

Italy. Progress report on cetacean research, January 2008 to December 2008, with statistical data for the *calendar year 2007*

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Please note that the language has not been revised. Each contributor is responsible for the accuracy of her/his data and released information. For any clarification, please, refer to each of the indicated persons/organisations.

1. SPECIES AND STOCKS STUDIED

IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Fin whale	<i>Balaenoptera physalus</i>	Italian waters, Ligurian Sea, Tyrrhenian Sea, Corsican Sea, Sardinian Channel, Sea of Cortez	2.1.1, 2.1.2, 2.2, 3.1.1, 4.1, 4.3, 5, 8, 9
Bryde's whale	<i>Balaenoptera edeni</i>	Sea of Cortez	4.1, 4.4, 5, 9
Sperm whale	<i>Physeter macrocephalus</i>	Ligurian Sea, Tyrrhenian Sea, Sea of Cortez	2.1.2, 2.2, 3.1.1, 4.1, 4.3, 5, 8, 9
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	Alboran Sea, Ligurian Sea, Tyrrhenian Sea	2.1.1, 2.1.2, 2.2, 3.1.1
Long finned pilot whale	<i>Globicephala melas</i>	Alboran Sea, Ligurian Sea, Tyrrhenian Sea	2.1.12.1.2, 2.2, 3.1.1, 3.1.3, 4.1, 4.4, 5, 9
Killer whales	<i>Orcinus orca</i>	Sea of Cortez	4.1, 4.4, 5, 9
Risso's dolphin	<i>Grampus griseus</i>	Alboran Sea, Italian waters, Ligurian Sea, Tyrrhenian Sea, Corsican Sea, Sardinian Channel	2.1.1, 2.1.2, 2.2, 3.1.1, 4.1, 4.3, 8
Common Bottlenose dolphin	<i>Tursiops truncatus</i>	Alboran Sea, Italian waters, Ligurian Sea, Tyrrhenian Sea, North Adriatic Sea, Mediterranean Sea, Strait of Sicily, North-west Sardinia, North-eastern Sardinia, North-western Spain (Atlantic Ocean), NW Greece (Amvrakikos Gulf), Western Ionian Sea (Italy), Eastern Ionian Sea (Greece), Sea of Cortez	2.1.1, 2.1.2, 2.2, 3.1.1, 3.2, 4.1, 4.3, 7.3.2, 8, 9
Short-beaked common dolphin	<i>Delphinus delphis</i>	Alboran Sea, Italian waters, Ligurian Sea, Tyrrhenian Sea, Eastern Ionian Sea, Greece	2.1.1, 2.1.2, 2.2, 3.1.1, 4.1, 7.3.2
Long-beaked common dolphin	<i>Delphinus capensis</i>	Sea of Cortez	4.1, 4.4, 5, 9
Striped dolphin	<i>Stenella coeruleoalba</i>	Alboran Sea, Italian waters, Ligurian Sea, Tyrrhenian Sea, Mediterranean Sea, Corsican Sea, Sardinian Channel	2.1.1, 2.1.2, 2.2, 4.1, 4.1, 4.3, 7.3.1, 7.3.2, 8, 9

2. SIGHTINGS DATA

2.1 Field work

2.1.1 Systematic

Target species	Date	Area	No. of sightings	Contact person/institute and references
Striped, Common, Common bottlenose and Risso's dolphin, Pilot and Cuvier's beaked whale	17-30/05/2008	Alboran Sea	164	Michela Podestà, MSNM
Fin whale	1-12/08/08	Pelagos sanctuary	12	G.Lauriano/ISPRA (ex-ICRAM)
As above	Jan-Dec 2008	Tyrrhenian Sea	10	S. Nuti, D. Bedocchi (Cetus)

Target species	Date	Area	No. of sightings	Contact person/institute and references
Fin whale	4-3/28 -10-08	Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel	5	Alberto Marco Gattoni, BB
<i>As above</i>	02/5/2008- 01/09/2008	Ligurian Sea	5	A. Moulins - CIMA
<i>As above</i>	June - October 2008	Ligurian Sea, Italy	15	TRI
Sperm whale	02/5/2008- 01/09/2008	Ligurian Sea	2	A. Moulins - CIMA
<i>As above</i>	June - October 2008	Ligurian Sea, Italy	27	TRI
<i>As above</i>	Jan-Dec 2008	Tyrrhenian Sea	1	S. Nuti, D. Bedocchi (Cetus)
Cuvier's beaked whale	02/5/2008- 01/09/2008	Ligurian Sea	5	A. Moulins - CIMA
<i>As above</i>	17/05/2008- 17/06/2008	Alboran Sea	13 sightings, more than 200 acoustic contacts to be checked	G.Pavan, CIBRA
<i>As above</i>	June - October 2008	Ligurian Sea, Italy	5	TRI
Long-finned pilot whale	June - October 2008	Ligurian Sea, Italy	4	TRI
<i>As above</i>	02/5/2008- 01/09/2008	Ligurian Sea	1	A. Moulins - CIMA
Risso's dolphin	4-3/28-10-08	Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel	5	Alberto Marco Gattoni, BB
<i>As above</i>	02/5/2008- 01/09/2008	Ligurian Sea	1	A. Moulins - CIMA
<i>As above</i>	June - October 2008	Ligurian Sea, Italy	8	TRI
Common bottlenose dolphin	01/01/08- 31/12/08	Northeastern Sardinia	38	fra.magnone@crimm.org/CRiMM onlus a.fozzi@crimm.org/CRiMM onlus
<i>As above</i>	January 2008 – October 2008	North-eastern coast of Sardinia (Tyrrhenian Sea)	184	Bruno Diaz Lopez / BDRI
<i>As above</i>	Jan-Dec 2008	Tyrrhenian Sea	55	S. Nuti, D. Bedocchi (Cetus)
<i>As above</i>	May 2008 – December 2008	North-western coast of Sardinia (Gulf of Alghero)	22	Bruno Diaz Lopez / BDRI
<i>As above</i>	June 2008 – September 2008	North-western coast of Spain (Atlantic Ocean)	20	Bruno Diaz Lopez / BDRI, Diaz Lopez et al., 2008b
<i>As above</i>	02/5/2008- 01/09/2008	Ligurian Sea	4	A. Moulins - CIMA
<i>As above</i>	From 01/06/08 to 31/09/08	Lampedusa Island	57	Gabriella La Manna /CTS
<i>As above</i>	From 15/06/08 to 13/09/08	Archipelago of La Maddalena	14	Irene Galante/CTS
<i>As above</i>	June - October 2008	Eastern Ionian Sea, Greece	29	TRI
<i>As above</i>	January - December 2008	North-western Greece, Amvrakikos Gulf	77	TRI

