

ITALY. PROGRESS REPORT ON CETACEAN RESEARCH, JULY 2004 TO MARCH 2005, WITH STATISTICAL DATA FOR THE CALENDAR YEAR 2004

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This report summarises information obtained from: Ambiente Mare (**A.M.**), Acquario di Genova (**ADG**), Aquastudio (**AQ**), Battibaleno (**BB**), Italian Tissue Bank Department of Experimental Veterinary Sciences of the University of Padua (**BIT**), **CETUS**, Centro Interdisciplinare di Bioacustica e Ricerche Ambientali Università degli Studi di Pavia (**CIBRA**), Consorzio Mediterraneo (**CM**), Centro Studi Cetacei (**CSC**), Centro Ricerca Delfini Caprera (**CTS**), Dipartimento di Biologia Sperimentale Sezione di Fisiologia Generale, Università degli Studi di Cagliari (**DBS**), Laboratorio di Biologia Marina ed Ecologia Animale University of Genoa – (**Dip.Te.Ris.**), Dipartimento Scienze Ambientali, Università di Siena (**DSA-US**), *Central Institute for Applied Marine Research* (**ICRAM**), Laboratory of Animal Cognition and Comparative Neuroscience Dept. of Psychology, University of Trieste (**LACNS**), Laboratorio Biomarker, Dipartimento Scienze Ambientali, Università di Siena (**LB-DSA-US**), NATO Undersea Research Centre – (**NURC**), Tethys Research Institute (**TRI**), WWF Liguria (**WWF L.**), Zoönomia (**ZNM**).

1. Species and stocks studied

Common name	Scientific name	Area	Items referred to
Striped dolphin	<i>Stenella coeruleoalba</i>	Corsican, Ligurian and Tyrrhenian Sea, Sardinian Channel	2.1.1; 2.2; 4.1, 4.4, 5, 9
Common bottlenose dolphin	<i>Tursiops truncatus</i>	Ligurian, Corsican, Tyrrhenian, Northern Adriatic Sea, Sardinian Channel, Eastern Ionian Sea, north-western Greece, Amvrakikos Gulf	2.1.1; 2.1.2; 2.2; 3.1.1; 3.2; 4.1, 4.3, 7.1; 5; 9
Short-beaked common dolphin	<i>Delphinus delphis</i>	Tyrrhenian, Corsica Sea, Sardinian Channel, Eastern Ionian Sea	2.1.1; 2.2; 3.1.1; 4.1; 9
Risso's dolphin	<i>Grampus griseus</i>	Ligurian and Tyrrhenian Sea; Northern Adriatic Sea	2.1.1; 2.2; 3.1.1; 4.1; 4.3, 4.4, 5; 9
Long-finned pilot whale	<i>Globicephala melas</i>	Ligurian and Tyrrhenian Sea	2.1.1; 2.2; 3.1.1; 4.1
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	Ligurian, Tyrrhenian and Ionian Sea	2.1.1; 2.2; 3.1.1; 9
Sperm whale	<i>Physeter macrocephalus</i>	Ligurian and Tyrrhenian Sea; Caribbean Sea	2.1.1; 2.2; 3.1.1; 4.1; 9
Fin whale	<i>Balaenoptera physalus</i>	Ligurian and Tyrrhenian Sea	2.1.1; 2.2; 3.1.1; 4.1; 4.4; 5, 9
Short-beaked common dolphin	<i>Delphinus delphis</i>	Ligurian and Tyrrhenian Sea	2.1.1; 2.2;
Commerson's dolphin	<i>Cephalorhynchus commersonii</i>	Southern Patagonia, Atlantic	9
Dusky dolphin	<i>Lagenorhynchus obscurus</i>	Southern Patagonia, Atlantic	9
Indo Pacific Humpback dolphin	<i>Sousa chinensis</i>	Tanzanian waters	2.1; 3.1.1; 6.3

2. Sightings data

2.1 Field work

2.1.1 SYSTEMATIC

Area	Period	Species (# of sightings)	Notes	Contact
Ligurian Sea	Summer 2004	Sperm whale (1), Striped dolphin (384), Risso's dolphin (2)	70 days of sailing boat visual surveys, 26 sightings.	G.Montesi/L. Banderali A.M.
Tyrrhenian Sea	Summer/Autumn 2004	Striped dolphin (12), Common bottlenose dolphin (24)	18 days of sailing boat visual surveys, 4 sightings	G.Montesi/L. Banderali A.M.
Pelagos Sanctuary	August/September 2003 (cruise SIRENA 2003)	Sperm whale, Fin whale, Cuvier's beaked whale, Risso's dolphin, Pilot whale, Common bottlenose dolphin, Striped dolphin, Short-beaked common dolphin	Vessel survey (4 ships) for 21 days.	Carron/Portunato/NU RC; Di Natale/AQ; Gnone ADG
Southern Tyrrhenian Sea	May 2004	Risso's dolphin, Pilot whale, Striped dolphin, Short-beaked common dolphin	Vessel survey (3 ships) for 10 days.	Carron/Portunato/NU RC; Gnone ADG
Strait of Messina	2004-2005	Sperm whale, Fin whale, Risso's dolphin, Pilot whale, Common bottlenose dolphin, Striped dolphin, Short-beaked common dolphin	Observation from land, either visual and video; 50% of the days	Celona AQ
Ligurian Sea (area off Genova and La Spezia)	2004-2005	Fin whale, Risso's dolphin, Common bottlenose dolphin, Striped dolphin, Short-beaked common dolphin	Boat survey; all the days with good weather conditions	Gnone/Caltavuturo ADG

