Monitoring Plan for the bottlenose dolphin *(Tursiops truncatus)* in Andalucía and Murcia

Extracted from the "Conservation Plan for the bottlenose dolphin *(Tursiops truncatus)* in Andalucía and Murcia"

First phase 2007 -2010

Developed in the context of the EC LIFE Nature Project

CONSERVATION OF CETACEANS AND SEA TURTLES IN MURCIA AND ANDALUCÍA

LIFE02NAT/E/8610

Sociedad Española de Cetáceos

A - INTRODUCTION

A.1. THE BOTTLENOSE DOLPHIN CONSERVATION PLAN

The Bottlenose Dolphin Conservation Plan (BDCP hereafter) has been developed in the context of Action A-2 of the EC LIFE Nature project LIFE02NAT/E/8610. The document consists of a series of **urgent conservation action guidelines** in the format of a **Conservation Plan Proposal** to be used by the relevant authorities. The BDCP has been designed to cover an initial four year phase focusing on the requirements for the recovery and conservation of the bottlenose dolphin *(Tursiops truncatus)* in the southern Spanish Mediterranean.

This initial BDCP is the result of a long process that started with the initiation in 1992 of a long-term sea dolphin and cetacean population monitoring programme in the Alborán Sea, followed by the "Mediterranean Project" as a first phase in the design of protected areas for the most vulnerable species in 1999 and finally the EC LIFE Nature project LIFE02NAT/E/8610 from 2002 to 2006.

A.2. SYNERGY WITH ACCOBAMS

When dealing with the challenge of the conservation and monitoring of populations of highly mobile marine pelagic species as dolphins, it is necessary to adequate our tools to the reality of the open seas; a vast territory that knows nothing about national boundaries or administrative competences.

The main role of a Conservation Plan is to provide coordination on a vertical plane transporting strategies and policies from the international level down through the regional, national and finally local level. Likewise, at each of these levels the Conservation Plan needs to coordinate on a horizontal plane in order to adequately implicate all stakeholders.

In this way even if actions are undertaken at a very local level, they are integrated in a common strategy, becoming a sound contribution that is adapted to the conservation requirements of the target species.

In the Mediterranean and Black seas, it is the Bonn Convention's Agreement for the Conservation of Cetaceans in the Black sea and Mediterranean Sea – (ACCOBAMS 2003) that acts as a regulating and coordinating body, providing guidelines and resolutions of common interest to its member states.

To be effective, a local monitoring plan as the one developed in this case for the Alboran sea and its contiguous Atlantic and Mediterranean waters, needs to be synergetic with ACCOBAMS, becoming a contribution to the regional framework that can be matched with similar initiatives in the region in order to generate a mutual benefit.

This approach is especially important given the challenge of making monitoring of cetacean populations cost efficient, providing opportunities for joint actions, comparative analysis, capacity building, etc.

A.3. THE IMPORTANCE OF BASELINE INFORMATION AND MONITORING

A.3.1. BASELINE INFORMATION

Baseline information is essential for any conservation plan, as stated, for example, by the Scientific Committee of ACCOBAMS and by Resolution 2.19 of the Second Meeting of the Parties of ACCOBAMS (November 2004).

For the BDCP and this Monitoring Plan (BDMP hereafter), "Baseline Information" provides the data foundation to the conservation plan, comprising fundamental information on both the target species and relevant human activities required to scientifically support management actions and to establish whether they are working successfully. In particular:

(1) it provides the data to determine whether management actions are necessary and can be viable, and to assign priorities where necessary;

(2) it establishes the reference level(s) to allow for the monitoring and analysis of trends and hence to provide a feedback mechanism to determine the effectiveness of the conservation plan and determine whether adjustments to the plan are necessary.

A.3.2. BASELINE DATA DEFICIT - PRECAUTIONARY PRINCIPLE

While ideally, all conservation plans and associated management actions are based on full and adequate scientific data, there are occasions when the potential conservation consequences of waiting for confirmatory scientific evidence may mean that it is better to take action immediately whilst collecting the necessary information. This has become known as following the "Precautionary Principle". However, we consider that application of the precautionary principle must be carefully considered and adequately justified.

One of the main challenges encountered in the process of developing this initial version of the BDMP has been that of lack of data, both with respect to:

(1) the target species (e.g. population assessment; natural history; habitat use); and

(2) human activities and their actual/potential impact at different levels (e.g. adequate data on "effort / scale" of certain human activities; adequate data on the effect(s) on the species.

An important part of developing both a BDCP and BDMP is to identify the major baseline information gaps in order to improve conservation measures. In response to this, the present version of the BDMP includes a series of research and monitoring actions which work towards obtaining the necessary baseline information for the establishment of adequate scientifically-based management actions.

A.3.3. MONITORING

Establishing the necessary baseline information as a scientific reference for conservation actions is only the first step for effective conservation. Once this is achieved, as many have stressed (e.g. Donovan, 2005), monitoring needs to be seen as an integral and essential part of management, not an optional extra. As stated by the European Union's Habitat Directive (Article 17): "the development of a Monitoring Plan is required to provide information on

the conservation status of the habitats and the species that the SAC have to conserve, and to determine the effectiveness of the Management Plan in achieving its conservation objectives". This Monitoring Plan therefore aims to obtain information on trends in the conservation status of our target species to examine the effectiveness of the management actions and if necessary adjust them to achieve our established conservation aims.

It is important to recognise that no conservation plan should be regarded as 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 to adjust the actions to the diverse changes that can occur, either in response to the results of the monitoring of the conservation plan actions themselves or to changing external factors.

This monitoring plan should thus be seen as an integral part of the Conservation Plan. It covers not only population parameters, to detect trends in its conservation status, but also human activities so that reliable and long-term information on their development is available.

B – MONITORING PLAN

B.1. DESIGNING THE MONITORING PLAN

The need for the Monitoring Plan to be an integral part of the Conservation Plan is emphasised above. The requirement for baseline/monitoring information is at two levels:

(1) monitoring the population [and habitat] characteristics (the Attributes defined in the BDCP); and

(2) monitoring human activities (those identified also in the BDCP).

In all cases it is necessary to prioritize the monitoring actions according to their usefulness and feasibility.

The Monitoring Plan must take into account the specific conservation objectives established for the various attributes, the practicality of the available monitoring tools (including data collection and analysis) to detect changes with sufficient reliability and the nature of the feedback to the Conservation Plan. Table 1 shows the Monitoring Plan for the population in a schematic way, together with the baseline information required.

For both the collection of baseline and monitoring information, it is important to consider the synergies between the data collection (and/or analysis) methods. Certain of these are the same or very similar for a variety of indicators. This is an important aspect to consider when prioritizing monitoring actions. For example, sampling methods can be generally summarised into three categories that can provide data for a variety of analytical methods, for both the monitoring of populations (see Table 1) and human activities (Table 2):

(1) Data collected from sampling from dedicated (e.g. line transect and/or concentrated photo-identification/biopsy) surveys:

- Distribution and habitat preference
- Line-transect abundance estimates
- Photo-identification (abundance, movements, stock structure)
- Biopsy sampling (genetics, toxicology, stable isotopes)
- Human activities

(2) Data collected from strandings[1] and by-catches

- Pathology
- Genetics
- Causes of mortality
- Stable isotopes
- Toxicology
- Diet

[1] The limitations of data collected from strandings for certain analyses must be recognised

(3) Data obtained from existing programmes for other purposes

- Oceanographic data
- Human activity (e.g. fishing effort, shipping schedules etc)
- Occurrence, distribution and abundance of some prey species

B.2. MONITORING PLAN SCHEME

Table 1. Baseline information required and scheme of Monitoring Plan for the population and habitat attributes

Attribute	Conservation Objective	Indicator	Baseline information			Monitoring Plan						
			Information required	Current data availability	Current analysis availability	Data requirement	Data collection methods requirements	Analytical methods requirements	Output	Sampling temporal plan	Feasibility	Priority
Genetic structure of the population	To maintain the genetic variability of the population	Level of genetic diversity of the population	Genetic diversity of the population: - Deviances from the Hardy Weinberg equilibrium - Allelic richness - Nucleotidic diversity	Partially available (more samples needed)	Not available yet, but foreseen for 2006	Skin biopsies or skin swabbing of animals from the region and from adjacent areas	Ship-board surveys	- Molecular analysis of mitochondrial DNA and microsatellites - Statistical analysis	- Deviances from the Hardy Weinberg equilibrium - Allelic richness - Nucleotidic diversity	Every 5 years	High	Medium
						Skin or other tissues from stranded or by-caught animals in the region and in adjacent areas	Strandings and by-catches			All stranded and by-caught animals	Low (low rate of strandings and by-catches)	Medium
	To avoid the fragmentation of the population and the genetic isolation of its sub-units (maintain or increase gene flow between population nuclei)	Genetic structure of the population	Genetic structure of the population: - Level of intrapopulation differentiation - Level of interpopulations differentiation - Migration rate	Partially available (more samples needed)	Not available yet, but foreseen for 2006	Skin biopsies or skin swabbing of animals from the region and from adjacent areas	Ship-board surveys	- Molecular analysis of mitochondrial DNA and microsatellites - Statistical analysis	- Level of intrapopulation differentiation - Level of interpopulations differentiation - Migration rate	Every 5 years	High	High
						Skin or other tissues from stranded or by-caught animals in the region and in adjacent areas	Strandings and by-catches			All stranded and by-caught animals	Medium	High

