Italy. Progress report on cetacean research, January to December 2010, with statistical data for the calendar year 2010

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[1] **Please note** that the English has not been revised. Each contributor is responsible for the accuracy of her/his language. Same responsibility applies for what concerns the accuracy of data and released information. For any clarification, please, refer to each of the indicated persons/organisations.

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1. SPECIES AND STOCKS STUDIED

IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Fin whale	*Balaenoptera physalus*	Tyrrhenian Sea (Italy); Ligurian Sea (Italy); Eastern Atlantic Ocean	2.1.1; 2.1.2; 2.2; 3.1.1; 4.1; 6.3.1; 8; 9; 11
Humpback whale	*Megaptera novaeangliae*	Tyrrhenian Sea	2.1.1; 2.2; 3.1.1; 3.2
Sperm whale	*Physeter macrocephalus*	Tyrrhenian Sea (Italy);); Ligurian Sea (Italy); Eastern Corsica Sea (France); Atlantic Ocean; Norwegian Sea; Sea of Cortez (Mexico)	2.1.1; 2.2; 3.1.1; 3.2; 4.1; 6.3.1; 9; 11
Cuvier's beaked whale	*Ziphius cavirostris*	Tyrrhenian Sea (Italy); Ligurian Sea (Italy); Sardinia Sea (Italy); Eastern Atlantic Ocean;	2.1.1; 2.2; 3.1.1; 3.2; 8; 9; 11
False killer whale	*Pseudorca crassidens*	Eastern Atlantic Ocean	9
Killer whale	*Orcinus orca*	Sea of Cortez (Mexico)	4.1; 4.4; 5; 9
Long-finned pilot whale	*Globicephala melas*	Tyrrhenian Sea (Italy); Ligurian Sea (Italy); Eastern Corsica Sea (France); Sea of Cortez (Mexico)	2.1.1; 2.1.2; 2.2; 3.1.1; 4.1; 4.4; 5; 9; 11.2
Short-finned pilot whale	*Globicephala macrorhynchus*	Eastern Atlantic Ocean	9
Risso's dolphin	*Grampus griseus*	Ionian Sea (Italy); Tyrrhenian Sea (Italy); Ligurian Sea (Italy); Eastern Atlantic Ocean	2.1.1; 2.1.2; 2.2; 3.1.1; 3.2; 4.1; 9; 11
Common bottlenose dolphin	*Tursiops truncatus*	Adriatic Sea (Italy); Ionian Sea, (Italy-Greece); Aegean Sea (Greece);Sicily Channel (Italy); Tyrrhenian Sea (Italy); Ligurian Sea (Italy); Sardinia Sea (Italy); Eastern Atlantic Ocean	2.1.1; 2.1.2; 2.2; 3.1.1; 3.2; 4.3; 8; 9; 11
Indo-Pacific bottlenose dolphin	*Tursiops aduncus*	Central Queensland (Australia)	4.1; 4.3; 4.4; 5; 9
Long-beaked common dolphin	*Delphinus capensis*	Sea of Cortez (Mexico)	4.1; 4.4; 5; 9

IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Short-beaked common dolphin	*Delphinus delphis*	Adriatic Sea (Italy); Ionian Sea (Greece); Aegean Sea (Greece); Sicily Channel (Italy);Tyrrhenian Sea (Italy); Ligurian Sea (Italy); Eastern Atlantic Ocean	2.1.1; 2.1.2; 2.2; 3.1.1; 3.2; 4.1; 8; 9; 11
Indo-Pacific humpback dolphin	*Sousa chinensis*	Central Queensland (Australia)	4.1; 4.4; 5; 9
Striped dolphin	*Stenella coeruleoalba*	Adriatic Sea (Italy); Ionian Sea (Italy); Aegean Sea (Greece); Tyrrhenian Sea (Italy); Ligurian Sea (Italy); Eastern Atlantic Ocean	2.1.1; 2.1.2; 2.2; 3.1.1; 3.2; 4.1; 4.3; 8; 9; 11; 11.1
Australian snubfin dolphin	*Orcaella heinsohni*	Central Queensland (Australia)	4.1; 4.3; 4.4; 5; 9

2. SIGHTINGS DATA

2.1 Field work

2.1.1 Systematic

Target species	Date	Area	No. of sightings	Contact person/institute and references
Fin whale	7-14/10/2010	North Tyrrhenian Sea	3 sightings, 5 animals	Gianni Pavan / CIBRA
As above	6 Feb / 20 Oct 2010	Ligurian Sea	1	Alberto Marco Gattoni Associazione Battibaleno (BB)
As above	March 2010 – May 2010	North-eastern coast of Sardinia (Tyrrhenian Sea)	9 Sightings / 12 days	Bruno Diaz Lopez / BDRI / bruno@thebdri.com
As above	May-October 2010	Ligurian Sea, Italy	44	S. Airoldi, TRI
As above	June - July 2010	Central Tyrrhenian Sea, Italy	7	S. Panigada, TRI
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	53	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	Jul-Aug 2010	Adriatic Sea	1	Caterina Fortuna/ISPRA & Drasko Holcer/BWI
As above	17/01-29/10/2010	Ligurian Sea, Tuscan Archipelago	4	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
Humpback whale	6-5/9-18	Tuscan waters	1	Cetus
Sperm whale	May-October 2010	Ligurian Sea, Italy	32	S. Airoldi, TRI
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	4	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	17/01-29/10/2010	Ligurian Sea, Corsica Sea	9	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
Cuvier's beaked whale	7-14/10/2010	North Tyrrhenian Sea	1 sighting, 2 animals 1 acoustic detection, 1 animal	Gianni Pavan / CIBRA
As above	May-October 2010	Ligurian Sea, Italy	3	S. Airoldi, TRI
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	3	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	Jul-Aug 2010	Adriatic Sea	1	Caterina Fortuna/ISPRA & Drasko Holcer/BWI
As above	17/01-29/10/2010	Ligurian Sea	3	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
Long-finned pilot whale	May-October 2010	Ligurian Sea, Italy	2	S. Airoldi, TRI
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	5	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
Risso's dolphin	7-14/10/2010	North Tyrrhenian Sea	1 sighting, 11 animals	Gianni Pavan / CIBRA
As above	6 Feb / 20 Oct 2010	Ligurian Sea	3	Alberto Marco Gattoni Associazione Battibaleno (BB)

Target species	Date	Area	No. of sightings	Contact person/institute and references
Risso's dolphin	Jul-Aug 2010	Adriatic Sea	11	Caterina Fortuna/ISPRA & Drasko Holcer/BWI
As above	May-October 2010	Ligurian Sea, Italy	4	S. Airoldi, TRI
As above	April - May 2010	Ionian Sea, Gulf of Taranto, Italy	9	S. Panigada, TRI
As above	June - July 2010	Central Tyrrhenian Sea, Italy	1	S. Panigada, TRI
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	3	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	17/01-29/10/2010	Ligurian Sea	2	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
Common bottlenose dolphin	1-1/12-31	Tuscan waters	14	Cetus
As above	7-14/10/2010	North Tyrrhenian Sea	1 sighting off effort, 2 animals	Gianni Pavan / CIBRA
As above	June/September 2010	Sicily channel-Lampedusa Island	51	Marina Pulcini- ISPRA-CTS
As above	01/01/10-31/12/10	Northestern Saridinia	24	fra.magnone@crimm.org/CRiMM onlus a.fozzi@crimm.org/CRiMM onlus
As above	Jan-Dec 2010	Ligurian Sea	17	G. Gnone, M. Bellingeri, F. Fossa / ADG
As above	January 2010 – December 2010	North-eastern coast of Sardinia (Tyrrhenian Sea)	216 Sightings / 108 days at sea	Bruno Diaz Lopez / BDRI / bruno@thebdri.com
As above	March 2010 – December 2010	North-western coast of Sardinia (Gulf of Alghero)	35 Sightings / 70 days at sea	Bruno Diaz Lopez & Alberto Addis/ BDRI / bruno@thebdri.com
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	13	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	Jul-Aug 2010	Adriatic Sea	126	Caterina Fortuna/ISPRA & Drasko Holcer/BWI
As above	April - May 2010	Ionian Sea, Gulf of Taranto, Italy	3	S. Panigada, TRI
As above	June - July 2010	Central Tyrrhenian Sea, Italy	1	S. Panigada, TRI
As above	19/01/10-22/06/10	Ligurian sea	1	M. Rosso/CIMA RF; M. Wurtz /DIBIO GE
As above	01/08/10-31/12/10	Ligurian sea	1	A. Moulins/CIMA RF
As above	17/03-20/05/2010 31/07/2010 22-23/10/2010	Ligurian Sea, Tuscan Archipelago, North-eastern coast of Sardinia	17	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE
As above	From 01/01/2010 to 31/12/2010	La Maddalena Archipelago	26	Gabriella La Manna/CTS
As above	From 01/01/2010 to 31/12/2010	Asinara Island	14	Gabriella La Manna/CTS
As above	June - September 2010	Eastern Ionian Sea, Greece	12	J. Gonzalvo, TRI
As above	April – October 2010	Amvrakikos Gulf, NW Greece	80	J. Gonzalvo, TRI
As above	May – September 2010	Gulf of Corinth, Greece	20	TRI
As above	31 june-31 august 2010	Ionian sea (Greece)	8	Elena Papale / Gaia Research Institute; Marta Azzolin / Gaia Research Institute
Short-beaked common dolphin	6-5/9-18	Tuscan waters	3	Cetus
As above	1 June-20 September 2010	Ionian sea (Greece) and Gulf of Corinth	6	Marta Azzolin / Gaia Research Institute; Elena Papale / Gaia Research Institute
As above	June/September 2010	Sicily channel-Lampedusa Island	2	Marina Pulcini- ISPRA-CTS
As above	11/06/2010 – 15/09/2010	Monfalcone Basin Area - Gulf of Trieste	5	M. Tempesta (Miramare MPA)
As above	June - September 2010	Eastern Ionian Sea, Greece	1	J. Gonzalvo, TRI
As above	May – September 2010	Gulf of Corinth, Greece	17	TRI

Target species	Date	Area	No. of sightings	Contact person/institute and references
Short-beaked common dolphin	May-October 2010	Ligurian Sea, Italy	1	S. Airoldi, TRI
Striped dolphin	17/01-29/10/2010	Ligurian Sea	48	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
As above	6-5/9-18	Tuscan waters	15	Cetus
As above	1 june-20 September 2010	Ionian sea (Greece) and Gulf of Corinth	19	Marta Azzolin / Gaia Research Institute; Elena Papale / Gaia Research Institute
As above	7-14/10/2010	North Tyrrhenian Sea	7 sightings, 50 animals 2 sightings off effort, 3 animals	Gianni Pavan / CIBRA
As above	6 Feb / 20 Oct 2010	Ligurian Sea	11	Alberto Marco Gattoni Associazione Battibaleno (BB)
As above	May – September 2010	Gulf of Corinth, Greece	41	TRI
As above	May-October 2010	Ligurian Sea, Italy	207	S. Airoldi, TRI
As above	April - May 2010	Ionian Sea, Gulf of Taranto, Italy	104	S. Panigada, TRI
As above	June - July 2010	Central Tyrrhenian Sea, Italy	113	S. Panigada, TRI
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	197	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	Jul-Aug 2010	Adriatic Sea	85	Caterina Fortuna/ISPRA & Drasko Holcer/BWI
Not identified dolphin	7-14/10/2010	North Tyrrhenian Sea	1 sighting, 2 animals	Gianni Pavan / CIBRA

ADG: Delfini Metropolitani research project. Boat-based random surveys. The study area is located along the Eastern Ligurian coast, between Genoa and La Spezia. The research platforms are two 5,10m long inflatable. Research activity is conducted during the all year, according to weather conditions. In 2010, 51 daily surveys were conducted for a total of 2613 km.

BB: The association BATTIBALENO has effected n° 57 sea expedition for the observation of the present cetacean in the Ligurian Sea, in the period between 6 February / 20 October 2010. The boat used by Battibaleno is "Physalie", a sail boat of 42 feet, especially equipped for the realization of photos, and video recordings. To our recognitions have participated doctors in scientist and researchers, but also students, journalists and impassioned.

BDRI: Using study techniques that neither harm nor seriously disturb the animals, BDRI researchers are engaged in the study of bottlenose dolphins, as well as collecting detailed information about their environment. Randomization of the surveys was attempted in order to cover the total study areas although the geographic distribution of effort varied depending on weather conditions. The main objective of these surveys was to continue to study the behaviour, use of habitat and distribution of bottlenose dolphins and correlate their presence, behavioural changes and social organization to the different levels of human activities (gillnet fisheries, trawlers, aquaculture and tourism).
- North-eastern coast of Sardinia (Tyrrhenian Sea): This research project is part of a long term study about the socioecology and behaviour of a Mediterranean resident bottlenose dolphin population since 1991. Data were collected by scientists and volunteers onboard 11 meters wooden vessel and a 5.3m motor-craft from January to December 2010. Additionally we performed land based observations of fin whales during spring season using spotting scopes and binoculars.
- North-western coast of Sardinia (Gulf of Alghero): This research project that started in 2008 focuses on photo-identification and population analysis. Data were collected by scientists onboard a 6m motor-craft from March to December 2010.

Cetus: The research vessel used by Cetus is the "Krill", a 40ft equipped sailing catamaran. The routes are fixed either by transects respecting constant values of length, speed and efforts or random routes. The boat routes and animal sightings are continuously recorded by GPS disposals. All activities are planned considering minimal disturbance to animals.
The centre controls the waters of the Tuscany:
- North Tuscany (Versilia coastline all year round, period generally considered February-November);
- Tuscan Archipelago during the Summer season (June-September)
Boat surveys have been made according to the following standard basis: Beaufort scale 3 or less; constant speed, n° of observers and weather conditions preventing disturbances to the animals. 2010: Effort 3.115 Km, Sightings n° 33, n° 966 sighted animal of 4 different species.

CIBRA: Short visual and acoustic survey in the North Tyrrhenian Sea in cooperation with CETUS, AMBIENTE MARE, ACQUARIO DI GENOVA, RIGHT WAVES, AEST. The survey was supported by the Italian Ministry of the Environment and by ARPA Toscana within the GIONHA Project (co-financed by the European programme "Programme de cooperation transfrontalière Italie/France "Maritime" 2007-2013).
Due to bad weather conditions the effort was 18h of visual monitoring and 40h of passive acoustic monitoring with wide band towed array (5.5 knots tow speed, depth 24m). Acoustic detections here reported refer to *Ziphius cavirostris* only (the acoustic data analysis for the other species is in progress).

CIMA RF: Three C-Pods were anchored off Savona. They collected acoustic data continually from August to December 2010. Data are not yet analyzed.

CRiMM onlus: Boat surveys have been taken on calm sea days following standard routes (Beaufort scale 3 or less). Survey routes are recorded with a GPS and each outing lasted between 3 and 6 hours. Composition of groups is determined by standard photo identification technique. In order to minimize the disturbances, dolphins has never been approached closer than 20-50 metres and females with calves have never been followed longer than 30 minutes.

DIBIO GE & CIMA RF: From 19 January to 22 June 2010, 7 surveys were conducted off Savona, aboard a 11-m long semi-rigid boat in order to detect common bottlenose dolphins. Boat's GPS positions were continuously recorded. At least four researchers participated in the surveys. Surveys were conducted on grid designed to collect sediment between Savona and the Bergeggi MPA.
From 17 January to 29 October 2010, 25 one-day surveys were conducted in Ligurian Sea and Tuscan Archipelago, aboard a 11m semi-rigid vessel, with an eye height of 4 m above sea level. Transect lines were not determined randomly but according to depths and to the species targeted by the survey. Ships' GPS positions were continuously recorded. At least four trained observers participated in the surveys. Most surveys were conducted following an acoustic grid of about 600 acoustic station, covering entire sperm whale distribution in the Ligurian and Corsica Sea (ISHMAEL Project).
From 1 to 15 September, 7 one-day surveys were conducted in the western Corsica sea, aboard a sailing boat with the collaboration of a French NGO (Participe Futur www.participefutur.org). This survey has been conducted following the sampling protocol planned for sperm whale (coupling visual survey with acoustic grid). Ships' GPS positions were continuously recorded. At least four trained observers participated in the surveys.

