

France. Progress report on cetacean research, January 2009 to December 2009, with statistical data for the calendar year 2009.

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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, French Guiana, South West Indian, New Caledonia, French Polynesia, Southern Ocean | 2.1.,2.2.,4.3.,4.4,5,8,9 |
| 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.,4.3.,6.3.,8,9 |
| Blue whale | <i>Balaenoptera musculus</i> | Southern ocean | 2.1.,9 |
| Fin whale | <i>Balaenoptera physalus</i> | Northeast Atlantic, Mediterranean, Southern Ocean | 2.1.,2.2,3.1,3.2,4.1.,4.3.,5,6,3,8 |
| Common minke whale | <i>Balaenoptera acutorostrata</i> | Northeast Atlantic, New Caledonia, Caribbean, Mediterranean | 2.1.,4.3.,8 |
| Antarctic minke whale | <i>Balaenoptera bonaerensis</i> | Southern ocean | 2.1. |
| Sperm whale | <i>Physeter macrocephalus</i> | Northeast Atlantic, Mediterranean, Caribbean, Réunion, Southern Ocean | 2.1.,2.2.,3.1.,3.2.,4.3.,6.3.,8,9 |
| Pygmy sperm whale | <i>Kogia breviceps</i> | Northeast Atlantic, Caribbean, Mayotte, New Caledonia | 2.1.,4.3. |
| Dwarf sperm whale | <i>Kogia sima</i> | Caribbean, Mayotte | 2.1.,4.3.,9 |
| Beaked whale | <i>Mesoplodon spp.</i> | Northeast Atlantic, Caribbean, Mayotte | 2.1.,3.1. |
| Blainville's beaked w. | <i>Mesoplodon densirostris</i> | Mayotte | 2.1. |
| Gervais's beaked whale | <i>Mesoplodon europaeus</i> | Caribbean | 2.1.,4.3. |
| Northern bottlenose whale | <i>Hyperoodon ampullatus</i> | Northeast Atlantic | 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.,4.3.,4.4.,5,8,9 |
| Killer whale | <i>Orcinus orca</i> | Caribbean, Southern Ocean | 2.1.,3.1.,5,8 |
| False killer whale | <i>Pseudorca crassidens</i> | Caribbean | 2.1.,3.1. |
| Pygmy killer whale | <i>Feresa attenuate</i> | Caribbean, New Caledonia, Reunion | 2.1.,3.1.,4.3. |
| Long-finned pilot whale | <i>Globicephala melas</i> | Northeast Atlantic, Mediterranean | 2.1.,2.2.,3.1.,4.4.,8,9 |
| Short-finned pilot whale | <i>Globicephala macrorhynchus</i> | Caribbean, Réunion, New Caledonia | 2.1.,2.2.,31 |
| Melon-headed whale | <i>Peponocephala electra</i> | Caribbean, Mayotte, Réunion | 2.1.,3.1.,3.2.,4.3.,8,9 |
| Risso's dolphin | <i>Grampus griseus</i> | Northeast Atlantic, Mediterranean, Caribbean, Mayotte | 2.1.,2.2.,3.1.,4.3.,4.4.,8,9 |
| Common bottlenose dolphin | <i>Tursiops truncatus</i> | Northeast Atlantic, English Channel, Mediterranean, Caribbean, Réunion | 2.1.,2.2.,3.1.,4.3.,7.3.,8,9 |
| Indo-Pacific bottlenose dolphin | <i>Tursiops aduncus</i> | Mayotte, Réunion, New Caledonia, Pacific Ocean | 2.1.,2.2.,3.1.,3.2.,4.1.,4.4. |
| Rough-toothed dolphin | <i>Steno bredanensis</i> | Caribbean, New Caledonia | 2.1.,3.1. |
| Indo-Pacific humpback dolphin | <i>Sousa chinensis</i> | Mayotte | 2.1. |
| Guiana dolphin | <i>Sotalia guianensis</i> | Guiana | 2.1.,2.2. |
| White-beaked dolphin | <i>Lagenorhynchus albirostris</i> | Northeast Atlantic | 2.1.,2.2. |
| 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.,4.2.,4.3.,4.4.,7.3.,8,9 |
| Striped dolphin | <i>Stenella coeruleoalba</i> | Northeast Atlantic, Mediterranean, Caribbean, Réunion | 2.1.,2.2.,3.1.,4.2.,4.3.,7.3.,8,9 |
| Pantropical spotted dolphin | <i>Stenella attenuate</i> | Caribbean, Mayotte, Réunion | 2.1.,2.2.,3.1.,8,9 |
| Atlantic spotted dolphin | <i>Stenella frontalis</i> | Caribbean | 4.3. |
| Spinner dolphin | <i>Stenella longirostris</i> | Caribbean, Mayotte, Réunion, New Caledonia, Pacific Ocean | 2.1.,2.2.,3.1.,3.2.,4.3.,8,9 |
| Harbour porpoise | <i>Phocoena phocoena</i> | Northeast Atlantic | 2.1.,2.2.,4.2.,4.3.,7.3.,8,9 |

2. SIGHTINGS DATA

2.1 Field work

2.1.1 Systematic

North-east Atlantic – Summer and winter cetacean distributions (mostly harbour porpoise and white beaked dolphin) are surveyed in the eastern English Channel and southern bight of the North Sea (OCEAMM).

GECC carries out a year-round cetaceans survey along the coasts of Normandy.

Systematic summer and winter surveys of coastal bottlenose dolphins were carried out along the coast of western Brittany (LEMM). Aerial surveys were carried out using line transect protocol to estimate abundance and seasonal patterns of small cetaceans in west Brittany (LEMM) in partnership with the Iroise marine natural park (*Parc Naturel Marin de l'Iroise*, PNMI).

Cetacean distributions were surveyed over the shelf of the Bay of Biscay (April-May and September-October) and English Channel (January) by CRMM/ULR and LIENSs/ULR in order to determine relative abundance, preferential habitats and relationship with distribution of 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 the Bay of Biscay (PELGAS survey) and since 2007 in the eastern part of the English Channel (IBTS survey). Since 2007, CRMM/ULR and IEO *Vigo* co-operated to collect data on cetacean distribution by using the same protocol in April and September in the south of the Bay of Biscay (PELACUS surveys). Finally, in 2009, CRMM-ULR collected sightings from a benthic fish survey over the shelf of the Bay of Biscay in October (EVHOE Survey, IFREMER). Data on top predators from PELGAS, PELACUS, EVHOE and IBTS surveys are stored in a single database managed by CRMM-ULR.

