



GRAND DAUPHIN  
Étude et Gestion  
en Méditerranée

01 & 02 December 2015  
Marseille

## International Workshop

Bottlenose dolphin conservation and monitoring  
in the North-Western Mediterranean Sea



Villa Méditerranée  
13002 Marseille  
FRANCE

Information: <http://www.gdegem.org>

Registration: [workshop@gis3m.org](mailto:workshop@gis3m.org)





## CONTENTS

<b>INTRODUCTION</b> .....	<b>4</b>
<b>ECOLOGY AND MONITORING</b> .....	<b>5</b>
<b>Díaz-López B.</b> The importance of behavioural research in bottlenose dolphin monitoring programs .....	<b>6</b>
<b>Hace A., Centrih T., Kotnjek P., Genov T.</b> Studies of bottlenose dolphins in the Gulf of Trieste (Northern Adriatic Sea).....	<b>7</b>
<b>Laran S., Lambert C., Blanck A., David L., Dorémus G., Pettex E., Van Canneyt O., Ridoux V.</b> New insight on bottlenose dolphin seasonal distribution in the NW Mediterranean Sea .....	<b>8</b>
<b>Marini C., Fossa F., Bellingeri M., Gnone G., Dhermain F., Nuti S., Airoidi S., Portunato N., Laran S., David L., Bonelli P., Trucchi R., Labach H., Santoni M.C., Vassallo P.</b> Predicting bottlenose dolphin ( <i>Tursiops truncatus</i> , Montagu, 1821) spatial distribution through random forest technique in Pelagos Sanctuary .....	<b>9</b>
<b>Ballardini M., Garibaldi F., Tittarelli C., Pautasso A., Iulini B., Pintore M.D., Giorda F., Grattarola C., Varello K., Durante S., Rosso M., Rossini I., Serracca L., Ercolini C., Riina M.V., Acutis P.L., Vivaldi B., Bozzetta E., Gorla M., Podestà M., Di Francesco C.E., Di Guardo G., Casalone C., Mignone W.</b> Results of post-mortem investigations on bottlenose dolphins ( <i>Tursiops truncatus</i> ) found stranded along the Ligurian coast of Italy (2010-2014) 10	
<b>Couet P., Besnard A., Gally F., Zanuttini C.</b> From identification to models: reassessment of usual methods for populations monitoring. The case of bottlenose dolphin ( <i>Tursiops truncatus</i> ) inhabiting the English Channel .....	<b>11</b>
<b>Nuti S., Salvioli F., Tozzi S.</b> Monitoring of the bottlenose dolphin <i>Tursiops truncatus</i> off Versilia coast (Italy, Tuscany): aspects of nonmigratory behaviour and residence time .....	<b>12</b>
<b>Round table summary and outputs</b> .....	<b>13</b>
<b>STRATEGIES OF CONSERVATION</b> .....	<b>14</b>
<b>Evans P.G.H.</b> Strategies of conservation .....	<b>15</b>
<b>David L., Salivas M., Descroix-Comanducci F.</b> Threats to bottlenose dolphin in the Mediterranean Sea, an attempt at the ACCOBAMS level .....	<b>16</b>
<b>Daniel B. &amp; Blanck A.</b> The approach of the French Marine Protected Area Agency for the bottlenose dolphin conservation .....	<b>17</b>



**Labach H., Barbier M., Jourdan J., David L., Daniel B.** Global bottlenose dolphin monitoring and conservation in the French Mediterranean MPA’s network ..... 18

**Bouchard B., Campagna S., Magnet L., Célérier A.** Marine mammal strandings: a unique opportunity to involve general public in their conservation ..... 19

**Round table summary and outputs** ..... 20

**MEASURES OF CONSERVATION** ..... 21

**Cañadas A.** Towards the conservation of bottlenose dolphins in the Mediterranean ..... 22

**Couvat J., Ratel M., Mayol P.** Reaching a “well” watching: the ACCOBAMS/Pelagos High Quality Whale-Watching® certification ..... 23

**Peirache M., Barcelo A., Jarin M.** MPA Management measures for cetaceans conservation ..... 24

**Round table summary and outputs** ..... 25

**NETWORKING** ..... 26

**Jedy de Grissac A.** Networking ..... 27

**Salivas M., Tasciotti A., Labach H., Montiglio C., Descroix-Commanducci F.**  
NETCCOBAMS: Network for the Conservation of Cetacean of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area ..... 28

**Gnone G., Bellingeri M., Labach H., Gimenez O., David L., Barbier M., Di-Meglio N., Jourdan J., Roul M., Azzinari C., Tomasi N., Robert N., Dhermain F., Cesarini C.** Intercet implementation in GDEGeM project ..... 29

**Mifsud C., Bonnici E., Cassar N., Grixti J., Sagarminagra R., Stevens D., Tabone M., Tejedor A., Metzger B.** Involvement of the Armed Forces of Malta (AFM), the Civil Protection Department (CPD), and local communities in cetacean research, monitoring and conservation in Maltese waters through networking..... 30

**Gimenez O., Labach H., David L., Barbier M., Di-Meglio N., Jourdan J., Roul M., Azzinari C., Tomasi N., Robert N., Dhermain F., Cesarini C., Gnone G., Bellingeri M.** A network for bottlenose dolphin photo-ID monitoring along the French Mediterranean coast. 31

**Round table summary and outputs** ..... 32

**CONCLUSION** ..... 33

**ANNEX - LIST OF THE PARTICIPANTS** ..... 34





## INTRODUCTION

In the framework of the GDEGeM project (Grand Dauphin Etude et Gestion en Méditerranée), the GIS3M (Groupement d'Intérêt Scientifique pour les Mammifères Marins de Méditerranée et leur Environnement), in partnership with the French Marine Protected Areas Agency, the WWF France, the ACCOBAMS and the Pelagos Sanctuary organized the international workshop "*Bottlenose dolphin conservation and monitoring in the North-Western Mediterranean Sea*" on the 1<sup>st</sup> and 2<sup>nd</sup> December 2015 in the Villa Méditerranée in Marseille. This Workshop has been proposed to many international and national scientists and experts working on cetaceans and especially on bottlenose dolphin but also to other persons manifesting an interest in protecting this species.

The workshop gathered 57 participants from France (44 participants), Italy (6 participants), Spain (3 participants), Monaco (1 participant), Malta (1 participant), Slovenia (1 participant) and United-Kingdom (1 participant). The list of the participants is reported in annex to this report.

Four thematics have been presented and discussed during this event through 16 talks, 4 poster presentations and round tables in the amphitheatre of the Villa Méditerranée: Ecology & Monitoring (4 talks, 3 posters), Strategies of conservation (4 talks, 1 poster), Measures of conservation (3 talks) and Networking (5 talks).

Because this workshop wouldn't have been possible without the help of many people, many thanks are particularly accorded to:

The guest speakers : Perter Evans, Ana Cañadas, Bruno Díaz-López and Alain Jeudy de Grissac for sharing their expertise and experience.

The Expert Committee: Hélène Labach (GIS3M), Boris Daniel (Agence des Aires Marines Protégées), Léa David (GIS3M, EcoOcéan Institut), Olivier Gimenez (GIS3M, CEFE CNRS), Pascal Mayol (GIS3M, Souffleurs d'Ecume), Denis Ody (GIS3M, WWF), Vincent Ridoux (Centre de Recherche sur les Mammifères Marins), Guido Gnone (Fondazione Acquario di Genova), Alain Barcelo (Parc naturel de Port-Cros).

The Organizing Committee: Hélène Labach, Susan Gallon, Boris Daniel, Léa David, Olivier Gimenez and Aurélie Tasciotti.

The GIS3M team: Maxime Barbier, Claire Bonneville and Céline Tardy.

