 common bottlenose d. and 19 striped d.

∅ constituted of 6 fin w., 1 common bottlenose d. and 7 striped d.

§ constituted of 8 humpback w., 114 sperm w., 1 dwarf or pygmy sperm w., 1 Cuvier's b. w., 2 Gervais's b. w., 4 pygmy killer w., 1 melon-headed w., 8 Fraser's d., 4 common bottlenose d., 43 pan-tropical spotted d., 1 striped d., 1 false killer w.

© constituted of 1 humpback w., 1 sperm w., 2 dwarf sperm w., 1 beaked w., 1 pygmy sperm w., 1 common bottlenose d., 6 pan-tropical spotted d., 1 Atlantic spotted d. and 1 spinner d.

@ constituted of 3 sperm w., 1 *Mesoplodon* sp., 3 delphinids, 2 common bottlenose d., 2 Fraser's d., 7 pantropical spotted d., 2 Atlantic spotted, 2 short-finned pilot w.

# constituted of 3 short-finned pilot w., 1 dwarf sperm w., 1 Blainville's beaked w., 1 Indo-pacific humpback d., 18 pantropical spotted d., 39 spinner d., 23 Indian Ocean bottlenose d., 1 common bottlenose d.

\* constituted of 6 spinner/pantropical spotted d., 3 Indian Ocean bottlenose d., 3 humpback w.

° constituted of 12 humpback w., 4 Indian Ocean bottlenose d.

### 2.1.2 Opportunistic, platforms of opportunity

*North-east Atlantic* - A ferry from Brest (France) to Cork (Ireland) is used as a platform of opportunity to survey cetaceans across Celtic Sea (LEMM). The same methodology is also applied along two ferry routes across English Channel from Saint-Malo and from Caen to Portsmouth (GMN).

*Mediterranean* - A ferry from Marseille (France) to Bejaia (Algeria) was used to survey fin whales and other cetaceans across western Mediterranean (CEBC).

The *Pelagos* sanctuary, NW Mediterranean, and ACCOBAMS will jointly deliver a label to whale-watching operators that will allow cetacean observers to use these vessels as platforms of opportunity under coordination by SDE.

*Caribbean* - Cetacean sightings were collected from a whale watch motor boat off leeward coast of Guadeloupe (AET). Data from St Barthelemy and St Martin were also collected by St Barthelemy Natural Reserve, *St Barth Cétacés* as well as the Natural Reserve of St Martin, and compiled by AET. An observatory has been created with currently 8 active members collecting cetacean documented sightings around Guadeloupe (BREACH). In Martinique, a fishermen network has provided encounter data (simple sighting) from small motor boats, mostly reporting the presence of sperm whales, short-finned pilot whales and Atlantic spotted dolphins (SEPANMAR).

Primary species	Area	Data type/method	Collected by	Platform	Location of archive	Contact person/institute and refs
Cetaceans	various areas of the Channel	opportunistic sightings	public, customs, scientists	Boat based	GECC	G. Mauger (GECC)
Cetaceans	Normandy	opportunistic sightings	GMN	Land, whale watching vessel, ferry	GMN	GMN
Cetaceans	Celtic Sea	Sightings	LEMM	Ferry	LEMM	S. Hassani (LEMM)
Common bottlenose dolphin	Hyères archipelago/ NW Mediterranean	opportunistic sightings	Data from fishermen, ferries and National Park wardens	Boat based	GECEM	F. Dhermain (GECEM)
Cetaceans	Mediterranean	Opportunistic sightings	French Customs	Aircraft and boat	CRC and Customs	S. Laran (CRC)
Fin whale <sup>§</sup>	Mediterranean Sea	Sightings	Scientists	Ferries	CEBC-COM	C. Cotté (CEBC)
Cetaceans <sup>§</sup>	Guadeloupe	Sightings	AET	Whale watching boat	AET	C. & R. Rinaldi (AET)
Humpback whales	St Barthélémy St Martin	Opportunistic sightings	Staff of St Martin and St Bartélémy natural reserves	Sea users	AET	C. & R. Rinaldi (AET) and contributors*

Cetaceans <sup>%</sup>	Martinique	Opportunistic sightings	Fishermen	Fishing boats Ferries	SEPANMAR	S. Jérémie (SEPANMAR)
Cetaceans	New Caledonia	Opportunistic sightings	Public, scientist	Various types of platform	OCNC	C. Garrigue (OCNC)
Humpback whale	French Polynesia	Acoustic data	Rodolphe Holler	Inflatable/small boat	GREC	A. Gannier (GREC)
Cetaceans	Guadeloupe	Sightings	BREACH	Whale-watch boats, sailing boats ...	BREACH	N. Gandilhon, (BREACH)

<sup>§</sup> also include sightings of striped and short-beaked common dolphins.

<sup>§</sup> constituted of 7 humpback w., 133 sperm w., 1 dwarf sperm w., 2 Gervais's b.w., 5 false killer w., 6 short-finned pilot w., 3 common bottlenose d., 17 Fraser's d., 101 pan-tropical spotted d., 1 striped d., 1 melon head d., 1 atlantic spotted d.

<sup>%</sup> constituted of 3 short-finned pilot w., 5 sperm w., 2 pan-tropical spotted d.

## 2.2 Analyses/development of techniques

Distribution patterns and relative abundance of small cetaceans were analysed in the Bay of Biscay from past aerial and boat-based surveys (LIENSs/ULR; Kiszka *et al.*, 2008; Certain, 2007; Certain *et al.*, *in press*).