Target species	Date	Area	No. of sightings	Contact person/institute and references
Common bottlenose dolphin	April – October 2008	Western Ionian Sea, Italy	0	TRI
<i>As above</i>	June - October 2008	Ligurian Sea, Italy	3	TRI
Short-beaked common dolphin	June – October 2008	Eastern Ionian Sea, Greece	7	TRI
Striped dolphin	1-12/08/08	Pelagos sanctuary	35	G.Lauriano/ISPRA
<i>As above</i>	Jan-Dec 2008	Tyrrhenian Sea	18	S. Nuti, D. Bedocchi (Cetus)
<i>As above</i>	4-3/28-10-08	Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel	6	Alberto Marco Gattoni, BB
<i>As above</i>	02/5/2008-01/09/2008	Ligurian Sea	42	A. Moulins - CIMA
<i>As above</i>	June - October 2008	Ligurian Sea, Italy	128	TRI

Various organisations: A visual/acoustic survey for studying cetaceans in the Alboran Sea (Mediterranean Sea) was organized by NURC (NATO Undersea Research Center, Italy). Studies are being carried out to analyze population density estimates, habitat use and to combine acoustic and visual detections.

BB: The association Battibaleno has effected n° 36 sea expedition for the observation of the present cetacean in the marine protected area of the Pelagos Sanctuary for Mediterranean Marine Mammals, in the period between 4 March / 28 October 2008. The boat used by Battibaleno is Physalie, a sail boat of 42 feet, especially equipped for the realization of photos, video and acoustic recordings. To our recognitions have participated doctors in scientist and researchers, but also students 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, presence 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 ecology and behaviour of a Mediterranean resident bottlenose dolphin population since 1991. Data were collected by scientists and volunteers onboard a 5.3m motor-craft and an 11 meters wooden vessel from January to October 2008.
- North-western coast of Sardinia (Gulf of Alghero): This is a new BDRI's research project focuses on photo-identification and population analysis. Data were collected by scientists and volunteers onboard a 6m motor-craft from May to December 2008.
- North-western coast of Spain: Data were collected by scientists and volunteers from land based observation points. BDRI researchers provided the quantified data about solitary bottlenose dolphin diving behaviour in the presence and absence of boats on the north-western coast of Spain.

CE.TU.S: Founded in 1999, the CE.TU.S. Centre is a private non-profit organization specialized in cetacean research instead the Pelagos Sanctaury waters. Exclusively based on autonomous fundraising CE.TU.S. team are marine biologist, engineers, naturalists. CETUS collected data since 2000 in the Versilian waters regarding ecology and behaviours od an important community of Tursiops truncatus. The research activity are conducted onboard the Krill sailing catamaran, equipped with photocamera, videocamera, computers and hydrophones. Surveys are carried out in two study areas in the Ligurian and North Tyrrhenian Sea: the first between La Spezia and Livorno (1300 Km²) and the second one around the Tuscany Archipelago (Capraia, Pianosa and Elba Islands) (2500 Km²).

The targets of these surveys were to continue to study the behaviour, presence, distribution, social organization of bottlenose dolphins; ecology of all cetacean species inside the Tuscan Archipelago.

CIBRA: A wide-band towed array and related signal processing equipment developed at CIBRA (University of Pavia, Italy) has been used in a visual/acoustic survey for studying Cuvier's beaked whales in the Alboran Sea (Mediterranean Sea). Results of the cruise organized by NURC (NATO Undersea Research Center, Italy) show the feasibility of detecting and tracking Cuvier's beaked whales with sub-surface towed arrays (Zimmer & Pavan, 2008; Pavan & al, 2009) and to map their presence on wide areas in support of both research and mitigation needs. Studies are being carried out to produce population density estimates and to combine acoustic and visual detections.

CIMA: From May, the 2nd to September, the 1st, 15 one-day surveys were conducted in Ligurian Sea, 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. From April the 20th to April the 27th the research group participated an oceanographic cruise onboard of the Atalante, an oceanographic vessel of IFREMER. The aim of the survey was to place OBS off Nice-Imperia and to register guns explosions. The research group from CIMA and DIBIO has been called in order to detect every cetacean in the range of the boat.

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.

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, Striped and Common bottlenose dolphin	Tyrrhenian Sea	Sightings, survey effort, environmental data, nautical traffic/Line transect	dedicated observer	Ferries		Antonella Arcangeli ISPRA (ex-APAT), AdL
Fin, Long finned pilot and Cuvier's beaked whale, Striped and Common bottlenose dolphin,	Ligurian Sea	Sightings/ line transect survey	Trained students	Ferries	CIMA	Paola Tepsich Fondazione CIMA
Fin whale, Risso's dolphin, Striped dolphin	Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel	Sail boat Visual survey 36 transect line campaigns photo identification	Crew Associazione Battibaleno	Sail boat Visual survey transect line campaigns photo identification	BB	Alberto Marco Gattoni, BB
Fin whale	Versilia Coastline and Tuscan Archipelago	Distance, Photo-ID, sighting data, behaviour, survey effort	crew	Whalewatching/Research Catamaran	Cetus HQ	S. Nuti, D. Bedocchi (Cetus)
Sperm Whale	Tuscan Archipelago	Distance sampling, Line transect survey	Crew	Whalewatching/Research Catamaran	Cetus HQ	S. Nuti, D. Bedocchi (Cetus)
Risso's Dolphins	Tuscan Archipelago	Photo-ID, sighting data, behaviour, survey effort	crew	Whalewatching/Research Catamaran	Cetus HQ	S. Nuti, D. Bedocchi (Cetus)
Common bottlenose dolphin	North-eastern coast of Sardinia	Trial of acoustic deterrent devices, interaction with gillnets fishery	Fishers & scientist	Fishing boats	Bottlenose Dolphin Research Institute - BDRI's Database	Bruno Díaz López / BDRI Troncone et al. 2008