Table 1. **(continuation).** Baseline information required and scheme of Monitoring Plan for the population and habitat attributes

Attribute	Conservation Objective	Indicator	Baseline information			Monitoring Plan						
			Information required	Current data availability	Current analysis availability	Data requirement	Data collection methods requirements	Analytical methods requirements	Output	Sampling temporal plan	Feasibility	Priority
Distribution and habitat use	To avoid the reduction (spatial and temporal) on a long term basis of the usage of areas important for the species	Size of areas used by dolphins and shifts in time	Size of the areas used by the dolphins	Available	Available for the Alborán Sea through spatial analysis. For the rest of the areas foreseen for 2006	Effort and sightings data	Ship-board surveys	Spatial analysis	Surface maps of habitat preference	Seasonal and yearly	High	High
		Frequency of use of the important areas and trends	Frequency of use of the adequate areas	Available	Available in terms of encounter rates			Statistical analysis	Seasonal and annual frequency of use of the areas	Seasonal and yearly	High	High
		Site fidelity of animals	Site fidelity of animals	Available	Available	Photo-identification		Mark-recapture	Levels of site fidelity of individual animals	Seasonal and yearly	Medium	Medium

Table 1. **(continuation).** Baseline information required and scheme of Monitoring Plan for the population and habitat attributes

Attribute	Conservation Objective	Indicator	Baseline information			Monitoring Plan						
			Information required	Current data availability	Current analysis availability	Data requirement	Data collection methods requirements	Analytical methods requirements	Output	Sampling temporal plan	Feasibility	Priority
Abundance	To maintain or increase in the long term the abundance of the species in the region	Abundance of dolphins and trends	Current abundance in southern Spanish Mediterranean	Available	Available for Alborán Sea, Gulf of Vera and Strait of Gibraltar.	Line transect data in southern Spanish Mediterranean	Ship-board surveys in southern Spanish Mediterranean	Spatial analysis	Abundance estimate and trends and surface maps of density	Seasonal and yearly	High	High
						Photo-identification		Mark-recapture	Abundance estimate and trends	Seasonal and yearly	Medium	High
									Catalogue of identified animals			
			Current abundance of population (as informed from genetics) in Mediterranean Sea	Not available. Basin-wide survey being planned within the ACCOBAMS framework	Not available	Line transect data in Mediterranean Sea	Ship-board surveys in Mediterranean Sea	Distance sampling	Abundance estimate and trends	Every 10 years	Low	High
								Spatial analysis	Abundance estimate and trends and surface maps of density			
			Viability of the population (including reproductive rates and survival)	Not available	Not available	Reproduction rates (sightings data and photo-identification)	Ship-board surveys	Population Viability Analysis	Prediction of the viability of the population	Every year	Low	Medium
						Survival (photo-identification)						

Table 1. (continuation). Baseline information required and scheme of Monitoring Plan for the population and habitat attributes

Attribute	Conservation Objective	Indicator	Baseline information			Monitoring Plan						
			Information required	Current data availability	Current analysis availability	Data requirement	Data collection methods requirements	Analytical methods requirements	Output	Sampling temporal plan	Feasibility	Priority
Health and nutritional status of the population	To avoid a deterioration of the health[2] and nutritional status of the population	Level of pathologies in animals	Level of pathologies in animals	Not available	Not available	Stranded or by-caught animals	Strandings and by-catches	Clinical and pathological examinations	Description and levels or proportions of pathologies	All strandings and by-catches	Low	Low
		Level of pollutants in animal tissues	Level of pollutants in animal tissues	Not available	Not available	Skin, blubber and other tissues	By-catches	Toxicological analysis	Quantitative levels of pollutants in the tissues of the animals	All by-catches. Biopsies every 5 years	Medium	Medium
						Skin biopsies of animals	Ship-board surveys				High	Medium
		Thickness of blubber layer	Nutritional status of animals	Not available	Not available	Stranded or by-caught animals	Strandings and by-catches	Measure of the blubber thickness	Blubber layer thickness	All strandings and by-catches	Low	Low
		Percentage of time used in searching for food				Sightings and behavioural data	Ship-board surveys	Statistical analysis	Proportion of time spent searching for food	Seasonal and yearly	High	Medium
		Number of mortalities the cause of which is identified as 'human activity'	Number of injuries and mortalities the cause of which is identified as 'human activity'	Not available	Not available	Number of injuries and mortalities the cause of which is identified as 'human activity'	Strandings and by-catches	Analysis of the causes of mortality	Estimated number and proportion of injuries and mortalities caused by different types of human activities	All strandings and by-catches	Low	Medium
							Observations at sea	Statistical analysis		All visual surveys	High	Medium
							Inquiries to fishermen			Yearly	Medium	Low
							Observers on fishing boats			Seasonal and yearly	Medium	High
		Composition of the diet of animals	Diet	Partially available through stable isotopes (not to species level)	Partially available through stable isotopes (not to species level)	Potential prey samples	Markets, fishing boats, etc.	Stable isotopes	Stable isotopes profiles for dolphins and prey	Seasonal and yearly	High	High
						Biopsy samples	Ship-board surveys				High	
						Skin, blubber and other tissues	Strandings and by-catches	Stable isotopes		All strandings and by-catches	Low	High
								Stomach contents	Stomach contents		Low	Low

[2] This includes injuries and death caused by human activities

Table 1. **(continuation).** Baseline information required and scheme of Monitoring Plan for the population and habitat attributes

Attribute	Conservation Objective	Indicator	Baseline information			Monitoring Plan						
			Information required	Current data availability	Current analysis availability	Data requirement	Data collection methods requirements	Analytical methods requirements	Output	Sampling temporal plan	Feasibility	Priority
Prey	To maintain or increase the availability of food resources for the animals	Abundance of the main prey species for bottlenose dolphins	Spatial distribution of potential prey	Partially available (IEO)	Partially available (IEO)	Spatial distribution of CPUE (catch per unit effort) of potential prey species	Oceanographic surveys	Spatial analysis	Surface maps of distribution of potential prey	Yearly	Low	High
			Abundance of potential prey	Partially available (IEO)	Partially available (IEO)	CPUE of potential prey species	Oceanographic surveys	Statistical analysis	Abundance of potential prey	Yearly	Low	High

Table 2. Baseline information required and scheme of Monitoring Plan for the human activities

Human activity	Baseline information required (and Indicator for the Monitoring Plan)	Present availability	Monitoring methods		Output	Sampling temporal plan	Priorization	
			Data requirement	Analytical requirements			Feasibility	Priority
Gillnets	Fishing effort	Partial availability (IEO – SGPM – CAP data).	Number of ships, and hours of fishing	Statistical analysis	Number of ships and hours of fishing	Yearly	High	High
	Diversity and volume of catches	Partial availability (IEO – SGPM – CAP data).	Catch statistics	Statistical analysis	Volume of catches by species	Yearly	Low	High
	Fishing areas	Partial availability (IEO – SGPM – CAP – Circe and Alnitak data).	On site data from visual surveys	GIS	Maps of fishing areas	Yearly	High	High
Driftnets	Fishing effort	Partially available (WWF)	Number and length of nets	Statistical analysis	Number and length of nets	Yearly	Low	High
	Fishing areas	Not available	On site data from visual surveys	GIS	Maps of fishing areas	Yearly	Low	High
Trawling	Fishing effort	Partial availability (IEO – SGPM – CAP data).	Number and power of ships, and hours of fishing	Statistical analysis	Number and power of ships and hours of fishing	Yearly	High	High
	Diversity and volume of catches	Partial availability (IEO – SGPM – CAP data).	Catch statistics	Statistical analysis	Volume of catches by species	Yearly	Medium	High
	Fishing areas	Partial availability (IEO – SGPM – CAP – Circe and Alnitak data).	On site data from visual surveys	GIS	Maps of fishing areas	Yearly	High	High
Sport fishing	Fishing effort	Not available	Number of ships, and hours of fishing	Statistical analysis	Number of ships and hours of fishing	Yearly	Medium	High
	Diversity and volume of catches	Not available	Catch statistics	Statistical analysis	Volume of catches by species	Yearly	Low	High
	Fishing areas	Partially available (Circe and Alnitak data)	On site data from visual surveys	GIS	Maps of fishing areas	Yearly	High	High
Release of captive or foreign marine mammals	Number of releases	No cases yet	Number and plans of releases	None	Number and plans of releases	Continuous	High	Medium
Dredging	Dredging effort	Available (official records)	Official records	Statistical analysis	Amount and intensity of dredging	Yearly	High	Medium
	Dredging areas	Available (official records)	Official records	GIS	Map of dredging areas	Yearly	High	Medium
Infrastructure construction	Present number and extension of infrastructure constructions (ports, wind farms, oil plants, etc.)	Available (official records)	New construction projects	GIS	Number and maps of new construction projects	Yearly	High	Medium
ADD and AHD	Technical specifications of ADD and AHD in use	Not available	Technical specifications	None	Reports of types of devices used	Yearly	Medium	Medium
	Spatial use of ADD and AHD	Not available	Numbers and locations	GIS	Map of ADD and AHD use	Yearly	Medium	Medium