Habitat modelling of sperm whale, long-finned pilot whale, Risso's dolphin (Praca and Gannier, 2008) and fin whale (Laran and Gannier, 2008) in the NW Mediterranean sea was conducted (CRC). Striped dolphins' distribution in coastal habitats was studied by using generalised additive modelling techniques (CRC).

Summer surveys from 1998 to 2005 were used to model habitat suitability of sperm whale, long-finned pilot whale and Risso's dolphin in the NW Mediterranean sea (CRC). Similarly, the distribution of fin whales was investigated along with environmental parameters in order to model their distribution in the NW Mediterranean. Distribution patterns, relative abundance, habitat preferences and risk assessment areas for collision and disturbance for cetaceans are currently analysed in the NW Mediterranean (écoOcéan Institut). Distribution, relative abundance and preferential habitat of cetaceans are currently analysed in *Golfe du Lion* (BREACH).

Photo ID analyses are under process for Guadeloupe and neighbouring islands (fidelity, movements, association between individuals; AET). Distribution, relative abundance and preferential habitat of cetaceans are currently analysed around Guadeloupe (BREACH). Relative abundance and distribution trends of small delphinids and sperm whales were assessed in territorial waters off Martinique from a sail-ship survey (SEPANMAR). Acoustics records highlighted both the paucity of within and among schools interactions and, a low abundance during the hurricane season. Analyses are underway to determine the impact of seasonal acoustic pollution on local movement pathway of resident groups. Creak counting is also a tool to understand sperm whales feeding habits. A catalogue of photographs is currently performed to compare abundance of sperm whales among Caribbean archipelago and to study habitat use and site fidelity by schools as well as group composition.

Distribution, habitat, relative abundance and social structure of delphinids are currently analysed around Mayotte (OMM). Some insights of habitat partitioning among delphinids have been investigated (Gross *et al.*, submitted). Species diversity and distribution data collected from 2004 to 2007 off Reunion were analysed (GLOBICE; Dulau-Drouot *et al.*, *in press*). Photo-identification data analysis of Indian Ocean bottlenose dolphin is in progress.

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Delphinids <sup>§</sup>	winter	Bay of Biscay	Aerial and boat based surveys	Relative abundance and spatial analysis	O. Van Canneyt (CRMM/ULR)
Sperm whale	June, July, October	Western Mediterranean	Creak counting in acoustic records	Feeding/IPI	A. Gannier (GREC)
Sperm whales, Delphinids	August, September	Martinique/ Caribbean	Creak counting Surveys and photo-ID	Feeding/IPI Abundance, site fidelity School composition	S. Jérémie (SEPANMAR)
Sperm whale*	Year round	Guadeloupe/ Caribbean	Surveys and photo-ID	Local abundance, distribution, site fidelity and group composition	C. & R. Rinaldi/AET
Fin whale	Year round	Mediterranean	Line transect survey	Distribution, relative abundance	C. Cotté (CEBC)
Sperm whale, long-finned pilot whale, Risso's dolphin	June, September	NW Mediterranean	Line transect	Distribution, relative abundance, biopsies and photo-ID	S. Laran (CRC)
Cetaceans	1991-2007	NW Mediterranean	Aerial and boat based surveys, photo-ID, genetic	Distribution, relative abundance, habitat preference, risk	L. David (écoOcéan Institut)

			and pollutants	assessment areas	
Delphinids	February and October 2007	Mayotte/SW Indian	Aerial survey / 24 hours of observation effort	Distribution / group composition / relative abundance	C. Pusineri (OMM)
Humpback whale	August to November 2007	Mayotte/SW Indian	Aerial survey / 15 hours of observation effort	Distribution / group composition / relative abundance	J. Wickel (OMM)
Delphinids <sup>#</sup>	May to December 2007	Mayotte/SW Indian	Boat-based surveys / 146 hours	Distribution / group structure / behaviour	J. Kiszka (OMM)
Cetacean	Year round	Réunion/SW Indian	Boat-based survey (388 hours of observation effort) and photo-ID	Distribution	V. Dulau-Drouot (GLOBICE)
Humpback whales	1999-2007	Oceania and East Australia	Photo-ID comparison	Rates of exchange	C. Garrigue (OCNC)
Cuvier's beaked whale	July 2007	Mediterranean	Acoustic behaviour	Click rate	A. Gannier (GREC)
Delphinids	Sept-Dec 07	Mediterranean	Acoustic classification	Whistles contours	A. Gannier (GREC)
Fin Whale, Common bottlenose dolphins	2005- April 2007	Golfe du Lion/NW Mediterranean	Line transect survey and photo-ID	Local abundance, Distribution / individuals recognition	N. Gandilhon & G. Azzinari (BREACH)
Fin Whale, Common bottlenose dolphins	July 2007	Corsica/NW Mediterranean	Line transect survey and photo-ID	Local abundance, distribution / individuals recognition	N. Gandilhon & A. Tasciotti (BREACH & GECEM)
Delphinids, ziphiidae, Humpback whales	February 2007, December 2007	Guadeloupe/ Caribbean	Line transect and acoustic survey	Local abundance, distribution	N. Gandilhon & E. Girou (BREACH/DIREN)

§ includes short-beaked common d., common bottlenose d.

\* includes sperm w., humpback w., beaked w., delphinids.