The volunteers for their precious help during the event: Isabelle Labach and Pierre-Louis Stenger.

All the Villa Méditerranée teams for their generosity, help and supply of amphitheatre.



## ECOLOGY AND MONITORING





## **The importance of behavioural research in bottlenose dolphin monitoring programs.**

Bruno Díaz-López<sup>1</sup>

<sup>1</sup> Chief Biologist & Founder of the Bottlenose Dolphin Research Institute BDRI, Av. Beiramar 192, O Grove, Galicia, Spain. [www.thebdri.com](http://www.thebdri.com)

Monitoring changes in bottlenose dolphin communities and then identifying the causes for them forms the core of conservation research and are further integral components of the information needed to manage human impacts on dolphin populations. Mediterranean bottlenose dolphin populations are affected by man's use of coastal waters, particularly by fisheries activities and habitat modification. Therefore, a science-based response to the conservation problems created by interactions between human activities and dolphins depends critically on accurate knowledge of the impacts caused by the interactions. In the Mediterranean Sea, most interactions with human activities are believed to involve the common bottlenose dolphins that exploit this human activity as an energetically efficient food source. A number of case studies carried out by Bruno Díaz López and col. in NW Mediterranean waters since the 1990's have shown that the understanding of animal behaviour is aimed to solve problems in the field of conservation biology. This is done by understanding the proximate and ultimate causes of problems that arise. By using patterns in bottlenose dolphins' behaviour, researchers were successful in these conservation efforts. More importantly, ignorance of animal behaviour in conservation projects may lead to their failure. The association of bottlenose dolphins with artisan fisheries and aquaculture indicates the behavioural flexibility of these animals to capitalize on human activities. Not only are dolphins frequently coming into conflict with human activities, but humans can also induce environmental stress on animals. Humans can begin to mitigate these stresses by understanding behaviours, such as the impact tourists have on bottlenose dolphins. Even though these examples are from local study sites, it is possible to extrapolate to other areas in the NW Mediterranean Sea.



## Studies of bottlenose dolphins in the Gulf of Trieste (Northern Adriatic Sea)

Ana Hacı<sup>1</sup>, Tina Centrih<sup>1</sup>, Polona Kotnjek<sup>1</sup>, Tilen Genov<sup>1,2,3</sup>,

<sup>1</sup> Morigenos – Slovenian Marine Mammal Society, Piran, Slovenia

<sup>2</sup> Department of Biodiversity, University of Primorska, Koper, Slovenia

<sup>3</sup> Sea Mammal Research Unit, University of St Andrews, United Kingdom

This contribution summarises what is known about the status of the common bottlenose dolphin (*Tursiops truncatus*) occurring along the Slovenian coast and in the Gulf of Trieste (northern Adriatic Sea). This area is used year-round by a local population of bottlenose dolphins, which have been the focus of a continuous study and monitoring between 2002 and 2015, primarily through boat-based surveys and photo-identification. Mark-recapture models show that up to 150 animals use the study area on an annual basis. Social network analysis showed that the local population is structured into distinct social clusters that display differential behaviour in relation to fisheries, while both photo-identification and genetic data suggest that this local population is a distinct unit from other local populations in the Adriatic Sea. Calves are present in 54 % of the encountered groups. This, together with behavioural data, indicates that dolphins use these waters for all aspects of their lives, including feeding, resting, socializing and breeding. Interactions with fisheries, particularly trawlers, where dolphins feed in association with operating trawlers, are common, with 32 % of all dolphin encounters involving an interaction. No bycatch was recorded during such interactions, but has been recorded for trammel nets. Analysis of biopsy samples showed that polychlorinated biphenyl (PCB) levels are relatively high and appear to exceed the threshold levels believed to be toxic. In addition, summer recreational boat traffic was identified as one of the main pressures to the population. The available information shows that this population meets the site assessment criteria for the designation of Natura 2000 sites for dolphins in Slovenia. Despite this, no sites for bottlenose dolphins have been designated thus far.



## **New insight on bottlenose dolphin seasonal distribution in the NW Mediterranean Sea**

Sophie Laran<sup>1</sup>, Charlotte Lambert<sup>2</sup>, Aurélie Blanck<sup>3</sup>, Léa David<sup>4</sup>, Ghislain Dorémus<sup>1</sup>, Emeline Pettex, Olivier Van Canneyt<sup>1</sup> & Vincent Ridoux<sup>1,2</sup>

<sup>1</sup> Observatoire PELAGIS, UMS 3462 CNRS/Université de la Rochelle, 5 allées de l'océan, 17000 La Rochelle, France.

<sup>2</sup> UMR 7273- Station d'Ecologie Expérimentale de Chizé-La Rochelle, CNRS/Université de La Rochelle, 2 rue Olympe de Gouges, 17000 La Rochelle, France.

<sup>3</sup> Agence des Aires Marines Protégées, 44 bis quai de la douane, 29229 Brest cedex 2, France,

<sup>4</sup> EcoOcéan Institut, 18 rue des Hospices 34090 Montpellier, France

The bottlenose dolphin *Tursiops truncatus* is one of the most widely spread cetacean species of the Mediterranean. Often reported to be a coastal dwelling species in the northwestern Mediterranean Sea, it was recently shown to be genetically close to the pelagic ecotype of the Atlantic Ocean. On the other hand, previous study efforts were mostly devoted to coastal habitats in the summer season rather than pelagic habitats and winter conditions. The seasonal distribution of common bottlenose dolphin in the North-Western Mediterranean Sea was explored from two aerial surveys conducted in winter and summer 2011-2012. Both surveys were carried out over the entire French Exclusive Economic Zone, and extended across waters of neighbouring countries including the whole Pelagos Sanctuary. The winter survey revealed new pattern on the distribution of the species, with a larger proportion of oceanic sightings, compares to the well-known coastal behaviour of the species. Youngs were encountered in both seasons. Mean pod size increased slightly in the summer (4.7 CV=19% instead of 3.6 CV: 17% in winter). Maximum densities per bathymetric strata peaked to 0.07 individuals per km<sup>2</sup> (estimates corrected for availability bias) and was encountered in the Tyrrhenian Sea strata in winter, and in the Gulf of Lions in summer. Total corrected abundances of bottlenose dolphins within the study area was estimated from 7,945 individuals (95% CI: 3,902 - 16,342) in winter, to 3,575 individuals (95% CI: 1,164 - 11,167) in the summer. The bottlenose dolphin was the only species to exhibit any preference for the Pelagos sanctuary. Habitats modelling analyses were also performed over the area, showing a shift from a clearly coastal distribution in the summer, as previously known, to a more pelagic distribution during winter, with the exception of the Tuscan archipelago where bottlenose dolphins were predicted at both seasons. Conducting aerial surveys is an efficient approach to provide baseline abundance estimates and distribution patterns in the framework of conservation instruments such as the Habitats Directive for the bottlenose dolphin. It is also a powerful tool to assess the relevance of an MPA, here mainly the Pelagos sanctuary, for this species. Our result bring new information on the distribution and the abundance of the only cetacean species listed in the Annex II of the EU Habitats directive in the area.