Ligurian/Tyrrhenian Sea	July 2004	Fin whale (2)	Sail boat visual survey	BB
Ligurian/Tyrrhenian Sea	July 2004	Common bottlenose dolphin (4)	Sailing boat visual survey	BB
Ligurian/Tyrrhenian Sea	July 2004	Risso's dolphin (2)	Sailing boat visual survey	BB
Ligurian/Tyrrhenian Sea	July 2004	Long-finned pilot whale (2)	Sailing boat visual survey	BB
Ligurian/Tyrrhenian Sea	July 2004	Sperm whale (2)	Sailing boat visual survey	BB
Ligurian/Tyrrhenian Sea	July 2004	Striped dolphin (21)	Sailing boat visual survey	BB
Ligurian, Tyrrhenian and Corsican Sea, Sardinian Channel	August 2004/ Feb. 2005	Fin whale (12)	Sailing boat visual survey 5 transect line campaigns/photo identification	BB
Mediterranean Sea	August 2004/ Febb 2005	Common bottlenose dolphin (3)	Sailing boat visual survey 5 transect line campaigns/photo identification	BB
Mediterranean Sea	August 2004/ Febb 2005	Risso's dolphin (3)	Sailing boat visual survey 5 transect line campaigns/photo identification	BB
Mediterranean Sea	August 2004/ Febb 2005	Striped dolphin (7)	Sailing boat visual survey 5 transect line campaigns/photo identification	BB
Mediterranean Sea	August 2004/ Febb 2005	Sperm whale (5)	Sailing boat visual survey 5 transect line campaigns/photo identification	BB
Tyrrhenian Sea	Summer/autumn 2004	Common bottlenose dolphin	75 sightings were performed in 99 days at sea totalling 329 hours effort	CTS
Sardinian Channel	September 2004 to date	Common bottlenose (11), Striped (5) and Short beaked common dolphin (2)	30 daily boat surveys (acoustic and visual) in the 2004 –2005 period.	F. Maggiani/ <i>DBS</i>
Tyrrhenian Sea	Summer 2004	Common bottlenose (4) and Striped dolphin (2)	12 daily Acoustic and visual surveys	F. Maggiani/ <i>DBS</i>
Corsican Sea	Summer 2004	Common bottlenose (2) and Striped dolphin (1)	8 daily Acoustic and visual surveys	F. Maggiani/ <i>DBS</i>
Corsican Sea	Autumn 2004	Common bottlenose dolphin	Passive acoustic (POD). Monitoring of fishing activity (by means of on board observer).	G. Lauriano/ICRAM
North-western Greece, Amvrakikos Gulf	January-December 2004	Common bottlenose dolphins (56)/year 2004	Boat surveys; 48 daily surveys/year 2004	TRI
Eastern Ionian Sea, Kalamos	April/June-September 2004	Short-beaked common (8), Common bottlenose dolphins (39)	Boat surveys; 68 daily surveys	TRI
Ligurian Sea	April-October 2004	Fin whale (11), Striped dolphin (126), Risso's dolphin (12), Common bottlenose dolphin (1), Long-finned pilot whale (5), Cuvier's beaked whale (4), Sperm whale (2)	Boat surveys; 89 daily surveys	TRI

A.M. Since 1993, A.M. developed research and study activities in the Mediterranean Sea. These activities (study, education and training) are carried out using a 16 m. long sailing boat and developed with the associated members or in collaboration with research centers/institutions (bioacoustics).

ADG. Acquario di Genova has a research team particularly dealing with cetaceans. Apart from the research carried out in the Aquarium, a specific research ("Metropolitan Dolphins") is carried out since 2002 in the area off the town of Genova, with regular surveys in all the days with good weather conditions. At the same time, photo-identification surveys and acoustic to define the ambient noise are carried out in the same area.

ADG staff co-operate with NURC (ex Saclantcen) either for the SOLMAR programme and for the research in the Southern Tyrrhenian Sea.

From 2003, a large majority of the research activity of ADG is under the Fondazione Acquario di Genova (FAdG), a no-profit organisation.

AQUASTUDIO. Aquastudio Research Institute has a long experience on cetacean studies and particularly on interactions between fishing activities and cetaceans. Most of the research activity deals with the large pelagic fishery in the Mediterranean, but several researches have been carried out to better define the impact of fishing gear on cetaceans and other marine species.

Aquastudio, together with the Department of Electronic and Electrical Engineering of the Loughborough University and IFREMER, had the opportunity to first test electronic deterrent devices (EDD) on gillnet fishery in the Mediterranean, and a similar study is currently conducted on the jigging fishery, while further studies are planned for 2004.