# includes Indian Ocean bottlenose d., spinner d., pan-tropical d.

### 3. MARKING DATA

#### 3.1 Field work

##### 3.1.1 Natural marking data

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Common bottlenose dolphin	Dorsal Fin	Normandy/NE Atlantic	In progress	Y	In progress	G. Mauger (GECC)
Common bottlenose dolphin	Dorsal fin	Channel/NE Atlantic	In progress	Y	In progress	GMN
Long-finned pilot whale	Dorsal fin	Bay of Biscay/NE Atlantic	19	Y	107	O. Van Canneyt (CRMM/ULR)
Risso's dolphin	Dorsal fin and body	Western Mediterranean	38	Y	In progress	A. Gannier (GREC)
Sperm whale	Fluke	Western Mediterranean	14	Y	166	A. Gannier (GREC)
Common bottlenose dolphin	Dorsal fin	Corsica/NW Mediterranean	2245 selected pictures	Y	206	F. Dhermain (GECEM)
Common bottlenose dolphin	Dorsal fin	Provence/ NW Mediterranean	295 selected pictures	Y	43	F. Dhermain (GECEM)
Fin whale, Risso's dolphin	Dorsal fins / sides	NW Mediterranean	In progress	Y	In progress	L. David (écoOcéan Institut)
Common bottlenose dolphin	Dorsal fin	Corsica/ NW Mediterranean	In progress	N	In progress	(BREACH and GECEM)
Sperm whale	Fluke	NW Mediterranean	In progress (c.10)	N	In progress	S. Laran (CRC)

Common bottlenose dolphin	Dorsal fin	NW Mediterranean	In progress (c. 10)	N	In progress	S. Laran (CRC)
Long-finned pilot whale	Dorsal fin	NW Mediterranean	In progress (c. 15)	N	In progress	S. Laran (CRC)
Fin whale	Right sides	NW Mediterranean	In progress	Y	In progress	N. Gandilhon, (BREACH)
Common bottlenose dolphin	Dorsal fin	<i>Golfe du Lion</i> / NW Mediterranean	> 12	Y	In progress	N. Gandilhon (BREACH)
Common bottlenose dolphin	Dorsal fin	Guadeloupe / Caribbean	17	Y	In progress	N. Gandilhon (BREACH)
Humpback whale	Ventral fluke	Guadeloupe, St Barthélémy and Montserrat/Caribbean	4	Y	29	C. & R. Rinaldi (AET)*
Sperm whale	Ventral fluke	Guadeloupe & Dominica/Caribbean	204 pict. / 54 ind.	Y	207	C. & R. Rinaldi (AET)
Common bottlenose dolphin	Dorsal fin	St Martin/Caribbean	In progress	Y	In progress	C. & R. Rinaldi (AET)**
Beaked whales and delphinids <sup>§</sup>	Dorsal fins / sides	Guadeloupe/Caribbean	41	Y	155	C. & R. Rinaldi (AET)
Sperm whale	Fluke	Martinique/Caribbean	In progress	Y	>20	SEPANMAR / GREC
Delphinids	Dorsal fin	Martinique/Caribbean	In progress	Y	> 20	SEPANMAR / GREC
Delphinids <sup>#</sup>	Dorsal fin	Mayotte/SW Indian	In progress	Y	In progress	J. Kiszka & C. Pusineri
Indian Ocean bottlenose dolphin	Dorsal fin	Réunion/SW Indian	In progress	Y	In progress	V. Dulau-Drouot (OCNC)
Humpback whale	Fluke and dorsal fin	Réunion/SW Indian	In progress	Y	In progress	V. Dulau-Drouot (OCNC)
Humpback whale	Fluke	New Caledonia/sub-stock E2	72 <sup>©</sup>	Y	504	C. Garrigue (OCNC)
Humpback whale	Ventral fluke	Guadeloupe/ Caribbean	In progress	Y	In progress	N. Gandilhon (BREACH)
Indian ocean bottlenose dolphin	Dorsal fin	New Caledonia	In progress	Y	80	C. Garrigue (OCNC)
Sperm whale	Fluke and dorsal fin	Crozet & Kerguelen/ Southern Ocean	6500	Y	80	C. Guinet (CEBC)
Killer whale	Dorsal fin	Crozet & Kerguelen/ Southern Ocean	22500	Y	195	C. Guinet/CEBC

\* contributors: St Barth Cétacés

\*\* contributors: St Martin Natural Reserve

§ include beaked whales, killer w., pygmy killer w., short-finned pilot w., melon-headed w., common bottlenose d., pan-tropical spotted d., Fraser's d., false killer w., striped d., spinner d., rough-toothed d.

# include melon-headed w., Risso's d., spinner d., pan-tropical spotted d., Indian Ocean bottlenose d.

© new individual fluke ID collected in 2007.

### 3.1.2. Artificial marking data

None deployed.

### 3.1.3 Telemetry data

Species	Tag type	No. successfully deployed	Maximum time transmitting	Contact person/institute; refs
Humpback whales	Argos satellite tag	12	52 days	C.Garrigue (OCNC)

A total of 12 satellite tags were deployed on humpback whales last winter in New Caledonia in order to identify breeding areas and migration routes. The project is a collaboration between Operation Cetaces in New

Caledonia, the U.S. National Marine Mammal Lab (Dr Alex Zerbini and Dr Phil Clapham), and Instituto Aqualie (Ygor Geyer, Rio de Janeiro). The work was primarily financed by Greenpeace International as part of a scientific collaboration.