Table 2 (continuation). Baseline information required and scheme of Monitoring Plan for the human activities

Human activity	Baseline information required (and Indicator for the Monitoring Plan)	Present availability	Monitoring methods		Output	Sampling temporal plan	Priorization	
			Data requirement	Analytical requirements			Feasibility	Priority
Maritime traffic[3]	Maritime traffic intensity	Available (DGMM statistics)	TSS records	Statistical analysis	Number of ships crossing the area	Yearly	High	Medium
	Spatial density of maritime traffic	Partially available (Circe and Alnitak data)	On site data on shipping from visual surveys	GIS	Maps of maritime traffic density	Yearly	High	Medium
	Number of maritime accidents involving toxic substances spills	Official records?	Official records	Statistical analysis	Number of maritime accidents involving toxic substances spills	Yearly	Medium	High
	Location of maritime accidents involving toxic substances spills	Official records? + CREPAD satellite images (not being used)	Official records	GIS	Maps of accidents and spills	Yearly	Low	High
Sonars / underwater explosions	Number of military / geological / oceanographic activities and characteristics of their emissions	Official records	Official records	Statistical analysis	Number of activities and characteristics of their emissions	Yearly	High	Medium
	Areas of military / geological / oceanographic activities	Official records	Official records	GIS	Maps of activities	Yearly	High	Medium
Oil exploitation	Number of exploitation activities and characteristics of their emissions	Official records	Official records	Statistical analysis	Number of activities and characteristics of their emissions	Yearly	High	Medium
	Areas of exploitation activities	Official records	Official records	GIS	Maps of activities	Yearly	High	Medium
Uncontrolled waste management	Number of plastics on surface	Not available	Plastic debris survey	Statistical analysis+ GIS	Abundance and maps of plastic debris on surface	Yearly	High	Low
	Number and location of waste management sites	Official records	Official records	Statistical analysis + GIS	Report and maps of waste management sites	Yearly	Medium	High
	Waste management procedures for ports, coastal towns, etc.	Official records	Official records and reports	Statistical analysis	Report on waste management procedures	Yearly	High	High
	Agriculture run off	CAP statistics	Agriculture toxic substance usage	Statistical analysis* GIS	Statistics and maps of areas of run off	Yearly	Medium	High
	Antifouling wash off	Not available	Shipyard data	Statistical analysis * GIS	Statistics and areas of washing off	Yearly	Low	Medium

[3] Maritime traffic includes here all ships in movement (large tonnage vessels, pleasure boats, fishing boats, whale-watching, military and research boats, etc.)

Table 2 (continuation). Baseline information required and scheme of Monitoring Plan for the human activities

Human activity	Baseline information required (and Indicator for the Monitoring Plan)	Present availability	Monitoring methods		Output	Sampling temporal plan	Priorization	
			Data requirement	Analytical requirements			Feasibility	Priority
Cetacean observation	Number and areas covered by research platforms	Available	Inquiries	Statistical analysis+ GIS	Statistics and areas of research	Yearly	High	Medium
	Number and areas covered by whale-watching boats	Available	Official records	Statistical analysis+ GIS	Statistics and areas of whale-watching	Yearly	High	Medium
	Number of reports on harassment	Not available	Direct observations	None	Reports on harassment	Yearly	Low	Low
	Number of reported cases of stranded animals with signs of mishandling	Not available	Clinical examination of stranded animals	None	Reports	All stranded animals	Medium	Low
Invasive research (involving direct contact or capture)	Number and type of research involving invasive methods	Available	Official records	None	Reports	Yearly	High	Medium
Aquaculture	Number and location of aquaculture farms	Official records	Official records	GIS	Maps of location of aquaculture farms	Yearly	High	Low
	Target and prey species	Official records	Official records	Statistical analysis	Target and prey species	Yearly	High	Low

C – BASELINE INFORMATION AVAILABLE AND NEEDED

Table 1 lists the baseline information required for each attribute, together with the current availability of data and analysis. This section provides the available quantitative information, a brief description that is still required, and indications on how this information should be used in the context of future monitoring. Data used to define this baseline information include those obtained during the LIFE02NAT/E/8610 project, as well as previous and additional data provided by Alnitak and CIRCE.

C.1. BASELINE INFORMATION ON THE POPULATION

C.1.1. GENETIC STRUCTURE OF THE POPULATION

Samples collected through biopsy sampling in the areas of the Gulf of Cádiz, Strait of Gibraltar and Alborán Sea, are being analysed to assess the genetic diversity and structure of the population. Results are expected for late 2006. These samples will also be compared to samples from the NE Atlantic and other Mediterranean areas (Balearic Islands, NE coasts of Spain, Italy, Greece, etc.) to assess the population identity of the animals inhabiting the Strait of Gibraltar and the northern Alborán Sea.

Samples are still needed from the Gulf of Vera, and more samples also from the Gulf of Cádiz, where sample size is still small. More samples from the Alborán Sea and Strait of Gibraltar are also needed, differentiating between resident and transient animals, to better understand the genetic structure of the population.

The baseline information on stock or population identity of the animals inhabiting the Southern Spanish Mediterranean coasts will be used to assess how these populations (if more than one) should be monitored and how specific conservation measures should be applied, as the situation would be different if there is only one stock/population or more than one in the geographic area covered by this Plan. Appropriate conclusions will be delivered when this information is available.

C.1.2. DISTRIBUTION AND HABITAT USE

Size of the areas used by the dolphins. This information is available for:

a) Southern Almería and Gulf of Vera in the form of surface map of habitat preference for the period 1992-2005 (Figure 1). Preferred habitats are the Seco de los Olivos underwater sea mount (as the most heavily used area), and secondarily the whole area off Southern Almería (corresponding to the proposed SAC which also includes the Seco de los Olivos sea mount) and the eastern and western parts off Southern Murcia (corresponding to the SAC in this area). Surface maps of habitat preference for 4 periods of years are also shown for Southern Almería: 1992-1997, 1998-2000, 2001-2003, 2004-2005 (Figure 2a-d), to illustrate how the main area used by the dolphins around the Seco de los Olivos underwater sea mount is always the main hot spot over the years. These maps were obtained through spatial modelling.

b) For the northern Alborán Sea, a habitat preference map is available for the period 2000-2005 (Figure 3). Preferred habitats are the Seco de los Olivos underwater sea mount (as the most heavily used area) and Bay of Almería (as also shown in Figures 1 and 2), the coastal waters of Granada and south of Punta Calaburras (Málaga) and Bay of Estepona. This map was obtained through spatial modelling.

c) For the Strait of Gibraltar a habitat preference map is available for the period 2000-2002 (Figure 4). This map was obtained through spatial modelling. Animals concentrate here in a very localised area in the central portion of the channel. This area corresponds to the proposed SAC.

d) For the Gulf of Cádiz, due to the low number of sightings, it is not possible to construct an accurate map of distribution, and only a map with sightings is available (Figure 5). A distribution map will be available soon thanks to ongoing research.

The two most heavily used areas in the whole area of Andalucía and Murcia are the Strait of Gibraltar (and specifically its central channel) and the waters off Southern Almería (especially around the Seco de los Olivos sea mount).

Future monitoring will assess: a) if the main important areas (namely, the Strait of Gibraltar and the Seco de los Olivos) remain highly used by bottlenose dolphins in the long term, and b) if the medium to heavily used areas (identified in points a) and b) above) remain being used by bottlenose dolphins in the long term.

It is important to incorporate natural variation in the future monitoring process, especially in terms of the extension of the areas used. Figure 2 shows natural variation in the use of the adequate areas during the past 15 years. A possible way of incorporating this natural variation is by creating surface maps of uncertainty (e.g. lower and upper 95%CI) (see Cañadas and Hammond 2006). The most appropriate way of dealing with this issue will be discussed in the near future with the relevant experts in scientific forums.