Cetaceans at sea are recorded by MNHN/CMCB under standardized line transect conditions in the Bay of Biscay year round since 1976 from vessels of *Douanes Françaises* and *Affaires Maritimes* (Custom and Coast Guard vessels).

Mediterranean - Two surveys were conducted in June and September in the NW Mediterranean, with a focus on sperm and pilot whales (GIS3M, CRC, WWF). The survey followed a line transect protocol, collecting both visual and acoustic data, interrupted for biopsy and photographic sampling.

Fin whales and common bottlenose dolphins were surveyed around *Golfe du Lion*, NW Mediterranean, in April 2009, August 2009 and October 2009 by using visual and acoustic transect lines and photo-ID (BREACH) to determine abundance and distribution.

Both boat-based and aerial surveys were conducted off the French Mediterranean coasts from early January to December 2009 (écoOcéan Institut). They were dedicated to studying cetacean distribution in relation to environmental variables, to map maritime traffic (commercial and leisure vessels) in cetacean habitats and to compare two monitoring techniques. And for the fifth year, *Swiss Cetacean Society* and *Cybelle Planète* collected data in summer for écoOcéan Institut on cetacean distribution and behaviour in relation with maritime traffic in the PELAGOS Sanctuary.

Sperm whales and Cuvier's beaked whales are surveyed in the NW Mediterranean, with a focus on behaviour and acoustics (GREC).

A collaborative scientific project on French Mediterranean canyon's head, focusing on deep sea cold water corals, was conducted by the Agency for Marine Protected Areas (AAMP). GIS3M (écoOcéan Institut and CRC) took part to the prospection at sea for cetaceans sighting. Ten canyons were visited.

Caribbean and Guiana - Sperm whales, humpback whales and other cetaceans were surveyed (sightings/acoustics) along the leeward coast of Guadeloupe year-round from a research sailing boat. Data were also collected off Dominica and Martinique in June and July and land based surveys were conducted during the humpback whale breeding season, December to May (AET). In April and November 2009, cetacean abundance and distribution surveys were conducted off Guadeloupe using transect lines and acoustics (BREACH) in order to compare distribution in the wet and dry seasons.

Unidentified delphinids, short-finned pilot whales, pantropical spotted dolphin, Cuvier's beaked whales and sperm whales were surveyed around Martinique in early may 2009 (SEPANMAR). Line-transect surveys (911 km) in both leeward and windward waters were performed by using a sailing boat. Photo-ID was performed for sperm whales, short-finned pilot whales and pantropical spotted dolphins over the leeward continental slope. Great acoustic disturbance was caused by a seismic vessel research never sighted.

Another survey performed in late november (1517 km) revealed residency of short-finned pilot whales, pantropical spotted dolphin, bottlenose dolphin, Fraser's dolphin, dwarf sperm whale, short finned pilot whale and sperm whale. Photo-ID and acoustic sampling was performed for sperm whale, short-finned pilot whale in areas used for nursing and feeding northward of the island.

Aerial surveys were conducted too, using line-transect methods to estimate distribution and abundance of cetacean species in Martinique territorial waters from December 2007 to May 2009.

South-west Indian - Both boat-based and aerial surveys were conducted around Mayotte throughout the year by OMM. Targeted species were mostly delphinids, but other toothed whales were also recorded (Kogiidae, Ziphiidae). Boat based surveys are conducted year round by GLOBICE, to look at species diversity and distribution around Reunion Island.

A large aerial survey was conducted from December 2009-April 2010 across waters of the Indian Ocean Commission countries (Comoros, Madagascar, La Réunion, Mauritius and Seychelles) by CRMM/ULR following line-transect methods to estimate distribution and relative densities of cetacean species. Details will be given in the 2010 report.

New Caledonia - Boat based surveys are conducted, in the eastern, western and southern lagoons of New Caledonia (OCNC). Targeted species are humpback whales (sub-stock E2), Indo-Pacific bottlenose dolphins and spinner dolphins.

Southern ocean - All cetaceans are 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). Killer whales and sperm whales were surveyed year round off Crozet and Kerguelen Islands. Killer whales were surveyed from the coast of Possession Island (Crozet Islands).

Large whales and other cetaceans were surveyed by using a systematic protocol from the supply and research vessel *Astrolabe* on its way from Hobart, Tasmania, to Dumont D'Urville, Adélie Land, and back as well as during the oceanographic cruises ECOTA and ALBION that are conducted yearly off Adélie Land, Antarctica area V (MNHN, OCNC, ULR).

| Target species | Date | Area | No. of sightings | Contact person /institute and references |
|---|-----------------------|--|-----------------------|---|
| Cetaceans | Summer / winter | Eastern English Channel / Southern North Sea | 88 ^p | S. Pézeril (OCEAMM) |
| Common bottlenose dolphin | Year round | Normandy | In progress | F. Gally (GECC) |
| Cetaceans | January | Eastern English Channel | 2 ^s | O.Van Canneyt (CRMM/ULR) |
| Cetaceans | April-May | Bay of Biscay | 231 ^s | O.Van Canneyt (CRMM/ULR) |
| Cetaceans | September-October | Bay of Biscay | 89 ^s | O.Van Canneyt (CRMM/ULR) |
| Cetaceans | Year round | Bay of Biscay | In progress | G. Hémerly and I. Castège (MNHN/CMCB) |
| Cetaceans | Year round | western Brittany | In progress | LEMM / PNMI |
| Cuvier's beaked whale | July | Western Mediterranean | In progress | A.Gannier (GREC) |
| Odontocetes | March-November | NW Mediterranean | In progress | A.Gannier (GREC) |
| Fin, sperm and long-finned pilot whales | June and September | NW Mediterranean | In progress | D.Ody (GIS3M, WWF, CRC) |
| Cetaceans | Year round | NW Mediterranean | In progress | L. David and N. Di-Méglio (écoOcéan Institut / GIS3M) |
| Cetaceans | Summer | NW Mediterranean | In progress | N. Di-Méglio and L.David (écoOcéan Institut) |
| Cetaceans | January-December 2009 | Guadeloupe/Caribbean | 44 + 275 ^Δ | N. Gandilhon, (BREACH) |
| Cetaceans | Year round | Guadeloupe Caribbean | 366 ^s | C. & R. Rinaldi (AET) |
| Odontocetes | May | Martinique | 13 ^b | S. Jérémie (SEPANMAR) |
| Odontocetes | November | Martinique | 19 ^s | S. Jérémie (SEPANMAR) |
| Delphinids | January to April 2009 | Mayotte/ SW Indian | 34 [#] | J. Kiszka (OMM) |
| Cetaceans | Year round | Réunion/ SW Indian | In progress | V. Dulau (GLOBICE) |
| Humpback whale | June to November | Réunion/ SW Indian | In progress | V.Dulau (GLOBICE) |