### 3.2 Analyses/development of techniques

AET carries out specific studies on sperm whales off Guadeloupe: analysis of surface behaviours, blow sequences, inter-individual associations and fidelity, maternal calves, impacts of human activities. Sperm whale abundance estimates are being carried out around Guadeloupe archipelago (AET), by using capture-mark-recapture methodologies (CMR) from photo-identification data. Additionally, studies of fidelity and individual associations are also conducted. A similar work is under way on delphinids and humpback whales in the same area and off St Barthélemy. AET also participates to the NAMSC catalogue to match flukes of sperm whales and, similarly, to the North Atlantic Humpback Whales catalogue. A regional catalogue for both these species and for small cetaceans is in progress with data collected from Guadeloupe and neighbouring islands.

Inter-individual associations are under study for Indian Ocean bottlenose dolphins and melon-headed whales in Mayotte (OMM). For these species, abundance estimates using CMR analyses are underway as well. Residency, site fidelity, association and movement pattern are being studied for Indian Ocean bottlenose dolphin in Réunion, from photo-identification data (GLOBICE). Inter-annual comparison of humpback whale photo-ID are undertaken to assess site fidelity between years.

Demographic investigations based on humpback whale photo-identification have been conducted by OCNC. They included population size estimate based on CMR, home range in New Caledonia and migration events in the South Pacific. The comparison of 692 humpback whale flukes representing the Oceania catalogue have been compared with a selection of east Australia (EA) catalogue containing a total of 1242 flukes, including Hervey Bay on the northern and Byron Bay on the southern migration routes. Overall, there were seven documented movements between EA and Oceania. Four cases of individuals moving between EA and Oceania were documented, all between EA and the closest breeding grounds of New Caledonia. A further three movements were recorded between EA and the New Zealand migratory corridor. The Oceania Catalogue has also been recently compared to the Balleny island catalogue (Antarctic Area V); no match was found (Franklin *et al.*, 2008, SC/60/SH2). These exchange rates between the islands of Oceania and the east coast of Australia have been used to create a model of abundance in Oceania (Jackson *et al.*, 2008, SC/60/SH15).

Using the CMR methodologies, killer whales survival was found to decrease over time; however poaching vessels operating on Crozet archipelago between 1996 and 2000 (during which 90 % of illegal fishing took place) were also found to have a significant and additive negative impact on killer whales survivals (Tixier & Guinet, in prep), supporting the hypothesis that illegal fishing was responsible for the strong decline in the number of killer whales observed in Crozet archipelago between 1990 and 2000 (Poncelet *et al.*, 2008).

## 4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

### 4.1 Biopsy samples (summary only)

Species	Area/stock	Calendar year/season - no. collected	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Sperm whale	NW Mediterranean	June and Sept 2007	Y	6	8	S. Laran (CRC)
Long-finned pilot whale	NW Mediterranean	June and Sep 2007	Y	2	8	S. Laran (CRC)
Fin whale	North western Mediterranean	2006/2007	Y	>25	>25	L. David (écoOcéan Institut)
Delphinids	Mayotte/SW Indian	2007 / 22	Y	62	185	J.Kiszka (OMM)
Humpback whale*	New Caledonia	July-Sept 2007/150	Y	612	850	C.Garrigue (OCNC)

\* Most biopsy samples listed above were collected for genetic, fatty acid or isotope analyses.

Genotype matching have been conducted between samples collected by the South Pacific Whale Research Consortium throughout Oceania (N = 1065) including New Caledonia and those collected from Antarctic feeding grounds (N=214). Using 17 microsatellite loci, sex and mitochondrial DNA; the method revealed 5 matches representing migratory connections (SC/60/SH13). One match allowed the discovery of the first direct evidence of migration between New Caledonia and Area V.

#### 4.2 Samples from directed catches (commercial, aboriginal and scientific permits) or by-catches

Samples from by-caught small cetaceans collected onboard fishing boats were collected in the course of by-catch monitoring programmes in pelagic trawl and gill- or trammel net fisheries (CRMM/ULR).

Species	Area/stock	Tissue type(s)	No. Collected	Archived (Y/N)	No. analysed	Contact person/institute
Short-beaked common dolphin	Bay of Biscay and Channel/Northeast Atlantic	Various*	4	Y	In progress	O.Van Canneyt (CRMM/ULR)
Harbour porpoise	Bay of Biscay and Channel/Northeast Atlantic	Various*	11	Y	In progress	O.Van Canneyt (CRMM/ULR)

\* typically: skin, blubber, teeth, stomach, muscle, kidney, liver, gonads

#### 4.3 Samples from stranded animals

Species	Area/stock	Tissue type	No. Collected	Archived (Y/N)	No. analysed	Contact person/institute
Cetaceans <sup>§</sup>	Bay of Biscay and Channel/Northeast Atlantic	Various*	61 <sup>§</sup>	Y	In progress	O.Van Canneyt (CRMM/ULR)
Harbour porpoise	Channel/ Northeast Atlantic	Various*	2	Y	In progress	GMN
Cetaceans	Mediterranean	Various*	58	Y	In progress	F.Dhermain (GECEM)
Cetaceans <sup>§</sup>	Guadeloupe/Caribbean	Various*	3 <sup>§</sup>	Y	In progress	C.&R.Rinaldi (AET) <sup>§</sup>
Cetaceans <sup>μ</sup>	Martinique/Caribbean	Various*	10 <sup>μ</sup>	N	In progress	S.Jérémie (SEPANMAR)
Short-finned pilot whale	Réunion	Skeleton	3	Y	-	C. Jammes (GLOBICE)
True's beaked whale	Réunion	Blubber	3	N	-	C. Jammes (GLOBICE)
Cetaceans <sup>#</sup>	New Caledonia	Various**	7 <sup>#</sup>	Y	11	C.Garrigue (OCNC)

\* typically: teeth or baleen plates, skin, blubber, muscle, reproductive organs, stomach contents, kidney, liver.