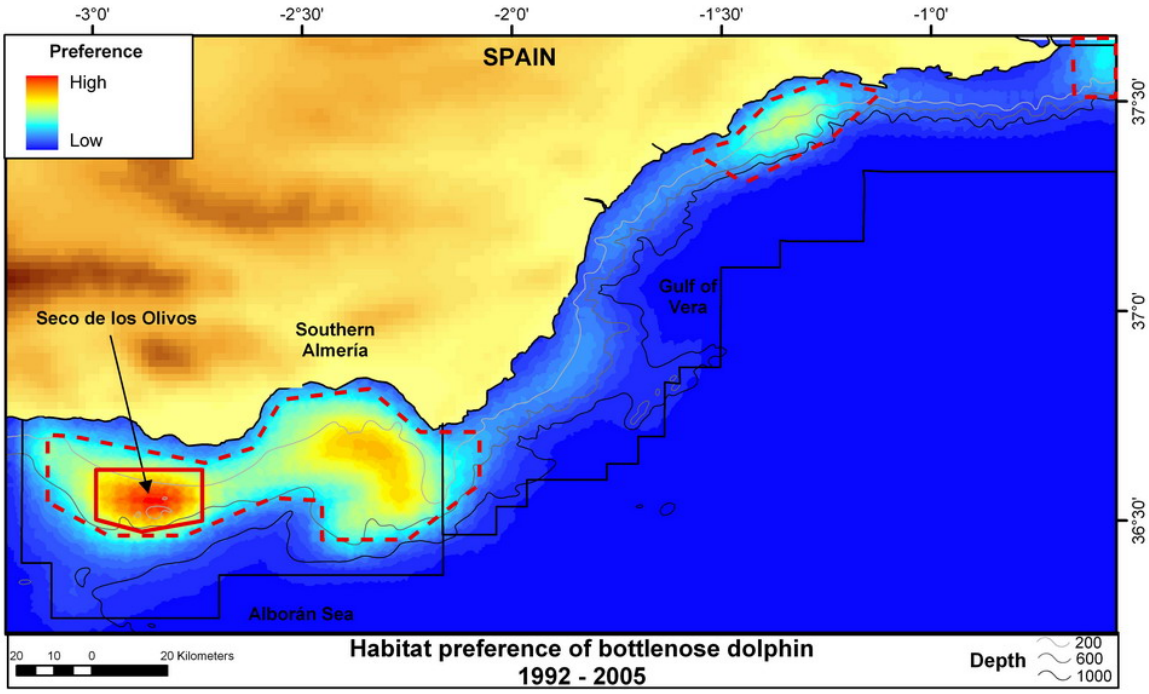
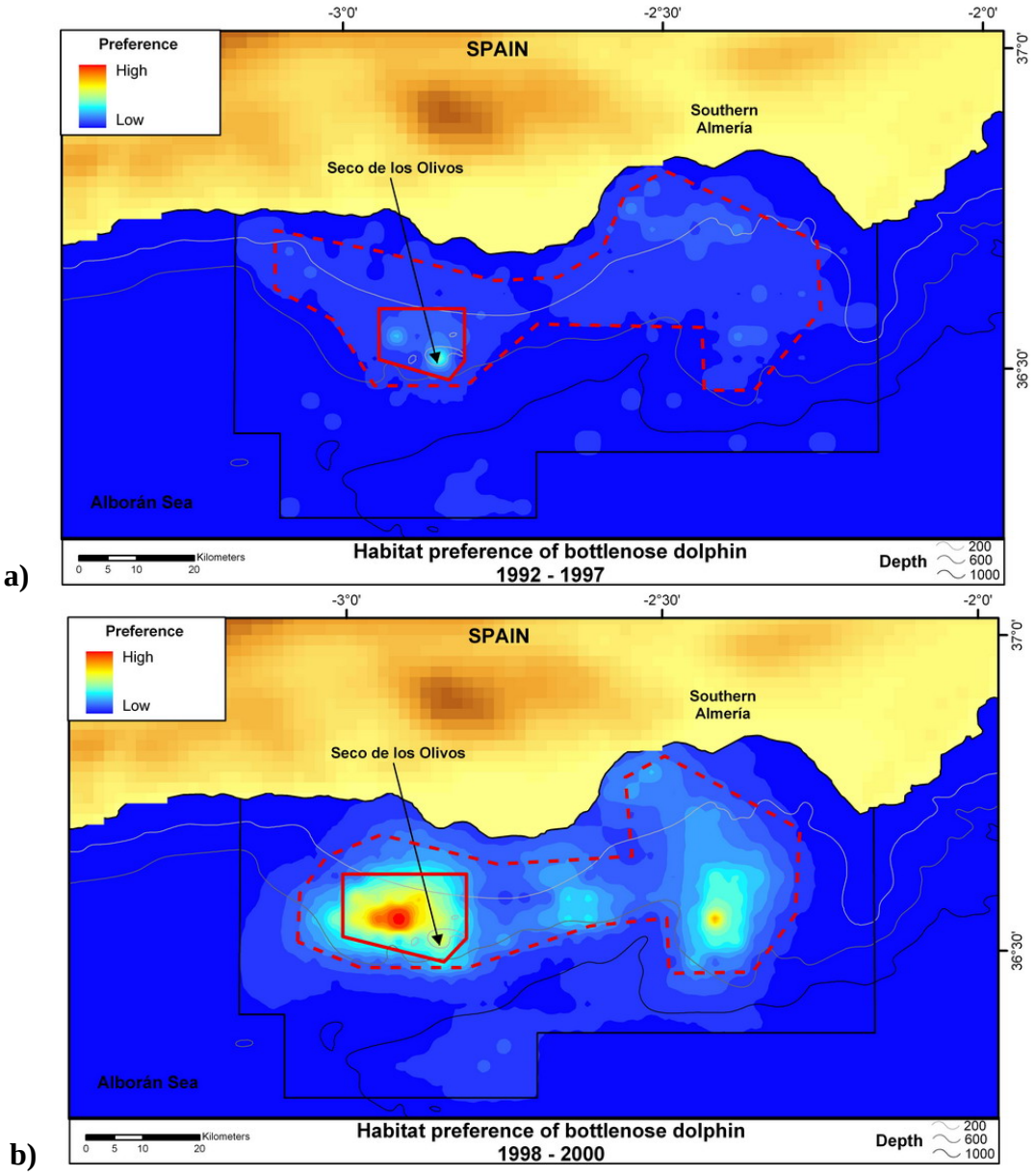


Fig. 1. Surface map of habitat preference for Southern Almería and Gulf of Vera for the period 1992 – 2005. Black lines show the study areas. Red solid line shows the very heavily used area. Red dashed lines show the medium to heavily used areas.



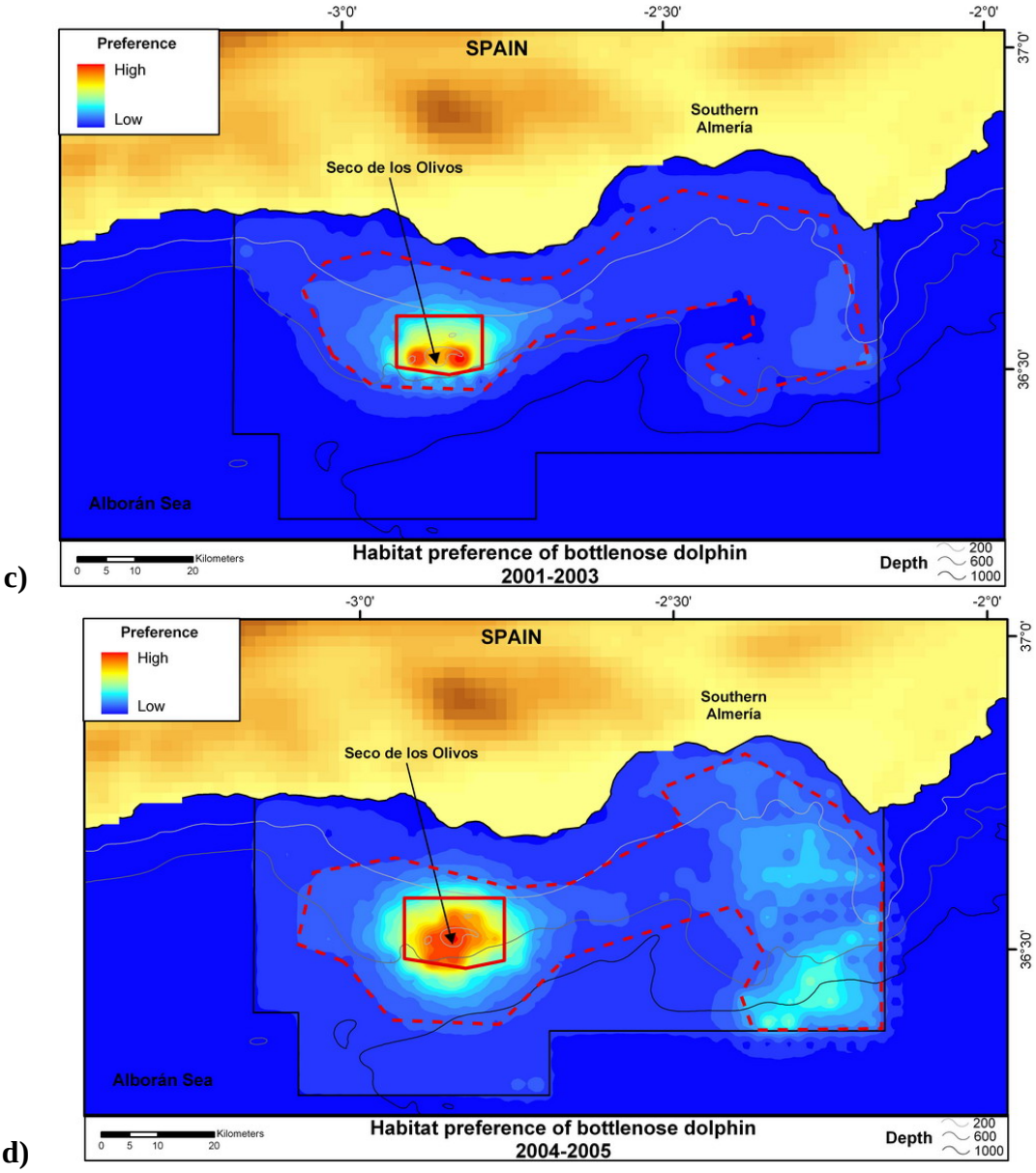


Fig. 2. Surface maps of habitat preference off Southern Almería for all periods: a) 1992 to 1997, b) 1998 to 2000, c) 2001 to 2003 and d) 2004 to 2005. Black line show the study area. Red solid line shows the very heavily used area. Red dashed lines show the medium to heavily used areas.