Aquastudio's staff co-operate with NURC (ex Saclantcen) either for the SOLMAR programme (since 1999) and for the research in the Southern Tyrrhenian Sea. Marine mammals conservation is another field of action, together with the co-operation with the national stranding network. Aquastudio has carried out several rescue operations on cetaceans.

CIBRA. Most field work in 2004 has been devoted to the implementation of procedures for mitigating the impact of geophysical surveys on marine mammals. New equipment and methodologies have been developed and tested to better support the detection and classification of underwater sounds for both mitigation and research purposes. The work has been carried out with Columbia University/Lamont-Doherty Earth Observatory in two areas: the Caribbean Sea and on the coast of Nicaragua, Honduras and Costa Rica. During the surveys in the Caribbean area significant information about sperm whales has been collected.

CETUS. Activity occurs in an 1300 Km² wide area in the North Tyrrhenian Sea. Work has been conducted on the “Krill” 40ft catamaran or on Comet Class sailing-boat.

CTS. Research in the Maddalena Archipelago National Park area (Central Tyrrhenian Sea) started in July 1999. Boat surveys follow standard routes around the archipelago and the wider surrounding area. Main issue is the monitoring of the bottlenose dolphin in the area.

NURC (ex SACLANTCEN). The NATO Undersea Research Centre – NURC is the most advanced research centre for marine acoustic research in Europe. The Centre is also specialised in physical oceanography. As concerns the cetacean study, NURC is carrying on a very complex programme since 1999, called SOLMAR (Sound, Ocean and Living Marine Resources), with the purpose to deeply study the possible correlation between oceanographic features in the Pelagos Sanctuary and the presence and distribution of cetaceans, with particular attention to some acoustic behaviours. A GIS data base, including all the available information on Mediterranean cetaceans, has been developed and updated in the last five years, in co-operation with several scientific institutes. The access is allowed to the contributors. A research has been carried out in 2004, in the Southern Tyrrhenian Sea, with the purpose to obtain comparative data.

ZMN. Since 1999 ZNM a project has been carried out named Zanzibar Cetacean Conservation Project (ZCCP) in cooperation with the local Institutions: Institute of Marine Sciences (IMS), P.O. box 668, Zanzibar, Tanzania and the University of Dar es Salaam (with a research permit issued by the Zanzibar Government). Surveys have been carried out for two months a year with a local boat. Data have been collected using tape recorders, sighting forms (including environmental data), digital video, Photo-ID, acoustic recordings with DAT and CRT Hydrophones (in cooperation with Italian CIBRA. G. Pavan).

2.1.2 OPPORTUNISTIC, PLATFORMS OF OPPORTUNITY

Area	Period	Species (# of sightings)	Notes
Mediterranean	2004/2005	Sperm whale, Fin whale, Risso's dolphin, Pilot whale, Common bottlenose dolphin, Striped dolphin, Short-beaked common dolphin, Rough-toothed dolphin	Observers on board of fishing vessels engaged in large pelagic fishery. 7 weeks in 2004; 1 week until April 2004. Contact: Di Natale/AQ
Eastern Ionian Sea	2004/2005	Risso's dolphin, Pilot whale, Bottlenose dolphin, Striped dolphin.	Log-book on fishing vessels engaged in jigging fishery for squids. Contact: Di Natale/AQ
Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel	August 2004/ Febb 2005	All whales & dolphins of Mediterranean Sea	Opportunistic Sailing boats by BB Transect line campaigns (700 miles crossed) – photo identification Distribution- Sighting frequency- behaviour- Presence absence
Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel	August 2004/ Febb 2005	Fin whale	Opportunistic Sailing boats by BB Transect line campaigns (500 miles crossed) – photo identification -Abundance distribution -Sighting frequency, behaviour Presence absence
Northern Adriatic Sea	January-December 2004	Common bottlenose dolphins (6)/year 2004	Boat surveys; 15 daily surveys/year 2004, distributed in four seasons; data collected by TRI
Ligurian Sea	May-September 2004	Cetaceans in the Pelagos sanctuary	Whale watching activity are conducted by Cooperativa Battellieri in collaboration with WWF L . Data collected are about the species, number of individuals and school type, calves; geographical coordinates, depth, weather condition and behaviour. Scientific stuff onboard.

2.2 Analyses/development of techniques

Area	Species	Methods	Data analysis	Results	Contact
Ligurian and Tyrrhenian Sea	Common bottlenose dolphin, Striped dolphin, Short-beaked common dolphin, Risso's dolphin, Long finned pilot whale, Cuvier's beaked whale, Sperm whale Fin whale,	Photoidentification, behavioural sampling	In progress	Sighting frequency, distribution (survey effort between June and October 2004; 30 sightings over 3.000 nautical miles travelled on effort). Population dynamics, social organization. Behaviour, ecology.	G. Montesi/L. Banderali A.M.

