

# Italy. Progress report on cetacean research, January 2009 to December 2009, with statistical data for the *calendar year* 2008

Compiled by Caterina Maria FORTUNA\*<sup>1</sup>, Elio FILIDEI jr., Mehdi AISSI, Antonella ARCANGELI, Davide BEDOCCHI, Michela BELLINGERI, Alessandro BORTOLOTTI, Antonio CELONA, Bruno COZZI, Francesco DE CARLO, Giovanni DI GUARDO, Bruno DIAZ LOPEZ, Fulvio FOSSA, Maria Cristina FOSSI, Alberto FOZZI, Stefania GASPARI, Maristella GIURISATO, Guido GNONE, Gabriella LA MANNA, Giancarlo LAURIANO, Renata MANGANO, Francesca MAGNONE, Cecilia MANCUSI, Letizia MARSILI, Sandro MAZZARIOL, Antonio MAZZOLA, Aurelie MOULINS, Silvio NUTI, Daniela Silvia PACE, Gianni PAVAN, Massimiliano PENNELLI, Michela PODESTÀ, Elena POLITI, Fabrizio SERENA, Massimiliano ROSSO, Antonello SALA, Paola TEPSICH, Maurizio WURTZ and Leonardo TUNESI

\*ISTITUTO SUPERIORE PER LA PROTEZIONE A LE RICERCA AMBIENTALE, DIPARTIMENTO III CRA 15, VIA DI CASALOTTI 300, 00166 ROME, ITALY

This report summarises information obtained from:

| Name of agency/institute                                                                                                                                              | Abbreviation (use in rest of report) | Contact e-mail address                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Accademia del Leviatano                                                                                                                                               | <b>ALEV</b>                          | ALEVIATANO@HOTMAIL.COM                                                                                                                             |
| Acquario di Genova, Italy                                                                                                                                             | <b>ADG</b>                           | GGNONE@ACQUARIODIGENOVA.IT<br>MBELLINGERI@ACQUARIODIGENOVA.IT<br>FFOSSA@ACQUARIODIGENOVA.IT                                                        |
| Associazione Battibaleno, Italy                                                                                                                                       | <b>BB</b>                            | INFO@BATTIBALENO.IT                                                                                                                                |
| BOTTLENOSE DOLPHIN RESEARCH INSTITUTE, Italy                                                                                                                          | <b>BDRI</b>                          | BRUNO@THEBDRI.COM                                                                                                                                  |
| Banca Dati degli Spiaggiamenti, Pavia, Italy                                                                                                                          | <b>BDS</b>                           | BANCADATISPIAGGIAMENTI@HOTMAIL.IT<br>GIANNI.PAVAN@UNIPV.IT<br>MICHELA_PODESTA@HOTMAIL.COM                                                          |
| Centro Interdisciplinare di Bioacustica e Ricerche Ambientali, Dipartimento di Biologia Animale, Università di Pavia, Italy                                           | <b>CIBRA</b>                         | GIANNI.PAVAN@UNIPV.IT                                                                                                                              |
| Centro Studi Cetacei, Italy                                                                                                                                           | <b>CSC</b>                           | CENTROSTUDICETACEI@LIBERO.IT                                                                                                                       |
| CE.TU.S., Italy                                                                                                                                                       | <b>CETUS</b>                         | CETUS@SUPEREVA.IT                                                                                                                                  |
| CIMA Research Foundation, Italy                                                                                                                                       | <b>CIMA RF</b>                       | AURELIE.MOULINS@CIMAFOUNDATION.ORG,<br>MASSIMILIANO.ROSSO@CIMAFOUNDATION.ORG<br>PAOLA.TEPSICH@CIMAFOUNDATION.ORG<br>MEHDI.AISSI@CIMAFOUNDATION.ORG |
| Consiglio Nazionale per le Ricerche, CNR-ISMAR, Ancona, Italy                                                                                                         | <b>CNR-ISMAR, ANCONA</b>             | A.SALA@ISMAR.CNR.IT                                                                                                                                |
| Consorzio Nazionale Interuniversitario per le Scienze del Mare, U.O. Università di Palermo, Italy                                                                     | <b>CONISMA</b>                       | AMAZZOLA@UNIPA.IT                                                                                                                                  |
| CRiMM onlus (Centro Ricerca Mammiferi Marini), Italy                                                                                                                  | <b>CRIMM ONLUS</b>                   | FRA.MAGNONE@CRIMM.ORG<br>A.FOZZI@CRIMM.ORG                                                                                                         |
| CTS Ambiente<br>Settore Conservazione della Natura Centro Ricerche Delfini Lampedusa Centro Ricerche Delfini Caprera Centro Recupero Tartarughe Marini Asinara, Italy | <b>CTS</b>                           | GABRIELLA.LAMANNA@GMAIL.COM<br>CONSERVAZIONE02@CTS.IT                                                                                              |
| Department of Comparative Biomedical Sciences, Faculty of Veterinary Medicine, University of Teramo, Italy                                                            | <b>UT-FVM-DCBS</b>                   | GDIGUARDO@UNITE.IT                                                                                                                                 |
| Department of Evolutionary Biology, L.E.M. Molecular Ecology Laboratory, University of Florence, Italy                                                                | <b>LEM-UNIFI</b>                     | STEFANIAGASPARI@GMAIL.COM                                                                                                                          |
| Department of Experimental Veterinary Science<br>Department of Public Health, Comparative Pathology and Veterinary Hygiene, University of Padova, Italy               | <b>UNIPD - SPERIVET</b>              | BRUNO.COZZI@UNIPD.IT<br>MARISTELLA.GIURISATO@UNIPD.IT<br>SANDRO.MAZZARIOL@UNIPD.IT                                                                 |
| Department of life sciences, Faculty of Sciences of Bizerte, Tunisia                                                                                                  | <b>FSB</b>                           | MEHDI.AISSI@FSB.RNU.TN                                                                                                                             |

<sup>1</sup> **Please note** that the English has not been revised. Each contributor is responsible for the accuracy of her/his language, data and released information. For any clarification, please, refer to each of the indicated persons/organisations.

| Name of agency/institute                                                            | Abbreviation (use in rest of report)    | Contact e-mail address                                                                                                                           |
|-------------------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| DIBIO, Università di Pisa                                                           | UNIFI DIBIO                             | ACASTELLI@BIOLOGIA.UNIFI.IT                                                                                                                      |
| Dipartimento di Biologia, Università di Genova, Italy                               | DIBIO GE                                | WURTZ-GE@UNIGE.IT                                                                                                                                |
| Dipartimento Scienze Ambientali, Laboratorio Biomarkers, Università di Siena, Italy | LB-DSA-US                               | FOSSI@UNISI.IT<br>MARSILI@UNISI.IT                                                                                                               |
| Environmental Protection Agency - Tuscany Region, Italy                             | ARPAT                                   | C.MANCUSI@ARPAT.TOSCANA.IT<br>F.SERENA@ARPAT.TOSCANA.IT                                                                                          |
| Istituto Superiore per la Protezione e la Ricerca Ambientale                        | ISPRA, DIP III CRA 15<br>ISPRA, NAT-BIO | CATERINA.FORTUNA@ISPRAMBIENTE.IT<br>GIANCARLO.LAURIANO@ISPRAMBIENTE.IT<br>LEONARDO.TUNESI@ISPRAMBIENTE.IT<br>ANTONELLA.ARCANGELI@ISPRAMBIENTE.IT |
| NECTON Marine Research Society                                                      | NECTON                                  | INFO@NECTON.IT<br>CELONA.NECTON@EMAIL.IT                                                                                                         |
| Oceanomare                                                                          | OCEANOMARE                              | INFO@OCEANOMARE.INFO                                                                                                                             |
| Tethys Research Institute                                                           | TRI                                     | TETHYS@TETHYS.ORG                                                                                                                                |
| Museo di Storia Naturale di Milano                                                  | MSNM                                    | MICHELA_PODESTA@HOTMAIL.COM                                                                                                                      |

## 1. SPECIES AND STOCKS STUDIED

| IWC common name             | IWC recommended scientific    | Area/stock(s)                                                                                                                                                                                                                                                                                                        | Items referred to                                                           |
|-----------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Fin Whale                   | <i>Balaenoptera physalus</i>  | Mediterranean Sea, Alboran Sea, Corsica Sea, Ligurian Sea, Messina Strait, Pelagie Archipelago, Pelagos Sanctuary, Sardinian Channel, Tyrrhenian Sea, Tuscan Archipelago, Versilia Coastline                                                                                                                         | 2.1, 2.1.1, 2.1.2, 2.2, 3.1.1, 4.1, 4.3, 6.3.1, 9, 11, 11.2                 |
| Sperm whale                 | <i>Physeter macrocephalus</i> | Mediterranean Sea, Aeolian archipelago, Alboran Sea, Ligurian Sea, Messina Strait, North-eastern coast of Sardinia, Pelagos Sanctuary, Tyrrhenian Sea, Tuscan Archipelago                                                                                                                                            | 2.1, 2.1.1, 2.1.2, 2.2, 3.1.1, 4.1, 4.3, 6.3.1, 8, 9, 11, 11.2              |
| Cuvier's beaked whale       | <i>Ziphius cavirostris</i>    | Alboran Sea, Ligurian Sea, Pelagos Sanctuary, Tyrrhenian Sea                                                                                                                                                                                                                                                         | 2.1, 2.1.1, 2.1.2, 2.2, 3.1.1, 4.3, 8, 9, 11                                |
| Pilot whale                 | <i>Globicephala melas</i>     | Alboran Sea, Ligurian Sea, Pelagos Sanctuary, Tyrrhenian Sea                                                                                                                                                                                                                                                         | 2.1, 2.1.1, 2.1.2, 2.2, 3.1.1, 4.1, 9, 11                                   |
| Risso's Dolphin             | <i>Grampus griseus</i>        | Alboran Sea, Corsica Sea, Ligurian Sea, Pelagos Sanctuary, Sardinian Channel, Tyrrhenian Sea, Tuscan Archipelago                                                                                                                                                                                                     | 2.1, 2.1.1, 2.1.2, 2.2, 3.1.1, 3.2, 4.1, 9, 11, 11.2                        |
| Common bottlenose dolphin   | <i>Tursiops truncatus</i>     | Mediterranean Sea, Amvrakikos Gulf, Eastern Ionian Sea, Greece, Gulf of Corinth, Ligurian Sea, Messina Strait, North-Est Sardinia, North-eastern Tyrrhenian Sea, Northern Tunisian Coast, NW Greece, North-west Sardinia, Pelagos Sanctuary, Strait of Sicily, Tuscan Archipelago, Tyrrhenian Sea Versilia coastline | 2.1, 2.1.1, 2.1.2, 2.2, 3.1, 3.1.1, 3.2, 4.1, 4.3, 8, 9, 10, 11, 11.1, 11.2 |
| Short-beaked common dolphin | <i>Delphinus delphis</i>      | Alboran Sea, Eastern Ionian Sea, Greece, Gulf of Corinth, Ligurian Sea, Messina Strait, Northern Tunisian Coast, Pelagie archipelago, Tyrrhenian Sea, Tuscan Archipelago                                                                                                                                             | 2.1, 2.1.1, 2.1.2, 2.2, 3.1.1, 4.1, 9, 11, 11.2                             |
| Striped dolphin             | <i>Stenella coeruleoalba</i>  | Mediterranean Sea, Aeolian archipelago, Alboran Sea, Corsica Sea, Greece, Gulf of Corinth, Ligurian Sea, Messina, Pelagos Sanctuary, Strait Sardinian Channel, Tyrrhenian Sea, Tuscan Archipelago                                                                                                                    | 2.1, 2.1.1; 2.1.2, 2.2, 3.1.1, 4.1, 4.3, 8, 9, 11, 11.2                     |

## 2. SIGHTINGS DATA

### 2.1 Field work

#### 2.1.1 Systematic

| Target species        | Date                    | Area                                                      | No. of sightings | Contact person/institute and references                             |
|-----------------------|-------------------------|-----------------------------------------------------------|------------------|---------------------------------------------------------------------|
| Fin whale             | 15-3/5-11               | Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel | 3                | Alberto Marco Gattoni/BB                                            |
| <i>As above</i>       | 29/05 – 27/09           | Central Tyrrhenian sea                                    | 75               | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>       | 30/05 - 27/09           | Northern Tyrrhenian sea                                   | 0                | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>       | 30/05 - 27/09           | Eastern Ligurian sea                                      | 3                | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>       | 6/06 - 13/09            | Weastern Ligurian sea                                     | 23               | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>       | 6-10/9-9                | Tuscan Archipelago                                        | 1                | S. Nuti, D. Bedocchi/Cetus                                          |
| <i>As above</i>       | 1-1/12-31               | Versilia coastline                                        | 0                | S. Nuti, D. Bedocchi/Cetus                                          |
| <i>As above</i>       | 2004 /in progress       | Pelagie archipelago – Messina Strait                      | 53               | R. Mangano, Aeolian Dolphin Center/NECTON                           |
| <i>As above</i>       | January - February 2009 | Ligurian and Tyrrhenian Sea, Italy                        | 1                | TRI                                                                 |
| <i>As above</i>       | May - October 2009      | Ligurian Sea, Italy                                       | 10               | TRI; Panigada et al. 2005, 2006, 2008; Azzellino et al. 2008a,b     |
| <i>As above</i>       | 21/07-2/08/09           | Pelagos Sanctuary                                         | 24               | G. Lauriano/ ISPRA, DIP III CRA 15; Lauriano. 2009.                 |
| <i>As above</i>       | 29/01/09-10/12/09       | Ligurian Sea                                              | 4                | A.Moulins/CIMA RF; P.Tepsich/CIMA RF                                |
| Sperm whale           | 29/01/09-10/12/09       | Ligurian Sea                                              | 7                | A.Moulins/CIMA RF; P.Tepsich/CIMA RF                                |
| <i>As above</i>       | 29/05 – 27/09           | Central Tyrrhenian sea                                    | 0                | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>       | 30/05 - 27/09           | Northern Tyrrhenian sea                                   | 1                | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>       | 30/05 - 27/09           | Eastern Ligurian sea                                      | 7                | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>       | 6/06 - 13/09            | Weastern Ligurian sea                                     | 4                | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>       | 21/07-2/08/09           | Pelagos Sanctuary                                         | 5                | G. Lauriano/ ISPRA, DIP III CRA 15; Lauriano. 2009.                 |
| <i>As above</i>       | January - February 2009 | Ligurian and Tyrrhenian Sea, Italy                        | 1                | TRI                                                                 |
| <i>As above</i>       | May - October 2009      | Ligurian Sea, Italy                                       | 27               | TRI; Engelhaupt et al. 2009; Azzellino et al. 2008a,b               |
| <i>As above</i>       | 6-10/9-9                | Tuscan Archipelago                                        | 1                | S. Nuti, D. Bedocchi/Cetus                                          |
| Cuvier's beaked whale | January - February 2009 | Ligurian and Tyrrhenian Sea, Italy                        | 1                | TRI                                                                 |
| <i>As above</i>       | 29/05 – 27/09           | Central Tyrrhenian sea                                    | 4                | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>       | 30/05 - 27/09           | Northern Tyrrhenian sea                                   | 0                | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>       | 30/05 - 27/09           | Eastern Ligurian sea                                      | 1                | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>       | 6/06 - 13/09            | Weastern Ligurian sea                                     | 0                | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>       | 29/01/09-10/12/09       | Ligurian Sea                                              | 7                | A.Moulins/CIMA RF; P.Tepsich/CIMA RF                                |
| <i>As above</i>       | 21/07-2/08/09           | Pelagos Sanctuary                                         | 4                | G. Lauriano/ ISPRA, DIP III CRA 15; Lauriano. 2009.                 |
| <i>As above</i>       | May - October 2009      | Ligurian Sea, Italy                                       | 3                | TRI; Azzellino et al. 2008b                                         |