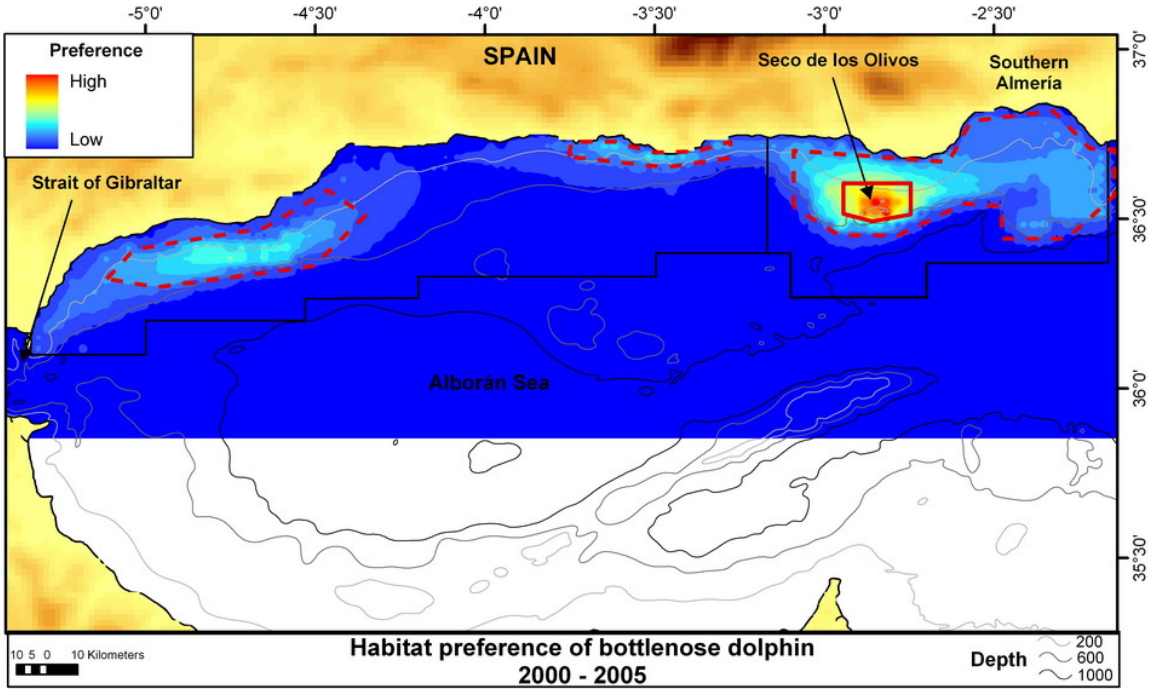


Fig. 3. Surface map of habitat preference for the northern Alborán Sea for the period 2000 – 2005. Black lines show the study areas. Red solid line shows the very heavily used area. Red dashed lines show the medium to heavily used areas.

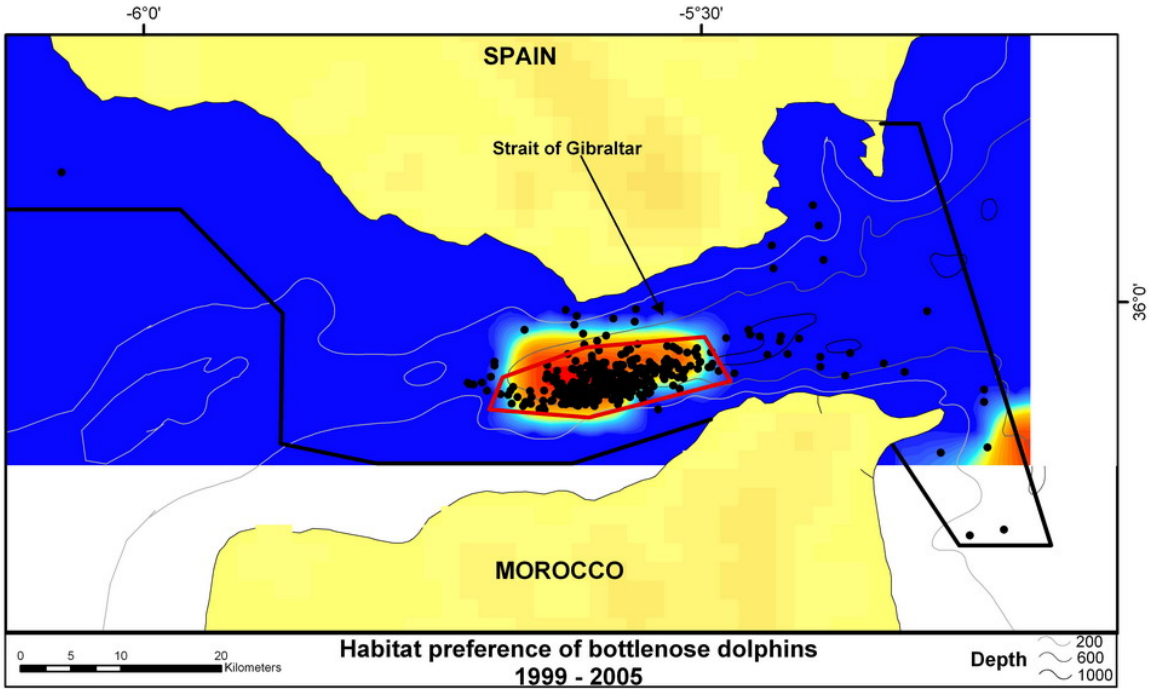


Fig. 4. Surface map of habitat preference for the Strait of Gibraltar for the period 2000-2002. Sightings of bottlenose dolphin (black dots) correspond to the period 1999 - 2005. The Black line shows the study area. The red line shows the most heavily used area by the dolphins.

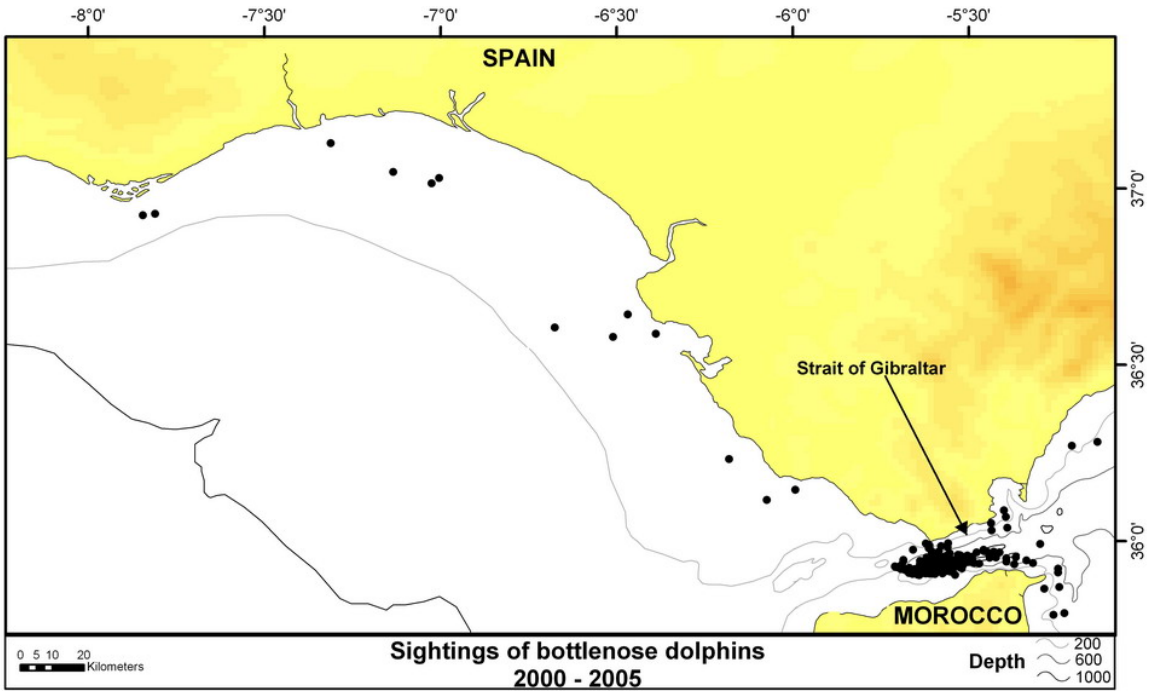


Fig. 5. Sightings of bottlenose dolphin in the Gulf of Cádiz between 2000 and 2005 (black dots).

Frequency of use of the adequate areas. Bottlenose dolphins are seen throughout all seasons in all surveyed areas. In the Strait of Gibraltar, the encounter rate is in average 1 group every 100km surveyed with adequate searching conditions. In the second most heavily used area, the encounter rate is in average of 0.73 groups every 100km surveyed, but with important variations depending on the presence or not of immigrant groups, varying from 0.40 to 1.28 groups every 100km surveyed.