DIBIO GE: From 17 March to 10 April 2010, six one-day survey were conducted in North-eastern coast of Sardinia, to study bottlenose dolphin behavior and distribution.

GAIA RESEARCH INSTITUTE: Between the 30 of June and the 31st of August 2010, 33 vessel based surveys (200 hours) were carried out in standard weather conditions, in the Greek Ionian waters. The goals of the surveys were to study cetacean's abundance and distribution in the Ionian Sea, to analyse their habitat use and behaviour, and to investigate cetacean's interaction with anthropogenic activities (fishery, boat traffic). 2300 km were navigated in an area of 2600 square kilometres of the Greek Ionian waters. A 12m sailing vessel was employed to follow transects planned *a priori* in order to heavily cover all the area of study.

Between the 1stof June and the 20thof September, 25 vessel based surveys were carried out in standard weather conditions, in the Gulf of Corinth (GOC), in order to investigate habitat use, acoustic, socio-ecology and behaviour of striped and common dolphin in an area of 700 square kilometres. A 4,5m rubber dinghy was employed, randomly navigating in the whole area of study.

ISPRA, DIP III CRA 15 (Lauriano): An aerial line transect surveys aimed to obtain baseline data on density and abundance estimates of fin whale, striped dolphin and common bottlenose dolphin has been carried out in the waters of the Pelagos sanctuary and to the adjacent area to south western boundary (Corsican and Sardinian Sea).

ISPRA, DIP III CRA 15 (Fortuna): During the summer 2010 (Jul 29 - Aug 16 2010), within the framework of research activities due to fulfil the Italian obligations to Regulation (EC) n. 812/2004 and to the ACCOBAMS ratification laws, the Italian Institute for Environmental Protection and Research (ISPRA), in cooperation with the Blue World Institute of Marine Research and Conservation (BW, Croatia) conducted the first Adriatic aerial survey in order to provide the first basin-wide information on abundance and distribution of cetaceans - particularly the common bottlenose dolphins (*Tursiops truncatus*) - and other protected species and species of conservation concern of different taxa (e.g. *Caretta caretta* and *Mobula mobular*) present there. This information constitutes a fundamental step for assessing their status and implementing activities to improve their protection and management at the basin level. It is important to highlight that the Adriatic Sea represents a sub-region of the European Marine Strategy Framework Directive (MSFD; 2008/56/EC). This data is, therefore, relevant for the implementation of the above mentioned European laws, as well as for the Habitats Directive (Council Directive 92/43/EEC), the Convention on Migratory Species (Bonn Convention) and ACCOBAMS, the Convention on Biological Diversity (CBD), the Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention) the Mediterranean Action Plan (MAP) and the General Fisheries Commission for the Mediterranean (GFCM). This project was mostly funded by Department of Fishery of the Italian Ministry of Agriculture, Food and Forestry. The Italian Ministry of the Environment provided funding for the training of

the observers and some support for data collection. In addition, the Croatian State Institute for Nature Protection funded extra research effort in two selected areas. The survey benefited from the support of a number of local institutions and organisations, including the Croatian Natural History Museum, the Croatian State Institute for Nature Protection, the Albanian Association for Protection of Aquatic Wildlife, the Institute for Marine Biology of Kotor from Montenegro and the Institute of the Republic of Slovenia for Nature Conservation and the Slovenian NGO Morigenos - Marine Mammal Research and Conservation Society. The research has been carried out under valid research and flight permits issued by relevant national administration (Croatian Ministry of Culture, Croatian State Geodetic Administration, Croatian Civil Aviation Agency, Croatian Air traffic Control, Ministry for Spatial Planning and Environment and the Ministry of Defence of Montenegro, Ministry of the Environment and Spatial Planning of Slovenia, Albanian Ministry of Environment, Forests and Water Administration and Albanian Ministry of Public Works and Transport, Civil aviation authority). The entire process has been supported by the ACCOBAMS Secretariat and ACCOBAMS national focal points. Additional support was also given by Simone Panigada (Tethys Research Institute, Italy) and by the International Whaling Commission (particularly, Greg Donovan).

Miramare MPA: A systematic monitoring of the presence and condition of two short-beaked common dolphin has been done from mid June to mid September 2010. The couple included an adult and a calf that remained in the shipyard area of Monfalcone (Gulf of Trieste, North Adriatic Sea) for 7 month. The adult is still present in the area while the calf has not been sighted after January 2011. The presence of the two individuals in a restricted area for a long period of time allowed for a systematic survey with data on presence, behaviour, photo-ID, environmental and sea-ambient noise data.

2.1.2 Opportunistic, platforms of opportunity

Primary species	Area	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
Fin whale	North-eastern Sardinia, central Tyrrhenian sea	Photo-ID, sightings, environmental data	Researchers	Whale watching vessel		L. Bittau/DIZGEV Univ. Sassari
As above	Ligurian Sea	Survey effort; sightings;	Researcher	Whale watching vessel	Acquario di Genova	Guido Gnone /ADG
As above	Ligurian Sea	Sail boat Visual survey 57 transect line campaigns photo identification	Crew Associazione Battibaleno	Sail boat Visual survey transect line campaigns photo identification	Operational center of the association Battibaleno Genova	Alberto Marco Gattoni Associazione Battibaleno (BB)
As above	Tuscan Arcypelagus	sightings	Crew	Research vessels		Micaela Bacchetta; CRC;
As above	Central and southern Tyrrhenian sea, western Ionian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	Central Tyrrhenian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	Eastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	Weastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Sperm whale	North-eastern Sardinia, central Tyrrhenian sea	Photo-ID, sightings, environmental data	Researchers	Whale watching vessel		L. Bittau/DIZGEV Univ. Sassari
As above	Ligurian Sea	Survey effort; sightings;	Researcher	Whale watching vessel	Acquario di Genova	Guido Gnone /ADG
As above	Norwegian Sea	Photo-ID; sightings; acoustic	Dedicated Observers	Whale-watching vessel		A.Moulins/CIMA RF

Primary species	Area	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
Sperm whale	Central and southern Tyrrhenian sea, western Ionian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	Central Tyrrhenian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	Northern Tyrrhenian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	Eastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	Weastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Cuvier's beaked whale	North-eastern Sardinia, central Tyrrhenian sea	Photo-ID, sightings, environmental data	Researchers	Whale watching vessel		L. Bittau/DIZGEV Univ. Sassari
As above	Ligurian Sea	Survey effort; sightings;	Researcher	Whale watching vessel	Acquario di Genova	Guido Gnone /ADG
As above	Central Tyrrhenian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	Eastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	Weastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Long-finned pilot whale	Eastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	Weastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Risso's dolphin	North-eastern Sardinia, central Tyrrhenian sea	Photo-ID, sightings, environmental data	Researchers	Whale watching vessel		L. Bittau/DIZGEV Univ. Sassari
As above	Ligurian Sea	Survey effort; sightings;	Researcher	Whale watching vessel	Acquario di Genova	Guido Gnone /ADG
As above	Ligurian Sea	Sail boat Visual survey 57 transect line campaigns photo identification	Crew Associazione Battibaleno	Sail boat Visual survey transect line campaigns photo identification	Operational center of the association Battibaleno Genova	Alberto Marco Gattoni Associazione Battibaleno (BB)
As above	Central and southern Tyrrhenian sea, western Ionian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	Central Tyrrhenian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
Common bottlenose dolphin	Sicily channel-Lampedusa Island	Photo-ID*; sightings	CTS	rigid hull inflatable boat	CTS	Marina Pulcini

Primary species	Area	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
Common bottlenose dolphin	North-eastern Sardinia, central Tyrrhenian sea	Photo-ID, sightings, environmental data	Researchers	Whale watching vessel		L. Bittau/DIZGEV Univ. Sassari
As above	Ligurian Sea	Survey effort; sightings;	Researcher	Whale watching vessel	Acquario di Genova	Guido Gnone /ADG
As above	Tuscan Arcypelagus	Photo-ID*; environmental; behaviour; sightings	Natauralist; researcher; students;	Research vessels		Micaela Bacchetta; CRC;
As above	Central and southern Tyrrhenian sea, western Ionian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	Central Tyrrhenian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	Northern Tyrrhenian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	Eastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	Weastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Short-beaked common dolphin	Sicily channel-Lampedusa Island	Photo-ID*; sightings	CTS/ Hydrosphera	rigid hull inflatable boat		Marina Pulcini
As above	Ligurian Sea	Survey effort; sightings;	Researcher	Whale watching vessel	Acquario di Genova	Guido Gnone /ADG
As above	Monfalcone Basin Area - Gulf of Trieste	Photo-ID*; sightings	biologists	scientific vessel of the Regional Agency for Environmental Protection of Friuli Venezia Giulia (ARPA FVG)	*Miramare MPA	M. Tempesta (Miramare MPA) and M. Celio (ARPA FVG)
As above	Monfalcone Basin Area - Gulf of Trieste	sightings	crew	Coast Guard vessel	*Miramare MPA	M. Tempesta (Miramare MPA)
As above	Central and southern Tyrrhenian sea, western Ionian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	Weastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Striped dolphin	North-eastern Sardinia, central Tyrrhenian sea	Photo-ID, sightings, environmental data	Researchers	Whale watching vessel		L. Bittau/DIZGEV Univ. Sassari
As above	Ligurian Sea	Survey effort; sightings;	Researcher	Whale watching vessel	Acquario di Genova	Guido Gnone /ADG
As above	Central and southern Tyrrhenian sea, western Ionian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	Central Tyrrhenian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev

Primary species	Area	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
Striped dolphin	Northern Tyrrhenian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	Eastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	Weastern Ligurian sea	sightings, environmental data	Researchers	Ferries	ISPRA, NAT-BIO	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	Ligurian Sea	Sail boat Visual survey 57 transect line campaigns photo identification	Crew Associazione Battibaleno	Sail boat Visual survey transect line campaigns photo identification	Operational center of the association Battibaleno Genova	Alberto Marco Gattoni Associazione Battibaleno (BB)

ADG: Opportunistic observations were collected from motor boat (whalewatching boats) in the Ligurian Sea (Genoa) from 10/04/2010 to 02/10/2010. 40 daily surveys were conducted for a total of about 4904 km.

CIMA RF: 167 surveys were conducted in Norwegian Sea in collaboration with Whalesafari Ltd, aboard whale-watching motor-vessels (M/S Reine and M/S Mann Dolphin). Italian MMO collected data: sperm whale acoustic emissions, boat's GPS coordinates, sighting's coordinates, whale behaviour according to whale-watching behavior, photo-id. Sperm whales were encountered 731 times.

DIZGEV Univ. Sassari: 17 surveys were conducted in 2010 off north eastern Sardinia in collaboration with Orso Diving company, aboard a whalewatching motor-vessels, 11-m long catamaran (Orso cat) totalling 1930 km of navigation. Researchers collected data: vessel's gps coordinates, oceanographic data, sighting's coordinates, photo-id, associated nectonic fauna, boat/ship's traffic. Six cetacean species were encountered: striped dolphin (n=27), sperm whale (n=7), fin whale (n=5); Cuvier's beaked whale (n=2), common bottlenose dolphin (n=2), Risso's dolphin (n=1).

ISPRA, Difesa Natura/FLT (Arcangeli): Synoptic and systematic surveys undertaken from platform of opportunity (ferries) have been held weekly from June to September. Dedicated observers followed the distance sampling protocol to collect data along the following 5 trans-regional fixed line transects in Ionian, Tyrrhenian and Ligurian sea: Catania-Civitavecchia (8112 NM travelled on effort), Civitavecchia-G.Aranci (4.740 NM travelled on effort); Livorno-Bastia (1.206 NM travelled on effort all year round); Savona-Bastia (3.893 NM travelled on effort); Nizza-Calvi (2.953 NM travelled on effort). The monitoring programme along these transects started in 2007 recording sightings, environmental parameters and data on maritime traffic.

ISPRA, DIP II CRA 15-CTS (Pulcini): A rigid hull inflatable boat (5.7 m long) was utilized for a long term work on bottlenosed dolphin (1996-2010). For each sighting the following minimum information was recorded: date, time, initial GPS position, species, number of individuals, estimated age class. Photo-identification was performed following Wursig and Jefferson (1990). Between 1997-2010, relatively large groups of *D.delphis* were also consistently encountered around the Pelagie Archipelago, Italy. A total of 43 individuals could be opportunistically photo-identified based on natural marks on their dorsal fins. Of these, 6 individuals were re-sighted in different years, suggesting a levels of site fidelity.

2.2 Analyses/development of techniques

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Fin whale	06/06/10-14/11/10	North-eastern Sardinia, central Tyrrhenian sea	PhotoID, vessel's tracklines data, environmental data	Spatio-temporal distribution and sighting frequency; habitat use and relative abundance;	L. Bittau/DIZGEV Univ. Sassari
As above	6-2/ 20 -10	Ligurian Sea	Sail boat Line transect survey photo identification	Distribution; sighting frequency (1100 miles crossed) Distribution-Sighting frequency - behaviour-Presence absence	Alberto Marco Gattoni Associazione Battibaleno (BB)
As above	March – May 2010	North-eastern coast of Sardinia (Tyrrhenian Sea)	Land based and boat based observation, presence of fin whales during spring season along Sardinian waters.	-Encounter rates	Diaz Lopez, B./BDRI

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Fin whale	May-October 2010	Ligurian Sea, Italy	Boat surveys, photo-identification, behavioural sampling (4828 km)	Encounter rate, distribution, abundance, habitat use, behaviour, ecology	S. Airoldi,TRI
As above	June - July 2010	Central Tyrrhenian Sea, Italy	Line transect, aerial surveys (6275 km)	Encounter rate, distribution, habitat use, abundance	S. Panigada, TRI
As above	15/6-5/7-2011	Corsican, Sardinian Seas and Pelagos sanctuary	Aerial line transect survey/11,431 km	Distribution, density and abundances	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	17/01-29/10/2010	Ligurian Sea, Tuscan Archipelago	Line transect survey	Distribution; Distance sampling	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
As above	09/05	Tuscan Arcypelagus	Line transect survey; fishing boat survey; specifical environmental status survey	Distribution; sighting frequency	Micaela Bacchetta; CRC;
As above	08/07 - 15/10/ 2010	Central and southern Tyrrhenian sea, western Ionian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	11/06 - 26/09/2010	Central Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	26/06 - 23/09/2010	Northern Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	06/06 - 24/09/2010	Eastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	06/06 - 12/09/2010	Weastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Humpback Whale	6-10/9-9	Tuscan waters	Line transect survey or random routes, Distance sampling, M-R	Sighting & Photo ID	Cetus
Sperm whale	17/01-29/10/2010	Ligurian Sea	PhotoID, Line transect survey, acoustics	Distribution, Habitat	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
As above	12/06/10-15/09/10	Norwegian Sea	PhotoID, Line transect Survey, acoustic data	Population estimates; Spatio-temporal distribution; Habitat; IPI estimates	A.Moulins/CIMA RF
As above	17/01-29/10/2010	Ligurian Sea	PhotoID, Line transect survey, acoustics	Distribution, Habitat	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
As above	15/6-5/7-2011	Corsican, Sardinian Seas and Pelagos sanctuary	Aerial line transect survey/11,431 km	Distribution	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	06/06/10-14/11/10	North-eastern Sardinia, central Tyrrhenian sea	PhotoID, vessel's tracklines data, environmental data	Spatio-temporal distribution and sighting frequency; habitat use and relative abundance;	L. Bittau/DIZGEV Univ. Sassari
As above	May-October 2010	Ligurian Sea, Italy	Boat surveys, photo-identification, behavioural sampling (4828 km	Encounter rate, distribution, abundance, habitat use, behaviour, ecology	S. Airoldi,TRI
As above	08/07 - 15/10/ 2010	Central and southern Tyrrhenian sea, western Ionian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	11/06 - 26/09/2010	Central Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	26/06 - 23/09/2010	Northern Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	06/06 - 24/09/2010	Eastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	06/06 - 12/09/2010	Weastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Cuvier's beaked whale	7-14/10/2010	North Tyrrhenian Sea	Line transect survey	Passive acoustic monitoring with wide band array towed by a 14m sailing boat	Gianni Pavan / CIBRA