Primary species	Area	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
Common bottlenose dolphin	North-eastern coast of Sardinia	Behavioural sampling, Photo-ID, Social structure analysis, Underwater behaviour Interaction with aquaculture, Ecological modelling	Scientist	Fish farm boats	Bottlenose Dolphin Research Institute (Local Photo-ID Catalogue)	Bruno Díaz López / BDRI Díaz López & Shirai 2008; Castel et al., 2008; Díaz López et al., 2008a
<i>As above</i>	North-eastern coast of Sardinia	Presence/Absence of dolphins	Fish farm workers and volunteers	Fish farm boats	Bottlenose Dolphin Research Institute - BDRI's Database	Bruno Díaz López / BDRI Castel et al. 2008
<i>As above</i>	North-eastern coast of Sardinia	Interaction with trawlers	Fishers and scientist	Trawlers	Bottlenose Dolphin Research Institute - BDRI's Database	Bruno Díaz López / BDRI
<i>As above</i>	Versilia Coastline and Tuscan Archipelago	Photo-ID, sighting data, behaviour, acoustic records, survey effort, environmental data	crew	Whalewatching/Research Catamaran	Cetus HQ	S. Nuti, D. Bedocchi (Cetus)
Striped Dolphins	Tuscan Archipelago	Distance sampling, Line transect survey	Crew	Whalewatching/Research Catamaran	Cetus HQ	S. Nuti, D. Bedocchi (Cetus)

ISPRA (ex-APAT): Weekly observations on cetacean were undertaken in “passing mode”, from dedicated observers, using ferries as platform of opportunity for dedicated sightings along three “fixed line transect”:

- from Civitavecchia (Latium) to Golfo Aranci (Sardinia), from June to September (Organizations: AdL, ISPRA, CRAB)
- from Livorno (Tuscany) to Bastia (Corsica), from February to December (AdL, ISPRA, University of Pisa)

from Savona (Liguria) to Bastia., from June to September (Organizations: AdL, ISPRA, University of Genoa DIBIO, CIMA Fondation).

BDRI: In order to understand the relationship between bottlenose dolphins and aquaculture, fish farm based observations were regularly undertaken from January 2008 to November 2008. Scientists, students and fishers collected data. Observations from trawlers were carried out in order to know the relationships between bottlenose dolphins and this fishery on the north-eastern coast of Sardinia from March 2008 to July 2008.

CE.TUS: The research vessel used by CETUS is the “Krill”, a 40ft equipped sailing catamaran. The routes are managed with transects in respect of constant values of length, velocity and efforts. The boat routes and animal sightings are continuously recorded by GPS disposals. All activities are settled to minimize the disturbance to animals.

2.2 Analyses/development of techniques

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
All	7/06 – 26/09	Ligurian Sea	Line transect survey/twice a week	Encounter rate (number of sightings per hour spent in observation in good weather condition), mean group size, distribution, abundance	Paola Tepsich Fondazione CIMA
All	15/06 – 28/09	Central Tyrrhenian Sea	Line transect survey/twice a week	<i>As above</i>	Antonella Arcangeli ISPRA, Accademia del Levitano

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
All	27/02-18/12	Northern Tyrrhenian Sea	Line transect survey/twice a week	<i>As above</i>	Antonella Arcangeli ISPRA, Accademia del Levitano
Fin, Sperm, Cuvier's beaked and long-finned pilot whale, Risso's, Common bottlenose, Striped dolphin	June - October 2008	Ligurian Sea, Italy	Boat surveys, photo-identification, behavioural sampling (7778 km)	Encounter rate, distribution, abundance, habitat use, behaviour, ecology	TRI
Fin whale, Striped dolphin	02/5/2008-01/09/2008	Ligurian Sea	Line transect survey	Spatio-temporal distribution; Habitat	A. Moulins, CIMA
Fin whale, Risso's dolphin, Striped dolphin	4-3/28 - 10	Ligurian Seas Tyrrhenian Sea, Corsican Sea Sardinian Channel	Sail boat Line transect survey Photo identification	Distribution; sighting frequency – behaviour - Presence absence (980 miles crossed)	Alberto Marco Gattoni, BB
Fin and Sperm whale, Striped dolphin	Jan-Dec & Summer	Versilia Coastline and Tuscan Archipelago	Line transect survey, Distance sample	Distribution; sighting frequency; Abundance;	S. Nuti, D. Bedocchi (Cetus)
Cuvier's beaked whale	17/05/08 -17/06/08	Alboran Sea	Line transect acoustic survey	Distribution; sighting frequency	G.Pavan, CIBRA
<i>As above</i>	02/5/2008-01/09/2008	Ligurian Sea	PhotoID, Line transect survey	Population estimates, Spatio-temporal distribution; Habitat	M. Rosso, CIMA
Risso's dolphin	02/5/2008-01/09/2008	Ligurian Sea	PhotoID	Population estimates	M. Rosso, CIMA
Risso's and common bottlenose dolphin	Summer	Tuscan Archipelago	Line transect survey, M-R.	Distribution; sighting frequency; Abundance;	S. Nuti, D. Bedocchi (Cetus)
Short-beaked common and Common bottlenose dolphin	June - October 2008	Eastern Ionian Sea, Greece	Boat surveys, photo-identification, behavioural sampling (3539 km)	Encounter rate, distribution, abundance	TRI
Common bottlenose dolphin	January - December 2008	North-western Greece, Amvrakikos Gulf	Boat surveys, photo-identification (1566 km)	Encounter rate, distribution, abundance	TRI
<i>As above</i>	June – October 2008	Eastern Ionian Sea, Greece	Boat surveys, photo-identification, behavioural sampling (3539 km)	Encounter rate, distribution, abundance	TRI
Common bottlenose dolphin	May 08 - December 08	North-western coast of Sardinia	40 boat surveys and 22 sightings, photo-identification and social structure studies, site-fidelity	- Encounter rates - GIS - Distribution, habitat use, site – fidelity and preferences - Population estimate (Photo-ID) - Association index (HWI)	Diaz Lopez, B./BDRI;
<i>As above</i>	02/5/2008-01/09/2008	Ligurian Sea	PhotoID, Line transect survey	Population estimates, Habitat	M. Rosso, CIMA