Ligurian Sea (area off Genova and La Spezia)	Fin whale, Risso's dolphin, Common bottlenose dolphin, Striped dolphin, Short-beaked common dolphin	Comparative visual/acoustic observation; photoidentification	In progress	Several resident bottlenose dolphins have been identified.	Gnone/Caltavuturo ADG
Mediterranean Sea	All whales & dolphins of Mediterranean Sea	Sail boat Transect line campaigns – photo identification	In progress	(700 miles crossed) Distribution- Sighting frequency-behaviour-Presence absence	BB
Ligurian/Tyrrhenian Sea	Fin whale	Sail boat Transect line campaigns – photo identification	In progress	(500 miles crossed) -Abundance distribution - -Sighting frequency - behaviour - presence absence	BB
North Tyrrhenian Sea	Common bottlenose dolphin	Photo-identification, mark-recapture. All data and records are managed with databases and electronic sheets.	In progress	In progress	CETUS
Sardinian Channel	Common bottlenose, Striped and Short-beaked common dolphin	Boat surveys, Photoidentification Acoustic	In progress.	Sighting frequency, distribution, acoustic	F.Maggiani/ <i>DBS</i>
Tyrrhenian Sea	Common bottlenose and Striped dolphin	Boat surveys, Photoidentification Acoustic	In progress.	Sighting frequency, distribution, acoustic	F.Maggiani/ <i>DBS</i>
Corsican Sea	Common bottlenose and Striped dolphin	Boat surveys, Photoidentification Acoustic	In progress.	Sighting frequency, distribution, acoustic	F.Maggiani/ <i>DBS</i>
Pelagos Sanctuary	Sperm whale, Fin whale, Cuvier's beaked whale, Risso's dolphin, Pilot whale, Bottlenose dolphin, Striped dolphin, Short-beaked common dolphin	Comparative visual/acoustic observation	In progress	Sighting frequency, distribution; correlation with ecologic, oceanographic and geographic conditions;	Carron/Portunato NURC
Southern Tyrrhenian Sea	Risso's dolphin, Pilot whale, Common bottlenose dolphin, Striped dolphin, Short-beaked common dolphin	Comparative visual/acoustic observation	In progress	Sighting frequency, distribution; correlation with ecologic, oceanographic and geographic conditions;	Carron/Portunato NURC
Pelagos Sanctuary	Sperm whale, Fin whale, Cuvier's beaked whale, Risso's dolphin, Pilot whale, Common bottlenose dolphin, Striped dolphin, Short-beaked common dolphin	Experimental use of infra-red binoculars	In progress	Good preliminary outputs.	Carron/Portunato NURC
Pelagos Sanctuary	Sperm whale	Vessel survey, acoustics, satellite data analysis, electronic tagging, oceanographic surveys	Vocal catalogue, distribution, ambient noise, correlation between presence and environmental conditions, identification of noise reaction level	The sperm whale diving behaviour has been deeply studied, as well as the catching behaviour and the acoustic characteristics. The ambient noise is quite well defined in summer time; The reaction level to external noise have been determined; correlation between presence (or distribution) and environmental features is still under analysis.	Carron, Portunato/NURC
Pelagos Sanctuary	Fin whale	Vessel survey, acoustics, satellite data analysis, oceanographic surveys	Vocal catalogue, distribution, ambient noise, correlation between presence and environmental conditions, identification of noise reaction level	The fin whale diving behaviour has been studied. The ambient noise is quite well defined in summer time; the reaction level to external noise have been examined but still not defined; correlation between presence (or distribution) and environmental features is still under analysis.	Carron, Portunato/NURC
Pelagos Sanctuary	Cuvier's beaked whale	Vessel survey, acoustics, satellite data analysis, oceanographic surveys	Vocal catalogue, distribution, ambient noise, correlation between presence and environmental conditions or bottom features, identification of noise reaction level	The Cuvier's beaked whale acoustic has been studied for the first time in the Mediterranean; The ambient noise is quite well defined in summer time; correlation between presence (or distribution) and environmental features is still under analysis, while it seems clear a major presence over bottom canyons.	Carron, Portunato/NURC
Pelagos Sanctuary	Sperm whale	Vessel survey, deep fishing with jigging,	Squid species vertical	Two species of squids have been sampled at various depth (till 1200	Di Natale/AQ