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Cuvier's beaked whale	06/06/10-14/11/10	North-eastern Sardinia, central Tyrrhenian sea	PhotoID, vessel's tracklines data, environmental data	Spatio-temporal distribution and sighting frequency; habitat use and relative abundance;	L. Bittau/DIZGEV Univ. Sassari
As above	May-October 2010	Ligurian Sea, Italy	Boat surveys, photo-identification, behavioural sampling (4828 km	Encounter rate, distribution, abundance, habitat use, ecology	S. Airoldi,TRI
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	Aerial line transect survey/11,431 km	Encounter rate, distribution, habitat use, abundance	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	17/01-29/10/2010	Ligurian Sea	PhotoID, Line transect survey	Population estimates, Spatio-temporal distribution; Habitat	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
As above	08/07 - 15/10/ 2010	Central and southern Tyrrhenian sea, western Ionian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	11/06 - 26/09/2010	Central Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	26/06 - 23/09/2010	Northern Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	06/06 - 24/09/2010	Eastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	06/06 - 12/09/2010	Weastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Long-finned pilot whale	May-October 2010	Ligurian Sea, Italy	Boat surveys, photo-identification, behavioural sampling (4828 km)	Encounter rate, distribution, abundance, habitat use, behaviour, ecology	S. Airoldi,TRI
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	Aerial line transect survey/11,431 km	Encounter rate, distribution, habitat use, abundance	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	08/07 - 15/10/ 2010	Central and southern Tyrrhenian sea, western Ionian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	11/06 - 26/09/2010	Central Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	26/06 - 23/09/2010	Northern Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	06/06 - 24/09/2010	Eastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	06/06 - 12/09/2010	Weastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Risso's dolphin	06/06/10-14/11/10	North-eastern Sardinia, central Tyrrhenian sea	PhotoID, vessel's tracklines data, environmental data	Spatio-temporal distribution and sighting frequency; habitat use and relative abundance;	L. Bittau/DIZGEV Univ. Sassari
As above	6 Feb / 20 Oct 2010	Ligurian Sea	Sail boat Line transect survey photo identification	Distribution; sighting frequency(1100 miles crossed) Distribution-Sighting frequency - behaviour-Presence absence	Alberto Marco Gattoni Associazione Battibaleno (BB)
As above	May-October 2010	Ligurian Sea, Italy	Boat surveys, photo-identification, behavioural sampling (4828 km)	Encounter rate, distribution, abundance, habitat use, behaviour, ecology	S. Airoldi,TRI
As above	April - May 2010	Ionian Sea, Gulf of Taranto, Italy	Line transect, aerial surveys (6547 km)	Encounter rate, distribution, habitat use, abundance	S. Panigada, TRI
As above	June - July 2010	Central Tyrrhenian Sea, Italy	Line transect, aerial surveys (6275 km)	Encounter rate, distribution, habitat use, abundance	S. Panigada, TRI
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	Aerial line transect survey/11,431 km	Encounter rate, distribution, habitat use, abundance	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Risso's dolphin	17/01-29/10/2010	Ligurian Sea	PhotoID, Line transect survey	Population estimates	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
As above	08/07 - 15/10/ 2010	Central and southern Tyrrhenian sea, western Ionian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	11/06 - 26/09/2010	Central Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	26/06 - 23/09/2010	Northern Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	06/06 - 24/09/2010	Eastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	06/06 - 12/09/2010	Weastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Common bottlenose dolphin	1-1/12-31	Tuscan waters	Line transect survey or random routes, M-R.	Distribution; sighting frequency; Abundance; Habitat use.	Cetus
As above	31 june-31 august 2010	Ionian sea (Greece)	Line transect survey; Photo-ID; distribution modelling	Distribution; sighting frequency; encounter rate; acoustic; behaviour	Elena Papale / Gaia Research Institute; Marta Azzolin / Gaia Research Institute
As above	01/01/10-31/12/10	Northestern Saridinia	Line transect survey	Distribution; sighting frequency; groups composition, behaviour	fra.magnone@crimm.org/CRiMM onlus a.fozzi@crimm.org/CRiMM onlus
As above	06/06/10-14/11/10	North-eastern Sardinia, central Tyrrhenian sea	PhotoID, vessel's tracklines data, environmental data	Spatio-temporal distribution and sighting frequency; habitat use and relative abundance;	L. Bittau/DIZGEV Univ. Sassari
As above	Jan-Dec 2010	Ligurian Sea	Boat-based random survey; photo-ID	Spatio-temporal distribution; sighting frequency; encounter rates; habitat use; abundance; home range	G. Gnone, M. Bellingeri, F. Fossa / ADG
As above	Jan 2010 – Dec 2010	North-eastern coast of Sardinia (Tyrrhenian Sea)	108 boat surveys and 216 sightings, behavioural sampling and foraging studies, photo-identification, use of habitat and social structure studies, bioacoustics, interaction with human activities, allomaternal cares and mother-infant separations, underwater behaviour, acoustic deterrent devices	-Encounter rates, population trends -GIS - Distribution, habitat use, site – fidelity and preferences -Population estimate, abundance models (Photo-ID) -Association index (HWI, networks) -Respiratory patterns and feeding behaviour -Individual & underwater behaviour -Bycatch and incidental captures -Use of whistles and burst pulsed sounds for communication -Trophic levels & Mass balance models -Trials of acoustic deterrent devices	Diaz Lopez, B./BDRI; Díaz López B., 2009, Díaz López B. & Shirai, J.A.B., 2010, Díaz López B., 2010a; Shirai et al., 2010; Díaz López B., 2010b; Díaz López B., 2011a; Díaz López B. & Bajraktarevic, S., 2011; Bajraktarevic, S. & Díaz López B. 2011; Díaz López B., 2011b; Díaz López , in press; Díaz López & Mariño, in press.
As above	Mar 2010 – Dec 2010	North-western coast of Sardinia	70 boat surveys and 35 sightings, distribution and habitat use, photo-identification and social structure studies, site-fidelity	-Encounter rates -GIS - Distribution, habitat use, site – fidelity and preferences -Population estimate, abundance models (Photo-ID) -Association index (HWI)	Diaz Lopez, B & Addis, A../BDRI; Addis et al., 2010;
As above	April-October 2010	Amvrakikos Gulf, NW Greece	Boat surveys, photo-identification (1234 km)	Encounter rate, distribution, abundance, habitat use, ecology	TRI; Bearzi et al. 2008a, 2010c

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Common bottlenose dolphin	June - September 2010	Eastern Ionian Sea, Greece	Boat surveys, photo-identification, behavioural sampling (911 km)	Encounter rate, distribution, abundance, habitat use, behaviour, ecology, interactions with fisheries	TRI; Bearzi et al. 2005, 2008b, 2010b, 2010c; Gonzalvo et al. 2011
As above	May – Sept 2010	Gulf of Corinth, Greece	Boat surveys, photo-identification; 7056 km	Movements	TRI; Bearzi et al. 2010c
As above	April - May 2010	Ionian Sea, Gulf of Taranto, Italy	Line transect, aerial surveys (6547 km)	Encounter rate, distribution, habitat use, abundance	S. Panigada, TRI
As above	19/01/10-22/06/10	Ligurian sea	PhotoID, point survey	Population estimates; Habitat	M. Rosso/CIMA RF; M. Wurtz /DIBIO GE
As above	01/08/10-31/12/10	Ligurian sea	Acosutic survey (C-Pod)	Presence/Asbsence	A. Moulins/CIMA RF
As above	17/01/10-29/10/2010	Ligurian Sea, Tuscan Archipelago, Sardinia	PhotoID, Line transect survey	Population estimates, social structure, Distribution, Interaction with trawling	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE
As above	June - July 2010	Central Tyrrhenian Sea, Italy	Line transect, aerial surveys (6275 km)	Encounter rate, distribution, habitat use, abundance	S. Panigada, TRI
As above	15/6-5/7-2011	Corsican, Sardinian Seas and Pelagos sanctuary	Aerial line transect survey/11,431 km	Distribution, density and abundances	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	01/01/2010 - 31/12/2010	La Maddalena Archipelago	Sea survey: 159 hours	Distribution; sighting frequency, encounter rate, habitat use.	Gabriella La Manna / CTS
As above	01/01/2010 - 31/12/2010	Asinara Island	Sea survey: 91 hours	Distribution; sighting frequency, encounter rate, habitat use.	Gabriella La Manna / CTS
As above	22/02 – 30/09	Tuscan Arcypelagus	Line transect survey; fishing boat survey; specifical environmental status survey	Distribution; sighting frequency; behaviour; human work interaction;	Micaela Bacchetta; CRC;
As above	08/07 - 15/10/ 2010	Central and southern Tyrrhenian sea, western Ionian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	11/06 - 26/09/2010	Central Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	26/06 - 23/09/2010	Northern Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	06/06 - 24/09/2010	Eastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	06/06 - 12/09/2010	Weastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Short-beaked common dolphin	6-10/9-9	Tuscan waters	Line transect survey or random routes, Distance sampling, M-R	Distribution; sighting frequency; Abundance; Habitat use.	Cetus
As above	31 June-31 august 2010	Ionian sea (Greece)	Line transect survey; Photo ID	Distribution; sighting frequency; encounter rate; acoustic; behaviour	Marta Azzolin / Gaia Research Institute; Elena Papale / Gaia Research Institute
As above	1 June-20 September 2010	Gulf of Corinth	Line transect survey; Photo ID	Distribution; sighting frequency; encounter rate; acoustic; behaviour	Marta Azzolin / Gaia Research Institute; Elena Papale / Gaia Research Institute
As above	10 – 15/ 09/ 2010	Monfalcone Basin Area - Gulf of Trieste	*In-situ* survey	presence, behaviour, photo-ID, environmental and sea-ambient noise data	M. Tempesta (Miramare MPA)
As above	June - September 2010	Eastern Ionian Sea, Greece	Boat surveys, photo-identification, behavioural sampling (911 km)	Encounter rate, distribution, abundance, habitat use, behaviour, ecology, interactions with fisheries	TRI; Bearzi et al. 2005, 2008b, 2010b; Gonzalvo et al. 2011
As above	May – September 2010	Gulf of Corinth, Greece	Boat surveys, photo-identification; 7056 km	Abundance, distribution	TRI; Bearzi et al. 2010b

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Short-beaked common dolphin	May-October 2010	Ligurian Sea, Italy	Boat surveys, photo-identification, behavioural sampling (4828 km)	Encounter rate, distribution, abundance, habitat use, ecology	S. Airoldi, TRI
As above	08/07 - 15/10/ 2010	Central and southern Tyrrhenian sea, western Ionian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	11/06 - 26/09/20 10	Central Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	26/06 - 23/09/20 10	Northern Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	06/06 - 24/09/20 10	Eastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	06/06 - 12/09/20 10	Weastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
Striped dolphin	6-10/9-9	Tuscan waters	Line transect survey or random routes, Distance sampling	Distribution; sighting frequency; Abundance; Habitat use.	Cetus
As above	31 june-31 august	Ionian sea (Greece)	Line transect survey; Photo ID; distribution modelling	Distribution; sighting frequency; encounter rate; acoustic; behaviour	Marta Azzolin / Gaia Research Institute; Elena Papale / Gaia Research Institute
As above	1 june-20 Septembe r	Gulf of Corinth	Line transect survey Photo ID	Distribution; sighting frequency; encounter rate; acoustic; behaviour	Marta Azzolin / Gaia Research Institute; Elena Papale / Gaia Research Institute
As above	06/06/10-14/11/10	North-eastern Sardinia, central Tyrrhenian sea	PhotoID, vessel's tracklines data, environmental data	Spatio-temporal distribution and sighting frequency; habitat use and relative abundance;	L. Bittau/DIZGEV Univ. Sassari
As above	6 Feb / 20 Oct 2010	Ligurian Sea	Sail boat Line transect survey photo identification	Distribution; sighting frequency (1100 miles crossed) Distribution-Sighting frequency - behaviour-Presence absence	Alberto Marco Gattoni Associazione Battibaleno (BB)
As above	May – Septembe r 2010	Gulf of Corinth, Greece	Boat surveys, photo-identification; 7056 km	Abundance, distribution	TRI; Bearzi et al. 2010b
As above	May-October 2010	Ligurian Sea, Italy	Boat surveys, photo-identification, behavioural sampling (4828 km)	Encounter rate, distribution, abundance, habitat use, ecology	S. Airoldi,TRI
As above	April - May 2010	Ionian Sea, Gulf of Taranto, Italy	Line transect, aerial surveys (6547 km)	Encounter rate, distribution, habitat use, abundance	S. Panigada, TRI
As above	June - July 2010	Central Tyrrhenian Sea, Italy	Line transect, aerial surveys (6275 km)	Encounter rate, distribution, habitat use, abundance	S. Panigada, TRI
As above	June - July 2010	Corsican, Sardinian Seas and Pelagos sanctuary	Aerial line transect survey/11,431 km	Encounter rate, distribution, habitat use, abundance	G.Lauriano (ISPRA); Lauriano & Panigada 2010 a,b)
As above	17/01-29/10/20 10	Ligurian Sea	PhotoID, Line transect survey	Population estimates	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; P. Tepsich/CIMA RF
As above	08/07 - 15/10/ 2010	Central and southern Tyrrhenian sea, western Ionian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; M.Tringali/KETOS
As above	11/06 - 26/09/20 10	Central Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev
As above	26/06 - 23/09/20 10	Northern Tyrrhenian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO
As above	06/06 - 24/09/20 10	Eastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF
As above	06/06 - 12/09/20 10	Weastern Ligurian sea	Fixed line transect; distance protocols/weekly	Distribution; relative abundance; interaction with nautical traffic	A. Arcangeli /ISPRA, NAT-BIO; P. Tepsich/CIMA RF

ADG: Delfini Metropolitani is a research project mainly focused on the bottlenose dolphin habits: habitat use, home range analysis, abundance estimate, interactions with human activity (fishing, trawling, sea traffic). We use photo-ID technique for abundance estimate, home range analysis and social structure analysis. We use ArcGIS 9.3 as a software tool for spatial analysis.

BDRI:
- Mark-recapture techniques: photo-identification catalogue (NE coast Sardinia since 1999, NW coast Sardinia since 2008) and population estimates, Mantel test and network diagrams to study social structure and sex ratio.
- Geographical Information System: spatial analyses, use of habitat and site fidelity
- Use and development of Open source software in dolphins research (Photo-ID and bioacoustical analyses)
- Bioacoustics: Acoustical repertoire and communication use, whistle characteristics and context-specific use of vocal signals.
- Trials of acoustic harassment devices efficacy to mitigate the interaction between bottlenose dolphins and aquaculture.
- Use of GLMM (General linear mixed models) and multivariate discriminant function analysis as a method to analyse dolphins behaviour and mass-balance models to explain dolphins presence and distribution

Cetus:
- Mark-recapture techniques: photo-id catalogues (since 1999) and population estimates (abundance, density, frequency, social structures). Ecological Index (ER, RAI, Natality, Recruitments, etc). Distance Sampling.
- Geographical Information System: spatial analyses and site fidelity. CMP.
- Study of the environmental variables to understand the distribution and presence of the animals (statistical tests, GLM, etc).
- Behaviour analyses. Bioacoustic recordings.

CIMA RF: All data collected by the CIMA RF were used for the analysis. Environmental parameters are correlated to define the physical oceanographic indicators that may indicate the cetacean habitats. Results are used to construct an multivariate predictive model of distribution.