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Common bottlenose dolphin	January 08 - October 08	North-eastern coast of Sardinia (Tyrrhenian Sea)	124 boat surveys and 184 sightings, photo-identification and social structure studies, behavioural sampling and foraging studies, bioacoustics, interaction with human activities, allomaternal cares and mother-infant separations	- Encounter rates - GIS - Distribution, habitat use, site – fidelity and preferences - Population estimate (Photo-ID) - Association index (HWI, networks) - Behaviour, feeding habits - Respiratory patterns - Underwater behaviour - Bycatch and incidental captures - Trophic levels - Mass balance models	Diaz Lopez, B./BDRI; Díaz López, 2008; Díaz López & Shirai 2008; Castel et al. 2008; Troncone et al. 2008; Bunke et al. 2008; Díaz López et al. 2008.
<i>As above</i>	From 01/06/08 to 31/09/08	Lampedusa Island	Sea survey: 83,35 hours	Distribution; sighting frequency, encounter rate, habitat use.	Gabriella La Manna / CTS
<i>As above</i>	From 15/06/08 to 13/09/08	Archipelago of La Maddalena	Sea survey: 151 hours	Distribution; sighting frequency.	Irene Galante/CTS
<i>As above</i>	01/01/08-31/12/08	Northern Saridinia	Line transect survey	Distribution; sighting frequency; groups composition, behaviour	fra.magnone@crimm.org/CRiMM onlus a.fozzi@crimm.org/C RiMM onlus
Striped dolphin	1-12/8/08	Ligurian Seas	Line transect survey	Abundance estimate/distribution; sighting frequency	G.Lauriano/ISPRA

BDRI:

- Mark-recapture techniques: photo-identification catalogue (since 1999) and population estimates, Mantel test and network diagrams to study social structure and sex ratio.
- -Geographical Information System: spatial analyses and site fidelity
- -Use and development of Open source software in dolphins research (Photo-ID and bioacoustical analyses)
- -Bioacoustics: Acoustical repertoire and communication use, noise pollution analyses
- -Use of GLMM (General linear mixed models) as a method to analyse dolphins behaviour and mass-balance models to explain dolphins presence and distribution

CIBRA: New signal processing techniques and tools are in development to further improve detection and classification of Cuvier's beaked whales acoustic signals.

CRiMM onlus: Description of movements and the home range for cetacean species like Common bottlenose dolphin (*Tursiops truncatus*) is priority to implement conservation measures. Research was carried out through boat surveys, with the use of photo-identifications techniques and with detailed recordings of behavioural data, distribution, sighting frequency, groups composition.

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, scars	Ligurian Sea, Italy	Analysis in progress	Y	431	TRI
<i>As above</i>	Permanent mark dorsal fin	Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel	3	Y	14	Alberto Marco Gattoni, BB
Sperm whale	Flukes	Ligurian Sea, Italy	32	Y	73	TRI
Cuvier's beaked whale	Dorsal fin	Ligurian Sea, Italy	3	Y	42	TRI
<i>As above</i>	Dorsal fin, flanks, head	Ligurian Sea	27	Y	124	M. Rosso - CIMA
Long-finned pilot whale	Dorsal fin	Ligurian Sea, Italy	Analysis in progress	Y	Analysis in progress	TRI
Risso's dolphin	Dorsal fin, body scars	Ligurian Sea, Italy	68	Y	396	TRI
<i>As above</i>	Permanent mark Dorsal fin	Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel	12	Y	53	Alberto Marco Gattoni, BB
<i>As above</i>	Dorsal fin	Ligurian Sea	6	Y	89	M. Rosso - CIMA
<i>As above</i>	Dorsal fin	Tuscan Archipelago.	0	Y	21	S. Nuti, D. Bedocchi (Cetus)
Common bottlenose dolphin	Dorsal fin	NW Greece, Amvrakikos Gulf	Analysis in progress	Y	156	TRI
<i>As above</i>	Dorsal fin	Eastern Ionian Sea, Greece	26	Y	101	TRI
<i>As above</i>	Dorsal fin	Ligurian Sea, Italy	Analysis in progress	Y	68	TRI
<i>As above</i>	Dorsal fin	N.E. Sardinia	4	Y	140	Francesca Magnone, Alberto Fozzi /CRIMM onlus
<i>As above</i>	Dorsal fin and body marks	North-eastern coast of Sardinia (Tyrrhenian Sea)	48	Y	69	Díaz López, B./BDRI; Díaz López, B. & Shirai, J.A.B. 2008
<i>As above</i>	Dorsal fin and body marks	North-western coast of Sardinia (Gulf of Alghero)	20	Y	20	Diaz Lopez B. /bruno@thebdri.com
<i>As above</i>	Dorsal fin	Ligurian Sea	22	Y	171	M. Rosso - CIMA
<i>As above</i>	Dorsal fin	Versilia coastline.	26	Y	136	S. Nuti, D. Bedocchi (Cetus)
<i>As above</i>	Dorsal fin	Tuscan Archipelago.	10	Y	43	S. Nuti, D. Bedocchi (Cetus)
<i>As above</i>	Dorsal fin	Mediterranean Sea	53	Y	184	Gabriella La Manna / CTS

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Short-beaked common dolphin	Dorsal fin	Eastern Ionian Sea, Greece	34	Y	165	TRI
<i>As above</i>	Dorsal fin	Ligurian Sea, Italy	0	Y	3	TRI

3.1.2. Artificial marking data

None.