\*\* typically: muscle, teeth, stomach contents, skin, liver, kidney.

§ includes 2 minke w., 1 sperm w., 4 Cuvier's b. w., 1 Sowerby's b. w., 2 long-finned pilot w., 34 short-beaked common d., 4 common bottlenose d., 12 striped d., 1 harbour p.

§ includes 1 pygmy sperm w., 1 spinner d., 1 common bottlenose d.; contributors: Guadeloupe Strandings Network

μ includes 1 Gervais's beaked w., 1 pygmy killer w., 1 Fraser's d., 1 Atlantic spotted d.

# includes 4 pygmy sperm w., 1 sperm w.

#### 4.4 Analyses/development of techniques

Biological parameters (age, reproductive status, diet, ...) and ecological markers (heavy metals, stable isotopes of N and C) analyses based on samples collected from stranded or by-caught animals are carried out to examine small cetacean population structure and ecology in the Bay of Biscay (LIENSs/ULR et CRMM/ULR) (Lahaye *et al.*, 2007a,b; Pusineri *et al.*, 2007; Pusineri *et al.*, *in press*; J. Spitz PhD thesis on going). Tissue samples of Cuvier's beaked whales were provided for a global phylogeographic study of the species (M. Dalebout). Tissue samples of common dolphin and harbour porpoise were provided for studies on population structure (M. Fontaine; K. Viaud; A. Viricel).

Trophic relationship of squid eating cetaceans (sperm whale, long-finned pilot whale, Risso's dolphin) and their prey inferred from stable isotope analysis (CRC) were analysed in collaboration with the University of Liège (Laboratory of Oceanology, E. Praca PhD thesis on going).

In Mayotte (OMM), trophic interactions between delphinids were investigated in collaboration with (LIENSs/ULR) by analysing stable isotopes (N and C) in biopsy samples (Gross *et al.*, submitted; J. Kiszka PhD thesis on going). Tissue samples for regional and global population studies were also provided for Indian Ocean bottlenose dolphins (collaboration with Stockholm University) and Indo-Pacific humpback dolphins (collaboration with American Museum of Natural History).

Tissue samples from New Caledonia were provided to LIENSs/ULR, France, for heavy metals analysis (P. Bustamante). Teeth were provided to CRMM/ULR for ageing (W. Dabin). Genetic analysis on skin samples are realised at Auckland University, NZ, and Oregon State University, USA (in collaboration with S. Baker).

### 5. POLLUTION STUDIES

Analyses of heavy metals are used to characterise sub-population structures and pattern in habitat and resource use by small cetacean in the Bay of Biscay rather than investigate their possible effect as pollutants.

Analyses of persistent organic pollutants (POPs) in Killer Whales from Crozet Archipelago were conducted and revealed that for the 11 individuals analysed toxic equivalent were below immunotoxicity and endocrine disruption threshold, but PCB concentrations exceeded some effect levels suggesting that organic contaminants cannot be ruled out as an additional threat to this declining population (Noel *et al.*, submitted).

Pollutants, trace metals and POP were analysed in biopsy samples (n=8) and skin and muscle of stranded squid eating cetaceans (sperm whale, long-finned pilot whale, Risso's dolphin) (CRC) in collaboration with the University of Liège (Laboratory for Oceanology, E. Praca PhD on going).

Analyses of organic pollutants (PCB, DDT, DDE, PBDE, HBCD, HAP) are in progress for fin whales biopsied in NW Mediterranean (écoOcéan Institut in partnership with WWF and LPTC, UMR 5255, Université de Bordeaux).

## 6. STATISTICS FOR LARGE CETACEANS

### 6.1 Corrections to earlier years' statistics for large whales

None.

### 6.2 Direct catches of large whales (commercial, aboriginal and scientific permits) for the calendar year 2006

None.

Species	Type of catch	Area/stock	Males	Females	Total landed	Struck and lost
N/A	N/A	N/A	0	0	0	0

### 6.3 Anthropogenic mortality of large whales for the calendar year 2007

#### 6.3.1 Observed or reported ship strikes of large whales (including non-fatal events)

Whale species	Sex	No.	Date	Location	Vessel type	Speed	Fate	How observed	Contact person/institute and refs
Fin whale	U	1	23/05/08	Eastern English Channel	U	U	D	French Navy	O. Van Canneyt (CRMM/ULR)
Fin whale	M	1	18/10/07	Eastern English Channel	U	U	D	French Navy and CRMM	O. Van Canneyt (CRMM/ULR)
Fin whale	F	1	08/06/07	Off Toulon/ NW Mediterranean	Aircraft-carrier	U	D	Crew	F. Dupraz (GECM)
Comments:									

The detectability of large whales from High Speed Ferries and from other ferries has been investigated in the aim of reducing strike risk (EPHE and SDE). This work was conducted within the limits of the *Pelagos* sanctuary, the international sanctuary for marine mammals in the northeastern Mediterranean, under a collaboration agreement with one of the main ferry companies operating from Nice and Marseille to Corsica. Another approach consists in training mariners and officers at *Ecole Nationale de la Marine Marchande* (National Shipping School in Marseille). Finally, the project REPCET is designed as to develop a tool that will inform in real time all vessels steaming in the area of the *Pelagos* sanctuary of the location of large whales reported by mariners themselves, so that they can adapt their route and speed accordingly.