| Target species            | Date                          | Area                                                             | No. of sightings | Contact person/institute and references                             |
|---------------------------|-------------------------------|------------------------------------------------------------------|------------------|---------------------------------------------------------------------|
| Long-finned pilot whale   | May - October 2009            | Ligurian Sea, Italy                                              | 1                | TRI                                                                 |
| <i>As above</i>           | 29/05 – 27/09                 | Central Tyrrhenian sea                                           | 0                | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>           | 30/05 - 27/09                 | Northern Tyrrhenian sea                                          | 0                | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>           | 30/05 - 27/09                 | Eastern Ligurian sea                                             | 0                | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>           | 6/06 - 13/09                  | Weastern Ligurian sea                                            | 0                | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>           | 21/07-2/08/09                 | Pelagos Sanctuary                                                | 5                | G. Lauriano/ ISPRA, DIP III CRA 15; Lauriano. 2009.                 |
| Risso's dolphin           | 15-3/5-11                     | Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel        | 4                | Alberto Marco Gattoni/BB                                            |
| <i>As above</i>           | 29/05 – 27/09                 | Central Tyrrhenian sea                                           | 3                | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>           | 30/05 - 27/09                 | Northern Tyrrhenian sea                                          | 0                | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>           | 30/05 - 27/09                 | Eastern Ligurian sea                                             | 1                | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>           | 6/06 - 13/09                  | Weastern Ligurian sea                                            | 0                | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>           | 6-10/9-9                      | Tuscan Archipelago                                               | 1                | S. Nuti, D. Bedocchi / Cetus                                        |
| <i>As above</i>           | May - October 2009            | Ligurian Sea, Italy                                              | 4                | TRI; Azzellino et al. 2008a; Gaspari et al. 2007a                   |
| <i>As above</i>           | 21/07-2/08/09                 | Pelagos Sanctuary                                                | 4                | G. Lauriano/ ISPRA, DIP III CRA 15; Lauriano. 2009.                 |
| <i>As above</i>           | 29/01/09-10/12/09             | Ligurian Sea                                                     | 2                | A.Moulins/CIMA RF; P.Tepsich/CIMA RF                                |
| Common bottlenose dolphin | Jan-Dec 2009                  | Ligurian Sea                                                     | 18               | G. Gnone, M. Bellingeri, F. Fossa /ADG                              |
| <i>As above</i>           | 29/05 – 27/09                 | Central Tyrrhenian sea                                           | 5                | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>           |                               | Northern Tyrrhenian sea                                          | 11               | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>           | 30/05 - 27/09                 | Eastern Ligurian sea                                             | 7                | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>           | 6/06 - 13/09                  | Weastern Ligurian sea                                            | 10               | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>           | 1-1/12-31                     | Versilia coastline                                               | 26               | S. Nuti, D. Bedocchi/Cetus                                          |
| <i>As above</i>           | 6-10/9-9                      | Tuscan Archipelago                                               | 7                | S. Nuti, D. Bedocchi/Cetus                                          |
| <i>As above</i>           | From 01/06/2009 to 31/09/2009 | Lampedusa Island                                                 | 51               | Gabriella La Manna/CTS                                              |
| <i>As above</i>           | From 01/03/2009 to 31/12/2009 | La Maddalena Archipelago                                         | 17               | Gabriella La Manna/CTS                                              |
| <i>As above</i>           | From 20/12/2009 to 31/12/2009 | Asinara Island                                                   | 1                | Gabriella La Manna/CTS                                              |
| <i>As above</i>           | 15 July- 15 October 2009      | Roman coastal waters (including the AMP "Secche di Tor Paterno") | 6                | Daniela Silvia Pace/Oceanomare                                      |
| <i>As above</i>           | June - September 2009         | Eastern Ionian Sea, Greece                                       | 3                | TRI; Bearzi et al. 2005, 2008b, in press                            |
| <i>As above</i>           | May – October 2009            | NW Greece, Amvrakikos Gulf                                       | 76               | TRI; Bearzi et. al. 2008a                                           |
| <i>As above</i>           | April – September 2009        | Greece, Gulf of Corinth                                          | 25               | TRI                                                                 |
| <i>As above</i>           | May - October 2009            | Ligurian Sea, Italy (coastal & pelagic waters, mostly pelagic)   | 0                | TRI                                                                 |

| Target species              | Date                          | Area                                                                                                                 | No. of sightings                                | Contact person/institute and references                             |
|-----------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------|
| Common bottlenose dolphin   | January - February 2009       | Ligurian and Tyrrhenian Sea, Italy                                                                                   | 7                                               | TRI                                                                 |
| <i>As above</i>             | January 2009 – November 2009  | North-eastern coast of Sardinia (Tyrrhenian Sea)                                                                     | 192 Sightings / 118 days at sea                 | Bruno Diaz Lopez/BDRI                                               |
| <i>As above</i>             | January 2009 – September 2009 | North-western coast of Sardinia (Gulf of Alghero)                                                                    | 24 Sightings / 69 days at sea                   | Bruno Diaz Lopez & Alberto Addis/BDRI                               |
| <i>As above</i>             | 01/01/09-31/12/09             | Northeastern Sardinia                                                                                                | 24                                              | fra.magnone@crimm.org/CRiMM onlus<br>a.fozzi@crimm.org/CRiMM onlus  |
| <i>As above</i>             | 29/01/09-10/12/09             | Ligurian Sea and Tyrrhenian Sea                                                                                      | 6                                               | A.Moulins/CIMA RF; P.Tepsich/CIMA RF                                |
| <i>As above</i>             | 29/01/09-10/12/09             | Ligurian Sea                                                                                                         | 1                                               | A.Moulins/CIMA RF; P.Tepsich/CIMA RF                                |
| <i>As above</i>             | 21/07-2/08/09                 | Pelagos Sanctuary                                                                                                    | 8                                               | G. Lauriano/ ISPRA, DIP III CRA 15; Lauriano. 2009.                 |
| Short-beaked common dolphin | April – September 2009        | Greece, Gulf of Corinth                                                                                              | 10 (in association with striped dolphin groups) | TRI                                                                 |
| <i>As above</i>             | 29/05 – 27/09                 | Central Tyrrhenian sea                                                                                               | 0                                               | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>             | 30/05 - 27/09                 | Northern Tyrrhenian sea                                                                                              | 1                                               | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>             | 30/05 - 27/09                 | Eastern Ligurian sea                                                                                                 | 0                                               | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>             | 6/06 - 13/09                  | Western Ligurian sea                                                                                                 | 2                                               | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>             | June - September 2009         | Eastern Ionian Sea, Greece (coastal waters of the Inner Ionian Sea archipelago, where the species was once abundant) | 0                                               | TRI; Bearzi et. al. 2005, 2008b; in press                           |
| <i>As above</i>             | 6-10/9-9                      | Tuscan Archipelago                                                                                                   | 1                                               | S. Nuti, D. Bedocchi/Cetus                                          |
| Striped dolphin             | 15-3/5-11                     | Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel                                                            | 11                                              | Alberto Marco Gattoni/BB                                            |
| <i>As above</i>             | 29/05 – 27/09                 | Central Tyrrhenian sea                                                                                               | 28                                              | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>             | 30/05 - 27/09                 | Northern Tyrrhenian sea                                                                                              | 9                                               | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>             | 30/05 - 27/09                 | Eastern Ligurian sea                                                                                                 | 93                                              | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>             | 6/06 - 13/09                  | Western Ligurian sea                                                                                                 | 117                                             | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>             | 6-10/9-9                      | Tuscan Archipelago                                                                                                   | 7                                               | S. Nuti, D. Bedocchi/Cetus                                          |
| <i>As above</i>             | Jan-Dec 2009                  | Ligurian Sea                                                                                                         | 6                                               | G. Gnone, M. Bellingeri, F. Fossa/ADG                               |
| <i>As above</i>             | April – September 2009        | Greece, Gulf of Corinth                                                                                              | 33                                              | TRI                                                                 |
| <i>As above</i>             | May - October 2009            | Ligurian Sea, Italy                                                                                                  | 175                                             | TRI; Azzellino et al. 2008a,b; Gaspari et al. 2007b                 |
| <i>As above</i>             | 21/07-2/08/09                 | Pelagos Sanctuary                                                                                                    | 280                                             | G. Lauriano/ ISPRA, DIP III CRA 15; Lauriano. 2009.                 |
| <i>As above</i>             | 29/01/09-10/12/09             | Ligurian Sea                                                                                                         | 121                                             | A.Moulins/CIMA RF; P.Tepsich/CIMA RF                                |
| <i>As above</i>             | January - February 2009       | Ligurian and N. Tyrrhenian Sea, Italy                                                                                | 114                                             | TRI                                                                 |

**ADG:** Delfini Metropolitani research project. Boat-based random surveys. The study area is located along the Eastern Ligurian coast, between Genoa and La Spezia. The research platforms are two 5,10m long inflatable. Research activity is conducted during the all year, according to weather conditions. In 2009, 50 daily surveys were conducted for a total of 2850 km.

**Battibaleno:** The association Battibaleno has effected n° 31 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 15 March / 5 November 2009. The boat used by Battibaleno is Physalie, a sail boat of 42 feet, especially equipped for the realization of photos, and video recordings. To our recognitions have participated doctors in scientist and researchers, but also students, journalists and impassioned.

**BDRI:** Using study techniques that neither harm nor seriously disturb the animals, BDRI researchers are engaged in the study of bottlenose dolphins, as well as collecting detailed information about their environment. Randomization of the surveys was attempted in order to cover the total study areas although the geographic distribution of effort varied depending on weather conditions. The main objective of these surveys was to continue to study the behaviour, use of habitat and distribution of bottlenose dolphins and correlate their presence, behavioural changes and social organization to the different levels of human activities (gillnet fisheries, trawlers, aquaculture and tourism).

- **North-eastern coast of Sardinia (Tyrrhenian Sea):** This research project is part of a long term study about the socioecology and behaviour of a Mediterranean resident bottlenose dolphin population since 1991. Data were collected by scientists and volunteers onboard a 5.3m motor-craft and an 11 meters wooden vessel from January to November 2009.
- **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 January to September 2009.

**CE.TU.S.:** the center works all year round (generally February-November) in the water the North Tuscany and during the summer season (June-September) it conducts at the same time studies on all the cetacean species in the Tuscan Archipelago waters. Boat surveys have been taken on calm sea days following standard routes (Beaufort scale 3 or less; constant velocity, n° of observers and weather conditions) and in respect of the terms to minimize the disturbances to the animals.

**Versilia Area:** During the 2009 Cetus has effected n° 26 sightings of *Tursiops truncatus* for a total of n° 351 sighted animals and an effort of 1476,39 Km.

**Tuscan Archipelago Area:** Cetus has effected n° 18 sightings for a total of n° 670 animals of six different species with an effort of 742 Km.

**CIMA RF DIBIO Ge:** From January the 29<sup>th</sup> to December the 10<sup>th</sup>, 31 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, searching mainly beyond the 1000m isobaths (where Cuvier's beaked whales and fin whale are more likely to be found). Ships' GPS positions were continuously recorded. At least four trained observers participated in the surveys. Most surveys were conducted following an acoustic grid planned to study sperm whale distribution.

From August the 8<sup>th</sup> to 26<sup>th</sup>, 20 one-day survey were conducted in the western Corsica sea, aboard a sailing boat with the collaboration of a French Associaton. This campain has been conducted following the sampling protocol planned for sperm whale (coupling visual survey with acoustic grid ). Ships' GPS positions were continuously recorded. At least four trained observers participated in the surveys.

**ISPRA, DIP III CRA 15:** An aerial survey has been conducted within the borders of the Pelagos Sanctuary in summer 2009; the aim of the study was to provide robust estimates on the cetacean abundances and density for management and conservation requirements.

**ISPRA, NAT-BIO; ALev; DIBIO Ge; UniPi DIBIO; CIMA RF:** Synoptic and systematic surveys from platform of opportunity (ferry) have been held weekly from June to September across all different ecosystems from coastline to deep sea. Dedicated observers followed the distance sampling protocol to collect data along the following 4 trans-regional fixed line transects in Tyrrhenian and Ligurian sea: Civitavecchia-G.Aranci (4.266 NM travelled on effort); Livorno-Bastia (1.742 NM travelled on effort); Savona-Bastia (3.893 NM travelled on effort); Nizza-Calvi (2.940 NM travelled on effort). The monitoring programme along these transects started in 2007 recording sightings, environmental parameters and data on nautical traffic.

**OCEANOMARE** - A pilot study on the presence of common bottlenose dolphin (*Tursiops truncatus*) was conducted in summer 2008-2009 around the "Secche di Tor Paterno" marine protected area (Tyrrhenian Sea, Italy). The MPA "Secche di Tor Paterno" is located about 10 miles south of the harbour of Ostia (20 km from Rome) and close to the delta of the Tiber river. In the protected area, heavy impact fisheries, as trawling, are forbidden, but small scale, traditional fisheries are allowed. However, trawling occurs just out of the four yellow buoys that mark the boundary of the protected area. Our preliminary investigations indicate that interactions between trawling boats and common bottlenose dolphins occur in the area. A more systematic study will be initiated in 2010 summer in order to: a) extend the knowledge of the population of common bottlenose dolphin around the "Secche di Tor Paterno", b) develop a regular monitoring systems, c) investigate the animals' status trend in the region and d) assess the impact of human activities on the population.

### 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                 | Ligurian Sea                                              | Survey effort; sightings;                                                               | Researcher                | Whale watching vessel                                                | Acquario di Genova                  | Guido Gnone/ADG                                          |
| <i>As above</i>           | Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel | Sail boat Visual survey 31 transect line campaigns photo identification                 | Crew                      | Sail boat Visual survey transect line campaigns photo identification | Battibaleno                         | Alberto Marco Gattoni/BB                                 |
| <i>As above</i>           | Versilia Coastline, Tuscan Archipelago                    | Distance sampling, Photo-ID, sighting data, behaviour, survey effort                    | crew                      | Whalewatching/Research Catamaran                                     | Cetus HQ                            | S. Nuti, D. Bedocchi/Cetus                               |
| <i>As above</i>           | Pelagos Sanctuary                                         | sightings Distance sampling                                                             | R. Canneri; M. M. Zeichen | Research vessel                                                      | ISPRA                               | G. Lauriano/ISPRA, DIP III CRA 15; Canneri et al. 2010   |
| <i>As above</i>           | Tuscany area (Ligurian sea)                               | Random lines coastal line transects                                                     | Crew                      | motor boat Poseidon, sail boat, ferries Olbia-Livorno                | ARPAT-Area Mare Livorno             | C. Mancusi/ARPAT                                         |
| <i>As above</i>           | Lampedusa island                                          | Survey effort, Photo-ID, Behaviour                                                      | Researcher                | Research boat                                                        | NECTON                              | A.Celona/NECTON<br>R.Mangano/NECTON<br>F.Macaluso/NECTON |
| Sperm whale               | Tuscan Archipelago                                        | Distance sampling, sighting data, behaviour, survey effort, acoustic records.           | Crew                      | Whalewatching/Research Catamaran                                     | Cetus HQ                            | S. Nuti, D. Bedocchi/Cetus                               |
| <i>As above</i>           | Ligurian Sea                                              | Survey effort; sightings;                                                               | Researcher                | Whale watching vessel                                                | Acquario di Genova                  | Guido Gnone/ADG                                          |
| <i>As above</i>           | Pelagos Sanctuary                                         | sightings Distance sampling                                                             | R. Canneri                | Research vessel                                                      | ISPRA                               | G. Lauriano/ISPRA, DIP III CRA 15                        |
| <i>As above</i>           | Messina Strait, Eolian Archipelago                        | Line transect/Distance sampling Photo-ID                                                | R.Mangano                 | Research boat                                                        | NECTON                              | A.Celona/NECTON                                          |
| Cuvier's beaked whale     | Ligurian Sea                                              | Survey effort; sightings;                                                               | Researcher                | Whale watching vessel                                                | Acquario di Genova                  | Guido Gnone/ADG                                          |
| Long Finned Pilot whale   | Pelagos Sanctuary                                         | sightings Distance sampling                                                             | R. Canneri                | Research vessel                                                      | ISPRA                               | G. Lauriano/ISPRA, DIP III CRA 15                        |
| Risso's dolphin           | Ligurian Sea                                              | Survey effort; sightings;                                                               | Researcher                | Whale watching vessel                                                | Acquario di Genova                  | Guido Gnone/ADG                                          |
| <i>As above</i>           | Tuscan Archipelago                                        | Distance sampling, Photo-ID, sighting data, behaviour, survey effort, acoustic records. | Crew                      | Whalewatching/Research Catamaran                                     | Cetus HQ                            | S. Nuti, D. Bedocchi/Cetus                               |
| <i>As above</i>           | Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel | Sail boat Visual survey 31 transect line campaigns photo identification                 | Crew                      | Sail boat Visual survey transect line campaigns photo identification | Battibaleno                         | Alberto Marco Gattoni/BB                                 |
| Common bottlenose dolphin | Ligurian Sea                                              | Survey effort; sightings;                                                               | Researcher                | Whale watching vessel                                                | Acquario di Genova                  | Guido Gnone/ADG                                          |
| <i>As above</i>           | Northern Tunisian coast                                   | Random lines                                                                            | Fishermen                 | Fisheries boat                                                       | FSB                                 | M. AISSI, FSB                                            |
| <i>As above</i>           | northern Adriatic Sea                                     | Sightings                                                                               | Researcher                | Fishing boats with independent observers                             | ISPRA, CoNISMa                      | C. Fortuna/ISPRA, DIP III CRA 15                         |