3.1.3 Telemetry data

Species	Tag type	No. successfully deployed	Maximum time transmitting	Contact person/institute; refs
Long-finned pilot whale	Radio-tag	1	21 min	TRI

3.2 Analyses/development of techniques

CETUS: Times/distances to resightings, abundance and density applying Photo-Id and M-R for identifiable species; abundance and density using distance sampling; behavioural patterns and opportunistic strategy studies; acoustical records matchings; space/time distribution with environmental data matching; etc.

CIMA: All sighted animals have been analyzed photographically using the matrix-photo identification and population size were estimated using the program CAPTURE. Bottlenose dolphin dorsal fin were characterized using EUROFLUKES.

CTS: The photo-identification data are used primarily to estimate the population size using mark-recapture models. At the moment, the analysis of 10 years of data collected in Lampedusa from 1996 to 2006 are in progress; the first aim is to provide a long term estimate of the population size for the study area. The resulting estimate will be used to evaluate the efficiency of the action inserted in the Action Plan for *Tursiops truncatus* in Lampedusa Island, adopted by the Marine Protected Area of Pelagie Islands. The analysis is carried out thanks to the synergic effort of people coming from different institutions: Gabriella La Manna (CTS), Daniela Pace (Oceano Mare) and Marina Pulcini. The photo-identification 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, by means of the standard distance deviation (spatial site fidelity); 3) to measure the amount of time each animal reside inside the study area (residence times).

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	2008/summer – 1	Y	In progress	193	TRI / Martine Berubé, University of Stockholm
<i>As above</i>	Ligurian Sea	2008/summer – 2	Y	7	151	LB-DSA-US, UNIFI
<i>As above</i>	Sea of Cortez	2008/summer – 5	Y	In progress	5	LB-DSA-US, UNIFI, J.Urban & L. Rojas-Bracho (Mexico)
Bryde's whale	Sea of Cortez	2008/summer – 4	Y	2	4	LB-DSA-US, UNIFI, J.Urban & L. Rojas-Bracho (Mexico)
Sperm whale	Ligurian Sea, Italy	2008/summer - 0	Y	3	3	TRI / Cristina Fossi, Letizia Marsili, University of Siena /
<i>As above</i>	Sea of Cortez	2008/summer – 14	Y	0	17	LB-DSA-US, UNIFI, J.Urban & L. Rojas-Bracho (Mexico)
Killer whale	Sea of Cortez	2008/summer – 2	Y	0	2	LB-DSA-US, UNIFI, J.Urban & L. Rojas-Bracho (Mexico)

Species	Area/stock	Calendar year/ season - no. collected	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Long-finned pilot whale	Ligurian Sea, Italy	2008/summer – 19	Y	In progress	39	TRI
<i>As above</i>	Alboran Sea	2008/summer – 12	Y	2	32	LB-DISA-US, UNIFI, Alnitak
Risso's dolphin	Ligurian Sea, Italy	2008/summer – 0	Y	28	28	TRI / Stefania Gaspari, University of Durham
Common bottlenose dolphin	Eastern Ionian Sea,	2008/summer – 0	Y	-	10	TRI / Ada Natoli, University of Durham
<i>As above</i>	NW Greece, Amvrakikos Gulf	2008 - 0	Y	-	20	TRI
<i>As above</i>	Ligurian Sea, Italy	2008/summer – 1	Y	In progress	1	TRI
<i>As above</i>	Adriatic Sea	2008/summer – 15	Y	1	46	LB-DISA-US, UNIFI, BW
<i>As above</i>	Sea of Cortez	2008/summer – 13	Y	13	13	LB-DISA-US, UNIFI, J.Urban & L. Rojas-Bracho (Mexico)
Long-beaked common dolphin	Sea of Cortez	2008/summer – 12	Y	2	12	LB-DISA-US, UNIFI, J.Urban & L. Rojas-Bracho (Mexico)
Short-beaked common dolphin	Alboran Sea	2008/summer – 15	Y	0	20	LB-DISA-US, UNIFI, Alnitak
<i>As above</i>	Eastern Ionian Sea, Greece	2008/summer – 0	Y	-	15	TRI / Ada Natoli, University of Durham
Striped dolphin	Ligurian Sea	2008/summer – 22	Y	0	305	LB-DISA-US - UNIFI
<i>As above</i>	Ligurian Sea, Italy	2008/summer – 0	Y	In progress	243	TRI / Stefania Gaspari, University of Durham
<i>As above</i>	Ligurian Sea	4	y	4	4	M. Wurtz - DIBIO

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

Species	Area/stock	Tissue type(s)	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Common bottlenose dolphin	Adriatic Sea	Skin, blubber	1	Y	1	CoNISMa, UNIFI

4.3 Samples from stranded animals

Species	Area/stock	Tissue type(s)	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Fin whale	Tyrrhenian Sea	Skin, blubber, liver, muscle, brain, kidney	1 (only 2008)	Y	1	LB-DISA-US – UNIPD
<i>As above</i>	Tuscan Archipelago	Internal Organs (Several)	1	Y	In Stock	http://www.mammiferimarini.spe.rivet.unipd.it/eng/index.htm
<i>As above</i>	Mediterranean	Lung, spleen, Kidney, liver, heart, skeletal muscle	6	Y	6	G. Di Guardo/DCBSUT
Sperm Whale	Tuscan Archipelago, Ligurian Sea	Internal Organs (Several)	2	Y	In Stock	http://www.mammiferimarini.spe.rivet.unipd.it/eng/index.htm
<i>As above</i>	Tyrrhenian Sea	Skin, blubber, liver, muscle, brain, genital apparatus, kidney	3 (only 2008)	Y	3	LB-DISA-US