| | | | | |
|---------------------------------|-------------------------------|------------------------------------|-------------|-------------------------------|
| Indo-Pacific bottlenose dolphin | Year round 2008 | Réunion/ SW Indian | In progress | V.Dulau (GLOBICE) |
| Humpback whale | July to September | New Caledonia, Pacific Ocean | In progress | C. Garrigue (OCNC) |
| Cetaceans | Austral summer | Southern Indian Ocean | In progress | C. Guinet (CEBC) |
| Killer and sperm whales | Year round | Crozet and Kerguelen Islands | In progress | C. Guinet (CEBC) |
| Cetaceans | December 2009 to January 2010 | Transit from Hobart to Adélie Land | 16* | C. Garrigue (OCNC, MNHN, ULR) |
| Cetaceans | December 2009 to January 2010 | Shelf area off Adélie Land | 38** | C. Garrigue (OCNC, MNHN, ULR) |

^p constituted of 156 harbour p. and 23 white-beaked dolphins, 1 unidentified d.

[§] constituted of 2 common minke w., 3 fin w., 2 unidentified w., 13 sperm w., 5 unidentified beaked w., 46 long-finned pilot w., 2, Risso's d., 1 false killer w., 144 short-beaked common d., 45 common bottlenose d., 13 striped d. and 44 unidentified d.

[∞] constituted of 7 fin w., 3 common bottlenose d. and 1 striped d.

^Δ constituted of 14 humpback w., 5 sperm w., 1 dwarf sperm w., 1 Gervais' beaked w., 3 unid. Beaked w., 1 pygmy killer w., 1 false killer w., 1 common bottlenose d., 1 rough-toothed d., 3 pan-tropical spotted d., 2 unid. delphinids, 1 unid. cetacean.

[§] constituted of (encounters) : 8 humpback w., 244 sperm w., 4 Cuvier's b. w., 3 Gervais's b. w., 1 unid. beaked w., 4 pygmy killer w., 9 Fraser's d., 8 common bottlenose d., 84 pan-tropical spotted d., 5 short-finned pilot w., 4 false killer w., 1 rough toothed d., 1 striped d., 1 pygmy sperm w.

ⁱ constituted of 12 humpback w., 4 common minke w., 1 unidentified w., 16 sperm w., 2 *Kogia* sp., 2 Cuvier's b. w., 2 unidentified b. w., 2 killer w., 2 false killer w., 5 short-finned pilot w., 4 common bottlenose d., 4 Fraser's d., 10 unidentified d., 2 unidentified medium cetacean

^g constituted of 2 fin w., 1 unidentified w., 3 sperm w., 3 Cuvier's b. w., 4 unidentified b. w., 8 short-finned pilot w., 1 Risso's d., 83 common bottlenose d., 31 Guiana d., 26 unidentified d., 2 unidentified medium cetacean.

^β includes sperm w., Cuviers's beaked w., short-finned pilot w., pantropical spotted d.

^δ includes sperm w., dwarf sperm w., short-finned pilot w., bottlenose d., Fraser's d., pantropical spotted d.

[#] constituted of 1 Blainville's beaked w., 2 Indo-pacific humpback d., 5 pantropical spotted d., 16 spinner d., 10 Indo-Pacific bottlenose d.

^{*} constituted of 10 spinner/pan-tropical spotted d., 3 Indo-Pacific bottlenose d.

^{*} includes 2 Antarctic minke w., 1 unidentified balaeopterids, 1 sperm w., 2 killer w., 1 long-finned pilot w., 3 common d., 2 common bottlenose d., 4 unidentified cetacean.

^{**} includes 5 Antarctic blue w., 18 Antarctic minke w., 1 humpback w., 8 unidentified balaeopterids, 5 killer w., 1 unidentified cetacean.

2.1.2 Opportunistic, platforms of opportunity

North-east Atlantic – Cetacean sightings were collected from the research vessel, *Pourquoi Pas?* (IFREMER), over the slope of the Bay of Biscay in October 2009. This survey (BOBGEO), in the framework of the European program *CoralFish*, has been carried out to identify and map deep-sea coral ecosystems at two locations in the northern and middle Bay of Biscay.

A ferry from Brest (France) to Cork (Ireland) is used as a platform of opportunity to survey cetaceans across the Celtic Sea (LEMM).

Mediterranean - Two monthly surveys with French Navy helicopters have been made by écoOcéan Institut all year long (third and last year) off the coast of Provence in the Mediterranean Sea.

Caribbean and Guiana - Cetacean sightings were collected from a whale-watch motor boat off leeward coast of Guadeloupe (AET). Data from St Barthélemy and St Martin were also collected by St Barthélemy Natural Reserve, *St Barth Cétacés* as well as the Natural Reserve of St Martin, and compiled by AET.

An observatory has been created to collect cetacean documented sightings around Guadeloupe (BREACH): over 225 sightings were documented in one year (May 2009 to May 2010).

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).

South-west Indian – Cetacean sightings were collected by scientists from the supply and research vessel *Marion Dufresnes* (TAAF) along the route between La Réunion Island and the Scattered Islands, during a supply operation conducted in April-May 2009 (Europa, Juan de Nova and Glorieuses Islands in the Mozambique Channel, and Tromelin Island) (CRMM/ULR).

| Primary species | Area | Data type/method | Collected by | Platform | Location of archive | Contact person/institute and refs |
|------------------------|---------------|--------------------|---------------------|------------------------------|---------------------|-----------------------------------|
| Cetaceans ^s | Bay of Biscay | Sightings / effort | Scientists | Research vessel | CRMM/ULR | O. Van Canneyt (CRMM/ULR) |
| Cetaceans | East English | Opportunistic | Public, scientists, | Boat based, seawatching, sea | OCEAMM | S. Pézeril (OCEAMM) |