| Primary species             | Area                                                      | Data type/method                                                                        | Collected by              | Platform                                                             | Location of archive (if applicable) | Contact person/institute and refs                      |
|-----------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------|-------------------------------------|--------------------------------------------------------|
| Common bottlenose dolphin   | Pelagos Sanctuary                                         | sightings<br>Distance sampling                                                          | R. Canneri                | Research vessel                                                      | ISPRA                               | G. Lauriano/ISPRA, DIP III CRA 15                      |
| <i>As above</i>             | Versilia Coastline, Tuscan Archipelago                    | Photo-ID, sighting data, behaviour, acoustic records, survey effort, environmental data | crew                      | Whalewatching/Research Catamaran                                     | Cetus HQ                            | S. Nuti, D. Bedocchi/Cetus                             |
| <i>As above</i>             | Tuscany area (south Ligurian sea)                         | Random lines (bottom trawl hauls); coastal line transects                               | Crew                      | Bottom trawler; motor boat Poseidon, sail boat                       | ARPAT-Area Mare Livorno             | C. Mancusi/ARPAT                                       |
| <i>As above</i>             | Lampedusa island Messina Strait Eolian Archipelago        | Photo-ID, sighting data, behaviour                                                      | Researcher                | Research boat                                                        | Necton Aeolian Dolphin Center       | R. Mangano/AEOLIAN DOLPHIN CENTER<br>A.Celona/ NECTON  |
| Short-beaked common dolphin | Ligurian Sea                                              | Survey effort; sightings;                                                               | Researcher                | Whale watching vessel                                                | Acquario di Genova                  | Guido Gnone/ADG                                        |
| <i>As above</i>             | Tuscan Archipelago                                        | Distance sampling, sighting data, behaviour, survey effort, acoustic records.           | Crew                      | Whalewatching/Research Catamaran                                     | Cetus HQ                            | S. Nuti, D. Bedocchi/Cetus                             |
| <i>As above</i>             | Northern Tunisian coast                                   | Random lines                                                                            | Fishermen                 | Fisheries boat                                                       | FSB                                 | M. AISSI, FSB                                          |
| Striped dolphin             | Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel | Sail boat Visual survey 31 transect line campaigns photo identification                 | Crew                      | Sail boat Visual survey transect line campaigns photo identification | Battibialeno                        | Alberto Marco Gattoni/BB                               |
| <i>As above</i>             | Ligurian Sea                                              | Survey effort; sightings;                                                               | Researcher                | Whale watching vessel                                                | Acquario di Genova                  | Guido Gnone/ADG                                        |
| <i>As above</i>             | Tuscan Archipelago                                        | Distance sampling, sighting data, behaviour, survey effort, acoustic records.           | Crew                      | Whalewatching/Research Catamaran                                     | Cetus HQ                            | S. Nuti, D. Bedocchi/Cetus                             |
| <i>As above</i>             | Pelagos Sanctuary                                         | sightings<br>Distance sampling                                                          | R. Canneri; M. M. Zeichen | Research vessel                                                      | ISPRA                               | G. Lauriano/ISPRA, DIP III CRA 15; Canneri et al. 2010 |
| <i>As above</i>             | Tuscany area (south Ligurian sea)                         | Random lines (bottom trawl hauls)                                                       | Crew                      | Bottom trawler                                                       | ARPAT-Area Mare Livorno             | C. Mancusi/ARPAT                                       |
| <i>As above</i>             | Eolian Archipelago                                        | Distance sampling, Behaviour.                                                           | Crew                      | Research boat                                                        | Necton                              | A. Celona/NECTON                                       |

**ADG:** Opportunistic observations were collected from motor boat (whalewatching boats) in the Ligurian Sea (Genoa) from 20/02/2009 to 04/09/2009. 39 daily surveys were conducted for a total of about 3400 km.

**ARPAT:** the Marine Sector of ARPAT, thanks to its projects (Marine Coastal Monitoring, Monitoring of Large Elasmobranchs Monitoring, Biodiversity Monitoring, Marine Vertebrate Monitoring, Demersal Resources Monitoring) carried on all over the year, collects opportunistic informations about cetaceans in the Tuscany area. During 2009 sightings data were collected directly by ARPAT researchers that were involved in bottom trawl surveys (MEDITS, CAMPBIOL, DISCARD, etc) or by other colleagues that were working onboard different motor boats (fishing boats, oceanographic vessel of ARPAT “Poseidon”, “Blue Dream” of Geopolaris,



etc.). We collected 17 sightings for a total of 66 animals: 4 striped dolphins, 53 bottlenose dolphins, 5 fin whales, 4 not identified dolphins. Data will be soon shared in the Tuscany Regional Observatory for Cetaceans (ORTC) database. The ORTC project was approved by Tuscany Region Council the 10<sup>th</sup> of April 2007 (AA.VV., 1997). The Cetacean Observatory represents the contribution of Tuscany Regional Council to a wider international initiative with the contribution of Italy, France and Principality of Monaco: the formerly known “Cetacean Sanctuary”. The Tuscany Region is planning a network system among the departments of Universities, the Regional Environmental Protection Agency (ARPAT) and the other institutions or associations in order to coordinate all the activities, both on the coast and in the sea, directed to the study and the observation of marine mammals. In order to constitute a working group with the involvement of all the technical and scientific contributions, a first preliminary meeting was carried the 17<sup>th</sup> May 2006 in Capoliveri (Elba Island) where several institutions gave their contributions. The aim of the meeting was to define the Observatory proposal and its opening to all the public and private bodies involved with biodiversity, sea waters protection and environmental indexes application, through the monitoring of marine mammals: this especially directed to their routes in the Mediterranean Sea, Ligurian and Tyrrhenian seas and along the coasts of Tuscany, Sardinia and southern France. First report of the activity of the ORTC (April 2007-May 2008) was published by Tuscany Region Council in May 2008 (AA.VV., 2008). For more detail on the ORTC see the site <http://www.regione.toscana.it/ambienteeterritorio/biodiversita/osservatorio/index.html>. This activity of ARPAT and the opportunistic informations collected on cetaceans are also part of the GIONHA (Governance and Integrated Observation of marine Natural Habitat) project. The aim of the project, co-financed by European funds, is to promote of marine natural habitats of the Pelagos Sanctuary protected area, important marine ecosystem characterized by the presence of cetaceans and to spread environmental sensibility through a participant management. See more on the site <http://www.arpat.toscana.it/gionha/gionha>.

**CE.TU.S:** 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 or with random routes. The boat routes and animal sightings are continuously recorded by GPS disposals. All activities are settled to minimize the disturbance to animals.

**CRiMM:** 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.

**FSB-CIMA RF:** During two consecutive years (2008 and 2009), we collected data about cetacean sighting positions from fishing boats. Questionnaires focused primarily cetacean sighting positions and biodiversity characteristics of the area. 20 fishing boats were considered in this investigation according to two main variables: educational profile of fishermen and experience level in identifying cetacean species. Sighting is validated only if the visual detection of a group of cetaceans was recorded at least by two different fishing boats. We collected 24 sightings in 2008 and 30 sightings.

**ISPRA, DIP III CRA 15; CoNISM; CNR-ISMAR, Ancona:** within the BYCATCH III monitoring programme, a total of 196 encounters of bottlenose dolphins were recorded in the northern Adriatic Sea, during opportunistic observations by fishery independent observers on board of pelagic/mid-water pair trawlers.

## 2.2 Analyses/development of techniques

| Target species  | Date               | Area                                 | Methods/effort                                                     | Parameters/ factors measured                                             | Contact person/institute; refs                                  |
|-----------------|--------------------|--------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------|
| Fin whale       | 6-10/9-9           | Tuscan Archipelago                   | Line transect survey or random routes, Distance sampling           | Distribution; sighting frequency; Abundance; Habitat use.                | S. Nuti, D. Bedocchi / Cetus                                    |
| <i>As above</i> | 1-1/12-31          | Versilia coastline                   | Line transect survey or random routes, Distance sampling           | Distribution; sighting frequency; Abundance; Habitat use.                | S. Nuti, D. Bedocchi / Cetus                                    |
| <i>As above</i> | 10/01/09-15/12/09  | Pelagic archipelago – Messina Strait | Line transect survey                                               | Distribution; sighting frequency                                         | A. Celona / NECTON                                              |
| <i>As above</i> | May - October 2009 | Ligurian Sea, Italy                  | Boat surveys, photo-identification, behavioural sampling (4258 km) | Encounter rate, distribution, abundance, habitat use, behaviour, ecology | TRI; Panigada et al. 2005, 2006, 2008; Azzellino et al. 2008a,b |
| <i>As above</i> | 29/01/09-10/12/09  | Ligurian Sea                         | Line transect survey                                               | Spatio-temporal distribution; Habitat                                    | A. Moulins, CIMA RF                                             |
| <i>As above</i> | 21/07-2/08/09      | Pelagos Sanctuary                    | Line transect survey/8846 km                                       | Abundance and density estimates                                          | G. Lauriano, ISPRA;                                             |

| Target species          | Date                    | Area                               | Methods/effort                                                     | Parameters/ factors measured                                             | Contact person/institute; refs                                      |
|-------------------------|-------------------------|------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|
| Fin whale               | January - February 2009 | Ligurian and Tyrrhenian Sea, Italy | Line transect, aerial surveys (8144 km)                            | Encounter rate, distribution, habitat use, abundance                     | TRI                                                                 |
| <i>As above</i>         | 29/05 – 27/09           | Central Tyrrhenian sea             | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>         | 20/05 – 23/10           | Northern Tyrrhenian sea            | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>         | 30/05 - 27/09           | Eastern Ligurian sea               | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>         | 6/06 - 13/09            | Weastern Ligurian sea              | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| Sperm whale             | 29/01/09-10/12/09       | Ligurian Sea                       | PhotoID, Line transect survey, acoustics                           | Habitat                                                                  | P. Tepsich CIMA RF                                                  |
| <i>As above</i>         | 6-10/9-9                | Tuscan Archipelago                 | Line transect survey or random routes, Distance sampling           | Distribution; sighting frequency; Abundance; Habitat use.                | S. Nuti, D. Bedocchi / Cetus                                        |
| <i>As above</i>         | May - October 2009      | Ligurian Sea, Italy                | Boat surveys, photo-identification, behavioural sampling (4258 km) | Encounter rate, distribution, habitat use, abundance, behaviour, ecology | TRI; Engelhaupt et al. 2009; Azzellino et al. 2008a,b               |
| <i>As above</i>         | January - February 2009 | Ligurian and Tyrrhenian Sea, Italy | Line transect, aerial surveys (8144 km)                            | Encounter rate, distribution, habitat use, abundance                     | TRI                                                                 |
| <i>As above</i>         | Gen-Dec 2009            | Eolian archipelago Messina strait  | Photo-ID Line transect survey                                      | Habitat Distribution                                                     | A. Celona / NECTON                                                  |
| <i>As above</i>         | 29/05 – 27/09           | Central Tyrrhenian sea             | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>         | 20/05 – 23/10           | Northern Tyrrhenian sea            | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>         | 30/05 - 27/09           | Eastern Ligurian sea               | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>         | 6/06 - 13/09            | Weastern Ligurian sea              | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| Cuvier's beaked whale   | January - February 2009 | Ligurian and Tyrrhenian Sea, Italy | Line transect, aerial surveys (8144 km)                            | Encounter rate, distribution, habitat use, abundance                     | TRI                                                                 |
| <i>As above</i>         | May - October 2009      | Ligurian Sea, Italy                | Boat surveys, photo-identification, behavioural sampling (4258 km) | Encounter rate, distribution, habitat use, abundance, behaviour, ecology | TRI; Azzellino et al. 2008b                                         |
| <i>As above</i>         | 29/01/09-10/12/09       | Ligurian Sea                       | PhotoID, Line transect survey                                      | Population estimates, Spatio-temporal distribution; Habitat              | M. Rosso, CIMA RF                                                   |
| <i>As above</i>         | 29/05 – 27/09           | Central Tyrrhenian sea             | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>         | 20/05 – 23/10           | Northern Tyrrhenian sea            | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>         | 30/05 - 27/09           | Eastern Ligurian sea               | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>         | 6/06 - 13/09            | Weastern Ligurian sea              | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic      | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| Long-finned pilot whale | May - October 2009      | Ligurian Sea, Italy                | Boat surveys, photo-identification, behavioural sampling (4258 km) | Encounter rate, distribution, habitat use, abundance, behaviour, ecology | TRI                                                                 |

| Target species            | Date                    | Area                                                      | Methods/effort                                                     | Parameters/ factors measured                                                                                                             | Contact person/institute; refs                                      |
|---------------------------|-------------------------|-----------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Long-finned pilot whale   | 29/05 – 27/09           | Central Tyrrhenian sea                                    | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                      | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALEv                         |
| <i>As above</i>           | 20/05 – 23/10           | Northern Tyrrhenian sea                                   | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                      | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>           | 30/05 - 27/09           | Eastern Ligurian sea                                      | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                      | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>           | 6/06 - 13/09            | Western Ligurian sea                                      | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                      | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| Risso's dolphin           | May - October 2009      | Ligurian Sea, Italy                                       | Boat surveys, photo-identification, behavioural sampling (4258 km) | Encounter rate, distribution, habitat use, abundance, behaviour, ecology                                                                 | TRI; Azzellino et al. 2008a; Gaspari et al. 2007a                   |
| <i>As above</i>           | 15-3/5-11               | Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel | Sail boat<br>Line transect survey<br>photo identification          | Distribution; sighting frequency (820 miles crossed)<br>Distribution-Sighting frequency - behaviour-Presence absence (820 miles crossed) | Alberto Marco Gattoni, / BB                                         |
| <i>As above</i>           | 6-10/9-9                | Tuscan Archipelago                                        | Line transect survey or random routes, Distance sampling, M-R      | Distribution; sighting frequency; Abundance; Habitat use.                                                                                | S. Nuti, D. Bedocchi / Cetus                                        |
| <i>As above</i>           | 29/01/09-10/12/09       | Ligurian Sea                                              | PhotoID                                                            | Population estimates                                                                                                                     | M. Rosso, CIMA RF                                                   |
| <i>As above</i>           | 29/05 – 27/09           | Central Tyrrhenian sea                                    | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                      | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALEv                         |
| <i>As above</i>           | 20/05 – 23/10           | Northern Tyrrhenian sea                                   | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                      | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>           | 30/05 - 27/09           | Eastern Ligurian sea                                      | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                      | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>           | 6/06 - 13/09            | Western Ligurian sea                                      | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                      | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| Common bottlenose dolphin | Jan-Dec 2009            | Ligurian Sea                                              | Boat-based random survey; photo-ID                                 | Spatio-temporal distribution; sighting frequency; encounter rates; habitat use; abundance; home range                                    | G. Gnone, M. Bellingeri, F. Fossa / ADG                             |
| <i>As above</i>           | 1-1/12-31               | Versilia coastline                                        | Line transect survey or random routes, M-R.                        | Distribution; sighting frequency; Abundance; Habitat use.                                                                                | S. Nuti, D. Bedocchi / Cetus                                        |
| <i>As above</i>           | 6-10/9-9                | Tuscan Archipelago                                        | Line transect survey or random routes, M-R.                        | Distribution; sighting frequency; Abundance; Habitat use.                                                                                | S. Nuti, D. Bedocchi / Cetus                                        |
| <i>As above</i>           | 01/06/2009 - 31/09/2009 | Lampedusa Island                                          | Sea survey: 58.82 hours                                            | Distribution; sighting frequency, encounter rate, habitat use.                                                                           | Gabriella La Manna / CTS                                            |
| <i>As above</i>           | 01/03/2009 - 31/12/2009 | La Maddalena Archipelago                                  | Sea survey: 113.31 hours                                           | Distribution; sighting frequency, encounter rate, habitat use.                                                                           | Gabriella La Manna / CTS                                            |
| <i>As above</i>           | 20/12/2009 - 31/12/2009 | Asinara Island                                            | Sea survey: 10 hours                                               | Distribution; sighting frequency, encounter rate, habitat use.                                                                           | Gabriella La Manna / CTS                                            |
| <i>As above</i>           | Feb-Mar 2009            | Lampedusa island                                          | Survey, Photo-ID                                                   | Distribution; sighting frequency, encounter rate, habitat use                                                                            | A.Celona/ NECTON                                                    |
| <i>As above</i>           | Ag-Ott                  | Eolian Island                                             | Line transect survey , random routes, Photo-ID                     | Distribution; sighting frequency, encounter rate, habitat use                                                                            | A. Celona/Necton R. Mangano/ Aeolian Dolphin Center                 |