Species	Area/stock	Tissue type(s)	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Risso's dolphin	NW Greece, Amvrakikos Gulf	skin, muscle, blubber, liver, pelvic bone	1	Y	-	TRI / Alexandros Frantzis, Pelagos Cetacean Research Institute
Common bottlenose dolphin	Ligurian Sea, North Adriatic Sea	Internal Organs (Several)	6	Y	In Stock	http://www.mammiferimarini.spe.rivet.unipd.it/eng/index.htm
<i>As above</i>	Tyrrhenian Sea	Skin, blubber, melon, liver, muscle, brain, genital apparatus, kidney	4 (only 2008)	Y	4	LB-DSA-US
<i>As above</i>	Mediterranean	Lung, brain, Spleen, lymph nodes, kidney, liver, intestine, heart.	30	Y	30	G. Di Guardo/DCBSUT
<i>As above</i>	NW Greece, Amvrakikos Gulf	skin, teeth, blubber	1	Y	-	TRI / Alexandros Frantzis, Pelagos Cetacean Research Institute
Striped Dolphin	Ligurian Sea	Internal Organs (Several)	4	Y	In Stock	http://www.mammiferimarini.spe.rivet.unipd.it/eng/index.htm
<i>As above</i>	Thirrenian Sea	Skin, blubber, melon, liver, muscle, brain, genital apparatus, kidney	4 (only 2008)	Y	4	LB-DSA-US
Striped Dolphin	Ligurian Sea	Skin, blubber, liver, pancreas, heart, kidney, lung, brain, spleen, tongue	33	y	5	M. Wurtz - DIBIO
<i>As above</i>	Ligurian Sea	Skull	3	Y	-	Michela Podestà, MSNM
<i>As above</i>	Mediterranean	Lung, brain, Spleen, lymph nodes, kidney, liver, testicle, heart, skin	26	Y	26	G. Di Guardo/DCBSUT

4.4 Analyses/development of techniques

DIBIO: Samples from internal organs and from blubber have been analysed for cytokeratin analysis. Samples of blubber have been analysed for Fatty acid analysis.

LB-DSA-US. In the free-ranging cetacean biopsies were valuated the Benzo(a)pyrene monooxygenase (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). The analytical method used was high resolution capillary gas chromatography with a 63Ni electron capture detector and an SBP-5 bonded phase capillary column (30 m long, 0.2 mm i.d.). The carrier gas was N₂ or He with a head pressure of 15.5 psi (splitting ratio 50/1). The scavenger gas was argon/methane (95/5) at 40 ml/min. Oven temperature was 100°C for the first 10 min, after which it was increased to 280°C at 5°C/min. Injector and detector temperatures were 200°C and 280°C respectively. A mixture of specific isomers was used to calibrate the system, evaluate recovery and confirm the results, which

were expressed in ng/g or µg/g dry weight (d.w.). Recoveries were calculated by adding known quantities of standard to homogeneous replicates of the same sample. 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). The organic fraction, concentrated to 1 ml in acetonitrile, was analysed by HPLC with fluorescence detection. A reversed-phase column (Supelcosil LC-18, 25 cm x 4.6 mm i.d., 0.5 µm particle size) was used with an acetonitrile/water gradient. The initial concentration of the gradient was 60% acetonitrile, increasing over 20 min to 100% acetonitrile, and then remaining stable for 10 min. The flow rate was 1 ml/min. Quantification was carried out using an external standard consisting of 16 PAHs from Supelco (EPA 610 polycyclic aromatic hydrocarbon mixture). 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. The skin sample was stored in sterile medium MEM Eagle Earle's salts w/L-glutamine and Sodium Bicarbonate (Gibco, Milan, Italy) + 10% gamma irradiated fetal calf serum (Gibco) + 1% MEM Not Essential Aminoacids (NEAA) solution 100X (Gibco) + 1% Penicillin/Streptomycin 100X (Gibco) + 0.1% Amphotericin B 100X (Gibco) at ambient temperature, and was processed within 24 h of collection. In the laboratory, each sample was washed with Earle's balanced salt solution (EBSS) (Gibco) containing antibiotic (Penicillin/Streptomycin 100X (Gibco) and antimycotic (Amphotericin B 100X (Gibco)) solutions. All specimens were handled using sterile techniques. First, the collected tissue was cut into small pieces with curved surgical scissors, placed in 30 mm Petri dishes and incubated with Trypsin-EDTA solution 1X (Gibco) for 15 min at 37°C. The biopsy fragments were washed again and then placed in Falcon 25 flasks, moistened with medium. After 24 h at 37°C in an incubator with 5% CO₂, the cultures were covered with 1 ml of medium. Half of the culture medium was replaced every 48 h with fresh medium. Successful cell cultures were obtained from: striped dolphin, bottlenose dolphin, common dolphin, risso's dolphin and fin whale. The first fibroblasts were observed after 7-21 days (Fig. 1). Cultures reached 90% confluence in 15-20 days, then were trypsinized, washed and placed in Falcon 50 and 125 flasks, after two and three trypsinizations respectively. The samples grew for over 4 months, however, there were signs of senescence and increased resistance to trypsin treatment. Contamination by microorganisms is one of the main causes of limited cell viability or slow cell growth. Rapid proliferation of bacteria, yeasts and fungal spores produces an unfavourable environment for the growth of the mammalian cells both by depletion of the available nutrients or for the changes in the pH. The contamination may be introduced into a culture from several routes but principally it is a dormant infection in the sampled specimens. In fact, the most persistent infection was an environmental *Candida* spp. The antimycotic (Amphotericin B 100X) in the medium was inactive against the fungus. Various unsuccessful attempts were made to stop the infection. The antimycotic Canesten 1% (Bayer) was also tried but the infection proliferated. Against bacterial infection, the cells were washed with Penicillin/Streptomycin 100X, and surprisingly, the fibroblasts continued to grow and the confluent layer did not seem to be damaged. We tested also Gentamicina but we notice that this antibiotic damaged the confluent layer.