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|---|---|----------------------------|---|---|---|--|
| | Channel Southern North Sea | sightings | OCEAMM | users | | |
| Cetaceans | English Channel | opportunistic sightings | public, customs, scientists | Boat based, land | GECC | F. Gally (GECC) |
| Cetaceans | Celtic Sea | Sightings | LEMM | Ferry | LEMM | S. Hassani (LEMM) |
| Common bottlenose dolphin | Provence coastline, NW Mediterranean | opportunistic sightings | Data from fishermen, ferries and National Park wardens | Boat based | GECEM | F. Dhermain (GECEM) |
| Cetaceans ^Δ | Provence | Sightings | Scientists | Whale-watching boats | SDE | P. Mayol (SDE) |
| Cetaceans | Provence, PELAGOS | Strip transect | Scientists | Helicopter of the French Navy | écoOcéan Institut | N. Di-Méglio (EOI) |
| Cetaceans [§] | Guadeloupe | Sightings | AET | Whale watching boat | AET | C. & R. Rinaldi (AET) |
| Humpback whales and other cetaceans ^{§§} | St Barthélémy St Martin Guadeloupe | Opportunistic sightings | St Martin St Barthélemy natural reserves AET | Sea users | AET / Natural Reserves of St Barthélemy and St Martin | C. & R. Rinaldi (AET) Réserve Naturelle St Martin, Réserve Naturelle St Barthélemy |
| Cetaceans [♣] | Guadeloupe | opportunistic sightings | Fishermen, BREACH members, Divers, coasts- guards | Boat based | BREACH | N.Gandilhon et E.Girou (BREACH) |
| Sperm whale Humpback whale Pantropical spotted dolphin | Martinique | Opportunistic sightings | Fishermen Skippers | Fishing boats Ferries Sailship skippers | SEPANMAR | S. Jérémie (SEPANMAR) |
| Cetaceans [□] | South West Indian | Sightings / effort | Scientists | Research and Supply vessel | CRMM-ULR | O.Van Canneyt (CRMM/ULR) |
| Cetaceans | New Caledonia | Opportunistic sightings | Public, scientist | Various types of platform | OCNC | C. Garrigue (OCNC) |

§ include sightings of minke w. long-finned pilot w., short-beaked common d. and striped d.

Δ include sightings of fin w., sperm w., long-finned pilot w., Risso's d., striped d.

§ constituted of : humpback w., sperm w., Gervais's b.w., false killer w., short-finned pilot w., Fraser's d., pan-tropical spotted d., melon headed w., unid delphinids.

§§ Including: killer w.

♣ included 15 species sightings

□ include sighting of fin w., sperm w., melon-headed d., striped d., common bottlenose d., spinner d.

2.2 Analyses/development of techniques

North-east Atlantic – Distribution patterns of small cetaceans in the shelf of the Bay of Biscay and risk assessment areas for by-catch were analysed from past aerial and boat-based surveys (Van Canneyt *et al.* 2009).

Mediterranean - Habitat modelling of sperm whale, long-finned pilot whale, Risso's dolphin were computed from summer surveys (1998 to 2005) in the NW Mediterranean sea (CRC and GREC; Praca *et al.* 2009) and striped dolphin's distribution in coastal habitats using generalised additive modelling techniques (CRC and ULR).

Habitat modelling from platform of opportunity data in the western Mediterranean was conducted by CEBC. 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). A study comparing aerial and ship data for fin whale and striped dolphin sightings and relative abundance was conducted by écoOcéan Institut (GIS3M). Prediction of fin whale and sperm whale distribution in relation to topographic and environmental parameters in the

PELAGOS Sanctuary has been made by the GIS3M (CRC and écoOcéan Institut). Two modelling exercises (GLM and ENFA) with the same set of data were compared.

Caribbean and Guiana - Habitat modelling and relative abundance estimates of cetaceans were conducted in the French West Indies and Guiana waters from 2008 aerial surveys (Van Canneyt *et al.* 2009).

Distribution, habitat, relative abundance and social structure of target populations are currently analysed around Martinique (SEPANMAR). Species diversity, rate of residency and distribution are processed from data collected. Feeding habits of sperm whales are currently assessed by acoustic study to improve knowledge on foraging.

South-west Indian – Distribution, habitat, behavioural budget and social structure of delphinids are currently analysed around Mayotte (OMM). Some insights of habitat partitioning among delphinids have been investigated (Gross *et al.*, 2009).

| Target species | Date | Area | Methods/effort | Parameters/ factors measured | Contact person/institute; refs |
|--|-----------------------------|---|--|--|--|
| Harbour porpoise | Year round 2004-2009 | Strait of Dover | Land based surveys (about 5 500 hours observation effort) | Local occurrence | S. Pézeril (OCEAMM) |
| Delphinids ^p | Summer and winter | Eastern Channel and Southern bight of North Sea | Line transect survey / 56 hours of observation effort / and spatial analysis | Distribution and habitat preference | S. Pézeril (OCEAMM) |
| Delphinids ^s | 2003-2008 | Bay of Biscay | Aerial and boat-based surveys / line transect | Distribution patterns, mapping of fishery-related risks | O. Van Canneyt (CRMM/ULR) |
| Cetaceans | 1991-2009 | NW Mediterranean | Aerial and boat based surveys | Distribution, relative abundance, habitat preference, risk assessment areas, monitoring techniques | L. David and N. Di-Méglio (écoOcéan Institut, GIS3M) |
| Fin whale and sperm whale | 1998-2008 | NW Mediterranean | Boat based surveys | habitat modelling | S. Laran (GIS3M / CRC / écoOcéan Institut) |
| Sperm w., long-finned pilot w., Risso's d. | September | NW Mediterranean | Line transect | Distribution, biopsies and photo-ID | S. Laran (CRC, GIS3M) |
| Cetaceans | 1991-2008 | NW Mediterranean | Aerial and boat based surveys | Distribution, relative abundance, habitat preference, risk assessment areas | L. David (écoOcéan Institut, GIS3M) |
| Fin whale | Year round | West Mediterranean | Line transect survey | Distribution, relative abundance | C. Cotté (CEBC) |
| Cetaceans ⁱ | February | Caribbean | Aerial survey / line transect | Relative abundance and habitat preference | O. Van Canneyt (CRMM/ULR) |
| Cetaceans ^e | October | French Guiana | Aerial survey / line transect | Relative abundance and habitat preference | O. Van Canneyt (CRMM/ULR) |
| Cetaceans [*] | August, September | Martinique/ Caribbean | Creak counting, surveys and photo-ID | Feeding/IPI Abundance, site fidelity | S. Jérémie (SEPANMAR) |
| Cetaceans [*] | Year round | Guadeloupe and Caribbean | Acoustic, aerial surveys and photo-ID | Local abundance, distribution, site fidelity group composition | C. & R. Rinaldi/AET |
| Fin Whale, Common bottlenose dolphins | 2005- 2009 | Golfe du Lion/NW Mediterranean | Line transect survey and photo-ID | Local abundance, Distribution / individuals recognition | C. Azzinari/ N. Gandilhon (BREACH/DIREN) |
| Cetaceans | 2007-2009 | Guadeloupe/ Caribbean | Line transect and acoustic surveys | Relative abundance and distribution | N. Gandilhon & E. Girou (BREACH) |
| Cetaceans | May 2008 – May 2010 | Guadeloupe/ Caribbean | Opportunistic sightings and ID monitoring | Individuals recognition / Distribution completion | N.Gandilhon (BREACH) |
| Cetaceans | December 2008 – in progress | Guadeloupe/ Caribbean | Acoustics, tags and biopsies monitoring | Distribution, biodiversity | N.Gandilhon (PhD program, BREACH) |
| Delphinids [#] | January to April 2009 | Mayotte/SW Indian | Boat-based surveys / 19 daily surveys | Distribution / group structure / behaviour | J. Kiszka & C. Pusineri (OMM) |