| Target species            | Date                          | Area                                               | Methods/effort                                                                                                                                                                                                                      | Parameters/ factors measured                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Contact person/institute; refs                                                                                   |
|---------------------------|-------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Common bottlenose dolphin | 10/1/09-15/12/09              | Messina Strait                                     | Boat-based random survey; photo-ID                                                                                                                                                                                                  | Distribution; sighting frequency; encounter rate, habitat use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | A. Celona/Necton                                                                                                 |
| <i>As above</i>           | 15 July-15 October 2009       | Tyrrhenian Sea                                     | Random survey                                                                                                                                                                                                                       | Distribution; sighting frequency; behaviour; interaction with fishery                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Daniela Silvia Pace / OCEANOMARE                                                                                 |
| <i>As above</i>           | May - October 2009            | NW Greece, Amvrakikos Gulf                         | Boat surveys, photo-identification (1310 km)                                                                                                                                                                                        | Encounter rate, distribution, abundance, habitat use, behaviour, ecology                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TRI; Bearzi et al. 2008a                                                                                         |
| <i>As above</i>           | June - September 2009         | Eastern Ionian Sea, Greece                         | Boat surveys, photo-identification, behavioural sampling (951 km)                                                                                                                                                                   | Encounter rate, distribution, abundance, habitat use, behaviour, ecology, interactions with fisheries                                                                                                                                                                                                                                                                                                                                                                                                                                        | TRI; Bearzi et al. 2005, 2008b, in press                                                                         |
| <i>As above</i>           | April – September 2009        | Greece, Gulf of Corinth                            | Boat surveys, photo-identification, behavioural sampling (4223 km)                                                                                                                                                                  | Encounter rate, distribution, abundance, habitat use, behaviour, ecology                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TRI                                                                                                              |
| <i>As above</i>           | May - October 2009            | Ligurian Sea, Italy                                | Boat surveys, photo-identification, behavioural sampling (4258 km)                                                                                                                                                                  | Encounter rate, distribution, habitat use, abundance, behaviour, ecology                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TRI                                                                                                              |
| <i>As above</i>           | January - February 2009       | Ligurian and Tyrrhenian Sea, Italy                 | Line transect, aerial surveys, distance sampling (8144 km)                                                                                                                                                                          | Encounter rate, distribution, habitat use, abundance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | TRI                                                                                                              |
| <i>As above</i>           | January 2009 – November 2009  | North-eastern coast of Sardinia (Tyrrhenian Sea)   | 124 boat surveys and 192 sightings, behavioural sampling and foraging studies, photo-identification and social structure studies, bioacoustics, interaction with human activities, allomaternal cares and mother-infant separations | <ul style="list-style-type: none"> <li>• Encounter rates, population trends</li> <li>• GIS - Distribution, habitat use, site – fidelity and preferences</li> <li>• Population estimate (Photo-ID)</li> <li>• Association index (HWI, networks)</li> <li>• Respiratory patterns and feeding behaviour</li> <li>• Individual behaviour</li> <li>• Respiratory patterns</li> <li>• Underwater behaviour</li> <li>• Bycatch and incidental captures</li> <li>• Communication</li> <li>• Trophic levels</li> <li>• Mass balance models</li> </ul> | Diaz Lopez, B./BDRI; Diaz López B., 2009, Diaz López B. & Shirai, J.A.B., 2010, Diaz López B., <i>in press</i> . |
| <i>As above</i>           | January 2009 – September 2009 | North-western coast of Sardinia                    | 69 boat surveys and 24 sightings, distribution and habitat use, photo-identification and social structure studies, site-fidelity                                                                                                    | <ul style="list-style-type: none"> <li>• Encounter rates</li> <li>• GIS - Distribution, habitat use, site – fidelity and preferences</li> <li>• Population estimate (Photo-ID)</li> <li>• Association index (HWI)</li> </ul>                                                                                                                                                                                                                                                                                                                 | Diaz Lopez, B & Addis, A../BDRI;                                                                                 |
| <i>As above</i>           | 01/01/09-31/12/09             | Northeastern Sardinia                              | Line transect survey                                                                                                                                                                                                                | Distribution; sighting frequency; groups composition, behaviour                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | fra.magnone@crimm.org/CRIImm onlus<br>a.fozzi@crimm.org/CRIImm onlus                                             |
| <i>As above</i>           | 01/01/09-28/02/09             | Northern Tunisian coast: inshore waters of Bizerte | Random lines                                                                                                                                                                                                                        | Spatio-temporal distribution, habitat description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | M. AISSI, FSB                                                                                                    |
| <i>As above</i>           | 29/05 – 27/09                 | Central Tyrrhenian sea                             | Fixed line transect; distance protocols/weekly                                                                                                                                                                                      | Distribution; relative abundance; interaction with nautical traffic                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/Alev                                                                      |
| <i>As above</i>           | 20/05 – 23/10                 | Northern Tyrrhenian sea                            | Fixed line transect; distance protocols/weekly                                                                                                                                                                                      | Distribution; relative abundance; interaction with nautical traffic                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                                                             |

| Target species               | Date                    | Area                                                      | Methods/effort                                                     | Parameters/ factors measured                                                                                                          | Contact person/institute; refs                                      |
|------------------------------|-------------------------|-----------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Common bottlenose dolphin    | 30/05 - 27/09           | Eastern Ligurian sea                                      | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                   | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>              | 6/06 - 13/09            | Weastern Ligurian sea                                     | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                   | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| Short-beaked common dolphins | 6-10/9-9                | Tuscan Archipelago                                        | Line transect survey or random routes, Distance sampling, M-R      | Distribution; sighting frequency; Abundance; Habitat use.                                                                             | S. Nuti, D. Bedocchi / Cetus                                        |
| <i>As above</i>              | 10/01/09 - 15/12/09     | Messina Strait – Pelagie archipelago                      | Line transect survey                                               | Distribution, sighting frequency                                                                                                      | A. Celona / NECTON                                                  |
| <i>As above</i>              | June - September 2009   | Eastern Ionian Sea, Greece                                | Boat surveys, photo-identification, behavioural sampling (951 km)  | Encounter rate, distribution, abundance, habitat use, behaviour, ecology                                                              | TRI; Bearzi et. al 2005, 2008a, in press                            |
| <i>As above</i>              | April – September 2009  | Greece, Gulf of Corinth                                   | Boat surveys, photo-identification, behavioural sampling (4223 km) | Encounter rate, distribution, abundance, habitat use, behaviour, ecology                                                              | TRI                                                                 |
| <i>As above</i>              | 29/05 – 27/09           | Central Tyrrhenian sea                                    | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                   | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>              | 20/05 – 23/10           | Northern Tyrrhenian sea                                   | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                   | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |
| <i>As above</i>              | 30/05 - 27/09           | Eastern Ligurian sea                                      | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                   | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i>              | 6/06 - 13/09            | Weastern Ligurian sea                                     | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                   | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| Striped dolphin              | Jan-Dec 2009            | Ligurian Sea                                              | Boat-based random survey; photo-ID                                 | Spatio-temporal distribution; sighting frequency; habitat use                                                                         | G. Gnone, M. Bellingeri, F. Fossa / ADG                             |
| <i>As above</i>              | 15-3/5-11               | Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel | Sail boat Line transect survey photo identification                | Distribution; sighting frequency (820 miles crossed) Distribution-Sighting frequency - behaviour-Presence absence (820 miles crossed) | Alberto Marco Gattoni, / BB                                         |
| <i>As above</i>              | 6-10/9-9                | Tuscan Archipelago                                        | Line transect survey or random routes, Distance sampling           | Distribution; sighting frequency; Abundance; Habitat use.                                                                             | S. Nuti, D. Bedocchi / Cetus                                        |
| <i>As above</i>              | 10/01/09 - 15/12/09     | Aeolian Archipelago – Messina Strait                      | Line transect survey                                               | Distribution, sighting frequency                                                                                                      | A. Celona / NECTON                                                  |
| <i>As above</i>              | April – September 2009  | Greece, Gulf of Corinth                                   | Boat surveys, photo-identification, behavioural sampling (4223 km) | Encounter rate, distribution, abundance, habitat use, behaviour, ecology                                                              | TRI                                                                 |
| <i>As above</i>              | May - October 2009      | Ligurian Sea, Italy                                       | Boat surveys, photo-identification, behavioural sampling (4258 km) | Encounter rate, distribution, habitat use, behaviour, ecology                                                                         | TRI; Azzellino et al. 2008a,b; Gaspari et al. 2007b                 |
| <i>As above</i>              | January - February 2009 | Ligurian and Tyrrhenian Sea, Italy                        | Line transect, aerial surveys (8144 km)                            | Encounter rate, distribution, habitat use, abundance                                                                                  | TRI                                                                 |
| <i>As above</i>              | 29/01/09-10/12/09       | Ligurian Sea                                              | Line transect survey                                               | Spatio-temporal distribution; Habitat                                                                                                 | A. Moulins, CIMA RF                                                 |
| <i>As above</i>              | 21/07-2/08/09           | Pelagos Sanctuary                                         | Line transect survey/8846 km                                       | Abundance and density estimates                                                                                                       | G. Lauriano, ISPRA;                                                 |
| <i>As above</i>              | 29/05 – 27/09           | Central Tyrrhenian sea                                    | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                   | A. Arcangeli/ISPRA, NAT-BIO; L. Marini/ALev                         |
| <i>As above</i>              | 20/05 – 23/10           | Northern Tyrrhenian sea                                   | Fixed line transect; distance protocols/weekly                     | Distribution; relative abundance; interaction with nautical traffic                                                                   | A. Arcangeli/ISPRA, NAT-BIO; A. Castelli/UniPi DIBIO                |

| Target species  | Date          | Area                 | Methods/effort                                 | Parameters/ factors measured                                        | Contact person/institute; refs                                      |
|-----------------|---------------|----------------------|------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|
| Striped dolphin | 30/05 - 27/09 | Eastern Ligurian sea | Fixed line transect; distance protocols/weekly | Distribution; relative abundance; interaction with nautical traffic | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |
| <i>As above</i> | 6/06 - 13/09  | Western Ligurian sea | Fixed line transect; distance protocols/weekly | Distribution; relative abundance; interaction with nautical traffic | A. Arcangeli /ISPRA, NAT-BIO; M. Wurtz/DIBIO Ge; P. Tepsich/CIMA RF |

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

**BDRI:** -Mark-recapture techniques: photo-identification catalogue (NE coast Sardinia since 1999, NW coast Sardinia since 2008) and population estimates, Mantel test and network diagrams to study social structure and sex ratio.

-Geographical Information System: spatial analyses, use of habitat and site fidelity

-Use and development of Open source software in dolphins research (Photo-ID and bioacoustical analyses)

-Bioacoustics: Acoustical repertoire and communication use, 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

#### **CETUS:**

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

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

**FSB- CIMA RF:** Due to the lack of accurate scientific information about cetacean distribution in this area, this work gives a preliminary idea about common bottlenose dolphin in this area. In 2008, from September to November, we collected 12 sightings of bottlenose dolphins. Data were analyzed in order to describe group size and group composition, habitat and distribution.

**ISPRA, DIP III CRA 15:** Analysis of the summer aerial survey have been performed by the software Distance 5 using both conventional (CDS) and multi covariate distance sampling methods (MCDS); Akaike's information criteria was then used to choose amongst the detection function models.

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

**TRI:** Analysis of the winter aerial survey have been performed by the software Distance 5.0 using both conventional (CDS) and multi covariate distance sampling methods (MCDS); Akaike's information criteria was then used to choose amongst the detection function models. Estimates for striped dolphins only were provided.

### 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                 | Permanent mark dorsal fin        | Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel | 5                    | Y               | 15                   | Alberto Marco Gattoni, / BB                   |
| <i>As above</i>           | Dorsal fin, blaze/chevron, scars | Ligurian Sea, Italy                                       | Analysis in progress | Y               | 431                  | TRI                                           |
| Sperm whale               | Flukes                           | Ligurian Sea, Italy                                       | 43                   | Y               | 85                   | TRI                                           |
| <i>As above</i>           | Flanks and Fluke                 | Ligurian Sea                                              | Na                   | Y               | na                   | M. Rosso, CIMA RF                             |
| Cuvier's beaked whale     | Flanks                           | Ligurian Sea                                              | Na                   | Y               | 115                  | M. Rosso, CIMA RF                             |
| <i>As above</i>           | Dorsal fin                       | Ligurian Sea, Italy                                       | 4                    | Y               | 46                   | TRI                                           |
| 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                                       | 42                   | Y               | 347                  | TRI                                           |
| <i>As above</i>           | Permanent mark Dorsal fin        | Ligurian e Tyrrhenian Sea, Corsican Sea Sardinian Channel | 9                    | Y               | 53                   | Alberto Marco Gattoni, / BB                   |
| <i>As above</i>           | Dorsal fin                       | Tuscan Archipelago.                                       | 5                    | Y               | 26                   | S. Nuti, D. Bedocchi / Cetus                  |
| <i>As above</i>           | Dorsal fin                       | Ligurian Sea                                              | na                   | Y               | 85                   | M. Rosso, CIMA RF                             |
| Common bottlenose dolphin | Dorsal fin                       | Tyrrhenian Sea                                            | 12                   | Y               | 12                   | Daniela Silvia Pace / OCEANOMARE              |
| <i>As above</i>           | Dorsal fin                       | Versilia coastline.                                       | 16                   | Y               | 152                  | S. Nuti, D. Bedocchi / Cetus                  |
| <i>As above</i>           | Dorsal fin                       | Tuscan Archipelago.                                       | 6                    | Y               | 49                   | S. Nuti, D. Bedocchi / Cetus                  |
| <i>As above</i>           | Dorsal fin                       | Strait of Sicily(Lampedusa Island)                        | 51                   | Y               | 224                  | Gabriella La Manna / CTS                      |
| <i>As above</i>           | Dorsal fin                       | Archipelago of La Maddalena (Sardinia)                    | 10                   | Y               | 10                   | Gabriella La Manna / CTS                      |
| <i>As above</i>           | Dorsal fin                       | Asinara Island (Sardinia)                                 | 0                    | Y               | 0                    | Gabriella La Manna / CTS                      |
| <i>As above</i>           | Dorsal fin                       | Messina strait                                            | 48                   | Y               | 300                  | R. Mangano / NECTON                           |
| <i>As above</i>           | Dorsal fin                       | Cape Milazzo Eolian archipelago                           | 31                   | Y               | 85                   | R.Mangano/Aeolian Dolphin Center              |
| <i>As above</i>           | Dorsal fin                       | Lampedusa Island                                          | 123                  | Y               | 164                  | A. Celona / NECTON                            |
| <i>As above</i>           | Dorsal fin                       | Ligurian Sea                                              | 20                   | Y               | 244                  | G. Gnone, M. Bellingeri, F. Fossa / ADG       |
| <i>As above</i>           | Dorsal fin                       | NW Greece, Amvrakikos Gulf                                | 69                   | Y               | 140                  | TRI; Bearzi et. al. 2005, 2008a, in press     |
| <i>As above</i>           | Dorsal fin                       | Eastern Ionian Sea, Greece                                | 26                   | Y               | 101                  | TRI; Bearzi et al. 2005, 2008b, in press      |
| <i>As above</i>           | Dorsal fin                       | Greece, Gulf of Corinth                                   | 25                   | Y               | 25                   | TRI                                           |
| <i>As above</i>           | Dorsal fin                       | Ligurian Sea, Italy                                       | 0                    | Y               | 68                   | TRI                                           |
| <i>As above</i>           | Dorsal fin and body marks        | North-eastern coast of Sardinia (Tyrrhenian Sea)          | 65                   | Y               | 69                   | Díaz López, B./BDRI                           |
| <i>As above</i>           | Dorsal fin and body marks        | North-western coast of Sardinia (Gulf of Alghero)         | 22                   | Y               | 22                   | Díaz Lopez B. & Addis, A. / bruno@thebdri.com |

| Species                     | Feature    | Area/stock                 | No. photo-id'd | Catalogue (Y/N) | Catalogue total | Contact person/institute; refs            |
|-----------------------------|------------|----------------------------|----------------|-----------------|-----------------|-------------------------------------------|
| Common bottlenose dolphin   | Dorsal fin | N.E. Saridinia             | 149            | Y               |                 | F. Magnone e A. Fozzi/CRiMM onlus         |
| <i>As above</i>             | Dorsal fin | Ligurian Sea,              | Na             | Y               | 149             | M. Rosso, CIMA RF                         |
| Short-beaked common dolphin | Dorsal fin | Eastern Ionian Sea, Greece | 34             | Y               | 165             | TRI; Bearzi et. al. 2005, 2008b, in press |
| <i>As above</i>             | Dorsal fin | Greece, Gulf of Corinth    | 7              | Y               | 7               | TRI                                       |
| <i>As above</i>             | Dorsal fin | Ligurian Sea, Italy        | 0              | Y               | 3               | TRI                                       |
| Striped dolphin             | Dorsal fin | Greece, Gulf of Corinth    | 226            | Y               | 226             | TRI                                       |

### 3.1.2. Artificial marking data

NA.