		light and fish baits and light attraction devices	distribution	m), in the same areas and at the same depths where sperm whales have been studied by NURC (ex Saclantcen); the results are still insufficient to have conclusions; correlation between presence (or distribution) of squid species and the sperm whale is under analysis.	
Eastern Ionian Sea and Strait of Messina	Striped dolphin	Log-book on squid fishing vessels	Interference between striped dolphin and jigging squid fishery; attacking behaviour; response to pingers (EDD)	Data analysis in progress	Di Natale/AQ
Eastern Ionian Sea and Strait of Messina	Common bottlenose dolphin	Log-book on squid fishing vessels	Interference between bottlenose dolphin and jigging squid fishery; attacking behaviour; response to pingers (EDD)	Data analysis in progress	Di Natale/AQ
Eastern Ionian Sea and Strait of Messina	Risso's dolphin	Log-book on squid fishing vessels	Interference between Risso's dolphin and jigging squid fishery; attacking behaviour; response to pingers (EDD)	Data analysis in progress	Di Natale/AQ
Egadi Islands (Egadi Marine Protected Area)	Common bottlenose dolphin	Boat survey	Interference between bottlenose dolphin and set net fishery; attacking behaviour; response to pingers (EDD)	Responses to various types of pingers have been studied, as well as the attacking behaviour. During the first year the results appeared quite good, with an impressive reduction of dolphin attacks.	Di Natale/AQ
North-western Greece, Amvrakikos Gulf	Common bottlenose dolphin	Boat surveys, photoidentification	Sighting frequency, habitat use, population dynamics and social organization	Study started: 2001 Sighting frequency, distribution (survey effort in 2004: 56 sightings over 439 km travelled on effort). Population dynamics, social organization. Relative sighting frequency one order of magnitude higher than in the adjacent Kalamos area. Abundant prey resources Bearzi 2004.	TRI
Eastern Ionian Sea	Common bottlenose dolphin	Boat surveys, photoidentification, behavioural sampling	Sighting frequency, habitat use, population dynamics and social organization	Study started: 1993 Sighting frequency, distribution (survey effort in 2004: 39 sightings over 4,304 km travelled on effort). Population dynamics, social organization. Behaviour, ecology, feeding habits. Mean sighting frequency 0.61 groups/100km in 1997-2003 Mean group size 6.8 individuals no longitudinal changes in sighting frequency and group size. High levels of site fidelity for a small portion of catalogued individuals, while the majority of individuals are transient. Dolphins are present at low but relatively stable densities throughout the study period. Bearzi <i>et al.</i> 2004, Bearzi <i>et al.</i> in press., Politi 1998; Politi <i>et al.</i> 2000	TRI
Eastern Ionian Sea	Short-beaked common dolphin	Boat surveys, photoidentification, behavioural sampling	Sighting frequency, habitat use, population dynamics and social organization	Study started: 1993 Sighting frequency, distribution (survey effort in 2004: 8 sightings over 4,304 km travelled on effort). Population dynamics, social organization.	TRI

		Collection of fish scales lost by prey during surface-feeding events	Diet	Behaviour, ecology, feeding habits. Relative sighting frequency decreased over the study period (from 2.18 groups/100km in 1997 to 0.40 groups/100km in 2003) Decrease in average group size (13.1 individuals in 1993-1996; 7.2 individuals in 1997-2001 and 9.2 individuals in 2002-2003) Highly resident community with low rates of immigration decline over the past eight years in number of encountered individuals Fission-fusion society. Main prey during surface feeding include sardines and anchovies <i>Agazzi et al.</i> 2004; <i>Bearzi et al.</i> 2003, <i>Bruno et al.</i> 2004, <i>Politi and Bearzi</i> 2004; <i>Bearzi et al.</i> in press, <i>Politi</i> 1998;	
Northern Adriatic Sea	Common bottlenose dolphin	Opportunistic ship surveys	Distribution and habitat use	Sighting frequency, distribution (survey effort in 2004: 7 sightings over 823 km travelled on effort). Bottlenose dolphin only regular cetacean species in the area. Mean sighting frequency 1.10 groups/100km	TRI
Ligurian Sea	Fin whale, striped dolphin, Risso's dolphin, Cuvier's beaked whale, sperm whale, long-finned pilot whale Striped dolphin, Risso's dolphin Cuvier's beaked whale, sperm whale	Boat surveys, photoidentification, behavioural sampling Skin swabbing <i>Ad libitum</i> ship surveys	Population structure	Habitat use. Fin whale abundance. Population estimate. Site – fidelity. <i>Azzellino et al.</i> in press, <i>Panigada et al.</i> in press (a); <i>Panigada et al.</i> in press (b), <i>Panigada et al.</i> in press (c), <i>Panigada et al.</i> 2003, <i>Patti et al.</i> in press Social and population structure of striped and Risso's dolphins in the Mediterranean Sea. <i>Gaspari</i> 2004 Habitat use of cetaceans along the continental slope, by correlating cetaceans presence with oceanographic parameters such as bathymetry and slope gradient. <i>Azzellino et al.</i> in press; <i>Patti et al.</i> in press.	TRI

CIBRA. New instrumentation for real-time sound recording, analysis and display were used in order to facilitate the detection of biological sound while surveying an area with towed arrays and/or sonobuoys to support the implementation of Acoustic Risk Mitigation Policies as well as to carry out monitoring and censusing activities. The instrumentation allows to monitor and record continuously for the whole duration of a survey with GPS tracking and GIS plotting of received sound categories. CIBRA developed a low cost oceanographic GIS system for acquiring and plotting acoustic survey data. CIBRA participated in the design and development of an underwater station for wideband acoustic monitoring that has been placed by INFN (National Institute of Nuclear Physics) on the seafloor 25 km out of Catania, Sicily, at a depth of 2400 m. The station is connected to the labs in Catania by a fiber optic cable to allow continuous real-time acquisition of 4 acoustic sensors with 45kHz bandwidth. Data is then transferred to CIBRA by terrestrial networks. The station began to transmit on January 2005.