#### 6.3.2 Fishery by-catch of large whales

Whale species	Sex	No	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
Sperm whale	U	1	18/06/07	Palavas/NW Mediterranean	D	U	U	Stranded, rope around tail	G. Astruc (EPHE)
Fin whale	F (young)	1	17/10/07	Marseille/NW Mediterranean	D	<i>Mullus surmuletus</i>	GNS	Caught in net	F. Dhermain (GECM)
Comments:									

## 7. STATISTICS FOR SMALL CETACEANS

### 7.1 Corrections to earlier years' statistics for small cetaceans

None.

**7.2 Direct catches of small cetaceans for the calendar year 2007**

None.

Species	Type of catch	Area/stock	Males	Females	Total landed	Struck and lost
N/A	N/A	N/A	0	0	0	0

**7.3 Anthropogenic mortality of small cetaceans for the calendar year 2006****7.3.1 Observed or reported ship strikes of small cetaceans (including non fatal events)**

None reported.

Species	Sex	No.	Date	Location	Vessel type	Speed	Fate	How observed	Contact person/ institute and refs
N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**7.3.2 Fishery bycatch of small cetaceans**

Species	Sex	No.	Date	Location	Fate	Targeted fish species	Gear	How observed ?	Source or contact
Common dolphin	N/A	15	February 2007	English Channel-Bay of Biscay	D	Tuna, Seabass,	PTM	M	O.Van Canneyt (CRMM/ULR)
Common dolphin	N/A	1	July 2007	Celtic Sea	D	Monkfish	GTR	V	O.Van Canneyt (CRMM/ULR)
Striped dolphin	N/A	3	January to March 2007	Bay of Biscay	D	Tuna	PTM	V	O.Van Canneyt (CRMM/ULR)
Harbour porpoise	N/A	2	July 2007	Celtic Sea	D	Monkfish	GTR	V	O.Van Canneyt (CRMM/ULR)
Harbour porpoise	N/A	9	February to November 2007	Bay of Biscay	D	sole, red mullet, pollack, monkfish	GTR, GNS	V	O.Van Canneyt (CRMM/ULR)
Long-finned pilot whale	N/A	1	July 2007	Bay of Biscay	D	Tuna	PTM	V	O.Van Canneyt (CRMM/ULR)
Common bottlenose dolphin	N/A	4	July 2007	Bay of Biscay	D	Tuna	PTM	V	O.Van Canneyt (CRMM/ULR)
Harbour porpoise	N/A	8	January to April 2007	Bay of Biscay	D	Flat fish, hake and anglerfish	GTN	V	O.Van Canneyt (CRMM/ULR)

Comments: only data from observer programme are given; stranded animals with unequivocal by-catch marks are not included; see table under section 8 for stranding data.

An observation program under the EU regulation 812/2004 started in July 2006 in France. Target fisheries include pelagic gears in Atlantic and Mediterranean waters and set nets in the Bay of Biscay.

When observing set netters primarily operating in the Bay of Biscay, some trips with observers extended into the Celtic sea or area VII. These areas were not planned in the sampling scheme and the by-catch observed there cannot be raised to fleets; it indicates only that by-catch occurred. Extrapolation was achieved for areas and fleet segments planned for observation according to regulation (see Table below).

Regulation Fleet Segments , year 2007	Observation effort	Cetacean estimated numbers				
	Days at sea with observers	Harbour porpoise	Common bottlenose dolphin	Long-finned pilot whale	Striped dolphin	Common dolphin

Pelagic trawls-single vessels (OTM) – boats length >= 15 meters ; ICESs areas VI, VII & VIII,	34	-	-	-		
Pelagic trawls-single vessels (OTM) – boats length < 15 meters ; ICESs areas VI, VII & VIII,	49	-	-	-		
Pelagic trawls-pair vessels (PTM) – all vessel lengths ; zones VI, VII & VIII	511	-	50	10	40	240
Pelagic trawls-single vessels (or pairs) – Méditerranéan Sea	89	-	-	-	0	0
Set nets, mesh > 80mm – vessels length < 15 meters, area VIII	213	500	-	-		
Set nets, mesh > 80mm – vessels length >= 15 meters, area VIII	124	90	-	-		0
TOTAL	1020	590	50	10	40	240

Three large pelagic vessels were not included in the sampling plan as they land in the Netherlands. They are similar to the Dutch fleet, and observation from the Dutch fleet for 2007 should be raised to these 3 boats as soon as the data are available.

It appears that the estimate of common dolphin by-catch in pelagic gears for 2007 was lower than estimated in the Petracet project (year 2005-2006). More common dolphins were caught in the sea-bass fisheries than in the tuna fishery. However the tuna fishery showed a greater variety of cetacean species.

Harbour porpoise were caught in ICES area VIII (Bay of Biscay) with set nets. The by-catch rate seemed to be higher in area VIIa than in area VIIIb. Several fisheries were concerned and by-catch might occur irrespective of mesh size. This is the first by-catch estimate for this gear and area. The annual report is made available on the *Internet*.

The Fishing Industry in North Brittany (Area VIIe) contracted a scientific observer located in Paimpol for observing vessels from this harbour. This observation program is not directly under the regulation. The observation started in July 2007. Sixty days at sea were observed during 2007 in several seasonal fisheries. One common dolphin by-catch was reported in September and no harbour porpoise was caught during 2007. This information suggests that by-catch rate of harbour porpoise may vary according to areas.