### 3.1.3 Telemetry data

NA.

## 3.2 Analyses/development of techniques

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

**CETUS:** Times/distances to resightings, abundance and density applying Photo-Id and M-R; behavioral patterns and opportunistic strategy studies; space/time distribution with environmental data matching; social structures and site fidelity; mother-calf associations; duration, characteristics and evolution of the natural marks.

**CIMA RF DIBIO Ge:** 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 are 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). The same objectives are carried out in the two other study areas: Archipelago of La Maddalena and Asinara Island, where the study is just started.

## 4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

### 4.1 Biopsy samples (summary only)

| Species         | Area/stock          | Calendar year/season - no. collected | Archive d (Y/N) | No. analysed         | Total holdings | Contact person/institute                                |
|-----------------|---------------------|--------------------------------------|-----------------|----------------------|----------------|---------------------------------------------------------|
| Fin whale       | Ligurian Sea, Italy | 2009/summer – 0                      | Y               | Analysis in progress | 193            | TRI; LB-DSA-US; Martine Berubé, University of Stockholm |
| <i>As above</i> | Ligurian Sea, Italy | 2009/summer – 4                      | Y               | 4                    | 4              | LB-DSA-US, UNIFI, ISPRA, DIP III CRA 15 (Lauriano)      |



| Species                     | Area/stock                 | Calendar year/<br>season - no.<br>collected | Archive<br>d (Y/N) | No.<br>analysed      | Total holdings | Contact person/institute                                                       |
|-----------------------------|----------------------------|---------------------------------------------|--------------------|----------------------|----------------|--------------------------------------------------------------------------------|
| Sperm whale                 | Ligurian Sea, Italy        | 2009/summer - 0                             | Y                  | 3                    | 3              | TRI; LB-DSA-US; Daniel Engelhaupt, University of Durham                        |
| <i>As above</i>             | Ligurian Sea, Italy        | 2009/summer – 2                             | Y                  | 2                    | 2              | LB-DSA-US, UNIFI ISPRA, DIP III CRA 15 (Lauriano)                              |
| Long-finned pilot whale     | Ligurian Sea, Italy        | 2009/summer – 0                             | Y                  | Analysis in progress | 39             | TRI                                                                            |
| Risso's dolphin             | Ligurian Sea, Italy        | 2009/summer – 0                             | Y                  | 28                   | 28             | TRI; LB-DSA-US; Stefania Gaspari/LEM-UNIFI                                     |
| Common bottlenose dolphin   | Eastern Ionian Sea, Greece | 2009/summer – 0                             | Y                  | -                    | 10             | TRI; LB-DSA-US; Ada Natoli, University of Durham                               |
| <i>As above</i>             | Adriatic Sea               | 2009/summer – 6                             | Y                  | Analysis in progress | 52             | LB-DSA-US, UNIFI, ISPRA, DIP III CRA 15 (Fortuna)                              |
| <i>As above</i>             | NW Greece, Amvrakiko Gulf  | 2009/ summer – 0                            | Y                  | -                    | 20             | TRI ; Karine Viaud-Martinez and Andrew J. Bohonak – San Diego State University |
| <i>As above</i>             | Ligurian Sea, Italy        | 2009/summer – 0                             | Y                  | Analysis in progress | 1              | TRI                                                                            |
| Short-beaked common dolphin | Eastern Ionian Sea, Greece | 2009/summer – 0                             | Y                  | -                    | 15             | TRI; LB-DSA-US; Ada Natoli, University of Durham                               |
| Striped dolphin             | Ligurian Sea, Italy        | 2009/summer – 0                             | Y                  | Analysis in progress | 243            | TRI; LB-DSA-US; Stefania Gaspari/LEM-UNIFI                                     |
| <i>As above</i>             | Ligurian Sea, Italy        | 2009/summer – 9                             | Y                  | 9                    | 314            | LB-DSA-US, UNIFI, ISPRA, DIP III CRA 15 (Lauriano)                             |

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

NA.

## 4.3 Samples from stranded animals

| Species                   | Area/stock                   | Tissue type(s)* | No. collected | Archived (Y/N) | No. analysed | Contact person/institute                                                    |
|---------------------------|------------------------------|-----------------|---------------|----------------|--------------|-----------------------------------------------------------------------------|
| Sperm Whale               | Adriatic Sea                 | I               | 7             | Y              | 3            | M. Giuriso/UNIPD - SperiVET                                                 |
| <i>As above</i>           | Adriatic Sea                 | I               | 7             | Y              | 7            | LB-DSA-US                                                                   |
| Sperm whale               | Adriatic Sea                 | II              | 3             | Y              | 3            | GDG/UT-FVM-DCBS                                                             |
| Cuvier's beaked whale     | Ligurian Sea                 | III             | 19            | Y              | NA           | M. Wurtz / DIBIOGE                                                          |
| Common bottlenose dolphin | NW Greece, Amvrakikos Gulf   | IV              | 1             | Y              | 0            | TRI; Karine Viaud-Martinez and Andrew J. Bohonak/San Diego State University |
| <i>As above</i>           | Tyrrhenian Sea               | V               | 2             | Y              | 1            | LB-DSA-US                                                                   |
| <i>As above.</i>          | Ligurian Sea                 | VI              | 27            | Y              | NA           | M. Wurtz / DIBIOGE                                                          |
| <i>As above.</i>          | Adriatic Sea, Tyrrhenian Sea | VII             | 3             | Y              | 3            | GDG/UT-FVM-DCBS                                                             |
| <i>As above.</i>          | Adriatic Sea, Ligurian Sea   | I               | 6             | Y              | 5            | M. Giuriso / UNIPD - SperiVET                                               |
| Striped Dolphin           | Ligurian Sea, Tyrrhenian Sea | I               | 5             | Y              | 3            | M. Giuriso / UNIPD - SperiVET                                               |
| <i>As above</i>           | Tyrrhenian Sea               | V               | 3             | Y              | 3            | LB-DSA-US, ISPRA, DIP III CRA 15 (Lauriano)                                 |
| <i>As above.</i>          | Ionian Sea, Tyrrhenian Sea   | VIII            | 7             | Y              | 7            | GDG/UT-FVM-DCBS                                                             |
| <i>As above.</i>          | Ligurian Sea                 | Skull           | 1             | Y              | 0            | Michela Podestà, MSNM                                                       |
| <i>As above.</i>          | Ligurian Sea                 | IX              | 15            | Y              | NA           | M. Wurtz / DIBIOGE                                                          |

I= Skin, blubber, muscles and main internal organs (several); II= Blubber, lung, heart, stomach, intestine, liver, kidney, pancreas, testicle, mesentery, mesenteric lymph node, prescapular lymph node, tracheo-bronchial lymph node, pulmonary lymph node; III=Skin+blubber, Stomach, Melon, Brain, muscle; IV= Tooth, skin, blubber; V=Skin, blubber, liver, muscle, brain, genital apparatus, kidney; VI= Skin+blubber, Pancreas, Liver, Lung, Kidney, Ovary, Stomach, Spleen, Heart, Melon, Brain, Pelvic bones, Uterus, Urinary bladder; VII= Skeletal muscle, lung, heart, intestine, kidney, urinary bladder, pancreas, adrenal glands, spleen, lymph node, brain; VIII= Skin, mammary gland, skeletal muscle, soft palate, salivary glands, lung, heart, stomach, intestine, liver, kidney, pancreas, adrenal glands, testicle, ovary, spleen, prescapular lymph nodes, tracheo-bronchial lymph nodes, pulmonary lymph nodes, hepatic lymph nodes, mesenteric lymph nodes, thymus, brain; IX= Skin+blubber, Pancreas, Liver, Lung, Kidney, Ovary, Stomach, Spleen, Heart, Melon, Brain, Pelvic bones, Uterus, Urinary bladder.

#### 4.4 Analyses/development of techniques

**UNIPD:** Samples from skin and from internal organs have been analysed with histological techniques and immunohistochemistry. When the body conditions of the stranded animal were optimal, biopsies were taken, preserved in a cryopreservation medium for primary epidermal cells cultures. Where necropsies had been performed, samples were examined by histopathological, microbiological, molecular, genetical, biological assays and toxicological techniques in order to understand the cause of death/stranding of animals.

**UT-FVM-DCBS:** Detailed immunohistochemical (IHC) and biomolecular (RT-PCR) investigations against *Morbillivirus* were carried out from the lung, brain (whenever available), lymph node and spleen tissues from all stranded striped dolphins, bottlenose dolphins and sperm whales under study. This was done in tight accordance with the objectives of a National Research Project funded by *Ministero dell'Ambiente e della Tutela del Territorio e del Mare* (Italian Ministry for the Environment), the Scientific Coordinator of which is Prof. Giovanni Di Guardo. As a matter of fact, the main aim of this Project is to monitor the presence/circulation of morbilliviruses throughout years among wild cetaceans found stranded along the Italian coastline. In this respect, all the aforementioned IHC and RT-PCR investigations yielded negative results, similarly to all microbiological and serological examinations against *Brucella* spp., which were also performed on the same animals.

As far as concerns the “development of techniques”, it should be also emphasized that, in consideration of the fact that the preservation degree of stranded cetacean carcasses often appears to be seriously compromised (with the validity of sero-epidemiological investigations being adversely affected by such condition), we overtook a preliminary study in this direction. More in detail, the above study was aimed at evaluating the decrease kinetics (fluctuations) of anti-*Morbillivirus* neutralizing antibodies in blood serum samples collected from stranded striped dolphins, following their exposure to different temperatures for different time intervals, in an attempt of “mimicking” as reliably as possible the corresponding “field” (summer and winter) conditions. The relevance of our work appears to be markedly enhanced by the lack of any previously published report addressing this important issue.

**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 N<sub>2</sub> 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% CO<sub>2</sub>, 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 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.

**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 mm<sup>2</sup> (INT\*mm<sup>2</sup>). 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.

**UNIPD:** Toxicological studies were also associated to the available histochemical, immunohistochemical and microscopic techniques in order to compare microscopic findings with toxicological ones. Samples for heavy metals, PCB, DDT and HPA were routinely sent to University of Siena. Biological assays were also used to assess any nervous impairment and toxicity using cell cultures, mice and *Gambusia* spp.

## 6. STATISTICS FOR LARGE CETACEANS

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

NA.

### 6.2 Direct catches of large whales (commercial, aboriginal and scientific permits) for the calendar year 2008

NA.

### 6.3 Anthropogenic mortality of large whales for the calendar year 2008

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

| Whale species                                                                                                                            | Sex | No. | Date       | Location                                         | Vessel type | Speed | Fate | How observed            | Contact person/ institute and refs |
|------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|------------|--------------------------------------------------|-------------|-------|------|-------------------------|------------------------------------|
| Fin whale                                                                                                                                | U   | 1   | 02/07/2008 | Ligurian Sea<br>43° 08' 588" N<br>07° 45' 126" E | U           | U     | X*   | Sighted from RV Pelagos | TRI                                |
| <i>As above</i>                                                                                                                          | U   | 1   | 12/06/2009 | Ligurian Sea<br>43° 21' 437" N<br>07° 56' 179" E | U           | U     | X*   | Sighted from RV Pelagos | TRI                                |
| Sperm whale                                                                                                                              | U   | 1   | 12/06/2008 | Ligurian Sea<br>43° 30' 340" N<br>07° 35' 120" E | U           | U     | X*   | Sighted from RV Pelagos | TRI                                |
| <i>As above</i>                                                                                                                          | U   | 1   | 06/08/2009 | Ligurian Sea<br>42° 44' 315" N<br>08° 39' 160" E | U           | U     | X**  | Sighted from RV Pelagos | TRI                                |
| <i>As above</i> (newborn)                                                                                                                | U   | 1   | 30/7/09    | Gulf of Olbia, NE coast Sardinia                 | Ferry       | U     | D*   | Scientist               | Díaz López, B./BDRI                |
| *Healed wound, hypothesised collision; ** Half tail cut off (healed), hypothesised collision. Fate: the whale swam away (X), killed (D). |     |     |            |                                                  |             |       |      |                         |                                    |

#### 6.3.2 Fishery bycatch of large whales

NA.

## 7. STATISTICS FOR SMALL CETACEANS

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

NA.

### 7.2 Direct catches of small cetaceans for the calendar year 2008

NA.

### 7.3 Anthropogenic mortality of small cetaceans for the calendar year 2008

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

NA.

### 7.3.2 Fishery bycatch of small cetaceans

| Species                    | Ratio of male to female (if known) | No. | No. extrapolated to fleet total (point estimate) | Range, CI or CV | Date of bycatch | Location (description or lat/long) | FAO statistical area (if known) | FAO area      | Fate | Targeted species | Gear | How observed? | Source or contact                                                     |
|----------------------------|------------------------------------|-----|--------------------------------------------------|-----------------|-----------------|------------------------------------|---------------------------------|---------------|------|------------------|------|---------------|-----------------------------------------------------------------------|
| Common bottlenose dolphin  | -                                  | 0   | -                                                | -               | -               | Adriatic Sea and Sicily Channel    | GFCM GSA 16, 17                 | Mediterranean |      | Anchovy          | TBN  | M             | Fortuna/ISPRA DIP III CRA 15; Mazzola/CoNISMa; Sala/CNR-ISMAR, Ancona |
| Comments: TBN= Pair trawls |                                    |     |                                                  |                 |                 |                                    |                                 |               |      |                  |      |               |                                                                       |

**ISPRA, DIP III CRA 15; CoNISMa; CNR-ISMAR, Ancona:** In 2009, ISPRA CRA 15 led the coordinated national monitoring programme of cetacean bycatch in Italian pelagic trawlers (BYCATCH III), funded in compliance with the Regulation (EC) No.812/2004, in cooperation with CoNISMa and CNR-ISMAR, Ancona. Twelve independent observers monitored a total of 907 hauls, in Adriatic and Sicily Channel. No bycatch of bottlenose dolphins (*Tursiops truncatus*) was observed.