3. Marking data

3.1 Field work

3.1.1 NATURAL MARKING DATA

Species	Feature	Area	Calendar year 2004 no. photographed	Catalogued (Y/N)	Catalogue total	Contact person/institute
Common bottlenose dolphin	Dorsal fin	Ligurian Sea	2004-2005	Y		Gnone ADG
Risso's dolphin	Dorsal fin	Ligurian Sea	2004-2005	Y		Gnone ADG

Striped dolphin	Dorsal fin	Ligurian Sea	2004-2005	Y		Gnone ADG
Fin whale	Permanent mark	Ligurian/Tyrrhenian Sea	90	Y	8	BB
Common bottlenose dolphin	Dorsal Fin	North Tyrrhenian Sea	21	Y	140	CETUS
Common bottlenose dolphin	Dorsal fin	Maddalena Archipelago National Park	30	Y	87	CTS
Common bottlenose dolphin	Dorsal fin	Tyrrhenian and Corsican Sea, Sardinian Channel	Photo No. 37 (17 c. bottlenose; 15 striped, 5 common d.)	Y		F. Maggiani/ <i>DBS</i>
Striped dolphin	Signature whistles		Signature whistles No. 53 (33 c. bottlenose, 20 striped)			
Short-beaked common dolphin						
Common bottlenose dolphin		Northwestern Greece, Amvrakikos Gulf	year 2004/summer/not analysed yet	Y	93	TRI
Common bottlenose dolphin	Dorsal fin	Eastern Ionian Sea	year 2004/spring-summer/not analysed yet	Y	60	TRI
Short-beaked common dolphin	Dorsal fin; white patch	Eastern Ionian Sea	year 2004/spring-summer/none	Y	78	TRI
Common bottlenose dolphin	Dorsal fin	Northern Adriatic Sea	year 2004 /none	Y	19	TRI
Common bottlenose dolphin	Dorsal fin	Ligurian Sea	year 2004/spring-summer/5	Y	68	TRI
Risso's dolphin	Dorsal fin; body scars	Ligurian Sea	year 2004/spring-summer/33	Y	276	TRI
Long-finned pilot whale	Dorsal fin	Ligurian Sea	year 2004/spring-summer/14	Y	68	TRI
Cuvier's beaked whale	Dorsal fin	Ligurian Sea	year 2004/spring-summer/1	Y	32	TRI
Sperm whale	Flukes, white body patches	Ligurian Sea	year 2004/spring-summer/2	Y	40	TRI
Fin whale	Dorsal fin, blaze and chevron, major scars	Ligurian Sea	year 2004/spring-summer/not analysed yet	Y	403	TRI

3.1.2. ARTIFICIAL MARKING DATA

3.1.3 TELEMETRY DATA

Species	Tag type	No. successfully deployed	Maximum time transmitting	Contact person/institute
Sperm whale	Electronic recorder with suckers	3	15 hours (recording)	Carron, Portunato NURC

3.2 Analyses/development of techniques

4. Tissue/biological samples collected

4.1 Biopsy samples

Species	Area	Calendar year/season	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Striped dolphin	Mediterranean Sea	45	Y	45	157	(LB-DSA-US) A. Natoli, University of Durham
Fin whale	Mediterranean Sea	5	Y	2	130	(LB-DSA-US) A. Natoli, University of Durham
Common bottlenose dolphin	Eastern Ionian Sea	2004/spring-summer/none	-	-	10	TRI
Short-beaked common dolphin	Eastern Ionian Sea	2004/spring-summer/none	-	-	15	TRI
Common	Northwestern	2004/spring	Y	in	9	TRI

bottlenose dolphin	Greece, Amvrakikos Gulf	-summer/9		progress		
Fin whale	Ligurian Sea	2004/spring summer/none	-	-	191	TRI
Striped dolphin	Ligurian Sea	2004/spring -summer/4	Y	in progress	184	TRI/LB-DSA-US /S. Gaspari, University of Durham
Risso's dolphin	Ligurian Sea	2004/spring summer/none	-	-	27	TRI
Long-finned pilot whale	Ligurian Sea	2004/spring -summer/1	Y	in progress	4	TRI
Sperm Whale	Ligurian Sea	2003/spring summer/none	-	in progress	3	TRI

BIT. The Mediterranean marine mammal tissue bank housed at the Department of Experimental Veterinary Sciences of the University of Padua (Italy) receives samples from cetacean who stranded along the Italian and adjacent coastline or who were victims of bycatches. According to field situations, different organs and tissues were sampled and formalin-fixed or frozen and send to the Bank. Researchers interested in histology, histopathology and other research fields can write and ask for samples at no cost. A detailed sampled specimens list is available at <http://www.sperivet.unipd.it/tissuebank/index.html>

4.2 Samples from directed catches or bycatches

*e.g. liver, skin, blubber etc.

4.3 Samples from stranded animals

*e.g. liver, skin, blubber etc.