## **Predicting bottlenose dolphin (*Tursiops truncatus*, Montagu, 1821) spatial distribution through random forest technique in Pelagos Sanctuary.**

C. Marini<sup>1</sup>, F. Fossa<sup>2</sup>, M. Bellingeri<sup>2</sup>, G. Gnone<sup>2</sup>, F. Dhermain<sup>3</sup>, S. Nuti<sup>4</sup>, S. Airolidi<sup>5</sup>, N. Portunato<sup>6</sup>, S. Laran<sup>7</sup>, L. David<sup>8</sup>, P. Bonelli<sup>9</sup>, R. Trucchi<sup>10</sup>, H. Labach<sup>11</sup>, M.C. Santoni<sup>12</sup>, P. Vassallo<sup>1</sup>

1 DISTAV, Dipartimento di Scienze della terra, dell'ambiente e della vita, Università degli studi di Genova, Corso Europa 26, 16132 Genova, Italy

2 Acquario di Genova, Area Porto Antico, Ponte Spinola, 16128 Genova, Italy

3 GECEM, Groupe d'Études des Cétacés en Méditerranée, Marseille, France

4 CE.TU.S, Centro di Ricerche sui Cetacei, Viareggio (LU), Italy

5 Tethys Research Institute, Milano, Italy

6 NURC, Nato Undersea Research Centre, La Spezia, Italy

7 Observatoire PELAGIS - UMS 3462 Université de La Rochelle, La Rochelle, France

<sup>8</sup> EcoOcéan Institut, Montpellier, France

<sup>9</sup> Ambiente Mare, Faenza (RA), Italy

<sup>10</sup> WWF Liguria, Genova, Italy

<sup>11</sup> GIS3M, Le Kalliste, Sausset-les-pins, France

*Corresponding author: [chiaramarini09@gmail.com](mailto:chiaramarini09@gmail.com)*

The bottlenose dolphin (*Tursiops truncatus*) inhabits mainly coastal waters (depths of less than 200 meters) of the Pelagos Sanctuary and it is reported mainly present in the eastern portion of the sanctuary and along the northwest coast of Corsica. The aim of this work is to propose a distribution model of bottlenose dolphins in the Pelagos Sanctuary using a regression model based on Random Forest analysis (RF), with a data set of sightings from 10 research groups working in the Pelagos Sanctuary. RF was previously used in a smaller area of the Sanctuary and showed more precise and accurate results than those obtained with other spatial analyses.

The model is developed using sighting data from 2005 to 2012 belonging to two training areas characterized by strongly different morphological parameters, thus representing the wide heterogeneity of the Pelagos sanctuary. Independent variables selected for the regression were depth, distance from coast, distance from 100 m bathymetry and seafloor slope. Even if bottlenose dolphin is usually considered a hostile species to be forced in the schemes of a model, RF regression displayed good results confirmed by the good prediction of presence/absence in the whole Pelagos Sanctuary area. The regression based on static environmental variables, has given strength to the proposed work and is expected to lead the way to the exportation of the model in other areas for the prediction of the bottlenose dolphin's pattern of presence.



## Results of post-mortem investigations on bottlenose dolphins (*Tursiops truncatus*) found stranded along the Ligurian coast of Italy (2010-2014)

Marco Ballardini<sup>1</sup>, Fulvio Garibaldi<sup>2</sup>, Cristiana Tittarelli<sup>1</sup>, Alessandra Pautasso<sup>1</sup>, Barbara Iulini<sup>1</sup>, Maria Domenica Pintore<sup>1</sup>, Federica Giorda<sup>1</sup>, Carla Grattarola<sup>1</sup>, Katia Varello<sup>1</sup>, Serena Durante<sup>1</sup>, Massimiliano Rosso<sup>3</sup>, Irene Rossini<sup>1</sup>, Laura Serracca<sup>1</sup>, Carlo Ercolini<sup>1</sup>, Maria Vittoria Riina<sup>1</sup>, Pier Luigi Acutis<sup>1</sup>, Barbara Vivaldi<sup>1</sup>, Elena Bozzetta<sup>1</sup>, Maria Gorla<sup>1</sup>, Michela Podestà<sup>4</sup>, Cristina Esmeralda Di Francesco<sup>5</sup>, Giovanni Di Guardo<sup>5</sup>, Cristina Casalone<sup>1</sup>, Walter Mignone<sup>1</sup>

<sup>1</sup> National Reference Centre for Diagnostic activities on stranded Marine Mammals (C.Re.Di.Ma.), Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d'Aosta (IZSPLV), Torino, I-10154, Italy.

<sup>2</sup> Department of Earth, Environment and Life Sciences (DISTAV), University of Genova, I- 16132 Italy

<sup>3</sup> CIMA Research Foundation, Savona, I-17100, Italy

<sup>4</sup> Natural History Museum, Milano, I-20121, Italy

<sup>5</sup> Faculty of Veterinary Sciences, University of Teramo, I-64100, Italy

Corresponding author: [marco.ballardini@izsto.it](mailto:marco.ballardini@izsto.it)

Performing post-mortem investigations on cetaceans stranded in a given area provides useful information to depict the health status of local populations, with important implications for their conservation and for human health as well, considering the zoonotic potential of several cetacean pathogens. In the period 1990-2014, 30 bottlenose dolphins *Tursiops truncatus* were found stranded dead along the Ligurian coast of Italy, in the Pelagos Sanctuary. Post-mortem investigations could be performed on 7 individuals (2 males, 1 female, 4 undetermined) stranded in the provinces of Savona and La Spezia between 2010 and 2014, thanks to a few research projects funded by the Ministry of Health and led by IZSPLV. A complete necropsy, followed by a whole panel of microbiological, virological, serological, histological, immunohistochemical, molecular and eco-toxicological analyses were possible in 2 cases out of 7, i.e. in the case of fresh carcasses. Whenever possible, diet analysis was conducted by examining the stomach contents, and teeth were collected for age determination. For 2 more carcasses, just a few analyses could be performed, due to their advanced decomposition status, while no diagnostic investigation could be done on the remaining 3 individuals, because of their extremely poor conditions. However, genetic analysis of muscle samples confirmed their species identity. Overall, an antropogenic cause of death could be determined or hypotesized in 3 cases out of 7 (bycatch in fishing nets, boat collision). A severe pneumonia was observed in one case, while a generalized *Escherichia coli* infection coupled with *Toxoplasma gondii*-positive histological and serological findings, as well as with anti-*Morbillivirus* antibodies in the serum, were detected in 1 male dolphin stranded in 2012.



## **From identification to models: reassessment of usual methods for populations monitoring. The case of bottlenose dolphin (*Tursiops truncatus*) inhabiting the English Channel.**

Couet Pauline<sup>1,2</sup>, Besnard Aurélien<sup>1</sup>, Gally François<sup>2</sup> and Cyrielle Zanuttini<sup>2</sup>

<sup>1</sup> Centre d'Écologie Fonctionnelle et Évolutive, Montpellier, 34293, France

<sup>2</sup> Groupe d'Etude des Cétacés du Cotentin, Cherbourg, 50130, France

Corresponding author: [pauline.couet@gmail.com](mailto:pauline.couet@gmail.com)

The development of conservation and management measures needs suitable indicators that describe the study population very precisely in order to detect changes in this population. Our work is focused on the population of bottlenose dolphins (*Tursiops truncatus*) inhabiting the English Channel. To date, the abundance estimate is used as the indicator to describe this population. This indicator is assessed with capture recapture methods based on the photo-identification of natural marks and the hypothesis of closed population. We have detected capture heterogeneity in the data set, which is not a parameter commonly integrated in current abundance estimates. So, to get a better estimation of the population size and to avoid bias, we have used multi-event models, which include this heterogeneity and assume that the population is open. Results are similar to those obtained with closed population models, but they are more accurate. Comparatively with other European bottlenose dolphin populations, the population of bottlenose dolphins inhabiting the English Channel seems to be one of the most important (360 animals on average). Finally, we have considered survival rate which is a crucial parameter to understand population dynamics, especially for long-lived species like dolphins. Values are close to other studied populations in the world for most of marked individual (99%). But strongly marked animals have low survival rate (91%), probably due to senescence or to transient individuals.