## 8. Strandings

| Species                    | No. strandings | No. post mortems | Contact person(s)/ Institute(s)                                                                                                                                                 | Contact email address(es)                                                                                                                                                                                                                                                          |
|----------------------------|----------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sperm whales               | 7              | 3                | Giovanni Di Guardo/University of Teramo, Faculty of Veterinary Medicine, Department of Comparative Biomedical Sciences<br>Sandro Mazzariol/SperiVet<br>Michela Podestà/MSNM/BDS | <a href="mailto:gdiguardo@unite.it">gdiguardo@unite.it</a><br><a href="http://www.mammiferimarini.sperivet.unipd.it/eng/index.htm">http://www.mammiferimarini.sperivet.unipd.it/eng/index.htm</a><br><a href="http://mammiferimarini.unipv.it">http://mammiferimarini.unipv.it</a> |
| Cuvier's beaked whale      | 2              | 2                | M. Wurtz / DIBIOGE<br>A.Moulins – CIMA RF Savona<br>BDS                                                                                                                         | <a href="mailto:Wurtz-ge@unige.it">Wurtz-ge@unige.it</a><br><a href="mailto:aurelie.moulins@cimafoundation.org">aurelie.moulins@cimafoundation.org</a><br><a href="http://mammiferimarini.unipv.it">http://mammiferimarini.unipv.it</a>                                            |
| Common bottlenose dolphins | 3              | 3                | Giovanni Di Guardo/University of Teramo, Faculty of Veterinary Medicine, Department of Comparative Biomedical Sciences                                                          | <a href="mailto:gdiguardo@unite.it">gdiguardo@unite.it</a>                                                                                                                                                                                                                         |
| As above                   | 1              | 1                | Cetus<br>BDS                                                                                                                                                                    | <a href="mailto:cetus@supereva.it">cetus@supereva.it</a><br><a href="http://mammiferimarini.unipv.it">http://mammiferimarini.unipv.it</a>                                                                                                                                          |
| As above                   | 6              | 5                | SperiVet<br>BDS                                                                                                                                                                 | <a href="http://www.mammiferimarini.sperivet.unipd.it/eng/index.htm">http://www.mammiferimarini.sperivet.unipd.it/eng/index.htm</a><br><a href="http://mammiferimarini.unipv.it">http://mammiferimarini.unipv.it</a>                                                               |
| As above                   | 2              | 2                | Francesca Magnone/ CRiMM onlus<br>Alberto Fozzi/CRiMM onlus                                                                                                                     | <a href="mailto:fra.magnone@crimm.org">fra.magnone@crimm.org</a><br><a href="mailto:a.fozzi@crimm.org">a.fozzi@crimm.org</a>                                                                                                                                                       |
| As above                   | 2              | 2                | M. Wurtz / DIBIOGE<br>A.Moulins /CIMA RF                                                                                                                                        | <a href="mailto:wurtz-ge@unige.it">wurtz-ge@unige.it</a><br><a href="mailto:aurelie.moulins@cimafoundation.org">aurelie.moulins@cimafoundation.org</a>                                                                                                                             |
| As above                   | 18             | 9                | BDS                                                                                                                                                                             | <a href="http://mammiferimarini.unipv.it">http://mammiferimarini.unipv.it</a>                                                                                                                                                                                                      |
| Striped dolphins           | 7              | 7                | Giovanni Di Guardo/University of Teramo, Faculty of Veterinary Medicine, Department of Comparative Biomedical Sciences                                                          | <a href="mailto:gdiguardo@unite.it">gdiguardo@unite.it</a>                                                                                                                                                                                                                         |
| As above                   | 9              | 3                | SperiVet<br>BDS                                                                                                                                                                 | <a href="http://www.mammiferimarini.sperivet.unipd.it/eng/index.htm">http://www.mammiferimarini.sperivet.unipd.it/eng/index.htm</a><br><a href="http://mammiferimarini.unipv.it">http://mammiferimarini.unipv.it</a>                                                               |
| As above                   | 1              | 1                | Cetus<br>BDS                                                                                                                                                                    | <a href="mailto:cetus@supereva.it">cetus@supereva.it</a><br><a href="http://mammiferimarini.unipv.it">http://mammiferimarini.unipv.it</a>                                                                                                                                          |
| As above                   | 4              | 4                | Francesca Magnone/ CRiMM onlus<br>Alberto Fozzi/CRiMM onlus                                                                                                                     | <a href="mailto:fra.magnone@crimm.org">fra.magnone@crimm.org</a><br><a href="mailto:a.fozzi@crimm.org">a.fozzi@crimm.org</a>                                                                                                                                                       |
| As above                   | 1              | 1                | M. Wurtz / DIBIOGE<br>A.Moulins /CIMA RF<br>BDS                                                                                                                                 | <a href="mailto:Wurtz-ge@unige.it">Wurtz-ge@unige.it</a><br><a href="mailto:aurelie.moulins@cimafoundation.org">aurelie.moulins@cimafoundation.org</a><br><a href="http://mammiferimarini.unipv.it">http://mammiferimarini.unipv.it</a>                                            |
| As above                   | 8              | 0                | BDS                                                                                                                                                                             | <a href="http://mammiferimarini.unipv.it">http://mammiferimarini.unipv.it</a>                                                                                                                                                                                                      |
| Undetermined               | 11             | 0                | BDS                                                                                                                                                                             | <a href="http://mammiferimarini.unipv.it">http://mammiferimarini.unipv.it</a>                                                                                                                                                                                                      |

**ARPAT:** the Marine Sector of ARPAT thanks to its projects (Marine Coastal Monitoring, Monitoring of Large Elasmobranchs Monitoring, Biodiversity Monitoring, Marine Vertebrate Monitoring, Demersal Resources Monitoring) carried on all over the year, collects informations also about cetaceans and takes part directly during the stranding cases along all the tuscan coasts, in some cases coordinating the operation of recovering dead or alive animals. During 2009 we recorded 15 cases of stranding of 15 animals: 10 Striped dolphin, 3 Bottlenose dolphin and 2 indetermined delphinidae. Among these, 14 were dead and 1 striped dolphins was alive and was kept alive for four days. All the informations regarding these strandings have been transmitted to the national stranding database (BDS) of University of Pavia.

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

- public access to view generic data such as date, species, geographical location on google map and bibliographic reference if available.
- controlled access for registered users that can access all recorded information such as causes of stranding, conditions of stranded animals, catalog of biological material sampled from animals, results of necroscopy, and photographic documents.

The database is linked to the Cetacean Tissue Bank (<http://www.mammiferimarini.sperivet.unipd.it>) of the University of Padova, where samples collected from the stranded specimens are stored since 2005.

**CE.TU.S.:** the centre collects informations and takes part directly during the stranding cases inside the area of jurisdiction (North Tuscany from the bound with Liguria to Pisa). During the 2009 we recorded 2 cases of stranding of dead dolphins: 1 Striped dolphin and 1 Bottlenose dolphin. All the informations regarding the stranding cases are always transmitted to the national stranding database.

**CRiMM:** 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 2009 there were 6 cases of stranding of dead dolphins: 2 Common bottlenose dolphin and 4 Striped dolphin (two of this cases werw about live stranding Striped dolphin, died later).

**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>. Data in the period 1986-2005 have been given to the Mediterranean stranding database (MEDACES). Data regarding strandings that occurred along the coasts of Italy during the year 2009 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).

**UNIPD:** Personnel from the Mediterranean Marine Mammals Tissue Bank and the Necropsy Unit are frequently called to perform post-mortem examinations on small cetaceans stranded along the Northern coasts of Italy and on many large cetaceans found all over Italy.

## 9. OTHER STUDIES AND ANALYSES

### BDRI:

- ***Effects of prey abundance on dolphins behaviour.*** This study represents some insights into understanding free ranging wild bottlenose dolphins' feeding behaviour. Dolphins may change hunting tactics as prey abundance change but how rapidly this occurs is unclear. However, they do not appear to concurrently modify their dive duration, and likely the time spent searching for prey. When top predators display behavioural responses to activities not directed at them, the task of studying all possible effects of human activities can become even more challenging. Further work should focus on elucidating how different levels of food intake induce social and behavioural changes in marine top predators (Díaz López B., 2009).

- **Mediterranean Common bottlenose dolphin's repertoire and communication use.** Bottlenose dolphins are an extremely vocal mammalian species and vocal communication plays an important role in mediating social interactions. This studies carried out year round represent the first attempt in the Mediterranean basin to outline the repertoire, production rates of social sounds, and associated behavior of Mediterranean bottlenose dolphins. (Díaz López B. & Shirai, J.A.B., 2010)
- **Environmental and biological effects associated with the presence of aquaculture industry (onshore and offshore fish farms).** Notable increases in coastal aquaculture make it vital to study the environmental effects associated with their presence. BDRI's researchers have examined the effects of aquaculture on marine fauna in general, and more specifically, the impacts of aquaculture on dolphins in different marine fin fish farms off the coast of Sardinia, Italy.
- **Trial of acoustics deterrents for prevention of dolphin bycatch.** BDRI researchers observed that the use of pingers (acoustics deterrent devices) or AHD (acoustic deterrent devices) have not an effective mitigation in the dolphins mortality due to bycatch on gillnets and aquaculture. The Dinner Bell and Habituation factors must be taken into consideration in these studies.
- **Boat traffic effects on bottlenose dolphin behaviour.** Current BDRI's main study area of Aranci Bay, Sardinia, provides an unique insight into an area where the interactions of bottlenose dolphins and vessels remains largely unchecked. Our studies showed that the dolphins were surfacing less regularly in the presence of vessels and this response was further enhanced during vessel approaches. Moreover, by examining the influence of different types of vessel it was evident that the dolphins elicited a stronger response to tourist than fisheries vessels. The behaviour vessels display around the dolphins as well as speed, engine type and distance of approach were all factors that needed to be taken into consideration when analysing the changes observed.
- **Ecosystem models to address the impacts caused by the interaction between bottlenose dolphins and human activities (fisheries & aquaculture).** From these models, we study the strengths and weaknesses of using the EwE approach to support the design of policies aimed at implementing marine mammals' conservation.
- **Ecosystem effects evaluated through trophic mass-balance models.** Marine aquaculture is an important growing worldwide industry. According to FAO (1995), "the achievement of real marine ecosystem-based management of fisheries implies the regulation of the use of the living resources based on the understanding of the structure and dynamics of the ecosystem of which the resource is a part". This premise requires an improvement of our understanding of the structure of marine ecosystems, and the interactions between ecosystem compartments and their changes due to human and environmental factors. (Díaz López B., *in press.*)

**CIBRA:** CIBRA participated to the research cruise MED09 organized by Woods Hole Oceanographic Institution in cooperation with NATO Undersea Research Center and other institutions. Within the goals of the cruise, CIBRA managed the acoustic survey in the Alboran Sea, Balearic Islands and North Tyrrhenian Sea to map the presence of Cuvier's beaked whales, Sperm whales, Pilot whales and to record sounds from Striped, Common and Risso's dolphins. For the purpose, a new instrumentation package based on two parallel wideband towed arrays has been developed to support the tracking of diving beaked whales. The final report of the cruise (D'Amico et al., 2010) is available on the WHOI website <http://www.whoi.edu/page.do?pid=33519>. The equipment and data analysis protocols developed to detect beaked whales signals allowed to accurately map the presence of diving beaked whales and to assess the number of animals present in each detection spot (paper in preparation). Other cetacean species have been detected and extensively recorded to support the research on species-specific sound signatures. CIBRA also participates to the EEC Project LIDO (Listening Into Deep Ocean) to monitor cetaceans and noise with deep platforms.

In 2009 CIBRA organized the 4th "International Workshop on Detection, Classification and Localization of Marine Mammals Using Passive Acoustics" and the 1st "International Workshop on Density Estimation of Marine Mammals Using Passive Acoustics". Program and abstracts are available on <http://www.unipv.it/cibra/DCLWorkshop2009.html>.

**CNR-ISMAR, Ancona; ISPRA, DIP III CRA 15; CoNISMa:** Concerns about the conservation of marine turtles in the Mediterranean led to the development of different types of turtle bycatch reducer devices (TEDs) designed by CNR-ISMAR of Ancona for the Italian demersal trawl fisheries (Lucchetti and Sala, 2009; Sala et al., *submitted*). The experiments were carried out during the TARTANET project which was conducted with the financial supports from the European Commission and Italian Ministry through the LIFE project NATURE (2004-2008). The knowledge achieved by CNR-ISMAR was used to develop during the BYCATCH III project a *Supershooter* TED for the semi-pelagic fisheries (*volante* trawl, in Italian). The Supershooter was arranged on the extension piece of the *volante* trawl. Sea trials were carried out in the North Adriatic Sea during two cruises. This area for its shallow waters and rich benthic communities is considered as one of the most important feeding habitat for both turtles and dolphins in the whole Mediterranean (Margaritoulis, 1988; Argano et al., 1992; Lazar et al., 2000; Lazar et al. 2004; Lucchetti and Sala, 2009). During the cruises, TED opening was set first at the lower and then at the upper panel of the net. An additional cover was joined under the TED

opening in order to collect the escapees. No change in traditional fishing practices are necessary and no evident increase in drag or chain polish or twisting of the codend was detected in the net fitted with the TEDs. Our results demonstrate that TEDs can function effectively in the Mediterranean Sea, and can be used to selectively target commercial species both in a mixed demersal and pelagic fisheries. Results allowed concluding that TEDs could represent a suitable solution in semi-pelagic trawl fisheries only when properly matched to fishing conditions (i.e. TED angle, construction materials, floatation, position and size of the exit hole, webbing flap etc.). The introduction of Supershooter TED might reduce both turtle mortality by avoiding the multiple submergences of a turtle (Lucchetti and Sala, 2009). TEDs could also reduce the amount of discard in the codend catch leading to an improvement of fish quality and to a reduction of the sorting time. However, there might be a risk in increasing the losses of large commercial species.

**CSC:** During the year 2009, the Decreto Dirigenziale n. 98 dell'11/08/2009 “*Costituzione del Comitato di Coordinamento per L'attuazione del Protocollo di Intesa per gli Interventi in Caso di Cetacei e Tartarughe Spiaggiate*” was approved within the Region Campania. The CSC guidelines for the intervention on stranded animals are therefore approved and applied in this Region. During the year 2009 the CSC cooperated with the Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d'Aosta in the preparation of formation courses to be held in 2010 on the rescuing of stranded cetaceans within the activity of the Italian Ministry of Health. On 29-30 October 2009, the CSC organized at Pescara the 8<sup>th</sup> National Italian Conference on Cetacean and Sea Turtles. Proceedings of the conference are available for download at <http://www.centrostudicetacei.it>.

**ISPRA, DIP III CRA 15; LEM-UNIFI:** within the framework of the BYCATCH III programme – national cetacean bycatch programme coordinated by ISPRA (DIP III CRA 15/ Fortuna) - a specific study on the structure of the Adriatic population of bottlenose dolphin was funded. The LEM-UNIFI conducted genetic analyses of skin samples (n=103) collected from 1991 to 2009 in various part of the Adriatic, from alive and stranded specimens. The study aims at defining the population status of *Tursiops truncatus* in the Adriatic Sea, assessing genetic variability and population genetic structure, using nuclear and mitochondrial DNA. The study aims to define whether bottlenose dolphins in the Adriatic Sea belong to a single population or are genetically differentiate as a result of habitat characteristics. This project is carried out in collaboration with several research teams (Mediterranean Marine Mammals Tissue Bank – University of Padova, Italy; Archeturtle – Ferrara, Italy; Blue World Institute (BWI) – Croatia; Tethys Research Institute – Milan, Italy; Fondazione Cetacea – Riccione, Italy; Department of Environmental Sciences - University of Siena, Italy).

**ISPRA-NAT-BIO; ALav; DIBIO GE; UniPi DIBIO; CIMA:** Compared to 20 years ago, results in central Tyrrhenian sea showed a remarkable increase in ER of Fin whale (more than 200%,  $P < 0,0001$ ), while ER of the other commonly sighted species (Striped dolphin, Common bottlenose dolphin, Cuvier's beaked whale) showed no statistical significant difference. Moreover, results showed a significant change in Fin whale distribution, more uniform during '90s and with a new hot spot observed in 2009 (as well as in 2007 and 2008) between 20 and 50 NM east of Sardinia. Results of the synoptic monitoring showed a different distribution of species along the areas, with max presence of Striped dolphin in the french part of the Pèlagos Sanctuary, Common bottlenose dolphin in the large continental shelf of Tuscany and two high density areas of Fin whale occurrence in the french part of Pelagos Sanctuary and in central western Tyrrhenian sea. The latter is outside the Pelagos Sanctuary and in an area that lacks of any protection.

**MSNM:** participated to a research cruise “MED09” organized by Woods Hole Oceanographic Institution (USA), in cooperation with NATO Undersea Research Center and other institutions, in the Alboran and Tyrrhenian Sea. Among the primary objectives were tracking of several cetacean species, monitoring of ambient noise in areas of variable human interaction, and environmental measurements to support habitat modelling. The final report of the cruise (D'Amico et al., 2010) is available on the WHOI website <http://www.whoi.edu/page.do?pid=33519>.

## 10. LITERATURE CITED

AA.VV., 2008. L'osservatorio Toscano dei cetacei. Primo report aprile 2007 maggio 2008, 18pp.

AA.VV., 2007. L'osservatorio Toscano dei cetacei. Delibera di Giunta del 10 aprile 2007, 24pp.

Argano, R., Basso, R., Cocco, M., Gerosa, G., 1992. New data on loggerhead (*Caretta caretta*) movements within Mediterranean. *Bollettino Museo Istituto Biologia Università di Genova* 56–57: 137–163.

Azzellino A., Airoidi S., Lanfredi C. Gaspari S. 2008a. Biological consequences of global warming: does sea surface temperature affect cetacean distribution in the western Ligurian Sea? *Journal of the Marine Biological Association of the United Kingdom* 88(6):1145-1152.

Azzellino A., Gaspari S., Airoidi S., B. Nani. 2008b. Habitat use and preferences of cetaceans along the continental slope and the adjacent pelagic waters in the Western Ligurian Sea. *Deep Sea Research Part I* 55:229-323.