The European project NECESSITY was achieved in 2007. Ifremer and CRMM/ULR participated to this project which dealt with impact of pelagic trawls on cetacean populations (mainly common dolphins). Several mitigation experiments were done. Some results on common dolphin were successful with two acoustic deterrents (CETASAVER, DDD). However all the by-catch could not be suppressed. The Fishing Industry has tested CETASAVER and DDD in the sea-bass fishery by using combined tows (tow with pingers and tow without pingers) and scientific observers. No by-catch occurred in the 4 trips experimenting DDD. A total of 10 trips deployed CETASAVER pingers (52 tows with pingers and 61 without pinger). A 50 % decrease of tows with by-catch and around 70 % of decrease in the numbers of dolphins caught were obtained. More experiments are required for a statistical approach and additional experiments are planned in 2008 with the Fishing Industry.

A synthesis of studies undertaken on the artisanal tuna gillnet fishery, including typology, capture and bycatches in NW Mediterranean from 2000-2005 has been produced (écoOcéan Institut, 2007). Of 102 cetaceans found stranded along the French Mediterranean coast, 6 striped dolphins and 1 common bottlenose dolphin showed unequivocal by-catch marks (F. Dhermain/GECÉM).

## 8. STRANDINGS

The French stranding network is nationally coordinated by CRMM/ULR under an agreement with the Ministry in charge of the Environment. Local voluntary observers, generally under local supervision by various institutions or NGOs (AET, EPHE, GECÉM, GECC, GEFMA, GLOBICE, GMN, LEMM, OCNC, SEPANMAR), have been trained to process stranded cetaceans (and pinnipeds) under a common standardized protocol. An annual synthesis of all strandings reported in France is produced by CRMM/ULR (Van Canneyt *et al.*, 2008).

In remote sectors of the coastline, notably in overseas territories where geographical constraints can be pregnant, the standard stranding reporting scheme may not be totally applicable and therefore reports are made more opportunistically; nonetheless periodic compilations are made and tissue samples collected (AET, CEBC, GLOBICE, OCNC, OMM, SEPANMAR).

Statistics of stranding for the coast of France in 2007 indicate a total number of 406 cetaceans reported (CRMM/ULR and all National Stranding Scheme field correspondents).

Stranded cetaceans found in overseas territories are available from AET, GLOBICE, OCNC, OMM and SEPANMAR.

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Cetaceans 2006/ French European coasts	827 <sup>¥</sup>	52	O.Van Canneyt (CRMM/ULR)	<a href="mailto:olivier.van-canneyt@univ-lr.fr">olivier.van-canneyt@univ-lr.fr</a>
Cetaceans 2007/ French European coasts	406 <sup>§</sup>	61	O.Van Canneyt (CRMM/ULR)	<a href="mailto:olivier.van-canneyt@univ-lr.fr">olivier.van-canneyt@univ-lr.fr</a>
Cetaceans 2006/ French Mediterranean coast	61	26	Frank Dhermain (GECM)	<a href="mailto:frank.dhermain@wanadoo.fr">frank.dhermain@wanadoo.fr</a>
Cetaceans 2007/ French Mediterranean coast	102	58	Frank Dhermain (GECM)	<a href="mailto:frank.dhermain@wanadoo.fr">frank.dhermain@wanadoo.fr</a>
Cetaceans / Guadeloupe	3 <sup>#</sup>	-	C.&R.Rinaldi (AET)	<a href="mailto:evastropic@wanadoo.fr">evastropic@wanadoo.fr</a>
Cetaceans / Martinique	4 <sup>*</sup>	none	S.Jérémie (SEPANMAR and collaborators)	<a href="mailto:reseau_cetaces972@hotmail.com">reseau_cetaces972@hotmail.com</a>
Cetaceans/ Réunion	3	0	C. Jammes (GLOBICE)	<a href="mailto:globice@globice.org">globice@globice.org</a>
Cetaceans / New Caledonia	5 <sup>§</sup>	3	C.Garrigue (OCNC)	<a href="mailto:op.cetaces@lagoon.nc">op.cetaces@lagoon.nc</a>

¥ data up-dated since SC/59/FranceProgRep and including 17 unidentified medium or large cetaceans, 70 unidentified small cetaceans, 1 humpback w., 7(1) fin w., 2(1) common minke w., 2 sperm w., 1 pygmy sperm w., 2 Cuvier's beaked w., 45 delphinids, 15(1) long-finned pilot w., 4 Risso's d., 55(4) common bottlenose d., 334(29) short-beaked common d., 96(3) striped d., 2(1) white-sided d., 3 white-beaked d., 171(12) harbour p. (in brackets number with tissue samples)

§ include 7 unidentified medium or large cetaceans, 9 unidentified small cetaceans, 1 humpback w., 6 fin w., 5(2) common minke w., 3(1) sperm w., 1 pygmy sperm w., 5(4) Cuvier's beaked w., 1 (1) Sowerby's beaked w., 9 delphinids, 11(2) long-finned pilot w., 2 Risso's d., 18(4) common bottlenose d., 160(35) short-beaked common d., 48(12) striped d., 1 white-sided d. and 171(1) harbour p. (in brackets number with tissue samples)

# include 1 pygmy sperm w., 1 spinner d., 1 common bottlenose d.

\* include 2 unidentified delphinids, 1 clymene d., 1 pan-tropical spotted d.

§ include 1(1) sperm w., 3(3) pygmy sperm w., 1(1) pygmy killer w. (in brackets number dissected)

## 9. OTHER STUDIES AND ANALYSES

### *Acoustics*

GREC developed a computer aided and statistical method to classify whistles from different delphinid species.

SEPANMAR investigates cetacean distribution in relation to man-induced disturbances in the marine and coastal habitats by using acoustic monitoring approaches. Understanding sperm whale feeding strategies and important foraging and socialising grounds is also a goal, notably in relation with natural or man induced changes in the ecosystem.