## Monitoring of the bottlenose dolphin *Tursiops truncatus* off Versilia coast (Italy, Tuscany): aspects of nonmigratory behaviour and residence time

Silvio Nuti<sup>1</sup>, Francesca Salvioli<sup>1</sup>, Saverio Tozzi<sup>1</sup>

<sup>1</sup> CE.TU.S. Research Center, Viareggio, 55049, IT

Corresponding author: [cetus@supereva.it](mailto:cetus@supereva.it)

### Background:

Since 1997, CE.TU.S. Research Center carries out monitoring campaigns on marine mammals in an area of about 7000km<sup>2</sup>, focusing on a group of bottlenose dolphins (*Tursiops truncatus* - Montagu, 1821) thriving off the Versilia coast (Italy, northern Tuscany).

### Material and methods:

At present, through the photoidentification method of Capture-Mark-Recapture, about 150 resident bottlenose dolphins were censused. With the present work, sightings collected by platforms of opportunity from 2003 to 2014 were analysed taking into account the 1) E.R., 2) R.A.I., 3) mean number of individuals per sighting per year, 4) the presence of new borns and calfs 5) data interpolations and 6) associations and behavioural observations.

### Main results:

Results highlighted that this group is nonmigratory, living in a 800 km<sup>2</sup> area, with bathymetric differences depending on season but never exceeding 100m. Censused individuals exhibited a high degree of variation in percentages of recapture (1-52) and average abundance of group (7,3 – 36,8). In particular, the presence of the individual A073 (P203 in the Pelagos list), characterized by a peculiar white-spotted body coloration, was reported longest and mostly recorded in conjunction with sightings with numerous dolphins and occurrence of pups. The long-term chronicle of that dolphin was therefore obtained.

### Conclusion:

The techniques used for the collection and analysis of data are standardized in research on cetaceans. The evolution in time and space of the feeding/breeding areas and intraspecific behavior of individual/groups of cetaceans is an extrapolated data. In this paper the cronostoria of a particular dolphin has been related to the characteristics of the group and used as explanatory example given i) its easy recognition at sea and ii) the observed behavior, from whose peculiarities one might assume the attribute of a leader.



## Round table summary and outputs

Concerning cetacean populations, their abundance, spatio-temporal distribution and behavior have to be monitored in order to get state of the art and follow trends for a better conservation aim. This monitoring should be planned on a long-term basis to be really helpful in understanding the populations and their ecology. Well considering time scale is important in a monitoring design: results from different seasons and periods of the day could bring different pictures of the situation. Preferably all fields of subject should be monitored to get a global view: ecology, biology, threats, demography, etc. Also habitat and human activities in the same area should be monitored in parallel. It appears clearly that different methods bring different results, sometimes complementary but that could be difficult to interpret. In term of monitoring, the most important is trends and « hotspots », rather than absolute numbers. The help of citizen science can be valuable but more useful and reliable if it goes through a scientific program with trained observers and framing documents. Last but not least, long-term monitoring is crucial and funds have to be allocated for a proper work of scientists and experts.



## STRATEGIES OF CONSERVATION





## Bottlenose dolphins Conservation Strategies

Peter G.H. Evans<sup>1</sup>

<sup>1</sup> Sea Watch Foundation & School of Ocean Sciences University of Bangor, Wales, UK

Marine mammals pose a particular challenge for management since for the most part they constantly move around. The first task in conservation therefore is to determine whether discrete populations exist and describe the ranges of individuals within these, identify high-density hot spots and the extent to which these vary over time. The EU Habitats Directive attempts to provide extra protection for species like the bottlenose dolphin that are listed on Annex II, by establishing a network of marine protected areas for them. The general aim is for the species to be maintained at (or restored to) favourable conservation status. That requires information on population dynamics, range and habitat, and the monitoring of human activities and operations that may impinge upon these so that these can be managed appropriately. We face particular challenges in trying to achieve our conservation aim. Drawing upon case studies of long-term research on the species, I will demonstrate some of those problems and outline potential solutions.



## Threats to bottlenose dolphin in the Mediterranean Sea, an attempt at the ACCOBAMS level

Léa David<sup>1,2</sup>, Maylis Salivas<sup>2</sup>, Florence Descroix-Comanducci<sup>2</sup>

<sup>1</sup> Ecoocéan Institut, Montpellier, 34090, France

<sup>2</sup> ACCOBAMS Secrétariat Exécutif, MC, 98000 Monaco

*Corresponding author: [lea.david2@wanadoo.fr](mailto:lea.david2@wanadoo.fr)*

The Scientific Committee of the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area (ACCOBAMS) is engaged since several years to identified areas important for Bottlenose dolphins in order to create a network of Marine Protected Areas to protect this species. The work is in progress, despite spatial heterogeneous knowledge. An effort has also been launched to train and support people where data is missing to fill gap of knowledge. In parallel to spatial management objectives, it has been decided to promote the threat based management approach. For that purpose, all spatial information on cetaceans critical Habitat, human activities and threats are being sought for the whole ACCOBAMS area. The spatial mapping of threats to cetaceans will enables to get a synoptic view of what happen where, and the similarities of problem that different countries have to faced (for example depredation by bottlenose dolphin in fishery gear occur similarly along the Algerian, Maltese, Tunisian, Sardinian coats, etc). The idea is also that the countries or organisms facing the same problems in the ACCOBAMS area, could join effort to find solutions at a Mediterranean level. On the other hand, a manager or decision-maker will understand the accumulation of threats for this coastal species inside its national waters. We will present the process of getting information including all experts from the ACCOBAMS area, and some results: identification of important areas for bottlenose dolphins, as well as the website as portal for scientists and managers and the enhancement of network of experts within a specific geographic area.



## The approach of the French Marine Protected Area Agency for the bottlenose dolphin conservation

Boris Daniel<sup>1</sup> & Aurélie Blanck<sup>1</sup>

<sup>1</sup>Agence des aires marines protégées, Antenne Méditerranée, Marseille, 13001, France

*Corresponding author: [boris.daniel@aires-marines.fr](mailto:boris.daniel@aires-marines.fr)*

The French Marine Protected Area Agency is a recent public establishment created in 2006 and placed under the governance of the Ministry of Ecology. The main assignments of the Agency is also to support public policies for the creation and management of marine protected areas in French maritime waters. Six categories of marine protected area are defined with various target and status of protection: marine sections of national parks, natural reserves, prefectural orders for the protection of biotopes, Natura 2000 sites (according to European Union habitats Directive and Birds Directive), the sections of the maritime public domains entrusted to Coastline Conservation and marine natural parks. Nine new categories were also defined in 2011 according to international conventions.

The national strategy for creation and management of marine protected areas is a roadmap for the marine protected areas network. The Agency is identified as a facilitator who have to: (i) contribute to the knowledge; (ii) contribute to healthy ecosystems; (iii) contribute to sustainable development activities; (iv) enroll in integrated policies for managing the marine environment and contribute to the coherence of land-sea Public Policy; (v) respond to objectives defined at multiple scales. This strategy is based in particular on the integration of European Directives : habitats, flora and fauna directive, and also the Marine Strategy Framework Directive.

To provide knowledge to supplement the marine protected areas network, but also to propose management and conservation actions, the Agency implemented in 2010 a data collection program on birds and marine mammals in mainland France (PACOMM program). This program is an operational implementation in order to answer two questions:

- What is the initial state of the ornithological and cetological resources in existing Natura 2000 sites?
- What new zones should be designated to supplement the offshore Natura 2000 network in accordance with the demands of The European Commission and following the conclusions of the 2010 biogeographical seminars?

The data obtained through this program furnish thus the opportunity to evaluate existing Natura 2000 sites and provide the basis to design new offshore Natura 2000 sites.

The chosen strategy of PACOMM program is based on a work of a group of experts. As a result, three initiatives have been programmed at seaboard level for the bottlenose dolphin conservation :: 1 - Dedicated aerial surveys; 2 - Observations on platforms of opportunity; 3 - local projects monitoring - GDEGeM : bottlenose dolphin program monitoring and conservation in Mediterranean.