Future monitoring will assess if the adequate areas (especially the most heavily used ones) remain being used in all seasons and, at least, with similar frequency as that identified as baseline. As in the previous point, uncertainty and natural variability needs to be incorporated in the process when analysing monitoring results.

Site fidelity of animals. The identified animals in the Gulf of Cádiz are resident in this area at least during the last period of the summer season and over the years, although they have high mobility.

In the Strait of Gibraltar, animals are resident during the whole summer (not enough data available during other seasons to assess residency) and over the years. There is no evidence of exchange or movements between this area and the adjacent areas of the Gulf of Cádiz and the Alborán Sea. Therefore, the animals in the Strait of Gibraltar can be considered as highly resident and most probably highly isolated.

There are possibly two 'types' of dolphins in the Alborán Sea. Some animals are resident and are seen over the years, especially in the area of Southern Almería, although some are seen occasionally also in the Gulf of Vera. From time to time, an immigration event occur (at least two events have been recorded since 1992) where 'transient' animals arrive to the area and

stay for some months or even 2-3 years before they apparently leave the area again. These animals are, therefore, not strictly resident in the area as the other 'type' but they become resident for relatively short periods of time.

Future monitoring will assess if the resident animals continue using their areas in the long term (in contrast with the short-term usage by transient or immigrant animals).

C.1.3. ABUNDANCE

Current abundance in southern Spanish Mediterranean. Although there is no baseline information at present for the Gulf of Cádiz (there is a low encounter rate), it is expected to be available in the near future as a result of ongoing research. Photo-identification analysis done up to know show a minimum of 88 animals identified.

For the Strait of Gibraltar, the abundance has remained fairly stable over a number of years (2002-2005). The abundance estimate for year 2002 has been chosen as the baseline for monitoring (Table 3), as being the closest available estimate to 'low' levels of disturbance in terms of fast ferry lines (began in 2002), and whale watching (began in 1998 but with major development in 2001).

The abundance of bottlenose dolphins in the Alborán Sea has been shown to fluctuate greatly due to the temporary immigration/ emigration of groups of animals. The baseline has been defined as the mean abundance estimate for the last 6 years (from 2000 to 2005). This is the period when the whole area has been surveyed, and includes periods of low and high density.

For the same reason, for the Gulf of Vera the mean abundance estimate for the last 6 years (from 2000 to 2005) is taken as baseline.

The estimated current mean abundance of bottlenose dolphins for each subarea is shown in Table 3. These subareas have been chosen to match study areas blocks. There is still no genetic information available to define what comprises a population. Photo-identification work has shown, nevertheless, that there does not seem to exist mixing among the animals found in the Gulf of Cádiz, the Strait of Gibraltar and the Alborán Sea and Gulf of Vera in one block (the same animals are found in these two last ones).

Years	Area	Point estimate	CV	95% CI
-	Gulf of Cádiz	currently not available		
2002	Strait of Gibraltar	230	0.22	166-374
2000 - 2005	Northern Alborán (including Southern Almería) and Gulf of Vera	905	0.12-0.38	728-1102
2000 - 2005	Southern Almería	428	0.12	340-509
-	Island of Alborán	currently not available		
2000 - 2005	Gulf of Vera	183	0.16-0.40	144-260

Table 3. Estimates of current mean abundances for Southern Spain

Future monitoring will assess possible trends in the populations in relation with the current abundance estimates taken as baselines. But before designing a monitoring programme, it is essential to carry out a power analysis in order to assess the optimal length of the time series

of abundance estimates and their precision, and the sensitivity to detect statistically significant population changes (see Action RA-002). This analysis will be useful in (1) assessing whether a proposed design has even a reasonable chance of detecting a trend, (2) estimating the number of sample occasions that will be required, (3) providing an estimate of the rate of change that will be detectable, and (4) comparing the efficacy of different proposed survey designs.

As an example, Figure 6 shows a hypothetical power analysis for four different values of coefficient of variation (CV). In general, low rates of change require a large number of years to be detected. As the CV of annual estimates varies according to the sampling effort, different values of CV can be used to explore the number of successful photo-identification surveys or amount of survey visual effort (considering the average encounter rates in the area) needed to detect a trend of a given magnitude.

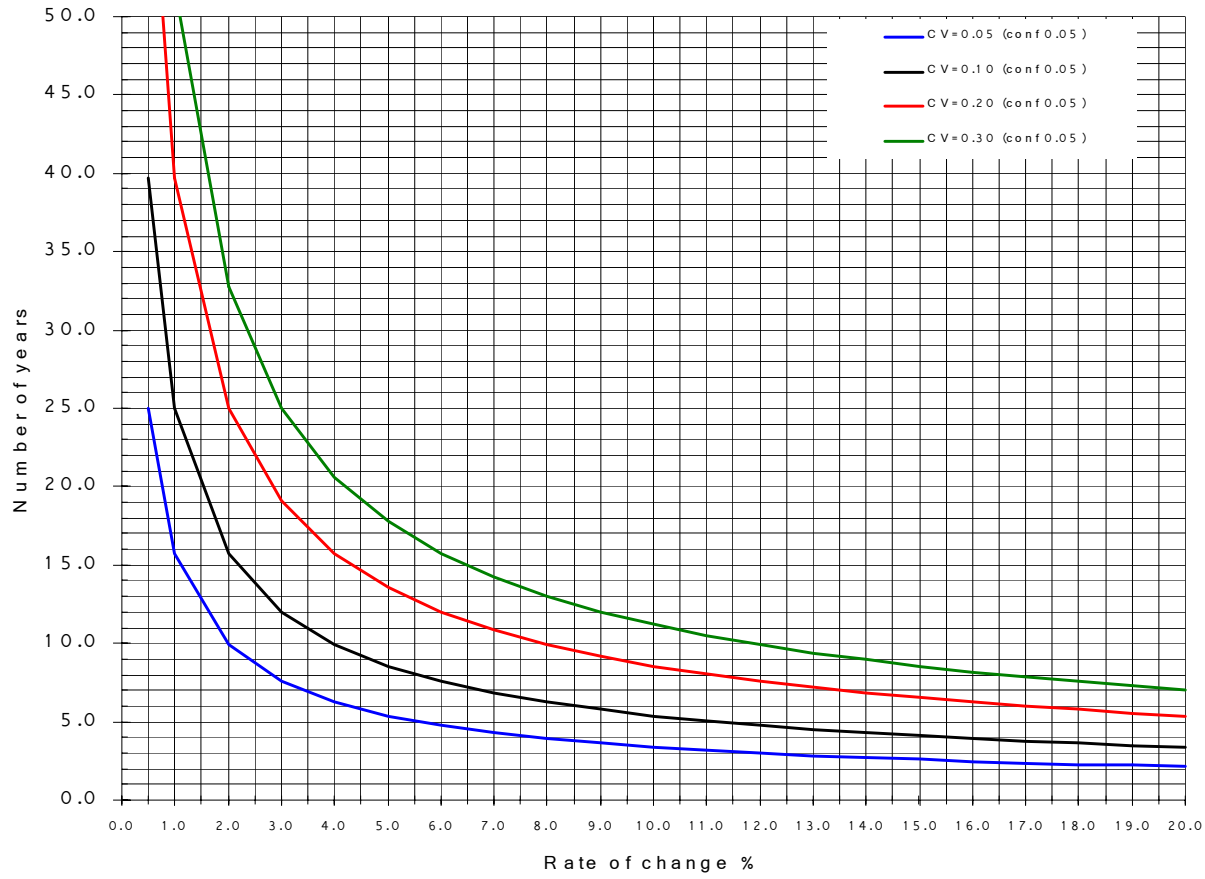


Fig. 6. Power analysis for four different coefficients of variation (CV), with a level of confidence of 95%. The larger the CV, the longest it will take (X axis) to detect a given rate of change (Y axis).

Current abundance of population (as informed from genetics) in Mediterranean Sea. This information is not yet available (only in portions of the basin). See Action MOA-001.

Viability of the population (including reproductive rates and survival). Data on abundance is available (see above), but data on reproduction rates and survival are still needed (see

Action MOA-003). Population Viability Analysis needs to be performed when all data is available (see Action MOA-004).

Once this information is available as baseline, future monitoring will assess how the viability of the population evolves (including, therefore, how the survival rate and the reproductive rates evolve with time).

C.1.4. HEALTH AND NUTRITIONAL STATUS OF THE POPULATION

Most of the information required (levels of pathologies in animals, levels of pollutants in animal tissues, nutritional status of animals, numbers of injuries and mortalities the cause of which is identified as 'human activities') is not available and needs to be collected (see Action MOA-003). Only data on diet is partially available through stomach contents in the Gulf of Cádiz, and through stable isotopes (not to the species level) in the Strait of Gibraltar, Gulf of Cádiz and Alborán Sea. Based on this information, there does not seem to be significant differences in the diet in all areas, and the diet seems to be very cosmopolitan, with a very large spectrum of prey. Only gilt sardine and needle fish do not appear in their diet, while hake and sea bream seem to constitute an important component. Also common octopus and *sparidae* seems to be consistently in the diet of bottlenose dolphins in this region. See Annex **MON-D10A1-01** for details.

Future monitoring will assess if there are significant shifts in the diet of the animals.