DIZGEV Univ. Sassari: All data collected by the DIZGEV Univ. Sassari were analyzed in collaboration with CIMA Research Foundation. Distribution, encounter rates, and habitat characteristics of cetaceans off north Eastern Sardinia were analysed on a square grid dividing the survey area into cells in order to plot vessel tracklines and sightings distributions. Environmental parameters were correlated to physical oceanographic indicators. Results are used to construct a multivariate predictive model of distribution. ER is measured as number of sightings per km on effort in good weather condition. Species-specific ER were calculated both with global values of ER for the whole study area. Geographical data are analysed with GIS program to map preferential areas of species presence.

GAIA RESEARCH INSTITUTE: All data collected by the Gaia Research Institute are used for statistical analysis. The following methods of data collection and analysis are employed:
- Abundance and distribution: distance sampling and mark-release-recapture techniques (photo-id catalogues).
- Behaviour, socio-ecology and interaction with anthropogenic activities: behaviour data collection, Markovian Chain.
- Ecology and habitat use: Geographical Information System and habitat modelling (GLM and Maxent).
- Analysis of repertoire and context-specific use of vocalizations (acoustic recordings, spectrogram analysis).

ISPRA-FLT: Data on relative abundance are analysed using a single transect as a statistical unit; after testing for independency of the dataset, ER is measured as number of sightings per hour and per Nautical Mile on effort in good weather condition, data are compared with parametric and non-parametric tests; geographical data are analysed with GIS program performing the non parametric Kernel analysis, after testing for independency of the dataset, to map preferential areas of species presence. To verify potential relationship with maritime traffic (ship >5m), a preliminary study on ship intensity, in presence and in absence of cetacean, is also undertaken. Trends, occupancy, correlation with environmental parameters and modelling are performed.

Miramare MPA: During a week of monitoring done in the mornings and afternoons from 10th to 15th September 2010 focusing on the two individuals of short-beaked common dolphins present in the area of Monfalcone shipyard (Gulf of Trieste, North Adriatic Sea), data on presence (count, time and location), animal behaviour, photo-ID and sea ambient noise has been collected.

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
Fin whale	Dorsal fin, blaze/chevron, body scars	Ligurian Sea, Italy	Analysis in progress	Y	431	M. Zanardelli, TRI
As above	Permanent mark dorsal fin	Ligurian Sea	1	Y	15	Alberto Marco Gattoni Associazione Battibaleno (BB)
Humpback whale	Dorsal fin and flukes	Tuscan waters	1	N		Cetus
Sperm whale	Fluke, patch and scripes	North-eastern Sardinia, central Tyrrhenian sea	8	Y	8	L. Bittau/DIZGEV Univ. Sassari
As above	Flukes	Ligurian Sea, Italy	26	Y	105	S. Airoldi, TRI
As above	Flanks and Flukes	Ligurian Sea	72	Y	284	M. Wurtz /DIBIO GE; J. Alessi/DIBIO GE; M. Rosso/CIMA RF
Cuvier's beaked whale	Dorsal fin, body scars scars	Ligurian Sea, Italy	Analysis in progress	Y	46	S. Airoldi, TRI
As above	Flanks	Ligurian Sea	NA	Y	120	M. Wurtz /DIBIO GE; M. Rosso/CIMA RF
Long-finned pilot whale	Dorsal fin	Ligurian Sea, Italy	Analysis in progress	Y	Analysis in progress	S. Airoldi, TRI
Risso's dolphin	Dorsal fin, patch and scripes	North-eastern Sardinia, central Tyrrhenian sea	14	Y	18	L. Bittau/DIZGEV Univ. Sassari
As above	Permanent mark Dorsal fin	Ligurian Sea	3	Y	56	Alberto Marco Gattoni Associazione Battibaleno (BB)
As above	Dorsal fin, body scars	Ligurian Sea, Italy	Analysis in progress	Y	342	S. Airoldi, TRI
Common bottlenose dolphin	Dorsal fin	Tuscan waters	16	Y	152	Cetus
As above	Dorsal fin	Ionian sea (Greece)	22	Y	70	Elena Papale / Gaia Research Institute; Marta Azzolin / Gaia Research Institute
As above	Dorsal fin	Sicily channel-Lampedusa Island		Y	148	Marina Pulcini
As above	Dorsal fin	N.E. Saridinia	7	Y	152	fra.magnone@crimm.org /CRiMM onlus a.fozzi@crimm.org/CRiMM onlus
As above	Dorsal fin	North-eastern Sardinia, central Tyrrhenian sea	3	Y	3	L. Bittau/DIZGEV Univ. Sassari
As above	Dorsal fin	Ligurian Sea	32	Y	243	G. Gnone, M. Bellingeri, F. Fossa / ADG
As above	Dorsal fin and body marks	North-eastern coast of Sardinia (Tyrrhenian Sea)	67	Y	69	Díaz López, B./BDRI
As above	Dorsal fin	NW Greece, Amvrakikos Gulf	85	Y	157	TRI; Bearzi et al. 2008a, 2010c
As above	Dorsal fin	Greece, Gulf of Corinth	28	Y	32	TRI; Bearzi et al. 2010c
As above	Dorsal fin	Ligurian Sea, Italy	0	Y	68	S. Airoldi, TRI
As above	Dorsal fin	Ligurian sea	17	Y	236	M. Wurtz /DIBIO GE; M. Rosso/CIMA RF
As above	Dorsal fin	Ligurian Sea, Tuscan Archipelago, Sardinia	136	Y	925	M. Wurtz /DIBIO GE J. Alessi/DIBIO GE
As above	Dorsal fin	NE Sardinian Sea	18	Y	29	Gabriella La Manna / CTS
As above	Dorsal fin	NW Sardinin Sea	24	Y	24	Gabriella La Manna / CTS
As above	Dorsal fin	Tuscan Arcypelagus	34	Y	157	Micaela Bacchetta; CRC

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Short-beaked common dolphin	Dorsal fin	Ionian sea (Greece)	10	Y	25	Marta Azzolin / Gaia Research Institute; Elena Papale / Gaia Research Institute
As above	Dorsal fin	Gulf of Corinth	2	Y	15	Marta Azzolin / Gaia Research Institute; Elena Papale / Gaia Research Institute
As above	Dorsal fin	Sicily channel-Lampedusa Island		Y	43	Marina Pulcini
As above	Dorsal fin	Monfalcone Basin Area - Gulf of Trieste	13	N		M. Tempesta (Miramare MPA
As above	Dorsal fin	Eastern Ionian Sea, Greece	8	Y	167	TRI; Bearzi et al 2010
As above	Dorsal fin	Greece, Gulf of Corinth	Pending	Y	7	TRI; Bearzi et al. 2010b
As above	Dorsal fin	Ligurian Sea, Italy	0	Y	3	S. Airoldi, TRI
Striped dolphin	Dorsal fin	Ionian sea (Greece)	15	Y	55	Marta Azzolin / Gaia Research
As above	Dorsal fin	Gulf of Corinth	160	Y	210	Marta Azzolin / Gaia Research Institute; Elena Papale / Gaia Research Institute
As above	Colour patterns, pigmentation variability, fluke, patches and scraipes	North-eastern Sardinia, central Tyrrhenian sea	45	Y	45	L. Bittau/DIZGEV Univ. Sassari
As above	Dorsal fin and body marks	North-western coast of Sardinia (Gulf of Alghero)	22	Y	22	Diaz Lopez B. & Addis, A. / bruno@thebdri.com
As above	Dorsal fin	Eastern Ionian Sea, Greece	23	Y	108	TRI; Bearzi et al. 2005, 2008b, 2010b, 2010c
As above	Dorsal fin	Greece, Gulf of Corinth	Pending	Y	214	TRI; Bearzi et al. 2010b

CIMA RF: All sighted animals have been analyzed photographically using the matrix-photo identification and population size were estimated using the program CAPTURE.

GAIA: Population size, distribution, site fidelity and social structure were studied using mark recapture photo-ID technique. The catalogue for bottlenose dolphin in Ionian Sea started in 2008, in 2009 the ones for striped and common dolphin both in the Ionian sea and in the Golf of Corinth.

3.1.2. Artificial marking data
None.

3.1.3 Telemetry data
None.

3.2 Analyses/development of techniques

ADG: We use photo-ID technique for abundance estimate, home range analysis and social structure analysis. We keep a bottlenose dolphin photo-ID catalogue in the eastern Ligurian Sea since 2001. Since 2006 we started to match our catalogue with research groups operating in contiguous areas (Tuscany, Corsica, Western Ligurian Sea), in order to describe the spatial behaviour of the bottlenose dolphin on a larger scale. The MCP (Minimum Convex Polygon) technique is also used for home range analysis (Mohr, 1947).

Cetus: Time and distance of resightings, abundance and density by Photo-Id and M-R; behavioral patterns and opportunistic strategy studies; space/time distribution with environmental data matching; social structures and site fidelity; mother-calf association; duration, characteristic and evolution of the natural marks.

CTS: The photo-identification data are used primarily to estimate the population size using mark-recapture models. The data will be used also: 1) to investigate the presence of identified animals in the study area over

time (temporal site-fidelity); 2) to verify if individual dolphins show a fidelity towards specific area inside the study area, 3) to measure the amount of time each animal reside inside the study area (residence times); 4) to verify if there is a mixture of individuals between the two study areas.

DIZGEV Univ. Sassari: All sighted animals have been analyzed photographically using the matrix-photo identification and population size were estimated using the program CAPTURE.

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	Ligurian Sea, Italy	2010/summer – 0	Y	Analysis in progress	193	TRI; Cristina Fossi and Letizia Marsili, University of Siena; Martine Berubé, University of Stockholm
Sperm whale	Ligurian Sea, Italy	2010/summer – 0	Y	3	3	TRI; Cristina Fossi and Letizia Marsili, University of Siena; Daniel Engelhaupt, University of Durham
As above	Sea of Cortez	Autumn 2010/15	Y	Analysis in	29	LB-DSA-US, J.Urban and L. Rojas-Bracho (Mexico)
Long-finned pilot whale	Ligurian Sea, Italy	2010/summer – 0	Y	-	39	TRI
Killer whale	Sea of Cortez (Mexico)	Autumn 2010/11	Y	Analysis in progress	13	LB-DSA-US, J.Urban and L. Rojas-Bracho (Mexico)
Long-finned pilot whale	Sea of Cortez (Mexico)	Autumn 2010/1	Y	Analysis in progress	1	LB-DSA-US, J.Urban and L. Rojas-Bracho (Mexico)
Risso's dolphin	Ligurian Sea, Italy	2010/summer – 0	Y	28	28	TRI; Cristina Fossi and Letizia Marsili, University of Siena; Stefania Gaspari, University of Durham
Common bottlenose dolphin	Ligurian Sea, Italy	2010/summer – 0	Y	-	1	TRI
Indo-Pacific bottlenose dolphin	Central Queensland (Australia)	Summer 2010/8	Y	Analysis in progress	8	LB-DSA-US, Daniele Cagnazzi (Australia)
Indo-Pacific humpback	Central Queensland (Australia)	Summer 2010/13	Y	Analysis in progress	13	LB-DSA-US, Daniele Cagnazzi (Australia)
Long-beaked common dolphin	Sea of Cortez (Mexico)	Autumn 2010/5	Y	Analysis in progress	17	LB-DSA-US, J.Urban and L. Rojas-Bracho (Mexico)
Striped dolphin	Ligurian Sea, Italy	2010/summer – 0	Y	Analysis in progress	243	TRI; Cristina Fossi and Letizia Marsili, University of Siena; Stefania Gaspari, University of Durham
Australian snubfin dolphin	Central Queensland (Australia)	Summer 2010/13	Y	Analysis in progress	13	LB-DSA-US, Daniele Cagnazzi (Australia)

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

None.

4.3 Samples from stranded animals

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Common bottlenose dolphin	Adriatic Sea	Skin, subcutaneous adipose tissue, musculo-skeletal tissue	6	Y	6	GDG
As above	North Adriatic Sea, North-west Sardinia	Internal organs (several	9	Y	9	http://www.mammiferimarini.sperivet.unipd.it/
As above	Ligurian Sea	Liver, muscle,, blubber (heart, kidney, lung, intestine, liver, spleen, skin, brain)	1	Y	0	walter.mignone@izsto.it/ZSPLV
As above	Tyrrhenian Sea	Skin, blubber, liver, muscle, brain, genital apparatus, kidney	1 (only 2010)	Y	1	LB-DSA-US
Striped dolphin	Ionian Sea	Liver, kidney, spleen, stomach (gastric parasitic nodule), lung, heart	16	Y	26	G. DI GUARDO (GDG)
As above	Western Sardinia	Liver, kidney, spleen, mesenteric lymph nodes, pulmonary lymph nodes, lung, heart, brain	23	Y	39	GDG
As above	Ligurian Sea	Internal organs (several	2	Y	0	http://www.mammiferimarini.sperivet.unipd.it/
As above	Ligurian Sea	adrenal gland	5	Y	5	Walter.mignone@izsto.it/ IZSPLV
As above	Ligurian Sea	Skeleton, Stomac contents, Interne organs, Muscle, Blubber	6	Y	0	A.Moulins/CIMA RF http://mammiferimarini.unipv.it
As above	Ligurian Sea	teeth	2	Y	0	A.Moulins/CIMA RF http://mammiferimarini.unipv.it
As above	Ligurian Sea	Stomac contents, Muscle, Blubber	4	Y	0	A.Moulins/CIMA RF http://mammiferimarini.unipv.it
As above	Ligurian Sea	Stomac contents, Muscle, Blubber	4	Y	0	A.Moulins/CIMA RF http://mammiferimarini.unipv.it
As above	Ligurian Sea	Skeleton, Stomac contents, Interne organs, Muscle, Blubber	6	Y	0	A.Moulins/CIMA RF http://mammiferimarini.unipv.it
As above	Tyrrhenian Sea	Skin, blubber, liver, muscle, brain, genital apparatus, kidney	3 (only 2010)	Y	3	LB-DSA-US
As above	Ligurian Sea	Skull	1	Y	0	Michela Podestà, MSNM

ISPRA, DIP III CRA 15 (Fortuna): Genetic analysis on 104 samples of skin of common bottlenose dolphins from the entire Adriatic Sea - carried out in 2010 by the University of Florence - seemed indicating the existence of a sub-structure within this basin.