The objectives of this last program are to: (i) define the responsibilities of each MPA for the conservation of bottlenose dolphin; (ii) identify offshore MPAs sites for the bottlenose dolphin; (iii) provide elements to build the marine framework strategy directive monitoring.



## Global bottlenose dolphin monitoring and conservation in the French Mediterranean MPA's network

Hélène Labach<sup>1</sup>, Maxime Barbier<sup>1</sup>, Julie Jourdan<sup>1</sup>, Léa David<sup>1</sup>, Boris Daniel<sup>2</sup>

<sup>1</sup>GIS3M, Sausset-les-pins, 13960, France

<sup>2</sup>Agence des aires marines protégées, Antenne Méditerranée, Marseille, 13001, France

*Corresponding author: [hlgis3m@gmail.com](mailto:hlgis3m@gmail.com)*

The Mediterranean bottlenose dolphin's sub-population is listed by IUCN as "vulnerable". As a mobile species, its conservation can be challenging. In the French Mediterranean waters, Marine Protected Areas, including 2 National parks, 1 Marine Park, 36 SAC or SCI and 5 SPAMI, cover 34% of the EEZ. This MPA network can provide an efficient support for a global monitoring and conservation of the species.

In 2013, the GIS3M launched GDEGeM, a collaborative and multi-disciplinary three years project. This project aims to improve the conservation of bottlenose dolphin in the north-western Mediterranean Sea through three main objectives: Improving the knowledge on the population; providing technical support to MPAs and strengthening the MPA's network to provide a global regional management tool.

A questionnaire sent to 24 MPA managers shows that the conservation of the species in the French Mediterranean MPAs could be largely improved. 100% of the responding managers declare that bottlenose dolphins have been observed in their MPA, but only 4 declare having specific measures implemented for the species. 95% think they could improve the management of the species in their MPA and could contribute to the conservation of the species at the north-western Mediterranean scale.

Two workshop were organized with French MPA managers and institutional bodies. A two days theoretical and practical training on monitoring protocols and conservation measures has been delivered to 32 MPA employees.

Standard protocols for data collection and storage have been provided. A network for opportunistic and monitoring data collected by MPAs has been set up in order to allow regular global data analysis.

The results of the monitoring and networking actions of the project should provide the needed material to implement a monitoring and conservation plan for the species in the French Mediterranean MPA network in close collaboration with neighboring countries.



## **Marine mammal strandings: a unique opportunity to involve general public in their conservation.**

Bertrand Bouchard, Sylvia Campagna, Laureen Magnet and Aurélie Célérier

Centre d'Ecologie Fonctionnelle et Evolutive CEFE, UMR 5175, CNRS, Université de Montpellier, Université Paul-Valéry Montpellier, EPHE, 1919 Route de Mende, Montpellier, 34293 Cedex 5, France.

*Corresponding author: [aurelie.celerier@cefe.cnrs.fr](mailto:aurelie.celerier@cefe.cnrs.fr)*

Strandings of marine mammals often gathers crowds and generate a real emotional impact on them. These events thus represent a particularly favorable context to deliver environmental awareness information to the general public.

We designed a set of posters to be installed easily along the security perimeter of the stranding site. They inform the population about the right conduct to adopt in the face of stranded animals (contact persons, health and safety guidelines...), as well as the importance of tissue sampling for conservation science.

They also display general information on marine mammal biology, and what are the simple actions citizens can take for protecting marine mammals and their environment.

This innovative campaign will thus not only help increase the stranding detection rates but also give citizens the information on how to get involved in simple marine mammal conservation actions. Because “to know, is to protect”



## Round table summary and outputs

The implementation of strategies of conservation is based on scientific results. Scientific knowledge is clearly needed on a long-term basis in order to understand history, changes and trends. Strategy should consider the spatial scale: global, regional or local area and population level: sub-population or management unit. Cetaceans are highly mobile animals occupying vast habitats, sometimes overlapping frontiers and are confronted to threats sometimes similar throughout their habitat or specific to a region. Strategies of conservation need to take into account this mobility, to be considered at the adequate scale and should be implemented at international level when necessary. In the aim to increase or maintain a favourable status of a population, two main approaches can be followed: a species and/or habitat-based approach through dedicated tools such as international agreements, regional conventions, national legislation and marine protected areas or an issue-based approach focusing on specific threats in order to limit their impact on the populations and that can be implemented at different geographical scales. Mitigation measures or protected areas can be adaptive in space and time: for example time closure for fisheries that can change on a seasonal or yearly basis or shifting of traffic separation scheme. It could be highly interesting and sometimes more efficient to consider adaptable tools for cetaceans conservation. Finally, strategies depend upon political will and means dedicated to the conservation.



## MEASURES OF CONSERVATION





## **Towards the conservation of bottlenose dolphins in the Mediterranean** Ana Cañadas<sup>1</sup>

<sup>1</sup> ALNILAM Research and Conservation

The conservation of cetaceans is often a cause for concern. They are charismatic species that attract the interest of the general public and therefore it becomes easier to call attention to their conservation problems. A rigorous science constitutes the basic support for conservation with some guarantee of success. Long-term strategies are required for the conservation of populations and habitats in response to human activities that have caused, or can cause, a negative effect on their status. One of the most common approaches to marine conservation is the establishment of marine protected areas (MPAs). MPAs may be the right solution in some cases for the conservation of certain critical habitats for feeding, reproduction or migration of some marine species. Nevertheless, their success as a conservation and management mechanism will depend on an adequate designation based on scientific studies of the habitats and species to be protected. But it needs to be emphasized that the design and creation of MPAs should not be the final aim of a conservation strategy, but just one more action within a conservation plan for the species, in which these areas and their management plans would be framed. For this reason we need a conservation plan that brings in the requirements for the conservation of the species at an appropriate scale, as it does not bind itself to a particular protected area but is applied to a more extensive geographical area, usually that of the competences of the involved authorities. The development of a plan, must follow a logical process taking into account all the necessary aspects for its success, from scientific information to an effective management regime. A Conservation Plan for bottlenose dolphins anywhere in the Mediterranean should therefore be developed according to a process which takes us from the science to the management following a series of steps. But a conservation plan does not constitute a definitive and unalterable document. It is rather a document that covers a temporal phase within the framework of the efforts for the conservation and recovery of a species, and therefore needs to be reviewed periodically, through a monitoring plan, to adjust the actions to the diverse changes that can occur, either in response to the conservation plan actions themselves or to external factors. It is also necessary to properly identify the threats. It is important to take into account that threats are very varied and can have an effect either only at the individual or also at the population level.