C.1.5. PREY

Data on spatial distribution and abundance of potential prey for bottlenose dolphins are partially available through the datasets of the IEO (Spanish Oceanographic Institute), but they need to be completed and maps need to become available.

Future monitoring should assess possible changes in the long term, that could potentially affect bottlenose dolphins.

C.2. BASELINE INFORMATION ON HUMAN ACTIVITIES

Refer to Table 2 for a list of the baseline information required on human activities and their present availability.

D – RESEARCH AND MONITORING ACTIONS

D.1. STRUCTURE OF THE ACTIONS

All the Actions included in the Conservation Plan describe:

- IDENTITY including: a) Type of action; b) Name of action and c) Level of priority

- DESCRIPTION including: a) Specific objectives it is developed for; b) Specific threats it is aimed to mitigate; c) Target; d) Method and materials; e) Expected results; f) Implementation; g) Timeline; and h) Cost

- LEGAL FRAMEWORK

- ACTORS including: a) Relevant authority; and b) Executers (operators – receivers)

- EVALUATION including: a) Indicator values; and b) Monitoring tool

D.2. TYPES OF ACTIONS

The Actions can be classified in several categories, following to large extent those established in the ACCOBAMS Conservation Plan of the Mediterranean common dolphin (www.accobams.org).

1. Research Actions

   These Actions are established where there is an urgent need for data to solve a specific problem (e.g. testing bycatch mitigation measures) or to obtain essential baseline data.

2. Monitoring Actions

   Actions involving lines of research on specific aspects of the species, the habitats or the human activities and their impact on the species. These actions focus on filling the scientific information gaps that are essential for effective conservation in terms of detecting and, if possible, explaining, changes. Monitoring Actions ensure that there is a systematic recording of those essential values that have been identified as indicators for the analyses of trends in the conservation status of the species and their habitats and in the threats and human activities that cause them. These Actions will assess, therefore, if the conservation objectives are being accomplished.

A prioritization of the actions has been done taking into account its feasibility and its importance.

D.2.1. RESEARCH ACTIONS

- Investigate the feasibility of obtaining baseline information in life history parameters and population viability analysis

D.2.2. MONITORING ACTIONS

- Large scale abundance estimate
- Local distribution and abundance
- Population structure
- Health, nutritional status and diet of the population
- Modelling of the population viability
- Trends in human activities

Investigate the feasibility of obtaining baseline population parameters at the levels of precision and accuracy of value to conservation and management

RESEARCH ACTION – BDCP-RA-001 Priority: HIGH

DESCRIPTION OF ACTION

- **Specific objectives it is developed for:**

  3: To avoid a decline in the long term of the abundance of the species in the region

  4: To avoid the reduction (spatial and temporal) on a long term basis of the usage of areas adequate for the species

  5: To ensure the long term viability of the population in the region

- **Specific threats it is aimed to mitigate:** not applicable
- **Rationale:** Before proposing use of any biological parameters, either as a means to monitor the 'population' or for for use in modelling (e.g. a VPA), it is necessary to investigate the feasibility of obtaining baseline population parameters at the levels of precision and accuracy of value to conservation and management, given the available information (data that can be collected) and the methods to be used. In particular, before designing a monitoring programme to assess changes in abundance of the population, it is essential to carry out a power analysis in order to assess the optimal length of the time series of abundance estimates and their precision, and the sensitivity to detect statistically significant population changes.
- **Target:** To determine the feasibility, given the available information (data that can be collected) and the methods being used, of obtaining baseline population parameters at the levels of precision and accuracy of value to conservation and management.
- **Method and materials:** Feasibility simulation studies (statistical analysis including power analysis)to:

  (a) estimate the level of effort required to estimate any parameters to specific levels of accuracy/precision;

  (b) estimate the level of effort required to determine natural variability for identified parameters;

  (c) estimate the level of effort required to detect changes (at specified levels over specified periods) in particular parameters;

  (d) assess whether a proposed design has even a reasonable chance of detecting a trend,

  (e) provide an estimate of the rate of change that will be detectable,

  (f) compare the efficacy of different proposed survey designs

  (d) assess the sensitivity of any proposed PVA to absolute and changing values of particular biological parameters, especially given the answers to the points above.

- **Expected results:** Feasibility study of obtaining baseline population parameters at the levels of precision and accuracy of value to conservation and management, and a complete power analysis determining the level of effort, the type of platform and the type of methodology to be used to be able to detect statistically significant population changes.
- **Implementation-Timeline:** Immediate. 2006-2007
- **Cost:** approximately 5000 €
- **Synergy with Loggerhead Turtle Conservation Plan:** NO

ACTION LEGAL FRAMEWORK

- ACCOBAMS

ACTORS

- **Responsible for coordination of action:**
- **Relevant authority:** Ministry of Environment (DGB), Regional Governments (Environmental Departments).
- **Stakeholders:** Scientists collecting data to feed the simulations. Scientists with experience in the field of statistical analysis and feasibility simulation studies.

ACTION EVALUATION

- **Indicator values:** Report
- **Action tracking tool:** Revision of report

PRIORITY

Importance: High - Feasibility: High

Large scale abundance estimate

MONITORING ACTION – BDCP-MOA-001 Priority: HIGH

DESCRIPTION OF ACTION

- **Specific objectives it is developed for:**

  3: To avoid a decline in the long term of the abundance of the species in the region

  4: To avoid the reduction (spatial and temporal) on a long term basis of the usage of areas adequate for the species

- **Specific threats it is aimed to mitigate:** not applicable
- **Rationale:** In order to put any threat into context, and given the unknown but probably large home range and movements of this species, it is necessary to obtain baseline information on abundance and distribution of bottlenose dolphins in the Mediterranean. The same survey can be used to obtain baseline data on human activities.
- **Target:** An estimate of abundance and distribution for the whole Mediterranean.
- **Method and materials:** Line transect visual surveys. Data will be analysed using distance sampling (design-based method) and spatial modelling (model-based method). Methods have been discussed in detail during a Workshop organised by ACCOBAMS in Valsaín, Segovia (Spain) in December 2004.
- **Expected results:** A report including abundance estimates in the whole area and in sub-areas, distribution and habitat preferences, G.I.S. layers.
- **Implementation-Timeline:** Immediate. 2007 – 2010
- **Cost:** approximately 6.000.000 € for the whole Mediterranean
- **Synergy with Loggerhead Turtle Conservation Plan:** YES

ACTION LEGAL FRAMEWORK

- ACCOBAMS, Habitats Directive

ACTORS

- **Responsible for coordination of action:** ACCOBAMS
- **Relevant authority:** European Commission, Ministry of Environment (DGB) and Ministry of Agriculture, Fisheries and Food (DGRP) and other Mediterranean countries.
- **Stakeholder:** NGOs, scientists and research institutions in all Mediterranean countries. Scientists with experience in the field of abundance estimation.

ACTION EVALUATION

- **Indicator values:** Reports – Management G.I.S.
- **Action tracking tool:** Revision of reports

PRIORITY

Importance: High - Feasibility: Medium

Local distribution and abundance

MONITORING ACTION – BDCP-MOA-002 Priority: HIGH

DESCRIPTION OF ACTION

- **Specific objectives it is developed for:**

  3: To avoid a decline in the long term of the abundance of the species in the region

  4: To avoid the reduction (spatial and temporal) on a long term basis of the usage of areas adequate for the species

- **Specific threats it is aimed to mitigate:** not applicable
- **Rationale:** In order to put any threat into context, and given the unknown but probably large home range and movements of this species, it is necessary to obtain baseline information on abundance and distribution of bottlenose dolphins in the area of application of the Conservation Plan. The same survey can be used to obtain baseline data on human activities. Specific estimates of abundance and distribution needs to be obtained also for local areas of special interest, such as the proposed SAC, to allow tracking of trends in abundance and shifts in distribution within those areas as a feedback mechanism to the Management Plans of these areas.
- **Target:** An estimate of abundance and distribution for the area of application of the Conservation Plan.
- **Method and materials:** Data will be collected in two ways depending on the characteristics of the area and the population: photo-identification and line transect visual surveys. Visual surveys conducted in the area need to collect data on bottlenose dolphins and human activities observations. Photo-identification data will be analysed through mark-recapture to obtain abundance estimates. Line transect data will be analysed using distance sampling (design-based method) or spatial modelling (model-based method) to obtain abundance estimates and distribution and habitat preference information. The appropriate method to be used in each area and the amount of effort required per year will be assessed in Action RA-001.
- **Expected results:** A report including abundance estimates, habitat use analysis, distribution analysis, G.I.S. layers.
- **Implementation-Timeline:** Immediate, but dependent on results from Action RA-001. 2007 – onwards
- **Cost:** depending on results from Action RA-001 (methods to be used in each area)
- **Synergy with Loggerhead Turtle Conservation Plan:** YES

ACTION LEGAL FRAMEWORK

- Habitats Directive, ACCOBAMS

ACTORS

- **Responsible for coordination of action:**
- **Relevant authority:** Ministry of Environment (DGB), Ministry of Agriculture, Fisheries and Food (DGRP) and Regional Governments (Environmental Departments).
- **Stakeholders:** Ministry of Agriculture, Fisheries and Food (DGRP), Local NGO's, scientists and research institutions with experience in the field of visual and acoustic surveys. Scientists with experience in the field of abundance estimation.