4.4 Analyses/development of techniques

IZSPLV: Post-mortem examinations and general tissue and biologic samples collection are routinely carried out at Imperia, at the local seat of Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d'Aosta. Anatomo-histopathological, immunohistochemical, microbiological, parasitological and toxicological investigations were performed on 5 entire and well preserved animal carcasses (Iulini et al, 2011) All animals were negative for Morbillivirus by RT-PCR, 4 were positive for *Toxoplasma gondii*. Parasites were often found in most of the examined organs and tissues. The most frequently detected lesions were pneumonia, hepatitis, myocarditis and enteritis; no neuropathological lesion were observed

LB-DSA-US: In the free-ranging cetacean biopsies were valuated the Benzo(a)pyrene monooxigenase (CYP1A1-BPMO) activity and the residue levels: chlorinated hydrocarbons (HCB, DDTs and PCBs), polycyclic aromatic hydrocarbons (PAHs), flame retardants (BFRs) and trace elements. In the biological material of stranded specimens were valuated only residue levels: chlorinated hydrocarbons (HCB, DDTs and PCBs), polycyclic aromatic hydrocarbons (PAHs), flame retardants (BFRs) and trace elements. MFO activity (CYP1A1-BPMO) has been assayed in skin biopsy samples by Fossi *et al*. (1992). BPMO activity was detected in the whole tissue. BPMO activity was assessed using the incubation mixture proposed by Kurelek *et al.* (1977) incubating each sample (plus the blanks) in a shaking bath for 2 h at 37°C. The activity was expressed in arbitrary units of fluorescence (AUF/h/g tissue). For analysis of HCB, DDTs and PCBs, the samples were freeze-dried and extracted with n-hexane in a Soxhlet apparatus followed by sulphuric acid clean-up and Florisil chromatography (Marsili & Focardi, 1996). PAHs were analysed by HPLC/Fluorescence system. Extraction was according to Griest & Caton (1983) and Holoubek et al. (1990), with several modifications developed in our lab Marsili et al., 1997). To detect Flame Retardants (PBDE), after extraction of samples, the extracts were analyzed on a GC/MS system (HP 6890 gas chromatograph coupled to an HP 5973 low-resolution mass spectrometer) using both EI and negative-chemical ionization (NCI) on an HP-5MS (5% phenyl methyl siloxane) capillary column, according to Pettersson et al. (2004). For the trace elements analysis, lyophilised and homogenised samples were acid-digested and analysed for trace elements using Atomic Absorption Spectrometry (AAS) and Emission Spectrometry (AES). Particularly FIMS-AAS (Flow Injection Mercury System) for determining Hg, THGF-AAS (Transversely Heated Graphite Furnace) and ICP-AES (Inductively Coupled Plasma). Cell cultures - An epidermal/dermal layer including a portion of the underlying blubber tissue was used to prepare culture fibroblasts. It is hoped to obtain genetic, biochemical and toxicological information from cultures of fibroblast cells grown from skin biopsy specimens and skin of stranded specimens dead from less than 12h. This data will be valuable for long-term field study of free-ranging cetaceans and for "in vitro" toxicological experiments. In particular the tissue culture system will allow the study of relationships between contamination and biochemical responses. One of the planned applications of this developed in vitro system will be the assessment of interspecies differences in the mixed function oxidase activity (CYP1A1, CYP2B) induced by *in vitro* treatment of various contaminants (DDTs, PCBs, PAHs, etc.) added at different concentrations Marsili et al., 2000; Marsili et al., 2008).

LB-DSA-US. **IMMUNOFLUORESCENCE TECHNIQUE**: The fibroblast cell cultures represent a "in vitro" surrogate of the whole animal that will be used for many purposes, including genetic and toxicological studies. In particular, fibroblasts can be used to test the vulnerability of cetaceans to different environmental contaminants such as organochlorine compounds, heavy metals and polycyclic aromatic hydrocarbons. The immunofluorescence technique uses antibodies, that conjugates at fluorescent tracings, able to bind cellular structures in highly specific way, allow the qualitative and quantitative evaluation of the target structures. Fibroblast cell cultures (third generation) of different species were exposed for 48 h to mixture of Arochlor 1260, pp'DDT e pp'DDE solubylised in DMSO (0,05%) added at three different doses: 1µg/ml, 5µg/ml and 25µg/ml. After, a first reaction with the primary antibodies for cytochromes 1A1-1A2 and 2B4 and for human estrogen receptor (hER) were applied, then were treated with the rispective secondary antibodies marked with a fluorochrome. The main results were the presence of the cytochromes 1A1-1A2 and 2B4 and of the estrogen receptor in the fibroblast cells revealed from the crossreaction of the antibody used and from the presence of fluorescence in the fibroblasts, and from the suspected increase of fluorescence in function of the treatment doses of contaminants.

LB-DSA-US. **WESTERN BLOT IN FIBROBLAST CELLS:** For western blot analysis, fibroblast extracts were separated by SDS-PAGE (10% polyacrylamide gels) and blotted onto nitrocellulose sheets for 1 hour at a constant voltage of 100 V. The membranes were saturated by incubating with blocking solution (2% BSA in TTBS) for 1 hour at room temperature. Primary polyclonal goat IgG anti rabbit P450 2B4 antibody was purchased from Oxford Biomedical Research (Michigan, USA). P450 2B4 diluted 1:1000 in TTBS-1% BSA, was allowed to incubate for 15 h at 4°C. Incubation with the BioRad anti-goat HRP labelled secondary antibody (1:3000 final dilution) was performed for 1 hour at room temperature and detection was carried out as outlined in

the Amersham ECL kit booklet. Semi-quantitative analysis was performed with Quantity One software (Bio-Rad). Results were expressed as Relative Volume Intensity mm2 (INT*mm2). Data were analyzed using non-parametric statistic of Kolmogorov-Smirnov.

LB-DSA-US. **Cyp 1A1 and Cyp 2B WESTERN BLOT:** For WB analysis of CYP1A1 and CYP2B, S9 fractions of tissue homogenates (slice biopsies and liver, in duplicate for each sample) were separated by SDS-PAGE (10% polyacrylamide gels – Criterion XT Precast Gel, Bio-Rad) and blotted onto nitrocellulose sheets (0.45 µm Bio-Rad) for 1 hour at 200 V. The membranes were saturated by incubating with blocking solution (3% gelatin dissolved in Tris-Buffered Saline containing 0.05% Tween-20, TTBS) for 1 hour at room temperature. Primary polyclonal antibodies were from Oxford Biochemical Research (Oxford MI, USA). Goat anti-rabbit CYP1A1 and CYP2B4, diluted 1:5000 and 1:1000, respectively, in TTBS-1% gelatin were incubated with cetacean proteins overnight at room temperature. Incubation with anti-rabbit HRP-labelled secondary antibody (1:3000 final dilution) was performed for 1 hour and 30 minutes at room temperature and detected according to the Bio-Rad Immun-Star HRP Chemiluminescent Kit booklet, using standardized times (Fossi et al., 2008). In order to validate WB analysis of CYP1A1 and CYP2B as a semi-quantitative detection tool in cetacean skin biopsies and slices. Total CYPs concentration in tissue was measured spectrophotometrically and a series of calibration curves for total CYPs from liver (ranging from 1.2 to 4.8 pmol total CYPs) and skin (including epidermis, dermis and blubber layers, ranging from 0.095 to 2.400 pmol of total CYPs) from stranded specimens of Tursiops truncatus were analysed in triplicate by Fossi and collaborators (2008). A triplicate skin standard (SS) was analyzed within the calibration curve, sub-aliquoted and maintained as an internal standard for subsequent WBs. Semi-quantitative analysis was performed for each WB (in triplicate) with Quantity One software (Bio-Rad, 1-D Analysis Software) using Adj.Vol.Int *mm2 as a quantitative parameter. The data were correlated with increasing pmol concentrations of total CYPs and two Excel Macros were produced (one for CYP1A1 and one for CYP2B) incorporating the normalizing factor of SS for quantification of unknown biopsy samples. A linear correlation was found between relative pmol CYP1A1 and Adj.Vol.Int *mm2 ($R = 0.9901$) and between relative pmol CYP2B and Adj.Vol.Int *mm2 ($R = 0.9914$). The two Excel Macros (one for CYP1A1 and one for CYP2B), incorporating the normalizing factor of SS (Skin Standard) were used for quantification of CYP1A and 2B4 in biopsy or liver slices (Fossi et al., 2008).

LB-DSA-US. **PCR-Real Time:** Subsamples of skin biopsy slices were used for gene expression analyses by qRT-PCR. Each sample was homogenized in duplicate and RNA was isolated using an Aurum Total RNA Fatty and Fibrous Tissue Kit (Bio-Rad). One microgram of RNA was reverse transcribed with the iScript cDNA Synthesis Kit (Bio-Rad). The real-time PCR reaction conditions were set as described in Spinsanti et al. (2006) and the reaction was run on an iCycler iQ5 (Bio-Rad) using SYBR Green detection chemistry in 96-well reaction plates. Primers were designed for the specific sequences of different species using Beacon Designer Software (Premier Biosoft International) for both housekeeping genes and genes of interest. Each reaction was carried out in triplicate, and the relative expression of the four genes of interest was normalized to expression of the control genes glyceraldehyde-3-phosphate dehydrogenase (GAPDH), tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein, zeta polypeptide (YWHAZ) and succinate dehydrogenase complex, subunit A (SDHA). The three housekeeping genes were selected according to Spinsanti et al. (2008). Raw threshold cycles (Ct) were converted into quantities according to the modified $\Delta\Delta$Ct method (Livak and Schmittgen, 2001).

SperiVet: Samples from skin and from internal organs have been analysed with histological techniques and immunohistochemestry. When the body conditions of the stranded animal were optimal, biopsies were taken, preserved in a cryopreservation medium for primary epidermal cells cultures.

UT-FVM-DCBS: In tight agreement with the objectives of a National Research Project financially supported by the Italian Ministry for the Environment and coordinated by Prof. Giovanni DI GUARDO (Project's title: "Cause di Mortalità e Studi Patogenetici in Cetacei Spiaggiati sulle Coste Italiane"), and in order to characterize the Toxoplasma gondii isolate(s) associated with the occurrence of a severe meningo-encephalitis in a number of striped dolphins (Stenella coeruleoalba) found stranded between 2007 and 2008 along the Ligurian Sea coast of Italy (see for reference Di Guardo et al., Veterinary Pathology 47: 245-253, 2010), we analyzed (in collaboration with the group of Dr. Donato Traversa, University of Teramo, Faculty of Veterinary Medicine, as well as in collaboration with Prof. Domenico Otranto, University of Bari, Faculty of Veterinary Medicine) T. gondii GRA-6 gene sequence by means of a single strand conformation polymorphism (SSCP) PCR technique.

5. POLLUTION STUDIES

IZSPLV: The toxicological investigations are in progress. The determination of Cd, Pb Cr was carried out through an atomic absorption spectrometry and electrothermal atomisation (ETA-AAS) and Zeeman background-correction, after an extraction through a micro-wave mineralization. Hg was extracted trough wet-methodology and detected trough flow injection atomic spectroscopy (FIAS-AAS). Eighteen Polychlorinated biphenyls (PCBs) congeners and aromatic hydrocarbons (IPA) were detected and quantify through a methodology decribed elesewhere in detail (Tarchino et al. 2009; Ottonello et al., 2008).

LB-DSA-US: The department of Environmental Science of the University of Siena has carried out research on the presence of chlorinated hydrocarbons (PCBs, DDTs and HCB), PAHs and trace elements in cetaceans from the Mediterranean Sea since many years. A new research investigates on the levels of flame retardants in cetaceans. See 4.4 Section.

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 2010
None.

6.3 Anthropogenic mortality of large whales for the calendar year 2010

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	15/07/10	Ligurian Sea 43°20'061 N 008°02'503 E	U	U	X	Researchers from RV Pelagos	S. Panigada, TRI
Fin whale	U	1	20/07/10	Ligurian Sea 43°19'488 N 008°12'439 E	U	U	X	Researchers from RV Pelagos	S. Panigada, TRI
Sperm whale	U	1	19/08/10	Ligurian Sea 43°38'906 N 007°46'483 E	U	U	X	Researchers from RV Pelagos	S. Panigada, TRI

6.3.2 Fishery bycatch of large whales

Whale species	Sex	No.	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
Sperm whale	M	1	18/8/10	Catania, Sicily,Italy	D	*Xiphias*	GND	A	BDS -Ketos
Comments: None.									

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 2010
None.

7.3 Anthropogenic mortality of small cetaceans for the calendar year 2010

7.3.1 Observed or reported ship strikes of small cetaceans (including non fatal events)

None.

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 statistical area (if known)	FAO area	Fate	Targeted species	Gear	How observed?	Source or contact
Common bottlenose dolphin	1:0	2	NA	-	15/11/2010	Adriatic Sea and Sicily Channel	GSA 16 & 17	Mediterranean	D	*Anchovy*	TBN	M	Fortuna/ISPRA DIP III CRA 15; Mazzola/CoNISMa; Sala/CNR-ISMAR, Ancona
Comments: According to Fortuna et al. 2010, a similar rate of bycatch would lead to about 10-20 annual captures. Given the rareness of the events, the CVs are extremely high and these figure are only indicatives.													

ISPRA, DIP III CRA 15 (Fortuna): Bycatch is still one of the main sources of anthropogenic mortality of species of conservation concern worldwide. Within the European Community, Member States are required to monitor and mitigate it, in order to insure a truly sustainable use of the marine ecosystem (see Habitats Directive). In 2010 the Italian National Institute for Environmental Protection and Research (ISPRA) continued the coordination of the monitoring programme of cetacean bycatch in Italian pelagic trawlers, funded in compliance with the Regulation (EC) No. 812/2004. The National Inter-University Consortium for Marine Sciences (CoNISMa) and the CNR- ISMAR of Ancona were the two main partners of this programme. Eight independent observers monitored 42 fishing boats for a total of 562 days at sea and 2,308 hauls. Two bycatch events of bottlenose dolphin were recorded in the northern Adriatic Sea on vessels registered in Emilia Romagna (GSA 17).

8. STRANDINGS

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Fin Whale	1	0	A.Moulins/CIMA RF BDS Istituto Zooprofilattico di Imperia	aurelie.moulins@cimafoundation.org http://mammiferimarini.unipv.it walter.mignone@izsto.it
Sperm whale	4	0	BDS Ketos UniRoma	http://mammiferimarini.unipv.it
Cuvier's beaked whale	1	0	BDS CIMA	http://mammiferimarini.unipv.it aurelie.moulins@cimafoundation.org
Common bottlenose dolphin	35	13	A.Moulins/CIMA RF BDS SperiVet Istituto Zooprofilattico di Imperia CriMM	aurelie.moulins@cimafoundation.org http://mammiferimarini.unipv.it sandro.mazzariol@unipd.it walter.mignone@izsto.it a.fozzi@crimm.org
As above	1	1	GDG/ UT-FVM-DCBS	gdiguardo@unite.it
As above	1	1	Coast Guard of Monfalcone	milena@riservamarinamiramare.it info@riservamarinamiramare.it
Striped dolphin	2	2	GDG/ UT-FVM-DCBS	gdiguardo@unite.it
As above	35	10	BDS Walter Mignone-IZSPLV A.Moulins/CIMA RF	http://mammiferimarini.unipv.it walter.mignone@izsto.it aurelie.moulins@cimafoundation.org
Undetermined	16	0	BDS	http://mammiferimarini.unipv.it

BDS: CIBRA (University of Pavia) and the Museum of Natural History of Milan (MSNM) maintain the official national stranding database granted by the Italian Ministry of the Environment, within the frame of the ACCOBAMS protocol to monitor cetacean populations. It is operative since January 2008 at the web address http://mammiferimarini.unipv.it and it contains stranding data since 1986, including also data published by CSC in years 1986-2005. All stranding data have been geo-referenced and transferred to a relational database. Each record in the database provides information about the date of the event, its location, data of the specimen such as species, sex, length, etc. The records also hold information about toxicological and parasitological investigations, description of samples collected and the institute where the samples are stored. Two types of access are allowed:

- public access to view generic data such as date, species, geographical location on google map and bibliographic reference if available.
- controlled access for registered users that can access all recorded information such as causes of stranding, conditions of stranded animals, catalog of biological material sampled from animals, results of necroscopy, and photographic documents.
The database is linked to the Cetacean Tissue Bank (http://www.mammiferimarini.sperivet.unipd.it) of the University of Padova, where samples collected from the stranded specimens are stored since 2005.

CIMA RF: is partner of the Ligurian stranding network. It gives logistical supports for the Coast Guards and is in charged of the necropsy in collaboration with the *Veterinary Medical Research Institute for Piemonte, Liguria and the Valle D'Aosta* (IZS) inside the Savona's district. All information regarding the stranding events have been communicated to the national stranding database and local authority (Ligurian Region). Samples have been collected for the national tissue bank and for all institutions that explicitly communicated to CIMA RF their needs.

GAIA RESEARCH INSTITUTE: the Greek Centre of Lakazeza (Milokopi, Perachora-Loutraki) collects information on dolphins stranding in the waters of the Gerania Mountain Natura 2000 area. The Centre is active year round. The reporting process of observed stranding is opportunistic.