| | | | | | |
|-----------------------|-------------|---------------|-------------------------|-------------------|-------------------|
| Cuvier's beaked whale | July 2008 | Mediterranean | Acoustic behaviour | Click rate | A. Gannier (GREC) |
| Delphinids | Sept-Dec 08 | Mediterranean | Acoustic classification | Whistles contours | A. Gannier (GREC) |

^p includes harbour p. and white-beaked d.

^s includes short-beaked common d. and common bottlenose d.

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

includes Indo-Pacific bottlenose d., spinner d., pan-tropical spotted d.

i includes humpback w., sperm w., large and small delphinids

g includes common bottlenose d., Guiana d.

* includes sperm w., short finned pilot w., pantropical spotted 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 | - | Y | In progress | François Gally (GECC) |
| Common bottlenose dolphin | Dorsal fin | Channel/NE Atlantic | In progress | Y | In progress | GMN |
| Common bottlenose dolphin | Dorsal fin | west Brittany | In progress | Y | In progress | S. Hassani (LEMM) |
| Long-finned pilot whale | Dorsal fin | Bay of Biscay/NE Atlantic | In progress | Y | 104 | O. Van Canneyt (CRMM/ULR) |
| Risso's dolphin | Dorsal fin and body | NW Mediterranean | 11 | N | In progress | GIS3M |
| Risso's dolphin | Dorsal fin and body | Western Mediterranean | In progress | Y | In progress | A. Gannier (GREC) |
| Sperm whale | Fluke | Western Mediterranean | In progress | Y | In progress | 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 | Dorsal fins / sides | NW Mediterranean | In progress | Y | 106 | N. Di-Méglio, L. David (écoOcéan Institut) |
| Risso's dolphin | Dorsal fins / sides | NW Mediterranean | In progress | Y | 421 | N. Di-Méglio, L. David (écoOcéan Institut) |
| Sperm whale | Fluke/sides | NW Mediterranean | In progress | Y | 24 | N. Di-Méglio, L. David (écoOcéan Institut) |
| Common bottlenose dolphin | Dorsal fin | Corsica/ NW Mediterranean | In progress | N | In progress | (BREACH and GECEM) |
| Sperm whale | Fluke/sides | NW Mediterranean | 3 | Y | 13 | S. Laran (CRC) |
| Long-finned pilot whale | Dorsal fin | NW Mediterranean | In progress (c. 20) | N | In progress | S. Laran (GIS3M/CRC) |
| Fin whale | Sides | NW Mediterranean | ≥ 66 selected pictures | Y | 17 | C.Azzinari (BREACH) |
| Common bottlenose dolphin | Dorsal fin | Golfe du Lion/ NW Mediterranean | ≥ 752 selected pictures | Y | 66 in progress | C.Azzinari (BREACH) |

| | | | | | | |
|---------------------------------|-------------------------------|---|--------------------------|-------------|----------------------------|--|
| Common bottlenose dolphin | Dorsal fin | Guadeloupe / Caribbean | ≥ 7400 selected pictures | Y | 71 in progress | N. Gandilhon (BREACH - thesis) |
| Humpback whales | Ventral flukes and dorsal fin | Guadeloupe | ≥ 1122 selected pictures | Y | 67 in progress (flukes) et | N. Gandilhon (BREACH) |
| Sperm whale | Ventral fluke | Guadeloupe | ≥ 287 selected pictures | In progress | ≥ 42 in progress | N. Gandilhon (BREACH) |
| Rough tooth dolphins | Dorsal fin and shape pods | Guadeloupe | ≥ 1500 selected pictures | Y | 36 | N. Gandilhon (BREACH) |
| Beaked whales § | Dorsal fins / sides | Guadeloupe | In progress | Y | 9 | N. Gandilhon (BREACH) |
| Humpback whale | Ventral fluke | Guadeloupe, St Barthélemy and Caribbean | 12 | Y | In process | C. & R. Rinaldi (AET)* |
| Sperm whale | Ventral fluke | Guadeloupe & Caribbean | 230 | Y | In process | C. & R. Rinaldi (AET) |
| Beaked whales and delphinids§ | Dorsal fins / sides | Guadeloupe and Caribbean | In process | Y | In process | C. & R. Rinaldi (AET) and contributors |
| Sperm whale | Fluke | Martinique/Caribbean | 15 | Y | >25 | SEPANMAR |
| Short finned pilot | Dorsal fin | | 30 | | > 40 | |
| Indo-Pacific bottlenose dolphin | Dorsal fin | Mayotte/SW Indian | In progress | Y | 71 | J. Kiszka et C. Pusineri (OMM) |
| Indo-Pacific bottlenose dolphin | Dorsal fin | Réunion/SW Indian | In progress | Y | 76 | V. Dulau-Drouot (GLOBICE) |
| Humpback whale | Fluke and dorsal fin | Réunion/SW Indian | In progress | Y | 110 | V. Dulau-Drouot (GLOBICE) |
| Humpback whale | Fluke | New Caledonia/sub-stock E2 | 45 | Y | 549 | C. Garrigue (OCNC) |
| Indo-Pacific bottlenose dolphin | Dorsal fin | New Caledonia Pacific Ocean | In progress | Y | 304 | M.Oremus (OCNC) |
| Spinner dolphin | Dorsal fin | New Caledonia Pacific Ocean | In progress | Y | 83 | M.Oremus (OCNC) |
| Sperm whale | Fluke and dorsal fin | Crozet & Kerguelen/ Southern Ocean | - | Y | 80 | C. Guinet (CEBC) |
| Killer whale | Dorsal fin | Crozet & Kerguelen/ Southern Ocean | - | Y | 218 | C. Guinet/CEBC |

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

include melon-headed w., spinner d., Indo-Pacific bottlenose d.