- Bearzi G., Agazzi S., Bonizzoni S., Costa M., Azzellino A. 2008a. Dolphins in a bottle: abundance, residency patterns and conservation of bottlenose dolphins *Tursiops truncatus* in the semi-closed eutrophic Amvrakikos Gulf, Greece. *Aquatic Conservation: Marine and Freshwater Ecosystems* 18(2):130-14.
- Bearzi G., Agazzi S., Gonzalvo J., Bonizzoni S., Costa M., Petroselli A. *In press*. Biomass removal by dolphins and fisheries in a Mediterranean Sea coastal area: do dolphins have an ecological impact on fisheries? *Aquatic Conservation: Marine and Freshwater Ecosystems*. DOI: 10.1002/aqc.1123
- Bearzi G., Agazzi S., Gonzalvo J., Costa M., Bonizzoni S., Politi E., Piroddi C., Reeves R.R. 2008b. Overfishing and the disappearance of short-beaked common dolphins from western Greece. *Endangered Species Research* 5:1-12.
- Bearzi G., Politi E., Agazzi S., Bruno S., Costa M., Bonizzoni S. 2005. Occurrence and present status of coastal dolphins (*Delphinus delphis* and *Tursiops truncatus*) in the eastern Ionian Sea. *Aquatic Conservation: Marine and Freshwater Ecosystems* 15:243-257.
- Cannari, R., Manca Zeichen, M., Lauriano, G. Monitoring cetaceans in the pelagos Sanctuary. European Cetacean Society 2010.
- D'Amico A., L. Southall B.L., Tyack P., 2010. MED-09 Final Cruise Report. Available at <http://www.whoi.edu/page.do?pid=33519>.
- Díaz López B. & Shirai, J.A.B., 2010. Mediterranean common bottlenose dolphin's repertoire and communication use. In: Dolphins: Anatomy, Behavior, and Threats, A.G: Pierce & L. Correa (Eds.), Nova Science Publishers, New York.
- Díaz López B., 2009. The bottlenose dolphin *Tursiops truncatus* foraging around a fish farm: Effects of prey abundance on dolphins' behaviour. *Current Zoology (Acta Zoologica Sinica)* 55(4):243-248.
- Díaz López B., *in press*. Aquaculture systems. In: *Handbook of Models used in Ecosystem and Environmental Management*, Sven Erik Jørgensen (Ed.), Copenhagen University, Denmark.
- Engelhaupt D.A., Hoelzel R., Nicholson C., Frantzis A., Mesnick S., Gero S., Whitehead H., Rendell L., Miller P., De Stefanis R., Canadas A., Airoidi S., Mignucci-Giannoni A.A. 2009. Female philopatry in coastal basins and male dispersion across the North Atlantic in a highly mobile marine species, the sperm whale (*Physeter macrocephalus*). *Molecular Ecology* 18:4193-4205.
- Fossi M.C., Casini S., Marsili L. 1999. Nondestructive biomarkers of exposure to endocrine-disrupting chemicals in endangered species of wildlife. *Chemosphere*, 39(8): 1273-1285.
- Fossi M.C., Marsili L. 1997. The use of nondestructive biomarkers in the study of marine mammals. *Biomarkers*, 2: 205-216.
- Fossi M.C., Marsili L., Leonzio C., Notarbartolo di Sciara G., Zanardelli M., Focardi S. 1992. The use of non-destructive biomarker in Mediterranean cetaceans: preliminary data on MFO activity in skin biopsy. *Mar. Poll. Bull.*, 24(9): 459-461.
- Fossi M.C., Marsili L., Neri G., Natoli A., Politi E., Panigada S. 2003. The use of non-lethal tool for evaluating toxicological hazard of organochlorine contaminants in Mediterranean cetaceans: new data ten years after the first paper published in MPB. *Mar. Poll. Bull.*, 46(8): 972-982.
- Gaspari S., Airoidi S., Hoelzel A.R. 2007a. Risso's dolphins (*Grampus griseus*) in UK waters are differentiated from a population in the Mediterranean Sea and genetically less diverse. *Conservation Genetics* 8(3):727-732.
- Gaspari S., Azzellino A., Airoidi S., Hoelzel A.R. 2007b. Social kin associations and genetic structuring of striped dolphin populations (*Stenella coeruleoalba*) in the Mediterranean sea. *Molecular Ecology* 16(14):2922-2933.
- Lauriano, G. 2009. Censimento dei cetacei nell'area del santuario dei Mammiferi marini e identificazione di aree trofiche per la verifica di situazioni stazionarie o in trasformazione. Rapporto tecnico per il Ministero dell'ambiente, 65 pp.
- Lazar, B., Margaritoulis, D., Tvrtkovic, N., 2000. Migrations of the loggerhead sea turtle (*Caretta caretta*) into the Adriatic Sea. In: Proceedings of the Eighteenth International Symposium on Sea Turtle Biology and Conservation. 3-7 March 1998, Mazatlan, Mexico. NOAA Technical Memorandum NMFS-SEFSC, Miami.
- Lazar, B., Margaritoulis, D., Tvrtkovic, N., 2004. Tag recoveries of the Loggerhead sea turtle *Caretta caretta* in the eastern Adriatic Sea: implications for conservation. *J. Mar. Biol. Ass. UK* 84: 475-80.
- Lucchetti, A., Sala, A., 2009. An overview of loggerhead sea turtle (*Caretta caretta*) bycatch and technical mitigation measures in the Mediterranean Sea. *Rev. Fish. Biol. Fisheries*, DOI 10.1007/s11160-009-9126-1.

Margaritoulis, D., 1988. Post-nesting movements of loggerhead sea turtles tagged in Greece. *Rapports Et Proces-Verbaux Des Reunions Commission Internationale Pour L'exploration Scientifique De La Mer Mediterranee* 31: 284.

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

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

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

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

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

Panigada, S., Notarbartolo di Sciara, G., Zanardelli Panigada, M., Airolidi, S., Borsani J.F., Jahoda, M. 2005. Fin whales summering in the Ligurian Sea: distribution, encounter rate, mean group size and relation to physiographic variables. *Journal of Cetacean Research and Management* 7(2):137-145.

Panigada, S., Notarbartolo di Sciara, G., Zanardelli Panigada, M. 2006. Fin whales summering in the Pelagos Sanctuary (Mediterranean Sea): overview of studies on habitat use. *Chemistry and Ecology* 22 (Supplement 1):255-263.

Panigada, S., Zanardelli, M., MacKenzie, M., Donovan, C., Mélin, F., Hammond, P.S. 2008. Modelling habitat preferences for fin whales and striped dolphins in the Pelagos Sanctuary (Western Mediterranean Sea) with physiographic and remote sensing variables. *Remote Sensing of the Environment* 112:3400-3412.

## 11. PUBLICATIONS

### 11.1 Published or 'In Press' papers only

Abdulla A., Gomei M., Hyrenbach D., Notarbartolo di Sciara G., Agardy T. 2009. Challenges facing a network of representative marine protected areas in the Mediterranean: prioritizing the protection of underrepresented habitats. *ICES Journal of Marine Science* 66(1):22-28.

Aïssi M., Daly Yahia MN 2010. Partitioning of the northern Tunisian coasts into hotspots of cetacean distribution. *Rapp Comm int Mer Médit* 39:

Arcangeli, A., Crosti, R. 2009. The short-term impact of dolphin-watching on the behaviour of bottlenose dolphins (*Tursiops truncatus*) in Western Australia. *The Journal of Marine Animals and Their Ecology* 2(1): 3-9

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

Bearzi G. 2009. Delfini e pesca: interazioni trofiche e depredazione in aree marine costiere del Mediterraneo. *Thalassia Salentina* 32:5-11.

Bearzi G., Agazzi S., Gonzalvo J., Bonizzoni S., Costa M., Petroselli A. *In press*. Biomass removal by dolphins and fisheries in a Mediterranean Sea coastal area: do dolphins have an ecological impact on fisheries? *Aquatic Conservation: Marine and Freshwater Ecosystems*. DOI: 10.1002/aqc.1123

Bearzi G., Costa M., Politi E., Agazzi S., Pierantonio N., Tonini D., Bastianini M. 2009. Cetacean records and encounter rates in the northern Adriatic Sea during the years 1988-2007. *Annales Series Historia Naturalis* 19(2):145-150.

Bearzi G., Fortuna C.M., Reeves R.R. 2009. Ecology and conservation of common bottlenose dolphins *Tursiops truncatus* in the Mediterranean Sea. *Mammal Review* 39(2):92-123.

Cozzi B., Mazzariol S., Podesta` M. and Zotti A, 2009. Diving Adaptations of the Cetacean Skeleton. *The Open Zoology Journal*, 2: 24-32.

Di Guardo, G., Proietto, U., Di Francesco, C.E., Marsilio, F., Zaccaroni, A., Scaravelli, D., Mignone, W., Garibaldi, F., Kennedy, S., Forster, F., Iulini, B., Bozzetta, E. and Casalone, C. 2009. Cerebral toxoplasmosis in striped dolphins (*Stenella coeruleoalba*) stranded along the Ligurian Sea coast of Italy. *Vet. Pathol.* (Veterinary Pathology OnlineFirst, published on December 31, 2009 as doi:10.1177/0300985809358036).

Díaz López B. & Shirai, J.A.B., 2010. Mediterranean common bottlenose dolphin's repertoire and communication use. In: *Dolphins: Anatomy, Behavior, and Threats*, A.G. Pierce & L. Correa (Eds.), Nova Science Publishers, New York.

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

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

Engelhaupt D., Hoelzel R.A., Nicholson C., Frantzis A., Mesnick S., Gero S., Whitehead H., Rendell L., Miller P., de Stefanis R., Canadas A., Airolidi S., Mignucci-Giannoni A.A. 2009. Female philopatry in coastal basins and male dispersion across the North Atlantic in a highly mobile marine species, the sperm whale (*Physeter macrocephalus*). *Molecular Ecology* 18:4193-4205.

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

Fossi M.C., Urban J., Casini S., Maltese S., Spinsanti G., Panti C., Porcelloni S., Panigada S., Lauriano G., Niño-Torres C., Rojas-Bracho L., Jimenez B., Muñoz-Arnanz J., Marsili L. In press. A multi-trial diagnostic tool in fin whale (*Balaenoptera physalus*) skin biopsies of the Pelagos Sanctuary (Mediterranean Sea) and the Gulf of California (Mexico). *Marine Environmental Research*.

Genov, T., Wiemann, A., Fortuna, C.M. 2009. Towards identification of the bottlenose dolphin (*Tursiops truncatus*) population structure in the North-eastern Adriatic Sea: preliminary results. *Varstvo narave* 22:73–80.

Lauriano, G. Caramanna, L., Scarnò, M. and Andaloro, F. 2009. An overview of dolphin depredation in Italian artisanal fisheries. *J. Mar. Biol. Ass. U.K.* (doi:10.1017/S0025315409000393)

Lauriano, G., Panigada, S., Canneri, R., Manca Zeichen, M and G. Notarbartolo di Sciara. In press. Abundance estimate of striped dolphins (*Stenella coeruleoalba*) in the Pelagos Sanctuary (NW Mediterranean Sea) by means of line transect survey. *J. Cetacean Res. Manage.*

Piroddi C., Bearzi G., Christensen V. In press. Effects of local fisheries and ocean productivity on the northeastern Ionian Sea ecosystem. *Ecological Modelling*. DOI:10.1016/j.ecolmodel.2010.03.002

Rako, N., Holcer, D., Fortuna, C.M. 2009. Long-term inshore observation of a solitary striped dolphin, *Stenella coeruleoalba*, in the Vinodol Channel, Northern Adriatic Sea (Croatia). *Natura Croatica*, 18(2):427-436.

Riccobene G. and NEMO Collaboration. 2009. Long-term measurements of acoustic background noise in very deep sea. *Nucl. Instr. and Meth. A*. 604 (2009) S149-S157.

Sala, A., Lucchetti, A., Affronte, M., submitted. Effects of Turtle Excluder Devices (TEDs) on bycatch and discards reduction in the demersal fisheries of Mediterranean Sea. *Fisheries Research*.

Van Bressem, M.-F., Raga, J.-A., Di Guardo, G., Jepson, P.D., Duignan, P., Siebert, U., Barrett, T., De Oliveira Santos, M.C., Moreno, I.B., Siciliano, S., Aguilar, A. and Van Waerebeek, K. 2009. Emerging infectious diseases in cetaceans worldwide and the possible role of environmental stressors. *Dis. Aquat. Org.* 86:143-57 (doi: 10.3354/dao02101).

Zotti, A., Poggi, R., Cozzi, B. 2009. Exceptional bone density DXA values of the rostrum of a deep-diving marine mammal: a new technical insight in the adaptation of bone to aquatic life. *Skeletal Radiol.* 38: 1123-5.

## 11.2 Unpublished literature

Aïssi M, Daly Yahia MN 2009. Is the bay of Bizerte a school ground for juvenile bottlenose dolphin to learn hunting techniques? In Proceedings of the first biennale conference on cetacean conservation in southern Mediterranean, October 1st – 4th 2009, Tabarka, Tunisia. p27.

Alessi J., Rosso M., 2009. Heterogeneity from natural marks in bottlenose dolphin (*Tursiops truncatus*). Proceedings of the 23rd Annual Conference of the European Cetacean Society. 2-4 March, Istanbul, Turkey.

Arcangeli A, Muzi E, Tepsich P, S. Carcassi, A. Castelli, R. Crosti, M. Di Vincenzo, C. Magliozzi, L. Marini, A. Poggi, A. Poldi, M. Pulcini, S. Ricci, C. Safontas, S. Sdringola & E. Ukmar 2010. Large scale cetacean monitoring from passenger ferries in Italy, networking summer 2008 surveys. European Research on Cetaceans 23 G.J. Pierce (in press).

- Arcangeli A., Crosti R., Marini L., Poggi A., Poldi A., Pulcini M., Ukmar E. 2009. Monitoring cetacean populations over 15 years in Central Tyrrhenian Sea using a non-dedicated ferry as a observation platform. European Research on Cetacean 22 G.J. Pierce, E. Philips & R. Lick
- Arcangeli A., Marini L. 2010. Riding ferries from XX to XXI century: results from a long term monitoring program in the Central Tyrrhenian Sea. 24th ECS Conference - Stralsund 2010.
- Arcangeli A., Muzi E., Tepsich P., Carcassi S., Castelli A., Crosti R., Di Vincenzo M., Magliozzi C., Marini L., Poggi A., Poldi A., Pulcini M., Ricci S., Safontas C., Sdringola S., Ukmar E. 2009. Reti di monitoraggio cetacei in Italia con l'uso dei traghetti di linea come piattaforma di opportunità. 8° Convegno Nazionale sui Cetacei e sulle Tartarughe - Pescara, October 2009.
- Arcangeli A., Tepsich P.2, Campana I., Carcassi S., Crosti R., Luperini C., Morgana S., Muzi E., Ruvoilo A., Tassara L. 2010. Large scale monitoring in the North western Mediterranean Sea - results of two years of research using fixed transect surveys. 24th ECS Conference - Stralsund 2010.
- Arcangeli A., Muzi E., Tepsich P., Carcassi S., Castelli A., Crosti R., Di Vincenzo M., Magliozzi C., Marini L., Poggi A., Poldi A., Pulcini M., Ricci S., Safontas C., Sdringola S. & Ukmar E., 2009. Large scale cetacean monitoring from passenger ferries in Italy. Networking summer 2008 surveys. Proceedings of the 23rd Annual Conference of the European Cetacean Society. 2-4 March, Istanbul, Turkey.
- Arrigoni M., Panigada S., Manfredi P., Santangelo G., Bramanti L. 2009. Demography of Mediterranean fin whale. 18th Biennial Conference on the Biology of Marine Mammals, Quebec City, Canada, 12-16 October 2009.
- Biello, M. 2009. Relazione tra inquinamento acustico e produzione sonora del tursiope nella costa nororientale della Sardegna. Thesis project in Biology. University of Bologna, Italy.
- Bottaro, M., Fortuna, C.M., Vallini, C., Filidei jr, E., Ruffino, M., Di Muccio, S., Consalvo, I., Gion, C., Giovanardi, O., Mostarda, E., Tarulli, E., Scacco, U., Mazzola, A. 2009. A conservation and management chance for elasmobranchs in the Italian waters: first results from monitoring of cetacean by-catch in the Adriatic Sea. 13th European Elasmobranch Association Conference, 19th-22nd November 2009, Palma de Mallorca, Spain.
- Bräger, S., K. Brensing, R. Caddell, K. C. Detloff, S. Dolman, P. Evans, V. Frank, J. Haelters, R. Kless, K. Lucke, L. Nunny, G. Pavan, M. Simmonds (Convenor), H. Westerberg, 2009. Report of the Intersessional Working Group on the Assessment of Acoustic Disturbance. ASCOBANS.
- Carnabuci M., Fossa F., Gnone G., Longo A., Bellingeri M. and Nuti S. 2009. Association patterns and habitat use of a bottlenose dolphin (*Tursiops truncatus*) population in the Western Ligurian Sea. Proceedings of the 23rd Annual Conference of the European Cetacean Society, 2-4 March 2009, Istanbul, Turkey.
- Casas, C. 2009. Informe de práctica profesional en biología. University Zulia, Maracaibo, Venezuela.
- Cozzi, B., Giurisato, M., Notarbartolo di Sciarra, G. and Mazzariol, S., 2009. Conservation of the cetacean specimens: a tool to monitor the health of the Mediterranean Sea. International Symposium of the Environmental Specimen Bank. 3 - 5 December, Matsuyama, Japan [Oral Presentation]
- Cseke, S. 2009. Characteristics of Whistles from Resident Bottlenose Dolphins (*Tursiops truncatus*) in northeast Sardinia, Italy. Student Research Project, University of Bremen, Germany.
- D'Amico A., L. Southall B.L., Tyack P., 2010. MED09 Final Cruise Report. Available at <http://www.whoi.edu/page.do?pid=33519>
- Di Francesco, C.E., Di Guardo, G., Proietto, U., Mignone, W., Casalone, C. and Marsilio, F. 2009. Effetti della temperatura sulla stabilità anticorpale in sieri di stenella striata (*Stenella coeruleoalba*) positivi per Morbillivirus. Paper presented at the VIII Convegno Nazionale sui Cetacei e sulle Tartarughe, Pescara, Italy, October 2009. 2pp.
- Di Guardo, G. 2009. Morbillivirus e mammiferi acquatici: Progressi, incertezze e storie inattese. Paper (Invited Lecture) presented at the VIII Convegno Nazionale sui Cetacei e sulle Tartarughe, Pescara, Italy, October 2009. 2pp.
- Di Guardo, G., Di Francesco, C.E., Proietto, U., Marsilio, F., Baffoni, M., Mignone, W., Casalone, C., Garibaldi, F., Forster, F. and Kennedy, S. 2009. Laboratory diagnosis of *Morbillivirus* and *Toxoplasma spp.* infections in stranded dolphins. Paper presented at the 23rd Conference of the European Cetacean Society (ECS), Istanbul, Turkey, March 2009. 1p.
- Di Guardo, G., Proietto, U., Di Francesco, C.E., Marsilio, F., Marruchella, G., Zucca, P., Casalone, C., Mignone, W., Fossi, M.C., Marsili, L., Mazzariol, S., Cozzi, B., Agrimi, U., Forster, F. and Kennedy, S. 2009. Le epidemie da Morbillivirus nei mammiferi acquatici, con particolare riferimento a quelle del 1990-1992 e del 2006-2007