IZSPLV: During 2010 the veterinarians of IZSPLV intervened on site in 7 stranding events The strandings of striped dolphins were completely opportunistic, whereas the stranding of bottlenose dolphin was suspected of bycatch: the stomach was full of just ate fishes and pieces of fishing net. All the animals were found stranded along the Ligurian Coastline: 4 in Savona province, 1 in Genoa province, 1 in La Spezia province and 1 in Imperia province. Three of 7 strandings were concentrated in August in Savona province., the other ones were concentrated in the first 6 months of the year The organizational flow adopted in cases of cetacean strandings along the Ligurian coastline was defined through the creation of a regional stranding network.**Miramare MPA:** Miramare MPA is a focal point in the Gulf of Trieste for the reporting of data on cetacean strandings. It coordinates a network of associations involved in case of strandings such as Coast Guard, Regional Agency for Environmental Protection, the Maritime Police, the Fire brigade, Veterinaries, etc.

9. OTHER STUDIES AND ANALYSES

BDRI: Effects of prey abundance on dolphins behaviour: This study represents some insights into understanding free ranging wild bottlenose dolphins' feeding behavior. Dolphins may change hunting tactics as prey abundance change but how rapidly this occurs is unclear. When top predators display behavioral responses to activities not directed at them, the task of studying all possible effects of human activities can become even more challenging. These studies are focused on elucidating how different levels of food intake induce social and behavioral changes in marine top predators (Díaz López, 2010).
BDRI: Mediterranean Common bottlenose dolphin's repertoire and communication use: Bottlenose dolphins are an extremely vocal mammalian species and vocal communication plays an important role in mediating social interactions. These studies carried out year round represent the first attempt in the Mediterranean basin to outline the repertoire, production rates of social sounds, and associated behavior of Mediterranean bottlenose dolphins (Díaz López B. & Shirai, J.A.B., 2010; Díaz López B., 2010a; Shirai et al., 2010; Díaz López B., 2010b; Díaz López B., 2011a; Díaz López B. & Bajraktarevic, S., 2011; Bajraktarevic, S. & Díaz López B. 2011; Díaz López B., 2011b).
BDRI: Environmental and biological effects associated with the presence of aquaculture industry (onshore and offshore fish farms): Notable increases in coastal aquaculture make it vital to study the environmental effects associated with their presence. BDRI's researchers have examined the effects of aquaculture on marine fauna in general, and more specifically, the impacts of aquaculture on dolphins in different marine fin fish farms off the coast of Sardinia, Italy (Díaz López, in press).
BDRI: Trial of acoustics deterrents for prevention of dolphin bycatch: BDRI researchers observed that the use of pingers (acoutics deterrent devices) or AHD (acoustic deterrent devices) have not an effective mitigation in the dolphins mortality due to bycatch on gillnets and aquaculture. The Dinner Bell and Habituation factors must be taken into consideration in these studies (Díaz López, in press).
BDRI: Boat traffic effects on bottlenose dolphin behaviour: Current BDRI's main study area of Aranci Bay, Sardinia, provides an unique insight into an area where the interactions of bottlenose dolphins and vessels remains largely unchecked. Our studies showed that the dolphins were surfacing less regularly in the presence of vessels and this response was further enhanced during vessel approaches. Moreover, by examining the influence of different types of vessel it was evident that the dolphins elicited a stronger response to tourist than fisheries vessels. The behaviour vessels display around the dolphins as well as speed, engine type and distance of approach were all factors that needed to be taken into consideration when analysing the changes observed.
BDRI: Ecosystem models to address the impacts caused by the interaction between bottlenose dolphins and human activities (fisheries & aquaculture): From these models, we study the strengths and weaknesses of using the Ecopath with Ecosim approach to support the design of policies aimed at implementing marine mammals' conservation (Díaz López, 2009; Díaz López, in press).

BDRI: Ecosystem effects evaluated through trophic mass-balance models: Marine aquaculture is an important growing worldwide industry. According to FAO (1995), "the achievement of real marine ecosystem-based management of fisheries implies the regulation of the use of the living resources based on the understanding of the structure and dynamics of the ecosystem of which the resource is a part". This premise requires an improvement of our understanding of the structure of marine ecosystems, and the interactions between ecosystem compartments and their changes due to human and environmental factors (Díaz López B., *in press*.).

CIBRA: participated to the research cruise "Sirena 10" (see MSNM above) by providing two wideband towed arrays, the data acquisition/display workstation and trained personnel. CIBRA research is mainly addressed at developing detection and classification hardware and software for both research and mitigation needs. Analysis of Sirena 10 acoustic data is still in progress. CIBRA participates in the EDA (European Defence Agency) project POMM (Protection of Marine Mammals). In years 2009-2010, activities – including the BDS - have been financed by the Italian Ministry of the Environment.

GAIA RESEARCH: Analysis of context specific vocalizations of *Stenella coeruleoalba*: during the summers 2009 and 2010 a research study was conducted in the Gulf of Corinth in order to analyze vocalizations of striped dolphin in relation to behaviour.

ISPRA, Difesa Natura/FLT (Arcangeli): Results of 2010 monitoring programme confirm the variability occurring in cetacean presence and distribution along the areas monitored and during the years. Giving that, cetacean seems to preferentially concentrate during summer in some areas (hot spots), especially in central Tyrrhenian sea and in the north-western of the Pelagos Sanctuary. Results emphasize the concern about cetacean diversity in central Mediterranean sea: only striped dolphin, common bottlenose dolphin and fin whale occur quite regularly in almost all the areas monitored while all the other species, known to be regular in the Mediterranean region, are quite rare and extremely confined. Species seem to distribute differently among the areas throughout the years, not showing a clear tendency. Results underline that conservation programs need to be based on long term and large scale data to help in the understanding of dynamic processes that drive marine ecosystem and influence presence and relative abundance of cetacean species.

IZSPLV: In August 2009, a two-years research project funded by the Italian Ministry of Health was started in order to create an Italian surveillance network focused on monitoring the disease conditions affecting cetaceans found stranded along the Ligurian Sea coast. Indeed, the study of stranded cetaceans provides a great opportunity to monitor their health *status*. The organizational flow adopted in cases of cetacean strandings along the Ligurian coastline was defined.. Intervention on a case of stranding is an organized action requiring equipment, personnel and support services and needing the collaboration of local authorities (navy, coastguard, etc.), veterinary institutions and research groups. Specific protocols for intervention on site and collection, transportation and storage of biologic specimens and samples were proposed (Tittarelli et al., 2011). Prior to samples collection, some very relevant biologic parameters (stranding location and date, size/species of stranded animals, state - dead or alive -, injuries/decomposition code) have to be collected. *Post-mortem* examinations and general tissue and biologic samples collection are routinely carried out at Imperia, at the local seat of Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d'Aosta. Moreover, specific training courses on necropsy protocols and techniques, as well as on the pathology and biologic samples collection from stranded cetaceans are periodically organized. In conclusion, the experience on cetaceans found stranded along the Ligurian Sea coast of Italy can be considered a starting point for the creation of a national surveillance network aimed at both monitoring the health *status* of free-ranging marine mammals and protecting public health.

Miramare MPA: At the end of 2010 a study was launched on sea ambient noise linked to the presence of two short-beaked common dolphins in the area close to the Miramare MPA. The study is still under way.

MSNM: participated to a research cruise "Sirena10" in the Eastern North Atlantic organized by the NATO Undersea Research Centre (NURC) within the Marine Mammal Risk Mitigation (MMRM) project. A visual and acoustic survey was performed, also deploying and comparing passive acoustic monitoring technologies. The relationship between the physical, chemical, biological environment and marine mammal distribution was also among the goals of the research.

UniGe-Dip.Te.Ris: During the period 2009-2010 a research supported by the MATTM was carried out by the Centro di Biologia Marina del Mar Ligure, Dipteris, University of Genoa, about "Pelagic cephalopods diversity in the Pelagos Sanctuary and their role in the trophic web regarding Cetaceans". In the Sanctuary, among 8 Cetacean species of regular occurrence, four are teuthophagous (*Physeter macrocephalus, Ziphius cavitrostris, Globicephala melas, Grampus griseus*) and other three have a mixed diet which includes cephalopods (*Stenella coeruleoalba, Tursiops truncatus, Delphinus delphis*). Cephalopods species occurring in the area are 54, i.e. 93% of the Teuthofauna of all Italian Seas. About half of them can be found in the landings of several local fishing activities, while the remaining species are rarely sampled. Pelagic species of the latter group are the most frequent in the stomach contents of top predators, both cetaceans and large fish and sharks: in particular five species of the families Ommastrephidae, Histioteuthidae and Cranchidae resulted key elements in the food web.

UT-FVM-DCBS: In tight agreement with the objectives of a National Research Project financially supported by the Italian Ministry for the Environment and coordinated by Prof. Giovanni DI GUARDO (Project's title: "*Cause di Mortalità e Studi Patogenetici in Cetacei Spiaggiati sulle Coste Italiane*"), and in order to characterize the *Toxoplasma gondii* isolate(s) associated with the occurrence of a severe meningo-encephalitis in a number of striped dolphins (*Stenella coeruleoalba*) found stranded between 2007 and 2008 along the Ligurian Sea coast of Italy (see for reference Di Guardo *et al*., *Veterinary Pathology* 47: 245-253, 2010), we analyzed (in collaboration with the group of Dr. Donato Traversa, University of Teramo, Faculty of Veterinary Medicine, as well as in collaboration with Prof. Domenico Otranto, University of Bari, Faculty of Veterinary Medicine) *T. gondii* GRA-6 gene sequence by means of a single strand conformation polymorphism (SSCP) PCR technique. Following utilization of the aforementioned technique, we were able to characterize from the genetic/genomic point of view three *T. gondii* isolates obtained from the brain tissue of three of the above striped dolphins. More in detail, one of such isolates (TSL3) showed a classical "Type II" genotype, while the remaining two strains (TSL2 and TSL6) were characterized by an "atypical" Type II genetic/genomic profile.

10. LITERATURE CITED

Addis, A., Díaz López, B., Rabino, S., Fabiano, F. and Shirai., J.A.B.. 2010. Bottlenose dolphin presence in an offshore marine fin fish farm on the north-western coast of Sardinia. 24th Annual Conference of the European Cetacean Society ECS , Straldund, Germany, March 2010

Bajraktarevic, S. & Díaz López B., 2011. Vocal production by free-ranging bottlenose dolphin mother-infant pairs during feeding activities. 25th Annual Conference of the European Cetacean Society ECS , Cadiz, Spain, March 2011.

Bearzi G., Politi E., Agazzi S., Bruno S., Costa M., Bonizzoni S. 2005. Occurrence and present status of coastal dolphins (*Delphinus delphis* and *Tursiops truncatus*) in the eastern Ionian Sea. *Aquatic Conservation: Marine and Freshwater Ecosystems* 15:243-257.

Bearzi G., Agazzi S., Bonizzoni S., Costa M., Azzellino A. 2008*a*. Dolphins in a bottle: abundance, residency patterns and conservation of bottlenose dolphins *Tursiops truncatus* in the semi-closed eutrophic Amvrakikos Gulf, Greece. *Aquatic Conservation: Marine and Freshwater Ecosystems* 18(2):130-14.

Bearzi G., Agazzi S., Gonzalvo J., Costa M., Bonizzoni S., Politi E., Piroddi C., Reeves R.R. 2008*b*. Overfishing and the disappearance of short-beaked common dolphins from western Greece. *Endangered Species Research* 5:1-12.

Bearzi G., Agazzi S., Gonzalvo J., Bonizzoni S., Costa M., Petroselli A. 2010*a*. Biomass removal by dolphins and fisheries in a Mediterranean Sea coastal area: do dolphins have an ecological impact on fisheries? Aquatic Conservation: Marine and Freshwater Ecosystems 20(5):549-559.

Bearzi G., Bonizzoni S., Agazzi S., Gonzalvo J., Currey R.J.C. 2010b. Striped dolphins and short-beaked common dolphins in the Gulf of Corinth, Greece: abundance estimates from dorsal fin photographs. *Marine Mammal Science*. DOI: 10.1111/j.1748-7692.2010.00448.x

Bearzi G., Bonizzoni S., Gonzalvo J. 2010c. Mid-distance movements of common bottlenose dolphins in the coastal waters of Greece. *Journal of Ethology*. DOI 10.1007/s10164-010-0245-x

Díaz López B. 2011. Do dolphins use context-specific social signals in their communication? Vocalizations and underwater behaviour of free-ranging bottlenose dolphins. 25th Annual Conference of the European Cetacean Society ECS , Cadiz, Spain, March 2011.

Díaz López B. & Bajraktarevic, S., 2011. Do free-ranging male bottlenose dolphins use vocalizations in a different way than females? European Association of Marine Mammals, Barcelona, Spain. March, 2011.

Díaz López B., in press. Aquaculture systems. In: Handbook of Models used in Ecosystem and Environmental Management,Sven Erik Jørgensen (Ed.), Copenhagen University, Denmark.

Díaz López B., & Mariño, F., in press. Trial of an AHD efficacy on bottlenose dolphin behavioural changes in Sardinia, Italy. Marine and Freshwater Behaviour and Physiology.

Díaz López B., 2011. Whistle characteristics in free-ranging bottlenose dolphins (Tursiops truncatus) in the Mediterranean Sea: influence of behaviour. Mammalian Biology 76: 180-189.

Díaz López B. 2010a. Aquaculture & Dolphins: how to use Ecosystem Models to address the impacts caused by the interactions. 24th Annual Conference of the European Cetacean Society ECS , Straldund, Germany, March 2010

Díaz López, B., 2010b. Predation and competition: The impact of Aquaculture and Fisheries on bottlenose dolphin populations in Sardinia, Italy. 17 ème Conférence Internationale sur les Cétacés en Méditerranée, Nice France, January 2010.

Díaz López B. & Shirai, J.A.B., 2009. Mediterranean common bottlenose dolphin's repertoire and communication use. In: Dolphins: Anatomy, Behavior, and Threats, A.G: Pierce & L. Correa (Eds.), Nova Science Publishers, New York. pp. 129-148.

Díaz López B., 2009. The bottlenose dolphin Tursiops truncatus foraging around a fish farm: Effects of prey abundance on dolphins' behaviour. Current Zoology (Acta Zoologica Sinica) 55(4):243-248.

Di Guardo, G., Proietto, U., Di Francesco, C.E., Marsilio, F., Zaccaroni, A., Scaravelli, D., Mignone, W., Garibaldi, F. Kennedy, S., Forster, F., Iulini, B., Bozzetta, E. and Casalone, C. 2010. Cerebral toxoplasmosis in striped dolphins (*Stenella coeruleoalba*) stranded along the Ligurian Sea coast of Italy. *Veterinary Pathology* 47: 245-253.

Fossi M.C. and Marsili L. (1997). The use of nondestructive biomarkers in the study of marine mammals. *Biomarkers*, **2**: 205-216.

Fossi M.C., Casini S. and Marsili L. (1999). Nondestructive biomarkers of exposure to endocrine-disrupting chemicals in endangered species of wildlife. *Chemosphere*, **39**(8): 1273-1285.

Fossi M.C., Marsili L., Leonzio C., Notarbartolo di Sciara G., Zanardelli M. and Focardi S. (1992). The use of non-destructive biomarker in Mediterranean cetaceans: preliminary data on MFO activity in skin biopsy. *Mar. Poll. Bull.*, **24**(9): 459-461.

Fossi M.C., Marsili L., Neri G., Natoli A., Politi E. & Panigada S. (2003). The use of non-lethal tool for evaluating toxicological hazard of organoclorine contaminants in Mediterranean cetaceans: new data ten years after the first paper published in MPB. *Mar. Poll. Bull*., **46**(8): 972-982.

Fossi, M.C., Casini, S., Bucalossi, D., Marsili, L., 2008. First detection of CYP1A1 and CYP2B induction in Mediterranean cetacean skin biopsies and cultures fibroblasts by Western Blot Analysis. Mar. Environ. Res. 66(1), 3-6.