3.1.2. Artificial marking data

None deployed.

3.1.3 Telemetry data

None deployed.

| Species | Tag type | No. successfully deployed | Maximum time transmitting | Contact person/institute; refs |
|---------|----------|---------------------------|---------------------------|--------------------------------|
| N/A | N/A | N/A | N/A | N/A |

3.2 Analyses/development of techniques

Mediterranean - EcoOcéan Institut carries out specific studies on fin whales in the north-western Mediterranean Sea including analysis of blow sequences, link to environmental parameters and impacts of human activities.

Caribbean and Guiana - AET carries out specific studies on sperm whales off Guadeloupe including analysis of surface behaviours, blow sequences, inter-individual associations and fidelity, maternal care, 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. A similar work is under way on delphinids and humpback whales in the same area, off St Barthélemy, St Martin and the neighbouring islands. 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.

Southwest Indian - Photo-identification data analysis of Indo-Pacific bottlenose dolphin has been performed for Mayotte. Inter-individual associations, site fidelity, home range estimate and abundance are under study for Indo-Pacific bottlenose dolphins, melon-headed whales and spinner dolphins in Mayotte (OMM).

New Caledonia and Polynesia - Residency pattern, local population structure and abundance of Indo-Pacific bottlenose dolphins and spinner dolphins in the lagoon of New Caledonia are currently investigated using capture-recapture methods based on photo-ID and genetic data. Photographs and genetic samples (biopsy and stranding) were collected opportunistically since 1996 but systematic surveys were initiated in 2008.

Further demographic investigations based on humpback whale photo-identification have been conducted by OCNC including migration events in the South Pacific. Humpback whale flukes collected in Eastern Australia (EA, Hervey Bay and Byron Bay, N = 650) and in Oceania (N = 130) in 2005 were compared with the catalogues of Oceania and of EA (1999-2004) previously created. This process resulted in new matches between EA and both New Zealand and New Caledonia (in progress).

Southern ocean - one humpback whale photo-identified off Adélie land during the CETA project was positively matched with an individual of Hervey bay, Australia (OCNC, MNHN, ULR)..

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 |
|------------------------------------|--------------------------------|---|-------------------|-----------------|----------------|----------------------------------|
| Fin whale | North western Mediterranean | 2006/2009 | Y | >80 | >80 | Denis Ody (WWF, GIS3M) |
| Indo-Pacific bottlenose dolphin | Mayotte/SW Indian | 2009/year round - 6 | Y | 110 | 233 | J.Kiszka (OMM) |
| Humpback whale | Adélie land | 2009/ December | Y | 0 | 1 | C. Garrigue (OCNC, MNHN, ULR) |

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

Samples from by-caught small cetaceans 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 | Various* | 1 | N | In progress | W. Dabin (CRMM/ULR) |
| Harbour porpoise | Bay of Biscay and Channel/Northeast Atlantic | Various* | 5 | N | In progress | W. Dabin (CRMM/ULR) |
| Striped dolphin | Mediterranean | Various* | 1 | N | In progress | W. Dabin (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 | Brittany | Various* | 38 | Y | In progress | S. Hassani (LEMM) |

| | | | | | | |
|------------------------|--|------------------|-------------------|---|----------------|------------------------------------|
| Cetaceans [§] | Bay of Biscay and Channel/ Northeast Atlantic | Various* | 123 [§] | Y | In progress | W. Dabin (CRMM/ULR) |
| Cetaceans | Mediterranean | Various* | 150 ^{§§} | Y | In progress | F.Dhermain & F. Dupraz (GECEM) |
| Cetaceans [§] | Guadeloupe/Caribbean | Various* | 4 [§] | Y | In progress | C.&R.Rinaldi (AET) [§] |
| Cetaceans ^μ | Martinique/Caribbean | Various* | 10 ^μ | N | In progress | S.Jérémie (SEPANMAR) |
| Humpback whale | Réunion | Bone, blubber | 4 | N | - | C. Jammes (GLOBICE) |
| Cetaceans [#] | New Caledonia Pacific Ocean | Various** | 4 | Y | | 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 1 fin w., 1 humpback w., 1 Cuvier's b. w., 1 bottlenose b. w., 1 killer w., 7 long-finned pilot w., 12 Risso's d., 81 short-beaked common d., 5 common bottlenose d., 6 striped d., 16 harbour p.

§§ includes mostly striped d. and common bottlenose d., 1 Cuvier's b.w., 1 sperm w. and 1 minke w.

§ includes 1 melon head w., 1 spinner d., 1 common bottlenose d.

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

includes 2 pygmy sperm whales, 2 dwarf sperm whales

4.4 Analyses/development of techniques

North-east Atlantic - Biological parameters (age, reproductive status, diet, ...) and ecological tracers (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; Dabin *et al.*, 2009; J. Spitz, PhD thesis). Modelling of the fisheries impact on the eastern North Atlantic common dolphin population by using Leslie matrix models is underway.

Mediterranean - Trophic relationship of sperm whale, long-finned pilot whale, Risso's dolphin and their prey were inferred from stable isotope analysis (CRC, in collaboration with the University of Liege, Laboratory of Oceanology; Praca, 2008).

Southwest Indian - In Mayotte (OMM), trophic interactions between delphinids have been investigated in collaboration with (LIENSs/ULR) by analysing stable isotopes (N and C) in biopsy samples. The same samples are also used for social structure analyses in Indo-Pacific bottlenose dolphins (J. Kiszka, PhD thesis).

5. POLLUTION STUDIES

North-east Atlantic - A study on pollutants (TBT, lindane, fluorenten, indenopyren and BCB 153) has started in partnership with the Marine Nature Park of the Iroise Sea, the University of Brest and Océanopolis.

The EU project BIO CET (2001-3), which focused on the causes and effects of pollution by organic contaminants in small cetaceans of the European Atlantic, stimulated further analyses well beyond formal completion of the project (LIENSs/ULR, P. Mendez-Fernandez, PhD Thesis).