Species	Area	Calendar year/season total	Archived (Y/N)	Tissue type(s)*	Contact person/institute
Striped dolphin	North eastern Sardinia.	1	Y	Liver, kidney, heart, skin, blubber, muscle	CTS
Striped dolphin	Ligurian Sea	5	Y	All samples	Dip.Te.Ris
Fin whale	Ligurian Sea	2	Y	Skin, ovaries, placenta, skeleton.	Dip.Te.Ris.
Striped dolphin	Sardinian Sea	2004/1	Y	head	F.Maggiani/ <i>DBS</i>
Common bottlenose dolphin	Sardinian Channel	2005/1	Y	head	F.Maggiani/ <i>DBS</i>
Striped dolphin	Ligurian and Adriatic Sea	2	Y	Melon, blubber, thyroid, kidney, intestine, brain, lung, liver, spleen, hearth, stomach, pancreas, muscle	S. Corsolini/DSA-US
Common bottlenose dolphin	North Adriatic Sea	1	Y	Full necropsies according to the standard protocols	P. Zucca/ LACNS

4.4 Analyses/development of techniques

DBS-UC. NMR to melon and mandible. Histology to melon and mandible. Acoustic reconstruction of melon 3-D map.

BIT-UP. A research in collaboration with the Bio Engineering department of the Polytechnic of Milan and the department of Veterinary Clinical Sciences, (University of Milan), has completed a simulated-compression study on the respiratory airways of the striped dolphin. The tracheas of several stranded dolphins have been compared to those of pigs and goats (whose trachea is extremely similar to the human). Biomechanical properties of the dolphin organ show increased elasticity and resistance to environmental pressure to the depth of several hundred meters. The resulting changes suggest evolutionary adaptation to diving. Data have been published on "The Anatomical Record" (Cozzi, 2005).

LACNS. The head of a Risso's dolphin was examined, before necropsy, using computed axial tomography (spiral CT unit, Philips AV1, Philips, Eindhoven, The Netherlands) and digital 3D models of the head were created to evaluate the pathologic lesions of parasitic origin (*Crassicauda grampicola*) on an independent workstation (EasyVision Release 5.2 system of Philips Medical Systems, Philips, 5684 PC Best, The Netherlands) (Zucca et al., 2004).

LB-DSA-US. In the free-ranging cetacean biopsies were valuated the Benzo(a)pyrene monooxygenase (BPMO) activity and the residue levels: chlorinated hydrocarbons (HCB, DDTs and PCBs) and polycyclic aromatic hydrocarbons (PAHs).

MFO activity (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 ^{63}Ni electron capture detector and an SBP-5 bonded phase capillary column (30 m long, 0.2 mm i.d.). The carrier gas was N_2 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 $5^\circ\text{C}/\text{min}$. 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 $\mu\text{g/g}$ 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).

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. This data will be valuable for long-term field study of free-ranging cetaceans. 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 (BPMO, EROD, PROD, Cyt.-1A1) 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 (Mascia Brunelli, Milan, Italy) + 10% gamma irradiated fetal calf serum (Mascia Brunelli) + 1% MEM Not Essential Aminoacids (NEAA) solution 100X (Mascia Brunelli) + 1% Penicillin/Streptomycin 100X (Mascia Brunelli) + 0.1% Amphotericin B 100X (Mascia Brunelli) 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) (Mascia Brunelli) containing antibiotic (Penicillin/Streptomycin 100X (Mascia Brunelli) and antimycotic (Amphotericin B 100X (Mascia Brunelli)) 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 (Mascia Brunelli) 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% CO_2 , 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.

5. Pollution studies

DSA-US. The department of Environmental Science of the University of Siena has carried out research on the presence of chlorinated hydrocarbons (dioxin-like PCBs, PCDDs, PCDFs, pesticides) and the relative dioxin Toxic Equivalents (TEQs) in cetaceans from the Mediterranean Sea since many years. Unpublished data on persistent organic pollutants concentrations and TEQs are available from Dr Simonetta Corsolini (Dipartimento Scienze Ambientali, Università di Siena - Via P.A. Marioli, 4, 53100 Siena, Italy, corsolini@unisi.it).

LACNS. Mercury and other heavy metals were determined on all the stranded dolphins, according to the standard protocols, by thermal decomposition, with an automatic analyzer (AMA 254, Altec Ltd. Khodlova 1297 CZ-19300 Prague, Czech Republic) by a specialized laboratory (Centro Studi Ambientali, Rimini) (Zucca *et al.*, 2004a and 2004b)

CIBRA. Recording and analysis of underwater noise sources. Implementation and testing of mitigation procedures during geophysical surveys in collaboration with the Columbia University / Lamont-Doherty Earth Observatory.

6. Statistics for large cetaceans

6.1 Direct catches (commercial, aboriginal and scientific permits) for the calendar year 20XX or the season

None

6.2 Non-natural mortality for the calendar year 20XX or the season 20XX/XX

6.2.1 STRANDINGS OR DEAD WHALES ENCOUNTERED AT SEA

Whale species	Location	Cause of death	Det.	Source or contact institution, contact name and telephone and/or e-mail
Fin whale	43°56' N, 08°40' E	U	V	WWF L.