## Reaching a “well” watching: the ACCOBAMS/Pelagos High Quality Whale-Watching® certification

Jerome Couvat<sup>1</sup>, Morgane Ratel<sup>1</sup>, Pascal Mayol<sup>1</sup>

<sup>1</sup> Association Souffleurs d’Ecume, La Celle, 831370, France  
*Corresponding author: [jerome.couvat@souffleursdecume.com](mailto:jerome.couvat@souffleursdecume.com)*

The whale-watching activity is a growing industry worldwide. With around 11 species of cetaceans regularly observed and more than 360 million tourists each year, the Mediterranean Sea is not exempt from this phenomenon. Intrusive and disturbing whale-watching practices can have detrimental effects for targeted species both at the individual and population level. On the contrary, respectful whale-watching is a fantastic opportunity to raise awareness of the general public on the conservation of marine life and to collect scientific data. In the French Mediterranean Sea, the whale-watching activity grows by 3.5% annually with around 35 operators currently recorded. Aware of the potential threats linked to this steady increase, the Pelagos Sanctuary and whale-watching operators gathered in a collaborative approach to structure the activity and provide a framework. This collaboration led to the creation of the ACCOBAMS/Pelagos High Quality Whale-Watching® certification in 2014. Certified operators commit to dedicated specifications relying on three axes: committing to the Code of Good Conduct for the observation of cetaceans enacted by Pelagos and ACCOBAMS, attending a 3-day training course in order to provide quality information to passengers and implementing a sustainable policy in the company (waste sorting on-board, fuel efficient engines, etc). Additionally, aerial detection and swim-with-cetacean activities are banned from the certification. Evaluations on-board are carried out to ensure the commitment to specifications. Based on these evaluations, a Committee composed of scientists, institutions and operators decides whether the operator keeps its certification or not. Currently, 14 operators were granted with the certification (around 40%) in the French Mediterranean Sea, including 2 operators who gave up aerial detection to access the certification. Based on ten years of collaboration between scientists, institutions and whale-watching operators, this tool provides the opportunity to manage whale-watching activity uniformly over the whole ACCOBAMS area.



## **MPA Management measures for cetaceans conservation**

Marion Peirache<sup>1</sup>, Alain Barcelo<sup>1</sup>, Marie Jarin<sup>1</sup>

<sup>1</sup> Port-Cros National Park, Pelagos Sanctuary French team, 83400, Hyères, France

Thanks to its experience as marine area manager and its situation at the western border of the Sanctuary, the PCNC has been entrusted with the coordination of the French part of Pelagos.

This dual expertise results in a strong involvement of the Park for marine mammals and consequently influences the training and the missions of its agents. This marine area frequented by marine mammals, is also the site of numerous water activities. Thus, management decisions are necessary in order to try and reduce potential impacts on cetaceans.

A wide range of tools has been developed in order to raise awareness amongst various audiences (from school children, boaters, naval officers to nautical event organizers).

In summer, facing a very high tourist activity, agents must handle certain situations that threaten the well-being and tranquility of cetaceans. This can be boaters not respecting the ACCOBAMS/Pelagos code for a good approach, film crews in search of the best shooting angle. Strandings of dead or, even more critical, live animals may also occur and have to be dealt with in a professional manner.

Furthermore, MPA managers can contribute to scientific monitoring of cetacean populations in their territory, and sometimes provide logistical and technical support.

On the initiative of the Port-Cros National Park and the Pelagos French team, a resolution has been proposed and further adopted at the 7th Scientific and Technical Council of the Pelagos Agreement (November 2014). It promotes the dissemination of good practices for marine mammals' approach by French MPA managers. The agents are better trained and equipped to ensure an accurate awareness according to MPAs ambitions.



## Round table summary and outputs

Conservation measures are mainly implemented through a top-down process (for example concerning the designation of MPA), but bottom-up process is also possible (such as the High Quality whale-watching label, a voluntary based tool) and can be in some cases complementary to a legal tool if run beforehand or in parallel. MPA need political support and dedicated means for an efficient implementation and application of regulations. MPA need also stability and longevity in the managing staff (elections often slow down even stop decisions and implementation processes). Mandatory measures can be implemented at a large scale, but need adequate control resources. Voluntary based measures need strong and efficient public, stakeholder awareness and teaching to be efficient.



## NETWORKING





## Networking

Alain Jeudy de Grissac<sup>1</sup>

<sup>1</sup>IUCN Centre for Mediterranean Cooperation

A network is defined as a group of people, organizations, or sites that are connected or that work together. The next question is for what purpose. Different answers could be considered:

- For increasing scientific knowledge,
- For influencing decision makers,
- For improving governance (legislation, institutions for management, enforcement, ...)
- For ...

Some examples of different networks will be presented, avoiding those dedicated to cetaceans as they will be presented in the different lectures, but focussing on the use of knowledge for influencing decision making and governance concerning conservation of the marine environment.

At the international level (CBD, UNCLOS), at the regional level (ACCOBAMS, BARCELONA Convention and GFCM) could be considered as networks of countries/decision makers for governance about marine conservation issues.

Concerning science, IUCN commissions on species and marine protected areas, CIESM, ACCOBAMS Scientific Committee, GFCM Scientific Advisory Committee, RAC/SPA as one of the centres of the Barcelona Convention/Mediterranean Action Plan are all using scientific data to propose recommendations, conservation action plans for species or declaration/labelization of marine protected areas. They are also networks at the interface of science and policy.

In term of scientific knowledge on cetaceans, the different following lectures and some elements from the previous ones show the importance of developing networks of scientist and of sharing the data as a group for providing useful information for influencing decision-makers

In term of identification and selection of sites for conservation efforts, the responsibility lays on governments (alone or jointly) supported in some cases by international or regional organisations defining labels under which sites are a kind of network (EBSA, KBA, BR, WHS, CCH, etc.).

In term of declaration and management of marine conservation areas, of their monitoring and evaluation, the national approaches are complemented by the regional agreement for cetaceans (ACCOBAMS). All these matters ought to be considered and integrated in the national jurisdiction, covering the definition of competence for enforcement and of penalties, but need to be extended in areas still outside national jurisdiction. This topic is particular relevant for cetaceans as they are migratory species and have specific requirements in the different stages of their life.



**NETCCOBAMS: Network for the Conservation of Cetacean of the Black Sea,  
Mediterranean Sea and Contiguous Atlantic Area**

Maylis Salivas<sup>1</sup>, Aurélie Tasciotti<sup>2,3</sup>, Hélène Labach<sup>3</sup>, Camille Montiglio<sup>1</sup>, Florence Descroix-  
Commanducci<sup>1</sup>

<sup>1</sup> ACCOBAMS, Monaco, 98000, Monaco

<sup>2</sup> WWF-France, Marseille, 13001, France

<sup>3</sup> GIS3M, Sausset-les-pins, 13960, France

*Corresponding author: [cmontiglio@accobams.net](mailto:cmontiglio@accobams.net)*

NETCCOBAMS is the first network for the conservation of cetacean of the Black Sea, Mediterranean sea and contiguous Atlantic area (NETCCOBAMS: [www.netccobams.com](http://www.netccobams.com)). It is been launched in Malta, April 2015, thanks to the collaboration between ACCOBAMS, WWF-France and GISM. This network aims at facilitating the information data flow and the dynamic exchange of knowledge and experiences between all experts involved in cetacean conservation in the ACCOBAMS area (scientists, managers, members of NGOs, members of IGOs, relevant national and regional administrations, students, etc.).

Through a dedicated and interactive webtool, NETCCOBAMS will provide the opportunity to relevant experts to discuss the best approaches and priority actions for a better knowledge and conservation of cetacean populations.

The dedicated website hosts a geoportal, a communication database, and a forum allowing to:

- Consult and find projects in the ACCOBAMS area,
- Meet and chat with other colleagues,
- Share files and experiences,
- Keep updated.

Members of NETCCOBAMS will be invited to add information regarding their projects, to launch specific discussion, to add documents and adverts.

The website ([www.netccobams.com](http://www.netccobams.com)) will be functional in September 2015.