- nel Mar Mediterraneo. Paper presented at the III Workshop Nazionale di Virologia Veterinaria, Bari, Italy, June 2009. 2pp.
- Fabiano, F. 2009. Fotoidentificazione del tursiope nel Golfo di Alghero, Sardegna. Master's degree Thesis in Biology, University of Sassari, Sardinia, Italy.
- Fortuna, C.M. 2009. Report for Italy under Council Regulation (EC) 812/2004 - Year 2008. Technical report prepared for the Ministero delle politiche agricole, alimentari e forestali, 9 pages.
- Fortuna, C.M., Vallini, C., Filidei jr., E., Gaspari, S., Ruffino, M., Strippoli, G., Giovanardi, O., Mazzola, A. 2009. Relazione Finale del Progetto “Avvio in Italia di un programma di monitoraggio delle catture accidentali di cetacei durante le operazioni di pesca degli strascichi pelagici (BYCATCH II)”. Final report of the BYCATCH II project funded Ministero delle politiche agricole, alimentari e forestali, 45 pages + annexes.
- Fossi M.C. Urban J., Casini S., Maltese S., Spinsanti G., Panti C., Porcelloni S., Panigada S., Lauriano G., Nino-Torres C.A., Rojas-Bracho L., Jimenez, B., Muñoz, J. Marsili L. 2009 biomarker responses and contaminant levels in fin whale (*Balaenoptera physalus*) skin biopsies of the Pelagos sanctuary (Mediterranean Sea) and of the Gulf of California (Mexico). SC/61/E17, 61th IWC Scientific Committee, Madeira (Portugal).
- Fossi, M.C., Holcer, D., Maltese S., Fortuna C., Wiemann, A., Canese, S., De Stephanis, R., Mackelworth P., Marsili, L. 2009. Preliminary results of organochlorines levels and biomarker responses in skin biopsies of the common bottlenose dolphins from the adriatic sea (Mediterranean Sea). SC/61/E18, 61th IWC Scientific Committee, Madeira (Portugal).
- Fozzi A., Magnone, F., Falconi R., Picollo V., Fozzi R., De Lazzari A., Trainito E., Navone A., (in press) - “Present Status of Common Bottlenose Dolphin (*Tursiops truncatus*)” along the Northeastern coast of Sardinia (ITALY) after nine years of field-research...what future?”. Abstract ECS 24th Conference, 22nd - 24th of March 2010, Stralsund, Germany.
- Gitter S.J., Panigada S., Airoidi S., Thomas J. 2009. Whistle repertoire and geographic variation of striped dolphins (*Stenella coeruleoalba*) in the Pelagos Sanctuary (Mediterranean Sea). 18th Biennial Conference on the Biology of Marine Mammals, Quebec City, Canada, 12-16 October 2009.
- Giurisato, M., Marcer, F., Mazzariol, S. and Cozzi, B. 2009 . The mediterranean Marine Mammal Tissue Bank of the University of Padova (Italy). SETAC Europe: 19th Annual Meeting. 31 May – 4 June, Goteborg. [Poster corner]
- Holcer, D., Nimak, M., Pleslić, G., Jovanović, J., Fortuna, C.M. 2009. Survey of bottlenose dolphins (*Tursiops truncatus*) in the area of Lastovo Island, Adriatic sea. Book of Abstracts 10 Croatian Biological Congress, Croatian Biological Society, Osijek, 14-20. September 2009.
- Klayn, S. 2009. Bottlenose dolphin presence and use of habitat along the north-eastern coast of Sardinia. Science Thesis. University of Brest, France.
- Lamoni L., Acosta Plata M., Jensen S.K., Tepsich P. and Moulin A., 2009. Ecology of sperm whale in a north Atlantic feeding ground off Norway. Proceedings of the 23rd Annual Conference of the European Cetacean Society. 2-4 March, Istanbul, Turkey.
- Lucchetti, A., Sala, A., Affronte, M., 2008. Turtle Excluder Devices Experiments in the Central Adriatic Sea. Report of the ICES Fisheries Technology Committee Working Group on Fishing Technology and Fish Behaviour, Tórshavn (Faroe Islands), ICES CM 2008/FTC:02 Ref. WGECO: 265 pp.
- Lucchetti, A., Sala, A., 2008. Loggerhead Turtle (*Caretta caretta*) bycatch, case study: Mediterranean Sea. Report of the ICES Fisheries Technology Committee Working Group on Fishing Technology and Fish Behaviour, Tórshavn (Faroe Islands), ICES CM 2008/FTC:02 Ref. WGECO: 265 pp.
- Mackelworth, P., Holcer D., Jovanović J., Fortuna, C.M. 2009. Marine conservation and accession, the future for the Croatian Adriatic. International Marine Conservation Congress, Washington DC, US: ‘Marine Conservation and accession, the future for the Croatian Adriatic’, Washington, May 2009.
- Magnone, F., Fozzi, A. 2009. Centro Ricerca Mammiferi Marini - Relazione Attività 2009. Document, (OT)-(unpublished). 59 pp. [Available from CRiMM Onlus, pdf version.]
- Manghi M., La Manna, G. 2009 Passive acoustic monitoring of common bottlenose dolphin, using bottom recorders, in the Pelagie Islands (Strait of Sicily - Mediterranean Sea). 1st International Workshop on Density Estimation of Marine Mammals Using Passive Acoustics, Pavia 2009.
- Marsili L., Casini S., Carletti L., Maltese S., Porcelloni S., Nino-Torres C.A., Rojas-Bracho L., Urban J., Fossi M.C. 2009 Success in fibroblast cell cultures from long-beaked common dolphin (*Delphinus capensis*) and Bryde's whale (*Balaenoptera edeni*) skin biopsies of the Gulf of California (Mexico): potential application for ecotoxicological studies. SC/61/E13, 61th IWC Scientific Committee, Madeira (Portugal).

Mayol P., Fortuna C., Sturlese A., Beaubrun P. 2009. Guide pratique à l'usage des opérateurs de whale-watching dans le Sanctuaire Pelagos. Document réalisé dans le cadre de la collaboration PELAGOS (Sanctuaire pour les Mammifères marins) /ACCOBAMS (Accord sur la Conservation des Cétacés de la Mer Noire, de la Méditerranée et de la zone Atlantique adjacente). Souffleurs d'Ecume Ed. 26 pages.

Mignone, W., Tittarelli, C., Casalone, C., Pautasso, A., Iulini, B., Bozzetta, E., Vivaldi, B., Di Guardo, G., Proietto, U., Di Francesco, C.E., Marsilio, F., Zaccaroni, A., Scaravelli, D., Kennedy, S., Forster, F. and Garibaldi, F. 2009. Indagini anatomo-istopatologiche, microbiologiche, parassitologiche e tossicologiche in cetacei spiaggiati in provincia di Imperia (2007-2009). Paper presented at the VIII Convegno Nazionale sui Cetacei e sulle Tartarughe, Pescara, Italy, October 2009. 2pp.

Miller, S. 2009. Trial of an acoustic harassment device for prevention of bottlenose dolphin (*Tursiops truncatus*) bycatch. Thesis project in Marine Biology and Oceanography. University de Pierre et Marie Curie (Paris VI), Paris, France.

Muzi E, Arcangeli A, Castelli A., Crosti R. 2010. Yearly round monitoring of cetacean populations in the Northern Tyrrhenian Sea (Pelagos Sanctuary) using ferries as research platform. 24th ECS Conference - Stralsund 2010.

Nimak, M., Pleslić, G., Mackelworth, P., Rako, N., Fortuna, C.M., Holcer, D. 2009. Unusual occurrence of a solitary striped dolphin (*Stenella coeruleoalba*) in Mlaj Lošinj harbour, Croatia. Book of Abstracts 10 Croatian Biological Congress, Osijek, 14-20. September 2009. Croatian Biological Society.

Notarbartolo di Sciara G. 2009. Red Sea spinner dolphin resting habitat protected through tourism management. First International Conference on Marine Mammal Protected Areas, Maui, 30 March - 3 April 2009.

Notarbartolo di Sciara G. 2009. The Pelagos Sanctuary for Mediterranean marine mammals: lessons to be learned for Maritime Spatial Planning in the Mediterranean. Joint Research Centre Workshop on the key principles for MSP, Ispra. 23 April 2009.

Notarbartolo di Sciara G. 2009. The Pelagos Sanctuary for the conservation of Mediterranean marine mammals: an iconic High Seas MPA in dire straits. Document prepared for the 2nd International Conference on Progress in Marine Conservation in Europe 2009, 2-6 November 2009. OZEANEUM / DMMM, Stralsund, Germany.

Notarbartolo di Sciara G. 2009. The Pelagos Sanctuary hanging in the balance: beacon for Mediterranean protection or failed park? First International Conference on Marine Mammal Protected Areas, Maui, 30 March - 3 April 2009.

Nuti S., Bedocchi D., Giuntoli L.. "Distribuzione degli avvistamenti di cetacei nell'Arcipelago Toscano" Convegno Nazionale sui Cetacei e le Tartarughe Marine. Riccione 2009.

Panigada S., Gianni A., Notarbartolo di Sciara G., Lauriano G. 2009. Abundance of striped dolphins in the Pelagos Sanctuary: insights through line transect surveys. 23rd Annual Conference of the European Cetacean Society, Istanbul, Turkey, 2-4 March 2009.

Panigada S., Notarbartolo di Sciara G. 2009. Fin whale, *Balaenoptera physalus* (Mediterranean subpopulation). IUCN Red List of Threatened Species, Updated regional assessment - Mediterranean Sea. IUCN Centre for Mediterranean Cooperation, Malaga, Spain. 6 pp.

Panigada S., Tejedor A., Giangreco R., Lauriano G. 2009. Measures for minimizing the risks of collisions with cetaceans. International Maritime Organisation (IMO), MEPC 59, 13-17 July, London, U.K.

Panigada, S., Lauriano, G. Donovan, G. 2010. Monitoring winter and summer abundance of cetaceans in the Pelagos Sanctuary, the Strait of Sicily and the Tyrrhenian Sea through aerial surveys: a contribution to conservation and the future ACCOBAMS survey Document: SC6-Inf12 ACCOBAMS SC6 (available at [http://www.accobams.org/index.php?option=com\\_docman&task=cat\\_view&gid=39&Itemid=50](http://www.accobams.org/index.php?option=com_docman&task=cat_view&gid=39&Itemid=50))

Panin M., Cozzi B., Butti C., Podestà M., Zotti A., Giurisato M., 2009. Dual-energy x-ray absorptiometry analysis of the bone density distribution patterns in the rostrum of two families of Odontoceti cetaceans: a comparative study. 23<sup>rd</sup> Annual Conference European Cetacean Society, 2-4 March, Istanbul, Turkey.

Panin M., Zotti A., Mazzariol S., Di Giancamillo M., Podestà M., Giurisato M., Cozzi B., 2009. Bone density and force-bearing adaptations to diving in the skeleton of dolphins and beaked whales. 18th Biennial Conference on the Biology of Marine Mammals. 12-16 October 2009. Quebec City, Canada.

Pavan G., 2009. Bioacoustic research for nature conservation. Public Service Review: Science and Technology 4.

Pavan G., 2009. Book Review: The underwater sound and the marine mammal acoustic environment: a guide to fundamental principles. FINS 4 (2): 20

- Pavan G., Fossati C., Priano M., Manghi M., 2009. Acoustic detection of Cuvier's beaked whales (*Ziphius cavirostris*). In: Dolman S., McLeod C. & Evans P.G.H. (Eds.), 2009. Proceedings of the Workshop "Beaked Whale Research". ECS Special Publication Series n. 51. 21st Annual meeting of the European Cetacean Society, San Sebastian, Spain, 26th April 2007. Pag. 31-35
- Podesta M., D'Amico A., Pavan G., 2009. Beaked whale strandings in the Mediterranean Sea. In: Dolman S., McLeod C. & Evans P.G.H. (Eds.), 2009. Proceedings of the Workshop "Beaked Whale Research". ECS Special Publication Series n. 51. 21st Annual meeting of the European Cetacean Society, San Sebastian, Spain, 26th April 2007. Pag. 18-22.
- Podestà M., Pavan G., Bernuzzi E., 2009. The online Italian Stranding Database. 23° Annual Conference European Cetacean Society, 2-4 March, Istanbul, Turkey.
- Polo L., Di-Méglio N., David, L. and Rosso, M., 2009. First analysis of long term association of Risso's dolphin (*Grampus griseus*) population in the ligure – provençal basin and Gulf of Lion. Proceedings of the 23rd Annual Conference of the European Cetacean Society. 2-4 March, Istanbul, Turkey.
- Pulcini M., Fortuna C.M., La Manna G., Triossi F., Pace D.S. GIS spatial analysis as management tool to describe the habitat use of bottlenose dolphins in the Lampedusa waters (Italy): results from eleven years of observation. 24th Annual Conference of European Cetacean Society, Stralsund, Germany, 22-24 March 2010.
- Pulcini, M., Pace, D.S., La Manna, G., Triossi, F., Fortuna, C.M. 2009. Abundance estimates and residency of bottlenose dolphins in the Lampedusa area (Sicily, Italy) in eleven years of observation: implications for the management. 8° Convegno Nazionale sui Cetacei e sulle tartarughe, Pescara 20-30 Ottobre 2009.
- Rabino, S. 2009. Distribuzione del tursiope nella costa nordovest della Sardegna. Master's degree Thesis in Biology, University of Sassari, Sardinia, Italy.
- Rako, N., Holcer, D., Mackelworth, P., Fortuna, C.M. 2009. Visitor or invader? Recent occurrences of striped dolphin (*Stenella coeruleoalba*) in the Croatian part of the Adriatic sea. 2nd European Conference on Conservation Biology (ECCB), Prague 1-5 September 2009.
- Rosso M., Moulins A. & M. Wurtz, 2009. Population estimation size, residency pattern and site fidelity of Cuvier's beaked whale (*Ziphius cavirostris*) in the Genoa canyon, NW Mediterranean Sea. Proceedings of the 18th biennial conference on the biology of marine mammals, 12-16 October 2009, Quebec city, Canada [Oral].
- Scanga, V. 2009. Whistles characteristics of Sardinian bottlenose dolphins. Thesis project in Veterinary. University of Lyon, France.