Iulini B., Pautasso A., Tittarelli C., Pintore M. D., Serracca L., Garibaldi F., Grattarola C., Goria M., Fioravanti M. L. Varello K., Di Guardo G., Mignone W., Casalone C. 2011 Postmortem investigation on cetaceans found stranded along the Ligurian sea coast of Italy. Paper presented at the 25th conference of the European cetacean society, 21st-23st March 2011, 300 pp

Livak, K.J., Schmittgen, T.D., 2001. Analysis of relative gene expression data usingreal-time quantitative PCR and the 2(-Delta Delta C(T)) method. Methods. 25, 402-408.

Marsili L. and Focardi S. (1996). Organochlorine levels in subcutaneous blubber biopsies of fin whales (*Balaenoptera physalus*) and striped dolphins (*Stenella coeruleoalba*) from the Mediterranean Sea. *Envir. Poll.*, **91**(1): 1-9.

Marsili L., D'agostino A., Malatesta, T., Bucalossi, D., Fossi M.C. (2004). Theoretical models to evaluate hazard due to organochlorine compounds (OCs) in Mediterranean striped dolphin (*Stenella coeruleoalba*). *Chemosphere*, **56**: 791-801.

Marsili L., Fossi M.C., Casini S., Savelli C., Jimenez B., Junin M. and Castello H. (1997). Fingerprint of polycyclic aromatic hydrocarbons in two populations of southern sea lions (*Otaria flavescens*). *Chemosphere*, **34**(4) : 759-770.

Marsili L., Fossi M.C., Neri G., Casini S., Gardi C., Palmeri S., Tarquini E & Panigada S. (2000). Skin biopsies for cell cultures from mediterranean free-ranging cetaceans. *Mar. Envir. Res.*, **50**(1-5): 649-652.

Marsili L., Fossi M.C., Notarbartolo di Sciara G., Zanardelli M., Nani B. and Panigada S. (1998). Relationship between organochlorine contaminants and mixed function oxidase activity in skin biopsy specimens of Mediterranean fin whales (*Balaenoptera physalus*). *Chemosphere*, **37**(8): 1501-1510.

Marsili L., M. C. Fossi, D. Bucalossi, S. Porcelloni, S. Maltese And S. Casini (2008). Use of immunofluorescence technique in cultured fibroblasts from Mediterranean cetaceans as new "in vitro" tool to investigate effects of environmental contaminants. *Mar. Envir. Res.*, **66(1)**:151-153.

Ottonello G., Vivaldi B., Garibaldi A.C., Ferrari A. Mignone W., Tarchino F. 2008. Detection of 18 Pcb congeners in the blubber of stranded striped dolphins from Tirrenian sea. Paper presented at ISA 2008. Ferrara 25-27 June2008, 69-70 pp.

Shirai, J.A.B. Díaz López, B., Mihailova, M. and Casas, C. 2010. Long-term study of whistle contours and repeated whistles of free ranging bottlenose dolphins. 24th Annual Conference of the European Cetacean Society ECS , Stralsund, Germany, March 2010

Spinsanti, G., Panti, C., Bucalossi, D., Marsili, L., Casini, S., Frati, F., Fossi, M.C., 2008. Selection of reliable reference genes for qRT-PCR studies on cetacean fibroblast cultures exposed to OCs, PBDEs, and 17β-estradiol. Aquat. Toxicol. 87, 178-186.

Spinsanti, G., Panti, C., Lazzeri, E., Marsili, L., Casini, S., Frati, F., Fossi, M.C., 2006. Selection of reference genes for quantitative RT-PCR in striped dolphin (Stenella coeruleoalba) skin biopsies. BMC Mol. Biol. 7, 32-42.

Tarchino F., Lettieri L., Prearo M., Mignone W., Serracca L., Vivaldi B. 2009. Presenza di DDT e suoi metaboliti in esemplari di *Stenella coeruleoalba* spiaggiati lungo le coste del Ponente Ligure. Paper presented at llMediterraneo: aspetti emergenti e risposte della scienza del mare. Cesenatico, 8-10 July 2009.

Tittarelli C., Casalone C., Pautasso A., Iulini B., Gnone G., Gili C., Di Guardo G., Garibaldi F. Ercolini C. and Mignone W. 2011 Health surveillance of stranded cetaceans along the Ligurian seacoast of Italy 2011. Paper presented at the 25th Conference of the European Catacean Society 21st-23rd March 2011, Cadiz, Spain. 297 pp.

11. PUBLICATIONS

11.1 Published or 'In Press' papers only

Fortuna, C.M., Vallini, C., Filidei, E. jr, Ruffino, M., Consalvo, I., Di Muccio, S., Gion, C., Scacco, U., Tarulli, E., Giovanardi, O., Mazzola, A. 2010. Bycatch of cetaceans and other species of conservation concern during pair trawl fishing operations in the Adriatic Sea (Italy). *Chemistry and Ecology* 26(Supplement):65–76.

Maltese, S., Marsili, L., Bartolini, M., Coppola, D., Casini, S., Fossi, M. C., De Stephanis, R., Fortuna, C., Canese, S., Lauriano, G., Holcer, D., Urban, J. 2010. Ecotoxicological status of Tursiops truncatus in the Mediterranean Sea and in the Gulf of California (Sea of Cortez-Mexico) using skin biopsy as diagnostic tool. *Comparative Biochemistry and Physiology A-Molecular & Integrative Physiology* 157 (1): S26-S26.

Arcangeli A., 2010. ISPRA cetacean monitoring network along fixed transects. *Biologia Marina Mediterranea* 17(1):400-401.

Attia El Hili H., Cozzi B., Ben Salah C., Podesta` M., Ayari W., Ben Amor N. and Mraouna R., 2010. A survey of cetaceans stranded along the northern coast of Tunisia: recent findings (2005–2008) and a short review of the literature. *Journal of Coastal Research*. West Palm Beach (Florida) 26(5): 982–985.

Bearzi G., Agazzi S., Gonzalvo J., Bonizzoni S., Costa M., Petroselli A. 2010. Biomass removal by dolphins and fisheries in a Mediterranean Sea coastal area: do dolphins have an ecological impact on fisheries? Aquatic Conservation*: Marine and Freshwater Ecosystems* 20(5):549-559.

Bearzi G., Bonizzoni S., Agazzi S., Gonzalvo J., Currey R.J.C. 2010. Striped dolphins and short-beaked common dolphins in the Gulf of Corinth, Greece: abundance estimates from dorsal fin photographs. *Marine Mammal Science*. DOI: 10.1111/j.1748-7692.2010.00448.x

Bearzi G., Bonizzoni S., Gonzalvo J. 2010. Mid-distance movements of common bottlenose dolphins in the coastal waters of Greece. *Journal of Ethology*. DOI 10.1007/s10164-010-0245-x

Bearzi G., Pierantonio N., Affronte M., Holcer D., Maio N., Notarbartolo di Sciara G. 2011. Overview of sperm whale *Physeter macrocephalus* mortality events in the Adriatic Sea, 1555–2009. *Mammal Review*. DOI: 10.1111/j.1365-2907.2010.00171.x

Bearzi G., Pierantonio N., Bonizzoni S., Notarbartolo di Sciara G., Demma M. 2010. Perception of a cetacean mass stranding in Italy: the emergence of compassion. Aquatic Conservation: *Marine and Freshwater Ecosystems* 20:644-654.

Bearzi G., Reeves R.R., Remonato E., Pierantonio N., Airoldi S. 2010. Risso's dolphin *Grampus griseus* in the Mediterranean Sea. *Mammalian Biology*. DOI: 10.1016/j.mambio.2010.06.003

Bombardi, C., Grandis, A., Nenzi, A., Giurisato, M. and Cozzi, B. 2010. Immunohistochemical localization of substance P And cholecystokinin in the dorsal root ganglia and spinal cord of the bottlenose dolphin (*Tursiops truncatus*). *Anat Rec* (Hoboken). 293:477-84.

Cozzi B., Panin M., Butti C., Podestà M., Zotti A., 2010. Bone Density Distribution Patterns in the Rostrum of Delphinids and Beaked Whales: Evidence of Family-Specific Evolutive Traits. *The Anatomical Record (Hoboken)* 293:235–242.

Crosti R., Arcangeli A., Moulin A., Tepsich P. and Tringali M., 2011. Cetacean and maritime traffic in deep sea waters, a relation to avoid. *Biologia Marina Mediterranea* (in press).

Di Francesco, C.E., Marsilio, F., Proietto, U., Mignone, W., Casalone, C. and Di Guardo, G. 2010. Anti-*Morbillivirus* antibodies in stranded striped dolphins (*Stenella coeruleoalba*): Time and temperature dependent fluctuations. *Aquatic Mammals* 36: 294-297.

Di Guardo G., Proietto U., Di Francesco C. E., Marsilio F., Zaccaroni A., Scaravelli D., Mignone W., Garibaldi F., Kennedy S., Forster F., Iulini B., Bozzetta E., Casalone C. 2010. Cerebral Toxoplasmosis in Striped Dolphins (*Stenella coeruleoalba*) stranded along the Ligurian Sea Coast of Italy. *Vet Pathol*. 2010 47: 245-253.

Díaz López B. & Shirai, J.A.B., 2009. Mediterranean common bottlenose dolphin's repertoire and communication use. In: Dolphins: Anatomy, Behavior, and Threats, A.G: Pierce & L. Correa (Eds.), Nova Science Publishers, New York. pp. 129-148.

Díaz López B., & Mariño, F., in press. Trial of an AHD efficacy on bottlenose dolphin behavioural changes in Sardinia, Italy. *Marine and Freshwater Behaviour and Physiology.*

Díaz López B., 2009. The bottlenose dolphin Tursiops truncatus foraging around a fish farm: Effects of prey abundance on dolphins' behaviour. *Current Zoology* (*Acta Zoologica Sinica*) 55(4):243-248.

Díaz López B., 2011. Whistle characteristics in free-ranging bottlenose dolphins (*Tursiops truncatus*) in the Mediterranean Sea: influence of behaviour. *Mammalian Biology* 76: 180-189.

Díaz López B., *in press*. Aquaculture systems. In: Handbook of Models used in Ecosystem and Environmental Management,Sven Erik Jørgensen (Ed.), Copenhagen University, Denmark.

Fossi M. C., Urban J., Casini S., Maltese S., Spinsanti G., Panti C., Porcelloni S., Panigada S., Lauriano G., Nino-Torres C., Rojas-Bracho L., Jimenez B., Munoz-Arnanz J., Marsili L. 2010 - A Multi-Trial diagnostic tool in fin whale *(Balenoptera physalus)* skin biopsies of the Pelagos Sanctuary (Mediterranean Sea) and the Gulf of California (Mexico*). Marine Environmental Research*, **69 (1):** S17-S20.

Frantzis, A., Airoldi, S., Notarbartolo-di-Sciara, G., Johnson, C., Mazzariol, S. 2011. Inter-basin movements of Mediterranean sperm whales provide insight into their population structure and conservation. *Deep Sea Res* - I, 58:454-459.

Godard-Codding C.A.J., Clark R., Fossi M.C., Marsili L., Maltese S., West A.G., Valenzuela L., Rowntree V., Polyak I., Cannon J.C., Pinkerton K., Rubio-Cisneros N., Mesnick S.L., Cox S.B., Kerr I., Payne R., Stegeman J.J. 2011 – Pacific Ocean – Wide profile of CYP1A1 expression, stable Carbon and Nitrogen Isotope Ratios, and Organic Contaminant Burden in sperm whale skin biopsies. *Environmental Health Perspectives,***119(3):** 337-343.

Gonzalvo J., Moutopoulos D.K., Bearzi G., Stergiou K.I. 2011. Fisheries mismanagement in a Natura 2000 area in western Greece. *Fisheries Management and Ecology* 18(1):25-38.

La Manna, G., Clò S., Papale E. and Sarà G. 2010. Boat traffic in the Lampedusa waters (Strait of Sicily, Mediterranean Sea) and its relationship to common bottlenose dolphin (*Tursiops truncatus*) coastal distribution. *Ciencias Marinas* (2010), 36(1): 71–81.

Lauriano G., Panigada S. 2010. Aerial survey in the Pelagos Sanctuary for the Management and Conservation of the protected species. *Biologia Marina Mediterranea*, 17(1):43-46.

Lauriano G., Panigada S. 2010. Line-transect distance sampling through aerial surveys for density and abundances estimates. *Biologia Marina Mediterranea*, 17(1):404-405.

Lauriano, G., Panigada, S., Canneri, R., Manca Zeichen, M. & Notarbartolo di Sciara, G. *2011*. Abundance estimate of striped dolphins (Stenella coeruleoalba) in the Pelagos Sanctuary (NW Mediterranean Sea) by means of line transect survey. *J. Cetacean Res. Manage*. 11(3): 279–283.

Lauriano, G, Fortuna, C.M., Vacchi, M. 2011. Occurrence of killer whales (*Orcinus orca*) and other cetaceans in Terra Nova Bay, Ross Sea, Antarctica. *Antarctic science* 23(2):139-143.

Marini L. & Arcangeli A., 2011. Changes in cetacean abundance and distribution over 20 years along a trans-regional fixed line transect in the central Tyrrhenian sea. *European Research on Cetaceans 24* G.J. Pierce Ed. (in press).

Mazzariol S., Di Guardo G., Marsili L., Fossi M.C., Leonzio C., Petrella A., Ferrante M., Airoldi S., Frantzis A., De Beraldo Quiros Y.M., Pavan G., Podesta' M., Garibaldi F., Vizzini S., Gaspari S., Zizzo N., Traversa D., Marcer F., Cozzi B., Fernandez A. 2011 – Sometimes sperm whales (*Physeter macrocephalus*) cannot find their way back to the high seas: a multidisciplinary study on a mass stranding. *Plos One*, in press.

Panti, C., Spinsanti, G., Marsili, L., Casini, S., Fossi, M.C. 2011 - Ecotoxicological diagnosis of striped dolphin (*Stenella coeruleoalba*) from the Mediterranean basin by skin biopsy and gene expression approach. *Ecotoxicology*, in press.

Pavan G., Thomas L., Adam O., (Editors), 2010. Proceedings of the 4th International Workshop on Detection, Classification and Localization of Marine Mammals Using Passive Acoustics and 1st International Workshop on Density Estimation of Marine Mammals Using Passive Acoustics. *Applied Acoustics*, 71(11): 991-1112.

Peruffo, A., Panin, M., Suman, M., Mazzariol, S., Ballarin, C., Giurisato, M. and Cozzi, B. 2010. Research Strategies and Development Possibilities of a Marine Mammal Tissue Bank: Conservation Biology and Biomolecular Science. pp. 87-93. *In*: T. Isobe, K. Nomiyama, A. Subramanian and S. Tanabe (eds) "Interdisciplinary Studies on Environmental Chemistry". Vol. 4. Environmental Specimen Bank. Ehime University Press, Tokyo 222pp.

Piroddi C., Bearzi G., Christensen V. 2010. Effects of local fisheries and ocean productivity on the northeastern Ionian Sea ecosystem. *Ecological Modelling* 221(11):1526-1544.

Pretti C., Mancianti F., Nardoni S., Ariti G., Monni G., Di Bello D., Marsili L., Papini R. 2010 – Detection of Toxoplasma gondii infection in dolphins stranded along the Tuscan coast, Italy. *Revue Méd. Vét.*,161(10): 428-432.

Smith P.N., Afzal M., Al-Hasan R., Bouwman H., Castillo L.E., Depledge M.H., Subramanian M., Dhananjayan V., Fossi M.C., Kitulagodage M., Kylin H., Law R., Marsili L., O'hara T., Spinola M., Story P., Godard-Codding C. 2010 - Global Perspectives on Wildlife Toxicology: Emerging Issues. *In*: "Wildlife toxicology". Emerging Contaminant and Biodiversity Issues. Ed. Kendall R.J., Lacher T.E., Cobb G.P., Cox S.B. CRC PRESS. Taylor & Francis Group: 197-256.