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 solublysed 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 respective 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. 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.

5. POLLUTION STUDIES

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 2007

None.

6.3 Anthropogenic mortality of large whales for the calendar year 2007 and 2008

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

None.

6.3.2 Fishery bycatch of large whales

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 2007

None.

7.3 Anthropogenic mortality of small cetaceans for the calendar year 2007 & 2008

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

Species	Sex	No.	Date	Location	Vessel type	Speed	Fate	How observed	Contact person/ institute and refs
Striped dolphin	U	1	6/4/08	S. Vito, Taranto	U	U	-	Post mortem	Michela Podestà, MSNM

7.3.2 Fishery bycatch of small cetaceans

Species	Sex	No.	Date	Location	Fate	Targeted fish species	Gear	How observed?	Source or contact
Common bottlenose dolphin	M	1	14/04/08	S. Sabina, Carovigno, Brindisi	U	U	U	A	Paola Pino d'Astore
<i>As above</i>	F	1	08/10/08	Porto Garibaldi, Ravenna	D	Anchovy	PTM, TM	F	CoNISMa
<i>As above</i>	M	1	21/07/08	Pila	D	Anchovy	PTM, TM	F	CoNISMa
<i>As above</i>	U	1	09/11/08	Chioggia	X	Anchovy	PTM, TM	F	CoNISMa
Common dolphin	U	1	24/05/08	Positano, Salerno	U	U	U	A	Michela Podestà, MSNM
Striped dolphin	U	1	13/01/08	Bocche di Puglia	U	U	U	A	Paola Pino d'Astore
<i>As above</i>	M	1	15/03/08	Isola rossa, Olbia	U	U	U	A	CRiMM
<i>As above</i>	F	1	28/09/08	Tegghia liscia, Tavolara, Olbia	U	U	U	A	CRiMM
<i>As above</i>	F	1	05/04/08	Ventimiglia	U	U	U	A	Michela Podestà, MSNM
Undetermined	U	1	17/07/08	San foca, Lecce	U	U	U	A	G. Cataldini, Museo Gallipoli

8. STRANDINGS

2008

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
Fin whales	2	1	M. Podestà, MSNM - G. Pavan, CIBRA	bancadatispiaggiamenti@hotmail.it
<i>As above</i>	1	1	Cetus	cetus@supereva.it
Sperm whale	1	1	M. Podestà, MSNM - G. Pavan, CIBRA	bancadatispiaggiamenti@hotmail.it
<i>As above</i>	1	1	Cetus	cetus@supereva.it
Risso's dolphin	3	1	M. Podestà, MSNM - G. Pavan, CIBRA	bancadatispiaggiamenti@hotmail.it
<i>As above</i>	1	1	Cetus	cetus@supereva.it
Common bottlenose dolphin	26	3	See 7.3.2 Francesca Magnone, Alberto Fozzi/CRiMM onlus	bancadatispiaggiamenti@hotmail.it fra.magnone@crimm.org , a.fozzi@crimm.org
Striped dolphin	26	6	See 7.3.2 Francesca Magnone, Alberto Fozzi/CRiMM onlus	bancadatispiaggiamenti@hotmail.it fra.magnone@crimm.org , a.fozzi@crimm.org
<i>As above</i>	8	8	Cetus	cetus@supereva.it
<i>As above</i>	4	4	M. Wurtz - DIBIO	wurtz-ge@unige.it
Undetermined	21	0	See 7.3.2	See 7.3.2

CSC: A network to monitor cetacean stranding along the Italian coasts has been operating since 1986 by CSC, resulting in annual stranding reports as well as scientific output. Activities are in cooperation with other

Institutions. In year 2002 CSC turned into an NGO taking the name of CSC Onlus - Italian Association for the study of marine reptiles and mammals. The contact person is Alessandro Bortolotto, president of the CSC <centrostudicetacei@libero.it>. In 2008 the official secretary of CSC was moved to the Zoologic Museum of Naples' University "Federico II". Data in the period 1986-2005 have been given to the newly established national stranding database based upon an agreement signed between CSC and CIBRA.

Data regarding strandings that occurred along the coasts of Italy during the years 2006-2008 received by the network are presently being examined and a .pdf file will be soon available at the Italian National Stranding Network's official web site for free download to the scientific community as agreed within the National Assembly (contact persons: CSC Board). Due to the presence of several agencies that are collecting data and specimens on a local basis along the Italian coastline and not within our national network, data collection and quality has been deteriorating through passing years resulting in poor quality and territorial fragmentation. Steps to try to solve this problem are presently being made.

CIBRA (University of Pavia) and the **Museum of Natural History of Milan** maintain the 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>. Stranding data published yearly between 1986-2005 by Centro Studi Cetacei have been geo-referenced and transferred to a relational database. In recent years new agencies started the record of stranding information and consequently data for the database is now collected from different networks operating in the field. 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.

CRiMM onlus: In Northeastern Sardinia the CRiMM onlus Foundation's area of jurisdiction for strandings is between Capo Ferro (Northern limit) and Capo Monte Santo (South limit), islands and islets included except those included in the National Park of La Maddalena. During 2008 there were 9 cases of stranding of dead dolphins: 1 Common bottlenose dolphin and 8 Striped dolphin and only one case of live stranding Common bottlenose dolphin, died 2 days later.