Determination of death cause: N = full necropsy, V = visual observation entangled, cuts, etc., U = could not be determined.

N/A

The inclusion of this data

documented anecdotal, photos, etc. Example given.

[illegible]

6.3 Earlier years' statistics

CSC - Earlier years' statistics are available for the period 1986-1995 (Bortolotto and Podestà, 1997) included in Borri *et al.*, (1997) and for the period 1986-2001 (Podestà and Bortolotto, 2001; Bortolotto and Podestà, 2004). CSC 2004 report in preparation (contact person: M. Podestà, Natural History Museum of Milan).

7. Statistics for small cetaceans

7.1 For the calendar year 20XX

N/A

7.2 Earlier years statistics

As reported in section 6.3.

8. Strandings

CSC. A network to monitor cetacean stranding along the Italian coasts has been operating since 1986 by CSC, resulting in annual stranding reports. In 2002 CSC turned into a NGO named CSC Onlus - Italian Association for the study of marine reptiles and mammals. (contact person: Alessandro Bortolotto, centrostudicetacei@libero.it). Activities are in cooperation with the **BIT-UP** and **CIBRA**:

BIT-UP. Bruno Cozzi: bruno.cozzi@unipd.it; <http://www.sperivet.unipd.it/tissuebank/index.html>

CIBRA. For the activity managed by CSC, CIBRA developed a low cost oceanographic GIS. In cooperation with CSC, the Natural History Museum of Milan and other organizations a database and GIS of Cuvier's beaked whales stranded in the Mediterranean Sea in the last 120 years has been completed.

LACNS. Paolo Zucca: zucca@units.it http://www.psico.univ.trieste.it/labs/acn-lab/eng_p/e042_staff.html, Franco Zuppa, Marco Francese, Miramare Marinelife Reserve, Ministry of Environment, Viale Miramare, 349- 34146 Trieste, Italy.

ZNM. All the strandings occurring in the Archipelago of Zanzibar, Tanzania, are reported to the IMS: Institute of Marine Sciences (IMS), P.O. box 668, Zanzibar, Tanzania. (contact person: Dr. N. Jiddawi). Data regarding field seasons from 1999 to 2003 are available in: Mainardi, 2005; Bortolotto *et al.*, 2004; Tocchetti *et al.*, 2001.

9. Other studies and analyses

DIPTERIS			
Area	Species	Methodology	Results
Ligurian and Ionian Sea	Ziphius cavirostris (5), Sperm Whale (1)	Stomach content analysis	Orsi Relini L., Garibaldi F. in press
"Pelagos" Cetacean Sanctuary	macroplankton and nekton	sampled by IKMT	Knowledge of the cetaceans food web. Distribution of the mesopelagic organisms and isotopic and trace element composition of cetacean prey
	Fin whale	stranding and whale watching data	Fin whale Populations parameters (Orsi Relini <i>et al.</i> , 2004)
ICRAM			
Area	Species	Methodology	Results
Ligurian Sea-Pelagos sanctuary	Fin and Sperm whales	Passive acoustic	Seasonal occurrence and distribution, assessment of duration and quality of human produced underwater noise
Southern Patagonia	Commerson's and Dusky dolphin	Passive acoustic	Acoustic behaviour in relation to anthropogenic disturbance (whalewatching and fisheries)
ZMN-Activities			
Area	Species	Methodology	Results
Tanzanian waters (Zanzibar)	Indo Pacific Humpback dolphin	Public awareness	Ecology. Mainardi S., (2005)

ZMN. A program in collaboration with IMS has been developed to increase public awareness about cetacean populations off the Zanzibar waters. Mainardi S., (2005).

ICRAM. A whale watching code of conduct and fishery guidelines were developed for the sanctuary area. These two actions were related to a LIFE Project (LIFE03 AT/IT/000148) for the protection of the cetaceans in the "Pelagos" Sanctuary, leaded by Consortium Mediterraneo (CM). The ICRAM contact person is Silvestro Greco; while the project coordinator from CM is Paolo Pelusi.

CIBRA participates in the "Sound Oceanography and Living Marine Resources" (SOLMAR) research project set up by the NATO Undersea Research Center. The activity of CIBRA focuses mainly on:

- managing databases on scientific literature concerned with underwater bioacoustics, strandings, sightings
- developing sound analysis systems for field research on the acoustic emissions of cetaceans
- scientific support and participation in acoustic and visual surveys
- scientific support for the development and tuning of Acoustic Risk Mitigation Policies
- improving Cetacean Sound Library at CIBRA
- developing classification methods to identify vocalizing species
- developing instrumentation and methodologies for field research
- education and training

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 bottlenose dolphin (*Tursiops truncatus*), sampled in the marine park of Asinara (Sardinia, Italy), and of striped dolphin (*Stenella coeruleoalba*), sampled in the Whale Sanctuary (Ligurian Sea, Italy), 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 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.

Italy ratified the "Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area" **ACCOBAMS** in February 2005 (law 10/2/2005 n°27)

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