Mediterranean - Analyses of organic pollutants (PCB, DDT, DDE, PBDE, HBCD, HAP) have been done for female and male of fin whales biopsied in NW Mediterranean (WWF in partnership with GIS3M, écoOcéan Institut, CIRAD and LPTC, UMR 5255, University of Bordeaux). Additional large Odontocete biopsies collected in 2008/2009 have been analysed in collaboration with the University of Bordeaux (GIS3M, CRC).

Southern ocean - 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.*, 2009).

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 2008

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 2009**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 | 30/10/2009 | Eastern English Channel | U | U | D | Stranded with evidence of collision | O. Van Canneyt (CRMM/ULR) |
| Comments: | | | | | | | | | |

6.3.2 Fishery bycatch of large whales

None reported.

| Whale species | Sex | No | Date | Location | Fate | Targeted fish species | Gear | How observed? | Source or contact |
|---|--------------|----|------|------------|------|-----------------------|------|-------------------|-------------------|
| Humpback whale | Not reported | 1 | 2009 | Martinique | D | miscellaneous | FIX | Fishermen network | SEPANMAR |
| Sperm whale | Not reported | 1 | 2009 | Martinique | D | tuna | MIS* | Fishermen network | SEPANMAR |
| Comments: * entangled in a fish aggregating device, FAD | | | | | | | | | |

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 2008

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 2008**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 | Ratio of male to female (if known) | No. | No. extrapolated to fleet total (point estimate) | Range CI or CV | Date of bycatch | Location (description or lat/long) | FAO area | Fate | Targeted species | Gear | How observed | Source or contact |
|---------------------------|------------------------------------|-----|--|----------------|-----------------|---|----------|------|--------------------------|---------|---|------------------------|
| Harbour porpoise | Not known | 4 | 300 | 0.64 | 2009 | Channel and Atlantic, Bay of Biscay, ICES area VII-VIII | 27 | D | Sole, monkfish, sea-bass | GNR/GNS | Observer program under EU regulation | Yvon Morizur (Ifremer) |
| Common dolphin | Not known | 6 | 20 | 0.62 | Winter 2009 | Channel, ICES area VII | 27 | D | Sea bass | PTM | Observer program under EU regulation 812/2004 | Yvon Morizur (Ifremer) |
| Common dolphin | Not known | 21 | 300-400 | 0.89 | Winter 2009 | Atlantic, Bay of Biscay, ICES area VIII | 27 | D | Sea bass | PTM | Observer program under EU regulation 812/2004 | Yvon Morizur (Ifremer) |
| Common dolphin | Not known | 2 | 20 | 0.97 | Summer 2009 | Channel, ICES area VII | 27 | D | Sea bass | PTM | Observer program under EU regulation 812/2004 | Yvon Morizur (Ifremer) |
| Common dolphin | Not known | 115 | 900 | 0.66 | Summer 2009 | Atlantic, Bay of Biscay, ICES area VIII | 27 | D | Albacore tuna | PTM | Observer program under EU regulation 812/2004 | Yvon Morizur (Ifremer) |
| Common dolphin | Not known | 1 | 10 | 0.80 | Summer 2009 | Atlantic, Bay of Biscay, ICES area VIII | 27 | D | Miscellaneous | OTM | Observer program under EU regulation 812/2004 | Yvon Morizur (Ifremer) |
| Striped dolphin | Not known | 3 | 800? | 0.68 | 2009 | Atlantic waters, ICES area VIII | 27 | D | Hake | GNS/GTR | Observer program under EU regulation 812/2004 | Yvon Morizur (Ifremer) |
| Common bottlenose dolphin | Not known | 1 | 10 | 0.97 | 2009 | NW Mediterranean | 37 | D | anchovy | OTM | Observer program under EU regulation 812/2004 | Yvon Morizur (Ifremer) |
| Striped dolphin | Not known | 5 | 70 | 0.53 | 2009 | NW Mediterranean | 37 | D | Hake, pilchard, anchovy | OTM | Observer program under EU regulation 812/2004 | Yvon Morizur (Ifremer) |

Similarly to the previous years, France has deployed in 2009 a program of fishery observers as a contribution to EU regulation 812/2004. A total of 731 days at sea were observed during 308 trips for pelagic trawling and 324 days at sea observed during 238 trips for set nets. Changes occurred at the middle of the year in the sampling plan to make the implementation of all observer-based programs more cost-efficient. For the fleets concerned by assessment according to the EU regulation, estimates of by-catch for 2009 are around 1000 common dolphins in ICES area VII-VIII, 300

porpoises in area VIII, a quantity not well estimated of striped dolphins in area VIII, 70 striped dolphins and 10 bottlenose dolphins in the Mediterranean. All coefficients of variation (CV) in 2009 but one were over 0.60, considerably higher than target value of 0.3 required by EU regulation 812/2004. As fishing effort data for 2009 are not exhaustively compiled at the date of preparing this report, 2008 effort data were used to raise the observed by-catch. Most common dolphin by-catch events were observed in ICES area VIII in the winter sea bass fishery and in the summer tuna fishery.

Aside from the EU regulation, a scientific study named FilManCet started at the beginning of 2009 to assess by-catch rate in set nets in two areas of the Channel coasts. After one complete year, the preliminary results of that observer based study indicate that by-catch rate on non equipped nets appears to be low in the Western Channel compared to the Celtic and North Seas.

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, GECEM, GECC, GEFMA, GLOBICE, GMN, LEMM, OCEAMM, 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.*, 2009).

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 2008 indicate a total number of 777 cetaceans reported (CRMM/ULR and National Stranding Scheme field correspondents). For the calendar year 2009, statistics are uncompleted at the date of compiling this report.

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 2009/ French Atlantic | 427 [§] | 215 | O. Van Canneyt (CRMM/ULR) | olivier.van-canneyt@univ-lr.fr |
| Cetaceans 2008/ French Mediterranean | 150 [£] | 74 | F. Dhermain (GECEM) | frank.dhermain@wanadoo.fr |
| Cetaceans / Guadeloupe | 4 [#] | - | C.&R. Rinaldi (AET) | evastropic@wanadoo.fr |
| Cetaceans / Martinique | 1 [*] | - | S. Jérémie (SEPANMAR and collaborators) | reseau_cetaces972@hotmail.com |
| Cetaceans/ Réunion | 3 | 0 | C. Jammes (GLOBICE) | globice@globice.org |
| Cetaceans / New Caledonia | 4 | 0 | C. Garrigue (OCNC) | op.cetaces@lagoon.nc |

§ include 9 unidentified small cetaceans, 1 fin w., 1 humpback w., 2 Cuvier's beaked w., 1 bottlenose b. w. 28 unidentified d., 1 killer w., 12 long-finned pilot w., 4 Risso's d., 21 common bottlenose d., 240 short-beaked common d., 17 striped d., 90 harbour p.