Mackelworth, P., Holcer D., Jovanović J., Fortuna, C.M. 2010. Marine conservation and accession, the future for the Croatian Adriatic. *Environmental Management*, DOI 10.1007/s00267-010-9460-z

11.2 Unpublished literature

A.A.V.V. 2010. Mitigation of incidental catches of cetaceans in EU waters. Directorate General for Internal Policies, Policy Department B: Structural and Cohesion Policies, FISHERIES. IP/B/PECH/NT/2009_39.

Addis, A., Díaz López, B., Rabino, S., Fabiano, F. and Shirai., J.A.B.. 2010. Bottlenose dolphin presence in an offshore marine fin fish farm on the north-western coast of Sardinia. *24th Annual Conference of the European Cetacean Society ECS* , Straldund, Germany, March 2010

Arcangeli A, Muzi E, Tepsich P, S. Carcassi, Castelli A., Crosti R., Vincenzo M., Magliozzi C., Marini L., Poggi A., Poldi A., Pulcini M., Ricci S., Safontas C., Sdringola S., Ukmar E. (2010) - Large scale cetacean monitoring from passenger ferries in Italy, networking summer 2008 surveys. *Proceedings ECS* 23: 1-6 Pierce & Lick Eds.

Arcangeli A., 2010. Relazione preliminare sul network di monitoraggio cetacei, con particolare riferimento al tratto dello stretto di Messina. Dipartimento Difesa della Natura-Servizio Tutela della Biodiversità ISPRA.

Arcangeli A., Tepsich P., Campana I., Carcassi S., Crosti R., Luperini C., Morgana S., Muzi E., Ruvolo A., Tassara L., 2011. Large scale monitoring in the north western Mediterranean sea -results of two years of research using fixed transect surveys. *European Research on Cetaceans 24* G.J. Pierce Ed. (in press).

Arcangeli A., Tepsich P., Campana I., Tringali M., Carcassi S., Cionci F., Crosti R., Internullo E., Monaco C., Moulin A., Muzi E., Rosso M., Ruvolo A., 2011. Spatio-temporal variabilities in Cetacean presence and distribution in central-western Mediterranean sea. *25th ECS Conference* – Cadiz 2011.

Azzolin M., Anichini M., Galli A., Papale E., Giacoma C. 2010 Evidence of a striped dolphin (*Stenella coeruleoalba*) nursery zone in the waters of a terrestrial Nature 2000 Area "Mount Gerania (Gulf of Corinth)" *24th Annual Conference of the European Cetacean Society ECS* , Stralsund, Germany, March 2010.

Bajraktarevic, S. & Díaz López B., 2011. Vocal production by free-ranging bottlenose dolphin mother-infant pairs during feeding activities. *25th Annual Conference of the European Cetacean Society ECS* , Cadiz, Spain, March 2011.

Campana I., Arcangeli A., Carcassi S., Orasi A., 2011. Correlation between fin whale distribution and environmental parameters in central Tyrrhenian Sea. *25th ECS Conference* – Cadiz 2011.

Di Francesco, C.E., Proietto, U., Mignone, W., Casalone, C., Marsilio, F. and Di Guardo, G. 2010. Time and temperature dependant effects on antibody titre in *Morbillivirus*-positive blood sera from stranded striped dolphins (*Stenella coeruleoalba*). *Proceedings of the 38th Annual Symposium of the European Association for Aquatic Mammals (EAAM)*, Lisbon, Portugal, 12-15. March. 2010.

Di Guardo, G., Marruchella, G., Proietto, U., Di Francesco, C.E., Zucca, P., Pennelli, M., Mignone, W., Tittarelli, C., Casalone, C., Iulini, B., Bozzetta, E., Garibaldi, F., Scaravelli, D., Mazzariol, S., Fico, R., Eleni, C., Kennedy, S., Di Cesare, A. and Traversa, D. 2010. Reperti anatomo-istopatologici, immunoistochimici e parassitologici in cetacei rinvenuti spiaggiati sulle coste italiane dal 1998 al 2009. *Proceedings of the 7th Annual Meeting of the Italian Association for Veterinary Pathology* (*AIPVet*), Castelsardo (Sassari), Italy, 17-18. June. 2010. (Abstract available from AIPVet's website, www.aipvet.it).

Di Guardo, G., Proietto, U., Di Francesco, C.E., Marruchella, G., Zucca, P., Mignone, W., Tittarelli, C., Casalone, C., Iulini, B., Bozzetta, E., Garibaldi, F., Scaravelli, D., Mazzariol, S., Fico, R., Kennedy, S., Di Cesare, A. and Traversa, D. 2010. Pathological and parasitological findings in cetaceans found stranded along

the Italian coastline. *Proceedings of the 38th Annual Symposium of the European Association for Aquatic Mammals (EAAM)*, Lisbon, Portugal, 12-15. March. 2010.

Díaz López B. & Bajraktarevic, S., 2011. Do free-ranging male bottlenose dolphins use vocalizations in a different way than females? *European Association of Marine Mammals, Barcelona, Spain*. March, 2011.

Díaz López B. 2010a. Aquaculture & Dolphins: how to use Ecosystem Models to address the impacts caused by the interactions. *24th Annual Conference of the European Cetacean Society ECS* , Straldund, Germany, March 2010

Díaz López B. 2011. Do dolphins use context-specific social signals in their communication? Vocalizations and underwater behaviour of free-ranging bottlenose dolphins. *25th Annual Conference of the European Cetacean Society ECS* , Cadiz, Spain, March 2011.

Díaz López, B., 2010b. Predation and competition: The impact of Aquaculture and Fisheries on bottlenose dolphin populations in Sardinia, Italy. 17 ème *Conférence Internationale sur les Cétacés en Méditerranée*, Nice France, January 2010.

Donato T., Di Cesare A., Casalone C., Iulini B. Mignone W. Tittarelli C., Proietto U., Meloni, S., Buffatello G. Forster F., Kennedy S., and Di Guardo G. 2010. Molecular evidence for Toxoplasma gondii in the brain of striped dolphins (*Stenella coeruleoalba*) stranded along the Ligurian Sea coast of Italy. Available from Nature Precedings <http://dx.doi.org/10.1038/npre.2010.4930.1

Eleni, C., Cocumelli, C., Scholl, F., Di Francesco, C.E., Speranza, R., Pennelli, M. and Di Guardo, G. 2010. Encefalite da *Morbillivirus* in una stenella striata (*Stenella coeruleoalba*) rinvenuta spiaggiata sulle coste laziali. *Proceedings of the 7th Annual Meeting of the Italian Association for Veterinary Pathology* (*AIPVet*), Castelsardo (Sassari), Italy, 17-18. June. 2010. (Abstract available from AIPVet's website, www.aipvet.it).

Eleni, C., Cocumelli, C., Scholl, F., Di Francesco, C.E., Speranza, R., Pennelli, M. and Di Guardo, G. 2010. Su di un singolare caso di encefalite morbillivirale in una stenella striata (*Stenella coeruleoalba*) rinvenuta spiaggiata sulle coste laziali. *Proceedings of the International Symposium on "Anatomo-Pathological Investigations and Wildlife Management*", Isola del Gran Sasso (Teramo), Italy, 22-24. October. 2010.

Fortuna, C., Holcer, D., Filidei, E., Mackelworth, P., Tunesi, L. 2010. Distribution and abundance of megafauna in the Adriatic Sea: relevance for identification of important marine areas. 3rd International Workshop on Biodiversity in the Adriatic, October 2010, Piran, Slovenia.

Fortuna, C.M., Filidei, E. jr., Giovanardi, O., Tunesi, L. 2010. Valutazione dell'impatto della pesca sulle specie marine protette. Conferenza ISPRA per la conservazione delle biodiversità: Ricerca applicata, strumenti e metodi. La Biodiversità illustrata. Raccolta sessione poster. Roma, 24-26 novembre 2010.

Fossa F., Lammers M.O., Gnone G. 2010. Preliminary study of bottlenose dolphin (*Tursiops truncatus*) coastal pattern using an Ecological Acoustic Recorder (EAR). *European Association for Aquatic Mammals, 38th annual conference – Lisbon (Portugal.)*

Garibaldi F., Mignone W. Ballardini M., Di Guardo G., Tittarelli C., Podestà M. 2010. Nuove osservazioni sulla dieta di Stenella coeruleoalba (Meyen, 1833) in Mar Ligure occidentale. Paper presented at Where to go and what to eat? Migration and conservation in marine megavertebrate, Facoltà di Medicina veterinaria- Cesenatico, 21-22 May 2010, 35 pp.

Gnone G., Bellingeri M., 2010. Esperienza di aggregazione di dati tramite l'utilizzo di GIS: il progetto *Tursiops* Pelagos. *Biologia Marina Mediterranea*, 17 (1): 402-403

Maglio A., Gnone G., Fossa F., Bellingeri M., Liebana F. and Carnabuci M., 2010. Experimentation of Photo-Identification technique on striped dolphin (*Stenella Coeruleoalba*, Meyen 1833) in Ligurian Sea. *European Cetacean Society, 24th annual conference – Straslund (Germany).*

Magnone, F., Fozzi, A., Blini, V., Picollo, V., De Lazzari, A. Navone, A. 2010. Influence of anthropic activities on the social ecology of Common Bottlenose Dolphins (*Tursiops truncatus*) in North Eastern Sardinia – Italy. *Abstract 25th ECS Conference, Cadiz, Spain*.

Mazzariol S., Podestà M., Cozzi B. 2010. Reporting cetacean mortality related to ships strikes: the Italian experience. IWC/S10/SSW6.1. *Report Of The Joint IWC-Accobams Workshop On Ship Strikes*, 30-31.

Panigada S., Lauriano G., Burt L., Pierantonio N., Donovan G. 2010. Monitoring winter and summer abundance of cetaceans in the Pelagos Sanctuary through aerial surveys for conservation. 24rd Annual Conference of the European Cetacean Society, Stralsund, Germany.

Papale E., Galli A., Anichini M., Giacoma C., Azzolin M. 2010. "2009 summer sightings of common dolphin (*Delphinus delphis*) in the Ionian Islands" *24th Annual Conference European Cetacean Society, Stralsund, Germany. March 2010*:

Pautasso A. and Tittarelli C. 2010 Salute e conservazione dei cetacei in natura: aggiornamenti e prospettive future. La settimana veterinaria n°7. 11-13 October 2010, 26-28 pp.

Pavan G., Fossati C., Caltavuturo G., 2011. Ziphius 2010 Cruise Report. CIBRA Internal Report.

Pavan G., Francia C., Fossati C., Caltavuturo G.; 2010. Studio della distribuzione dello Zifio attraverso il rilevamento e riconoscimento dei segnali acustici emessi in immersione. Atti XLI Congresso SIBM. Biol. Mar. Mediterr. 17 (1): 408-409.

Pirotta E., Azzellino A., Airoldi S. 2010. Distribution and ecology of Risso's dolphin, Grampus griseus (Cuvier, 1812), in the Western Ligurian Sea in relation to physiographic, oceanographic and intrinsic biological parameters. 24rd Annual Conference of the European Cetacean Society, Stralsund, Germany.

Pulcini, M., Fortuna, C.M., La Manna, G., Triossi, F., Pace, D.S. gis spatial analysis as management tool to describe the habitat use of bottlenose dolphins in the Lampedusa waters (Italy): results from eleven years of observation. European Cetacean Society, 2010.

Remonato E., Panigada S., Leaper R., Donovan G. 2010. Ship strikes with cetaceans in the Mediterranean Sea: assessment, public awareness and mitigation measures. 24rd Annual Conference of the European Cetacean Society, Stralsund, Germany.

Scuderi A., Azzellino A., Jahoda M., Lanfredi C. 2010. Identification of fin whale feeding areas in the Western Ligurian Sea. 24rd Annual Conference of the European Cetacean Society, Stralsund, Germany.

Shirai, J.A.B. Díaz López, B., Mihailova, M. and Casas, C. 2010. Long-term study of whistle contours and repeated whistles of free ranging bottlenose dolphins. *24th Annual Conference of the European Cetacean Society ECS* , Straldund, Germany, March 2010

Tittarelli C ., Casalone C., Pautasso A., Iulini B., Bozzetta E., Varello K., Pezzolato M., Grattarola C., Garibaldi F., Di Francesco C. E., Di Guardo G., Gustinelli A., Fioravanti M.L., Mignone W. 2010. Indagini anatomo-istopatologiche, microbiologiche, parassitologiche e siero-epidemiologiche in cetacei spiaggiati in Liguria (2007-2010). Paper presented at the XII Congresso nazionale S.I.Di.L.V. 27-29 Ottobre 2010. 382-383 pp.

Tittarelli C ., Varello K., Bozzetta E., Pezzolato M., Iulini B., Casalone C., Pautasso A., Vivaldi B., Tarchino F., Di Guardo G., Garibaldi F., Mignone W. 2010. Adrenal adenoma in a specimen of striped dolphin (Stenella *coeruleoalba*) stranded along the Ligurian coast: a case study. Paper presented at the 38th Symposium of the EAAM. March 12-15, 2010, Lisbon, Portugal. 29.pp

Traversa D., Di Cesare A., Casalone C., Iulini B., Mignone W., Tittarelli C., Proietto U., Meloni S., Buffatello G., Forster F., Kennedy S., Di Guardo G. (2010). Molecular evidence for Toxoplasma gondii in the brain of striped dolphins (*Stenella coeruleoalba)* stranded along the Ligurian sea coast of Italy. Paper presented at the 12th International Congress of Parasitology (ICOPA XII), Melbourne, Australia, 15 August 2010.

Appendix 1. FOA fishing descriptions and codes

FAO FISHING GEAR CATEGORIES:	
SURROUNDING NETS	
With purse lines	PS
One-boat operated purse seines	PS1
Two-boat operated purse seines	PS2
Without purse lines (lampara)	LA
SEINE NETS	
Beach seines	SB
Boat seines	SV
Danish seines	SDN
Scottish seines	SSC
Pair seines	SPR
Seine nets (not specified)	SX
TRAWLS	
Bottom trawls	TBB
Beam trawl	OTB
Otter trawls (side or stern)	PTB
Pair trawls	TBN
Nephrops trawls	TBS
Shrimp trawls (not specified)	TM
Midwater trawls	
Otter trawls (side or stern)	OTM
Pair trawls	PTM
Shrimp trawls	TMS
Midwater trawls (not specified)	TM
Otter twin trawls	OTT
Otter trawls (not specified)	OT
Pair trawls (not specified)	PT
Other trawls (not specified)	TX
DREDGES	
Boat dredges	DRB
Hand dredges	DRH
LIFT NETS	
Portable lift nets	LPN
Boat-operated lift nets	LNB
Shore operated stationary lift nets	LNS
Lift nets (not specified)	LN

FALLING GEAR	
Cast nets	FCN
Falling gear (not specified)	FG
GILLNETS AND ENTANGLING GEAR	
Set gillnets (anchored)	GNS
Driftnets	GND
Encircling gillnets	GNC
Fixed gillnets (on stakes)	GNF
Trammel nets	GTR
Combined gillnet-trammel nets	GTN
Gillnets and entangling gillnets (not specified)	GEN
Gillnets (not specified)	GN
TRAPS	
Stationary uncovered pounds nets	FPN
Pots	FPO
Fyke nets	FYK
Stow nets	FSN
Barriers, fences, weirs, etc	FWR
Aerial traps	FAR
Traps (not specified)	FIX
HOOKS AND LINES	
Handlines and pole-lines (hand operated)	LHP
Handlines and pole-lines (mechanised)	LHM
Set longlines	LLS
Drifting longlines	LLD
Longlines (not specified)	LL
Trolling lines	LTL
Hooks and lines (not specified)	LX
GRAPPLING AND WOUNDING	
Harpoons	HAR
HARVESTING MACHINES	
Pumps	HMP
Mechanised dredges	HMD
Harvesting machines (not specified)	HMX
MISCELLANEOUS GEAR	MIS
RECREATIONAL FISHING GEAR	RG
GEAR NOT KNOWN OR NOT SPECIFIED	NK
SHARK CONTROL NETS	NSC
DERELICT FISHING GEAR	