### Intercet implementation in GDEGeM project

Guido Gnone<sup>1,2</sup>, Michela Bellingeri<sup>1,2</sup>, Hélène Labach<sup>2</sup>, Olivier Gimenez<sup>2,3</sup>, Léa David<sup>2,4</sup>,  
Maxime Barbier<sup>2</sup>, Nathalie Di-Meglio<sup>2,4</sup>, Julie Jourdan<sup>2,5</sup>, Marine Roul<sup>4</sup>, Caroline Azzinari<sup>2,6</sup>,  
Nicolas Tomasi<sup>7</sup>, Nicolas Robert<sup>8</sup>, Frank Dhermain<sup>2,5</sup>, Cathy Cesarini<sup>7</sup>

<sup>1</sup> Fondazione Acquario di Genova, Genoa, 16131, Italy

<sup>2</sup> GIS3M, Sausset-les-pins, 13960, France

<sup>3</sup> CEFE, UMR 5175, Montpellier, 34293, France

<sup>4</sup> Ecoocéan Institut, Montpellier, 34090, France

<sup>5</sup> GECEM, Sausset-les-pins, 13960 France

<sup>6</sup> BREACH, Ponteilla, 66300, France

<sup>7</sup> CARI, Calvi, 20260, France

<sup>8</sup> Parc naturel régional de Corse, Ajaccio, 20184

Corresponding author: [ggnone@costaedutainment.it](mailto:ggnone@costaedutainment.it)

Intercet is a Web-GIS platform designed to support collection and integrated analysis of geo-referred and photographic data. It was developed by Acquario di Genova for Regione Liguria within GIONHA (Governance and Integrated Observation of marine Natural Habitat) a Cross Border Cooperation Project involving Italian and French regions facing the North Tyrrhenian and Ligurian Sea (Tuscany, Liguria, Sardinia and Corsica). The main objective of this platform is to connect researchers in a cooperative network. Following an agreement between the Intercet administrator (Fondazione Acquario di Genova) and ACCOBAMS, Intercet was implemented in the Mediterranean Bottlenose Dolphin Conservation Plan (MBCP) as a common tool for data cross analysis on a Mediterranean level.

Since 2013 Intercet was also implemented in GDEGeM (*Grand Dauphin Etude et Gestion en Méditerranée*), a project coordinated by GIS3M (*Groupement d'Intérêt Scientifique pour les Mammifères Marins de Méditerranée et leur environnement*) to investigate the conservation status of the bottlenose dolphin along the French coasts of the Pelagos Sanctuary. The partners of GDEGeM have got training and support for loading data on the platform and until now a total of 14900 km of research effort were uploaded, together with 94 sightings of the target species. A total of 535 dolphins were photo-identified through their natural markings, using the Intercet standard protocol, and about 100 of these were successfully matched using the Intercet features, tracing their movements through the study areas of the partners involved. All this data were validated by the platform administrators and are fully available to the GDEGeM partners and Intercet users through the web site [www.intercet.it](http://www.intercet.it).

Intercet has proven to be a useful tool to support networking between groups involved in a collaborative research effort such as the GDEGeM project.



**Involvement of the Armed Forces of Malta (AFM), the Civil Protection Department (CPD), and local communities in cetacean research, monitoring and conservation in Maltese waters through networking.**

Carmen Mifsud<sup>1</sup>, Emanuel Bonnici<sup>2</sup>, Nikolas Cassar<sup>1</sup>, James Grixti<sup>3</sup>, Ricardo Sagarminagra<sup>4</sup>, Darrin Stevens<sup>1</sup>, Mark Tabone<sup>3</sup>, Ana Tejedor<sup>4</sup> & Benjamin Metzger<sup>5</sup>

<sup>1</sup>Environment Protection Directorate, Malta Environment and Planning Authority, Floriana, Malta

<sup>2</sup>Marine Section, Civil Protection Department, Malta,

<sup>3</sup>Maritime Squadron, Hay Wharf Base, Floriana FRN1820, Malta

<sup>4</sup>KAI Marine Services Spain

<sup>5</sup>Birdlife Malta, Abate Rigord Str., Ta'Xbiex, Malta

Corresponding author: [carmen.mifsud@mepa.org.mt](mailto:carmen.mifsud@mepa.org.mt)

The loggerhead turtle (*Caretta caretta*) and the bottlenose dolphin (*Tursiops truncatus*) are regularly found around Maltese waters, but until recently, information on the populations and conservation status of both species in the area was widely lacking. The EU LIFE+ project MIGRATE (LIFE11 NAT/MT/1070) was set up to address these information gaps by obtaining more data on the above species and to identify areas essential for the life cycle and reproduction of these protected species in Maltese waters.

To achieve these aims, amongst others, a citizen science approach was chosen, with the involvement of the Maritime Squadron of the Armed Forces of Malta (AFM) and the Civil Protection Department (CPD) as well as local NGOs, diving clubs and communities.

A scheme of training units was developed and implemented for the mentioned stakeholders in order to train the general public and officials from AFM and CPD in species identification. During such training, skills on the identification of all cetacean and marine turtle species recorded in Maltese waters and knowledge in what to do initially in case of sightings or encounters of injured animals was provided. Over 2 years (2013-2015), 9 training sessions (each 4-5 hours long) were dedicated to AFM and CPD officials. 16 additional sessions were carried out with different diving clubs, NGOs, fishers, interested members of the public and other sea-users. Over 100 AFM & CPD officials were trained together with some 200 people from the public, NGOs and other stakeholders. The resulting network has been proven to be working effectively with a substantial increase in the amount of data being gathered in recent time. Moreover, due to the training provided, more accurate and more specific data of higher quality was gathered and the profile of sea turtles and marine mammals in Maltese waters could be raised, underlining the effectiveness of such a citizen science based network.



## A network for bottlenose dolphin photo-ID monitoring along the French Mediterranean coast

Olivier Gimenez<sup>1,2</sup>, H el ene Labach<sup>2</sup>, L ea David<sup>2,3</sup>, Maxime Barbier<sup>2</sup>, Nathalie Di-Meglio<sup>2,3</sup>, Julie Jourdan<sup>2,4</sup>, Marine Roul<sup>3</sup>, Caroline Azzinari<sup>2,5</sup>, Nicolas Tomasi<sup>6</sup>, Nicolas Robert<sup>7</sup>, Frank Dhermain<sup>2,4</sup>, Cathy Cesarini<sup>6</sup>, Guido Gnone<sup>2,8</sup>, Michela Bellingeri<sup>2,8</sup>

<sup>1</sup> CEFE, UMR 5175, Montpellier, 34293, France

<sup>2</sup> GIS3M, Sausset-les-pins, 13960, France

<sup>3</sup> Ecooc ean Institut, Montpellier, 34090, France

<sup>4</sup> GECEM, Sausset-les-pins, 13960 France

<sup>5</sup> BREACH, Ponteilla, 66300, France

<sup>6</sup> CARI, Calvi, 20260, France

<sup>7</sup> Parc naturel r egional de Corse, Ajaccio, 20184

<sup>8</sup> Fondazione Acquario di Genova, 16128, Genova, Italy

Corresponding author: [Olivier.GIMENEZ@cefe.cnrs.fr](mailto:Olivier.GIMENEZ@cefe.cnrs.fr)

The Mediterranean bottlenose dolphin's (*Tursiops truncatus*) sub-population is listed by the IUCN and the IUCN-ACCOBAMS Red List assessment as "vulnerable". As a shelf inhabiting species, it is particularly threatened by the intensification of human activities. However, knowledge and studies on the species remain sparse and insufficient. The Mediterranean biogeographical Natura 2000 seminar in Brindisi, 2010, concluded to an insufficient Natura 2000 cover for the species and a lack of data in the off-shore waters in the Gulf of Lion.

In 2013, the GIS3M launched GDEGeM *Grand Dauphin Etude et Gestion en M editerran ee*, a three year collaborative and multidisciplinary project on bottlenose dolphin monitoring and conservation. Photo-ID surveys were organized during 2 years along the French Mediterranean coast thanks to a network of 5 local scientific and NGO partners. The study area was divided in 9 zones and assigned to one of the 5 partners according to its usual study area. A standard protocol was used and all pictures were gathered and compared through INTERCET, a web-GIS platform provided by Acquario di Genova. In total, 8 surveys were conducted in each zone, which resulted in around 4,000 km of prospection effort in Corsica, 5,200 km in Provence and 12,200 km in the Gulf of Lion. 150 groups (41 in Corsica, 18 in Provence and 91 in the Gulf of Lion) have been sighted and resulted in a total of 1,756 photo-identifications of 1,061 different individuals. No movement between the continental and Corsican coasts has been detected over the duration of the project. Discovery curves in the three regions are still growing. Abundance estimates were obtained using capture-recapture models for open populations for each season. The mean population size was estimated to 149 [IC 97,5 % : 67,1 – 335,5] individuals in Corsica and 714 [IC 97,5 % : 505 - 992] along the continental coast (Provence and Gulf of Lion).