Acoustic analyses of humpback whale songs are carried out at University of Queensland in collaboration with OCNC (E. Garland PhD project supervised by M. Noad).

CEBC investigates distribution, relative abundance and movements of large mysticetes, notably Antarctic blue whales and pygmy blue whales in the Indian sector of the southern ocean by analysing low frequency acoustic recordings.

### *Genetics*

Population structure of the short-beaked common dolphin in the Northeast Atlantic (Portugal to Scotland) was investigated by using mtDNA sequences and microsatellite markers (Mirimin *et al.*; Final Report for Necessity). Current knowledge on population status of short-beaked common dolphins in the Northeast Atlantic was reviewed in a Report to ASCOBANS/HELCOM (Murphy *et al.*, 2008).

In NW Mediterranean, biopsies were divided to retain a skin sample for future genetic analyses (n=6 sperm whales and n=2 long-finned pilot whales). First analyses have been made on fin whale biopsies from the Mediterranean and Atlantic seas regarding assessment of sex ratio and of polymorphism (écoOcéan Institut, in partnership with WWF and CIRAD).

OCNC carries out genetic studies on humpback whales in collaboration with the University of Auckland, NZ, and Oregon State University, USA, which include genetic diversity (mtDNA and nuclear markers), relatedness within sub-stock and between sub-stocks (genotyping of 17 loci) (Steel *et al.*, 2008, SC/60/SH13, Albertson-Gibb, 2008, SC/60/SH15).

Preliminary analyses on the population structure of rough-toothed dolphins from the Society Archipelago, French Polynesia, were carried out based on genetic markers and photo-identification data (University of Auckland; M. Oremus PhD thesis, 2008). Genetic samples of short-finned pilot whales collected opportunistically in French Polynesia and New Caledonia (stranding and biopsy samples) were included in an

analysis of the world-wide mtDNA phylogeography and diversity of this species (OCNC, University of Auckland; M. Oremus PhD thesis, 2008).

#### *Ecology*

The ecology of small cetaceans in the Bay of Biscay is being investigated by using multiple approaches, both direct and indirect (LIENSs/ULR, CRMM/ULR, Ifremer). Distribution is studied yearly during a one month survey cruise (PELGAS: Ifremer small pelagic fish survey) during which cetacean sightings are collected and fish biomass, phytoplankton concentration and oceanographic characteristics studied in parallel. Stranding data provides information on diet (stomach content), trophic levels (stable isotopes) and subpopulation structure or movement pattern (stable isotopes, heavy metals and contaminants).

The impact of oceano-climatic changes on marine ecosystems and in particular on common dolphin abundance was investigated. This study was made in the southern part of the Bay of Biscay (Hémery *et al.*, 2007).

The distribution of the striped dolphin in coastal waters of NW Mediterranean was studied by using generalised additive modelling (A.M. Meissner, CRC; MSc Univ Aberdeen). CRC continues to investigate seasonal changes in cetacean biomass over the year in order to better estimate their prey consumption.

Sperm feeding success and prey species inventory are underway off Guadeloupe (AET).

#### *Conservation, management and education*

écoOcéan Institut produces educational programmes and tools for schools, professionals, lay public and ill children to introduce them to marine biodiversity, cetaceans species and ecology, threats to cetaceans and their habitats and solutions proposed for the management of Marine Protected Area (PELAGOS sanctuary) as well as solutions that everybody can implement in his everyday life.

AET is involved in the French Caribbean whale sanctuary process, the Marine Mammal Action Plan (MMAP) UNEP CAR SPAW, the East Caribbean Cetacean Network (ECCN) and the CARIBwhale association. It also carries out studies on impact of boats on whales to set up regulations in the purpose of the sanctuary (revising the code of conduct for whale watching) and performs educational programs for schools and public).

In Martinique, SEPANMAR and his partner ECCEA, used to produce educational programmes toward professionals, schools and lay public to introduce to marine coastal biodiversity, water quality monitoring, ship strikes, acoustic disturbance, and more generally any management issue relevant to cetacean conservation. A new way has been found toward cultural activities by introducing to the public the important fauna with movies and theatre.

BREACH is involved in the French Caribbean whale sanctuary process and recently in the *Parc Marin de Banyuls* (NW Mediterranean) working group, as well as in educational programs about Cetacean; it has also created an Observatory for Guadeloupe Cetacean Sightings.

GLOBICE runs educative programs for scholars, local population, and sea users in Réunion.

OMM is in charge of assessing the conservation status of marine mammals in Mayotte in order to contribute to improving current regulation.

OCNC (Schaffar, A. and Garrigue, C.) completed the last field season of a 3-year research project investigating the potential effects of whale watching boats on the behaviour of humpback whales wintering in the Southern Lagoon of New Caledonia. In particular, this project aims to assess the temporal and spatial use of this area by humpback whales and boats (recreational and commercial), to compare the behaviour of humpback whales in the presence and in the absence of boats, and to work towards the implementation of whale watching regulations based on scientific data. Using a theodolite, land-based surveys were conducted from a lookout point located 189m above sea level between the 12th of July and the 19th of September 2007. Data collected on individually identified animals show that humpback whales are likely to be exposed to boats repeatedly within and between seasons, raising the issue of a potential cumulative impact.

OCNC participates to a study on status of commercial whale watching activity in the South Pacific Island region (Schaffar and Garrigue, 2007).

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Include all references cited in the text here. Please follow the official IWC style guide for references (<http://www.iwcoffice.org/publications/styleguide.htm>).

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