£ include 113 striped d., 10 common bottlenose d., 1 sperm w., 2 Cuvier's beaked w., 1 minke, 22 unid small delphinids

include 1 melon headed w., 1 common bottlenose d., 1 spinner d.

* include 1 pantropical spotted d.

9. OTHER STUDIES AND ANALYSES

Acoustics

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

CRC and GIS3M placed an autonomous hydrophone on a buoy located 50km offshore from Nice, to record occurrence of acoustic signals fin, sperm and long-finned pilot whales, as well as Risso's and striped dolphins. This work is conducted in collaboration with *l'Océanografic* (Valencia, Spain), UTL, Oceanwide Science Institute and the *Boussole* program from CNRS.

SEPANMAR investigates cetacean distribution in relation to man-induced disturbances in the marine and coastal habitats by using acoustic monitoring approaches. Possible long term changes in humpback whale songs in response to ship traffic and reproductive events will be monitored. Feeding ground range of pantropical spotted dolphins and sperm whales is studied to assess local impact of fisheries, coastal work (port and road) and seismic vessel surveys. Acoustic analyses are underway on humpback, sperm, dwarf sperm and melon-headed whales (SEPANMAR), in particular aiming at determining nyctemeral prey capture pattern in sperm whales.

In Madagascar (Ste Marie Island), UPS started a project whose 3 objectives were: humpback whale interactions (male/male, female/male, calf/female), humpback whale vocal repertoire, humpback whale recognition, identification and tracking, in collaboration with H. Glotin (UTL), P. White (University of Southampton) and *Megaptera* (www.megaptera.org).

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

CEBC investigates seasonal occurrence, distribution and movements of large mysticetes, notably blue whale subspecies near Crozet Islands (Samaran et al., *in press*). Nine autonomous hydrophones have been moored for one year in the Indian and Southern Oceans to record blue and fin whale low frequency calls in order to obtain seasonal occurrence and distribution at a larger scale. Four autonomous hydrophones have been moored near Scattered Islands in the southwest Indian Ocean to study during one year the seasonal occurrence of cetaceans (large whales, sperm whales and some dolphins) in the area.

Genetics

Population structure of the short-beaked common dolphin in the Northeast Atlantic (Portugal to Scotland) was investigated by using mtDNA control region sequences and 20 microsatellite markers (Mirimin *et al.* 2009). Samples analyzed included stranded and by-caught common dolphins.

A genetic study on harbour porpoise and bottlenose dolphin (coastal resident groups) has started (collaboration between the university of Brest and LEMM).

In NW Mediterranean, genetic analyses are conducted on biopsied sperm and long-finned pilot whale (CRC with NOAA Fisheries Service, La Jolla and CIRCE Spain). First analyses have been made on fin whale biopsies from the Mediterranean and Atlantic seas regarding assessment of sex ratio and of polymorphism (GIS3M, partnership between WWF and CIRAD).

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 along with several environmental data such as fish biomass, phytoplankton concentration and oceanographic characteristics. 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 (MNHN/CMCB).

The spatial distribution of the striped dolphin in coastal waters of NW Mediterranean was studied in parallel to isotope analyses (Meissner, on going MSc, Univ Aberdeen, CRC, ULR, GREC, EcoOcean Institut). In the Ligurian Sea, seasonal densities of main cetacean species were estimated to quantify their biomass and their prey consumption (CRC).

The identification of cetacean priority habitats in the French EEZ of the Caribbean and off Guiana is underway for the designation of marine protected areas within pelagic waters under French jurisdiction in this region (CRMM/ULR, with AET and SEPANMAR). Evaluation of sperm whale feeding success and prey species inventory are underway off Guadeloupe (AET).

Focal follows dedicated to investigating habitat use and social organisation were conducted on spinner, pantropical spotted, Indo-Pacific bottlenose dolphins and melon-headed whales in Mayotte (OMM, ULR; Gross *et al.*, 2009).

Conservation, management and education

GECC manages a regional observer network and organises educative programs for sea users. Educational workshops for schools are proposed by LEMM. LEMM is involved in the management council of *Parc Naturel Marin d'Iroise* (PNMI, west Brittany).

Acoustic deterrents are required in area VII on set nets for vessels greater than 12 meters. A pilot study was conducted in a marine protected area of ICES division VIIe in order i) to investigate by-catch rate of nets set in that area, ii) to study the efficiency of pingers to mitigate bycatch of cetaceans, iii) to study the true cost of well equipped nets in the commercial conditions of a monkfish fishery, iv) to compare three devices. One of the main conclusions of this pilot study was that no significant difference was found in the by-catch rate between equipped nets and non equipped nets

probably because of a too low abundance of porpoise in the area. After a one year of checking and replacing pingers, the costs of well equipped nets became 10 times higher than the initial costs (Ifremer, PNMI, LEMM-Océanopolis).

CRMM/ULR organised the 11th annual meeting of the national stranding scheme, in Corsica. In 2009, the theme was cetaceans and maritime traffic. The symposium was hosted by CRMM/ULR and co-hosted by *CARI (Cétacés Association Recherche Insulaire)*.

The project REPCET is designed to develop a tool that will inform in real time all vessels steaming in the Pelagos sanctuary of the location of large whales reported by mariners themselves, so that they can adapt their route and speed accordingly (SDE).

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 regional association. It also carries out studies on impacts 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. AET has also been carrying out studies on marine traffic since 2005.

BREACH is involved in the French Caribbean whale sanctuary process and recently in the project of *Parc Naturel Marin de Côte Vermeille* (NW Mediterranean) working group, as well as in educational programs about Cetacean.

In Martinique, SEPANMAR produces educational programmes toward professionals, schools and lay public concerning marine coastal biodiversity, water quality monitoring, ship strikes, acoustic disturbance, and more generally any management issue relevant to cetacean conservation.

GLOBICE runs educative programs for schools, 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.

CEBC/MNHN are investigating in association with fishermen mitigation measures to reduce depredation exercised by killer whales and sperm whales on demersal long lines targeting Patagonian tooth fish in the Crozet and Kerguelen EEZ.

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