These results, presented for the first time, will greatly help improving the knowledge about the population. Besides, their integration with further results obtained within the GDEGeM project (e.g., population genetic and social structure analyses) will contribute to the implementation of a coherent conservation effort into the MPA network.



## Round table summary and outputs

Networking is easiest when based on open access tools. Networks are existing almost in all professional categories (scientists, MPA managers) and at different scales (local, national, regional, global). Exchange of data, experience, tools and knowledge still need to be largely improved. Networks should include different stakeholders and so promote communication between scientists, policy makers and managers. If a network is a force, bringing together complementary stakeholders, it often depends on personal involvement of members. A network is often created on an urgent or specific need, it will live and last if it can provide an interest to its members such as a good feed-back, knowledge, support, tools, etc.



## CONCLUSION

This workshop addressed monitoring and conservation of the bottlenose dolphins in the north-western Mediterranean Sea.

To **monitor** the species, many tools and protocols exist and collaboration between teams need now to be improved to facilitate data exchange and collaborative projects. Networks exist for scientists, either at local, national, regional or international levels (GIS3M, ECS, ACCOBAMS, etc.), with supporting tools (NETCCOBAMS, INTERCET, MEDACES, etc.), providing the basis for long-term and vast areas studies. These networks can gather, at different levels, data coming from experts, managers and citizens (through citizen science framed by training with experts) and we all have now to make them live.

Considering **conservation**, many tools exist, of which efficiency can be reinforced through networks such as ACCOBAMS, MedPAN, IUCN, RAC/SPA, etc. and tools such as NETCCOBAMS, geo2i, Mapamed, etc. Many areas have been identified and proposed to be protected and are now in a political decision process. For several issues or threats already known, laws/labels/governance from national to international levels are implemented and still need to be properly applied. One of the key point today seems to be political will and means to implement what already exists. Another issue consists in encompassing the vast habitat of these highly mobile animals, that would require the implementation of larger or mobile and adaptive areas to deal with changing patterns on the middle or long term. Beside the place-based management approach, should be developed issue-based tools such as labels (such as the High Quality Whale-Watching® label), because they have the potential to be rapidly implemented in vast areas even at a regional scale (as the HQWW label which exist and is easily implementable everywhere in the Mediterranean Sea). This kind of issue-based tools can be implemented in a voluntary basis, based on the public choice or be mandatory. For the first option, public awareness and education is hardly needed, and for the second option again political will is needed.

Finally, considering **monitoring and conservation** of bottlenose dolphins in the north-western Mediterranean Sea, collaboration appears to be the key point to encourage, facilitating knowledge, experience and data spread and sharing. National and international specificity and requirements are sometimes constraining, but we already have a lot in hand, and through networking, bringing many active and committed people, we could rapidly improve the knowledge, be stronger and go further.



International Workshop  
Bottlenose dolphin conservation and monitoring in the North-Western Mediterranean Sea

## ANNEX - LIST OF THE PARTICIPANTS

Name	Organization	Country
Accornero-Picon Alessandra	Parc national des Calanques	France
Amic Julien	GECEM - Groupe d'Etude des Cétacés de Méditerranée	France
Ana Hace	Morigenos - Slovenian Marine Mammal Society	Slovenia
Arnal Céline	Cybelle Méditerranée	France
Ballardini Marco	IZSPLV - Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d'Aosta	Italy
Barbier Maxime	GIS3M - Groupement d'Intérêt Scientifique pour les Mammifères Marins de Méditerranée et leur environnement	France
Barcelo Alain	Parc national de Port-Cros	France
Blasi Monica F.	FILICUDI WildLife Conservation	Italy
Bondi Isabelle	Human Dolphin Foundation	France
Bonneville Claire	GIS3M - Groupement d'Intérêt Scientifique pour les Mammifères Marins de Méditerranée et leur environnement	France
Bouchard Bertrand	CEFE CNRS - Centre d'Ecologie Fonctionnelle et Evolutive	France
Bourgogne Hugo	-	France
Canadas Ana	Alnilam	Spain
Célérier Aurélie	CEFE CNRS - Centre d'Ecologie Fonctionnelle et Evolutive	France
Chauvin Margaux	Cybelle Méditerranée	France
Couet Pauline	GECC - Groupe d'Etude des cétacés du Cotentin	France
Couvat Jérôme	Souffleurs d'Ecume	France
Daniel Boris	AAMP - Agence des Aires Marines Protégées	France
David Léa	EOI - EcoOcéan Institut	France
Dhermain Frank	GECC - Groupe d'Etude des Cétacés de Méditerranée	France
Diaz Lopez Bruno	BDRI - Bottlenose Dolphin Research Institute	Spain
Di-Méglio Nathalie	EOI - EcoOcéan Institut	France
Dreux Elise	-	France
Dupraz Franck	GECEM - Groupe d'Etude des Cétacés de Méditerranée	France
Evans Peter	Sea Watch Foundation	United Kingdom
Ferrari Bruno	AAMP - Agence des Aires Marines Protégées	France
Franck Michel	Terre marine	France
Franck Sophie	Terre marine	France
Gallon Susan	GIS3M - Groupement d'Intérêt Scientifique pour les Mammifères Marins de Méditerranée et leur environnement	France
George Marion	Naturoscope	France
Gimenez Olivier	CEFE CNRS - Centre d'Ecologie Fonctionnelle et Evolutive	France
Goossens Alice	-	France
Guichard Benjamin	AAMP - Agence des Aires Marines Protégées	France
Imbert Mathieu	Parc national des Calanques	France
Jedy de Grissac Alain	IUCN	France
Jourdan Julie	GECEM - Groupe d'Etude des Cétacés de Méditerranée	France
Labach Hélène	GIS3M - Groupement d'Intérêt Scientifique pour les Mammifères Marins de Méditerranée et leur environnement	France
Landron Jacques	Participe Futur	France
Larivière Marie	GECEM - Groupe d'Etude des Cétacés de Méditerranée	France
Marini Chiara	DISTAV - Dipartimento di Scienze della terra, dell'ambiente e della vita	Italy
Marobin Delphine	Parc naturel régional de Camargue	France
Medioni Emilia	Ville de Marseille	France
Methion Séverine	BDRI - Bottlenose Dolphin Research Institute	Spain
Mifsud Carmen	Malta Environment and Planning Authority	Malta
Montiglio Camille	ACCOBAMS	Monaco
Nuti Silvio	CE.TU.S Research Center	Italy
Ody Denis	WWF	France
Peirache Marlon	Parc national de Port-Cros	France
Piante Catherine	WWF	France
Ridoux Vincent	CRMM - Centre de recherche sur les mammifères marins	France
Robert Nicolas	PNRC - Parc naturel régional de Corse	France
Roul Marine	EOI - EcoOcéan Institut	France
Salvioli Francesca	CE.TU.S	Italy
Santoni Marie-Catherine	OEC - Réserve naturelle des bouches de Bonifacio	France
Santostasi Nina Luisa	-	Italy
Stenger Pierre-Louis	LIENSs - Littoral Environnement et Sociétés	France
Zanuttini Cyrielle	GECC - Groupe d'Etude des cétacés du Cotentin	France