ACTION EVALUATION

- **Indicator values:** Reports – Management G.I.S.
- **Action tracking tool:** Revision of reports

PRIORITY

Importance: High - Feasibility: High

Investigation of population structure

MONITORING ACTION – BDCP-MOA-003 Priority: HIGH

DESCRIPTION OF ACTION

- **Specific objectives it is developed for:**

  1: To maintain the genetic variability of the population

  2: To avoid the fragmentation of the population and the genetic isolation of its sub-units

  5: To ensure the long term viability of the population in the region

  In a first stage, the primary purpose of this action is to understand what it is we are trying to conserve and how that relates to the estimates of abundance that are being obtained.

- **Specific threats it is aimed to mitigate:** not applicable
- **Rationale:** Genetic analysis is a tool that in a relatively short time enables to assess the population structure of a species and therefore provide useful information to define Management Units over a defined geographic range. Through a genetic analysis it may be possible to:
  - Assess the population structure of a species over an interested geographic range related to the populations inhabiting neighbouring areas.
  - Analyse the population or subpopulation structure in the interested area and assess whether different stocks can be identified in different sub-regions.
  - Get an insight in the social structure of a population analysing the kin structure within groups.
- **Target:** Precise data on population identity (phylogeography) and population genetic structure.
- **Method and materials:** Biopsies (skin) will be obtained from free- ranging dolphins taking advantage of the visual surveys (MOA-002), and from stranded animals. Analysis will be carried out on mitochondrial DNA and microsatellites.
- **Expected results:** Precise data on population identity (phylogeography) and population genetic structure.
- **Implementation:** Immediate
- **Timeline:** 2007 –2009
- **Cost:** approximately 42.000 €, including:

  Biopsies: 5.000 €; Ship time: associated to MOA-002 with no extra cost; Data collection from strandings: 5.000 €; Genetic analysis (100 samples): 12.000 €; Personnel costs (analyses): 10.000 €; Various and contingencies: 10.000 €
- **Synergy with Loggerhead Turtle Conservation Plan:** NO

ACTION LEGAL FRAMEWORK

- ACCOBAMS, Habitats Directive

ACTORS

- **Responsible for coordination of action:**
- **Relevant authority:** Ministry of Environment (DGB) and Regional Governments (Environmental Departments).
- **Stakeholders:** Scientists carrying out the visual surveys (Action MOA-002). Scientists with experience in biopsy sampling. NGO's, scientists and research institutions with experience in the field of sample collection from strandings. NGO's, scientists and research institutions with experience in the field of molecular analysis.

ACTION EVALUATION

- **Indicator values:** Annual reports
- **Action tracking tool:** Revision of reports

PRIORITY

Importance: High - Feasibility: High

Modelling of the population viability

MONITORING ACTION – BDCP-MOA-004 Priority: HIGH

DESCRIPTION OF ACTION

- **Specific objectives it is developed for:**

  1: To maintain the genetic variability of the population

  2: To avoid the fragmentation of the population and the genetic isolation of its sub-units

  3: To avoid a decline in the long term of the abundance of the species in the region

  4: To avoid the reduction (spatial and temporal) on a long term basis of the usage of areas adequate for the species

  5: To ensure the long term viability of the population in the region

  6: To avoid a deterioration of the health and nutritional status of the animals

- **Specific threats it is aimed to mitigate:** not applicable
- **Rationale:** This action intends to provide a population viability analysis – PVA - to estimate what will happen with the population(s) given certain impacts. These action needs to be fed with the information obtained from BDCP-MOA-002.
- **Target:** Population Viability Analysis (PVA)
- **Method and materials:** Statistical Modelling of population viability including data on: abundance estimates, survival, reproduction rates, other impacts. Survival and reproduction rates will be obtained from photo-identification (either carried out in action MOA-002 if photo-identification is carried out in all areas, or otherwise as part of this action). Analysis will focus on what will happen with the population at different levels of abundance and mortality rates.
- **Expected results:** Population Viability Analysis
- **Implementation-Timeline:** Immediate but depending upon results of actions RA-001 and MOA-002. 2007 – onwards
- **Cost:** approximately 25.000 € (field cost for photo-identification associated to action MOA-002)
- **Synergy with Loggerhead Turtle Conservation Plan:** NO

ACTION LEGAL FRAMEWORK

- ACCOBAMS, Habitat Directive

ACTORS

- **Responsible for coordination of action:**
- **Relevant authority:** Ministry of Environment (DGB) and Regional Governments (Environmental Departments).
- **Stakeholders:** Scientists with experience in the field of statistical analysis and PVA.

ACTION EVALUATION

- **Indicator values:** Reports
- **Action tracking tool:** Revision of reports

PRIORITY

Importance: Medium - Feasibility: Medium

Investigation on the health, nutritional status and diet of the population

MONITORING ACTION – BDCP-MOA-005 Priority: MEDIUM

DESCRIPTION OF ACTION

- **Specific objectives it is developed for:**

  6: To avoid a deterioration of the health and nutritional status of the animals

- **Specific threats it is aimed to mitigate:** not applicable
- **Rationale:** This action intends to work, first, on filling in the gaps of background information, and second to monitor such information on health and nutritional parameters which is required to provide the scientific base for the conservation of the species and the management of the human activities that have a potential impact on its population(s).

  Health parameters such as toxicology and pathology are relevant information to assess the health status of the population.

  Knowledge on the diet of the animals provides valuable information to assess the potential impact of fisheries in terms of competition for resources.

- **Target:** To obtain precise data on health parameters and diet of the populations
- **Method and materials:** Taking advantage of the visual surveys (MOA-002), the following data should be recorded and analysed:

  Biopsies (skin and blubber):

  1. stable isotopes (diet)
  2. toxicology (health parameters)

  From stranded animals, the stranding networks should obtain:

  1. stomach contents (diet)
  2. tissues samples for stable isotopes (diet)
  3. tissues samples of skin and internal organs (health parameters)

- **Expected results:** Data on health parameters and diet of the populations
- **Implementation Timeline:** Immediate. 2007 –2009
- **Cost:** approximately 200.000 €

  Biopsies: 5.000 € (no cost if in synergy with Action MOA-004); Ship time: associated to MOA-002 with no extra cost; Data collection from strandings: 50.000 €; Stable isotopes analysis (100 samples): 3.000 € (30 € per sample); Toxicological analysis (50 samples): 50.000 € (1.000 € per sample); Pathological examination (20 animals): 20.000 € (600 € per animal); Personnel costs (analyses): 50.000 €; Various and contingencies: 10.000 €

- **Synergy with Loggerhead Turtle Conservation Plan:** NO

ACTION LEGAL FRAMEWORK

- ACCOBAMS, Habitats Directive

ACTORS

- **Responsible for coordination of action:**
- **Relevant authority:** Ministry of Environment (DGB) and Regional Governments (Environmental Departments).

- **Stakeholders:** Scientists carrying out the visual surveys (Action MOA-002). Scientists with experience in biopsy sampling. NGO's, scientists and research institutions with experience in the field of data collection from strandings. Scientists with experience in the fields of molecular analysis, diet analysis and pathological examinations.

ACTION EVALUATION

- **Indicator values:** Annual reports
- **Action tracking tool:** Revision of reports

PRIORITY

Importance: Medium - Feasibility: Medium

Monitoring trends in human activities

MONITORING ACTION – BDCP-MOA-006 Priority: HIGH

DESCRIPTION OF ACTION

- **Specific objectives it is developed for:**

  3: To avoid a decline in the long term of the abundance of the species in the region

  4: To avoid the reduction (spatial and temporal) on a long term basis of the usage of areas adequate for the species

  5: To ensure the long term viability of the population in the region

  6: To avoid a deterioration of the health and nutritional status of the animals

- **Specific threats it is aimed to mitigate:** not applicable
- **Rationale:** It is necessary to ensure the follow up of periodic analysis of the human activities in the region to assess if any change in the population parameters might be due to qualitative or quantitative changes in human activities.
- **Target:** Uninterrupted yearly reports of human activities.
- **Method and materials:** Visual surveys conducted in the area need to collect data on human activities observations. The data will be analysed with different methods depending on the type in order to provide data and maps for the Management G.I.S.
- **Expected results:** Yearly report including qualitative and quantitative data on human activities in the area and G.I.S. layers.
- **Implementation-Timeline:** Immediate. 2006 – onwards
- **Cost:** Data collection associated to MOA-002 (no extra cost). Data analysis: approximately 6.000 €
- **Synergy with Loggerhead Turtle Conservation Plan:** YES

ACTION LEGAL FRAMEWORK

- ACCOBAMS

ACTORS

- **Responsible for coordination of action:**
- **Relevant authority:** Ministry of Environment (DGB) and Regional Governments (Environmental Departments), Ministry of Agriculture, Fisheries and Food (DGRP), Ministry of Public Works (Maritime Traffic, DGMM), local authorities.
- **Stakeholders:** Scientists carrying out the visual surveys (Action MOA-002). Local NGO's, scientists and research institutions able to collect human activities data.

ACTION EVALUATION

- **Indicator values:** Reports – Management G.I.S.
- **Action tracking tool:** Revision of reports

PRIORITY

Importance: High - Feasibility: Medium