9. OTHER STUDIES AND ANALYSES

BDRI: Effects of noise pollution on bottlenose dolphins (2007 – *in progress*): Noise pollution acoustical samples (from anthropogenic sources) were collected in presence and absence of dolphins to be considered as a cause of displacement of cetaceans from preferred habitats. If these impacts are of short duration they could be not significant, however, if the impact is repeated or of long duration may cause stress, debilitation and could influence the dolphins mortality.

BDRI: Environmental and biological effects associated with the presence of aquaculture industry (2004 – *in progress*) - 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.

BDRI: Trial of acoustics deterrents for prevention of dolphin bycatch (2007 and in progress) - BDRI researchers observed that the use of pingers (acoustics deterrent devices) has an effective mitigation in the dolphins mortality due to bycatch on gillnets. Definite proof that acoustic devices have a long-term effectiveness has not been found. The Dinner Bell and Habituation factors must be taken into consideration to test in future studies.

BDRI: Boat traffic effects on bottlenose dolphin behaviour (2006 – *in progress*) - 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: Interaction between a solitary wild dolphin and marine traffic off Spanish coast - BDRI researchers provided the first quantified data about solitary bottlenose dolphin diving behaviour in the presence and absence of boats on the north-western coast of Spain. The data reported by BDRI researchers could be used to implement precautionary management proposals that take into account the potential effects of boat presence on dolphins.

BDRI: Ecosystem effects evaluated through trophic mass-balance models (2007 – in progress) - 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.

CSC: During the year 2008, the CSC signed the Carta di Cerrano <<http://triviadicerrano.blogspot.com>> official act of AdriaPAN, the *Adriatic Protected Areas Network*. In May 2008, the CSC organized a course on Mediterranean cetacean identification as well as rescuing procedures for the Cost Guard’s personnel belonging to the Direzione Marittima Pescara (Abruzzo).

DCBSUT: Detailed immunohistochemical (IHC) investigations against *Morbillivirus* were carried out on the lung, brain, spleen and lymph node tissues from the above bottlenose dolphins and striped dolphins, as well as from the above fin whale (see Table 4.3). All such IHC analyses, which were carried out by means of a commercially available mouse monoclonal antibody (MoAb) recognizing a conserved epitope of the nucleoprotein (N) antigen of “Canine Distemper Virus” (CDV) yielded negative results in all stranded cetaceans under study. Similar results had been already obtained, during the second half of 2007 and the beginning of 2008, on a number of striped dolphins found stranded along the Ligurian Sea coast of Italy, 5 of which turned out, anyway, to be *Morbillivirus*-seropositive. In that case, however, it is of interest that 4 out of the 10 striped dolphins under study did also exhibit severe lesions of non-suppurative meningo-encephalitis, while being strongly seropositive to *Toxoplasma gondii* but *Morbillivirus*-seronegative (Di Guardo *et al.*, 2009).

UNITU: Long-term study on the potential impact of underwater noise irradiated from cruise ships on the marine environment in collaboration with ISPRA (ex-ICRAM); cruise ships departing from and arriving at various Italian harbours, identified by means of AIS (Automatic identification system) were recorded with respect to all acoustic aspects, and their principal acoustic characteristics were described in detail. Environmental acoustic factors, such as sound field and oceanographic descriptors were assessed in order to determine the potential impact of specific ships and navigational procedures on marine mammals, with the aim of compiling guidelines and recommendations for best practice of managing shipping traffic from and to continental harbours.

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Appendix 1. FOA fishing descriptions and codes

FAO FISHING GEAR CATEGORIES:		FALLING GEAR	
SURROUNDING NETS		Cast nets	FCN
With purse lines	PS	Falling gear (not specified)	FG
One-boat operated purse seines	PS1	GILLNETS AND ENTANGLING GEAR	
Two-boat operated purse seines	PS2	Set gillnets (anchored)	GNS
Without purse lines (lampara)	LA	Driftnets	GND
SEINE NETS		Encircling gillnets	GNC
Beach seines	SB	Fixed gillnets (on stakes)	GNF
Boat seines	SV	Trammel nets	GTR
Danish seines	SDN	Combined gillnet-trammel nets	GTN
Scottish seines	SSC	Gillnets and entangling gillnets (not specified)	GEN
Pair seines	SPR	Gillnets (not specified)	GN
Seine nets (not specified)	SX	TRAPS	
TRAWLS		Stationary uncovered pounds nets	FPN
Bottom trawls	TBB	Pots	FPO
Beam trawl	OTB	Fyke nets	FYK
Otter trawls (side or stern)	PTB	Stow nets	FSN
Pair trawls	TBN	Barriers, fences, weirs, etc	FWR
Nephrops trawls	TBS	Aerial traps	FAR
Shrimp trawls (not specified)	TM	Traps (not specified)	FIX
Midwater trawls		HOOKS AND LINES	
Otter trawls (side or stern)	OTM	Handlines and pole-lines (hand operated)	LHP
Pair trawls	PTM	Handlines and pole-lines (mechanised)	LHM
Shrimp trawls	TMS	Set longlines	LLS
Midwater trawls (not specified)	TM	Drifting longlines	LLD
Otter twin trawls	OTT	Longlines (not specified)	LL
Otter trawls (not specified)	OT	Trolling lines	LTL
Pair trawls (not specified)	PT	Hooks and lines (not specified)	LX
Other trawls (not specified)	TX	GRAPPLING AND WOUNDING	
DREDGES		Harpoons	HAR
Boat dredges	DRB	HARVESTING MACHINES	
Hand dredges	DRH	Pumps	HMP
LIFT NETS		Mechanised dredges	HMD
Portable lift nets	LPN	Harvesting machines (not specified)	HMX
Boat-operated lift nets	LNB	MISCELLANEOUS GEAR	MIS
Shore operated stationary lift nets	LNS	RECREATIONAL FISHING GEAR	RG
Lift nets (not specified)	LN	GEAR NOT KNOWN OR NOT SPECIFIED	NK
		SHARK CONTROL NETS	NSC
		DERELICT FISHING GEAR	