

Agenda Item 6.1

Project Funding through ASCOBANS

Progress of Supported Projects

Information Document 6.1.c

**Interim Project Report:  
Small Cetaceans in European Atlantic  
waters and the North Sea (SCANS-III)**

**Action Requested**

- Take note

Submitted by

Secretariat / St. Andrews University



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DELEGATES ARE KINDLY REMINDED  
TO BRING THEIR OWN COPIES OF DOCUMENTS TO THE MEETING**



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# *Small Cetaceans in European Atlantic waters and the North Sea (SCANS-III): Updated Project Introduction*

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## Background

A series of large scale surveys for cetaceans in European Atlantic waters was initiated in 1994 (SCANS; Hammond et al. 2002) and continued in 2005 (SCANS-II; Hammond et al. 2013) and 2007 (CODA 2009) with the purpose of providing estimates of abundance needed to put bycatch in a population context and to allow EU member States to discharge their responsibilities under the Habitats Directive. The frequency of these surveys was intended to be approximately decadal; a third survey is now due.

In the mid-1990s, the primary need was for comprehensive abundance estimates but, increasingly, there has been an additional need for robust assessments of the impact of human activities and for consistent Europe-wide monitoring and reporting. SCANS-II and CODA incorporated work to develop management frameworks for determining safe limits to harbour porpoise and common dolphin bycatch to meet specified conservation objectives. SCANS-II also included work to inform methods for monitoring abundance at temporal and spatial scales smaller than covered by the large-scale surveys. This work has only partially been utilised and it is now imperative to make significant progress to enable EU Member States together to achieve Good Environmental Status under the Marine Strategy Framework Directive.

To meet requirements of the 2014 LIFE call for Funding, the proposal is structured around answering a central *Environmental Problem*.

## Environmental problem which SCANS-III is designed to address:

Anthropogenic maritime activity continues to rise within the European Atlantic region threatening a range of cetacean species with predicted negative impacts. However, there are insufficient data and inadequate pan-European integration to assess the impact of these threats. Assessment of good environmental status and favourable conservation status of these highly mobile European Protected Species is thus currently impossible at the necessary spatial scale of the entire European Atlantic.

## Project objectives

SCANS-III comprises five linked objectives which together will move Member States forward several important steps towards effective implementation of the Habitats Directive and the Marine Strategy Framework Directive with respect to cetaceans. The European Atlantic is changing rapidly and it is essential that Member States have access to up-to-date robust information on the status of key species and the threats that they face so that mitigation and future monitoring can be directed effectively and efficiently to achieve and maintain favourable conservation status of species and good environmental status of European Atlantic waters.

- ***Objective 1 - Estimate the abundance of all cetaceans in shelf and oceanic waters of the European Atlantic in summer 2016***

Up-to-date information on distribution and abundance is at the heart of assessments of status and threats; this objective will provide that information at the necessary large spatial scale and provide essential updates to the information from 1994 and 2005. Objective 1 will be achieved through a large-scale multinational survey for cetaceans of all European Atlantic waters in July 2016 using a combination of ships and aircraft. The survey will be comparable with, but improve upon, surveys conducted in 1994, 2005 and 2007.

- ***Objective 2 - Collate all available data on fisheries bycatch mortality, noise pollution and shipping impacts on cetaceans in European Atlantic waters and create layers of threat in time and space.***

Objective 2 will be achieved through an extensive search and collation of available data from a range of sources and their incorporation into a fit-for-purpose database. The database will have the capability to generate threat layers at various scales of time and space.

- ***Objective 3 - Assess the impact of current and likely future anthropogenic activities on cetaceans in the European Atlantic.***

Impact assessments will use the new abundance data from Objective 1 and the collated data from Objective 2. Management frameworks to generate safe limits to human-induced cetacean mortality will be further developed so that they can be implemented at a European level.

Objective 3 will be achieved through the use of population models to assess the impact of estimated levels of human-induced mortality on the status of affected species.

- ***Objective 4 - Conduct an intensive, rigorous trial of methods for monitoring cetacean abundance***

This will inform best practice for monitoring as required by the Habitats Directive and as input to common indicators under the MSFD. EU Member States currently employ a variety of methods for monitoring cetacean abundance that are not readily combined to inform on status at the necessary spatial scale. This objective will allow a common approach to be followed for future cetacean monitoring.

Objective 4 will be achieved through a rigorous, small-scale, focussed survey in late summer 2015 to allow a robust comparison of the effectiveness of a suite of monitoring techniques. This survey will involve shipboard and aerial surveys, including digital photographic techniques, and static and towed passive acoustic techniques. In addition, the creation of a new generation of trained personnel and equipment will be achieved through a series of workshops and specific training sessions.

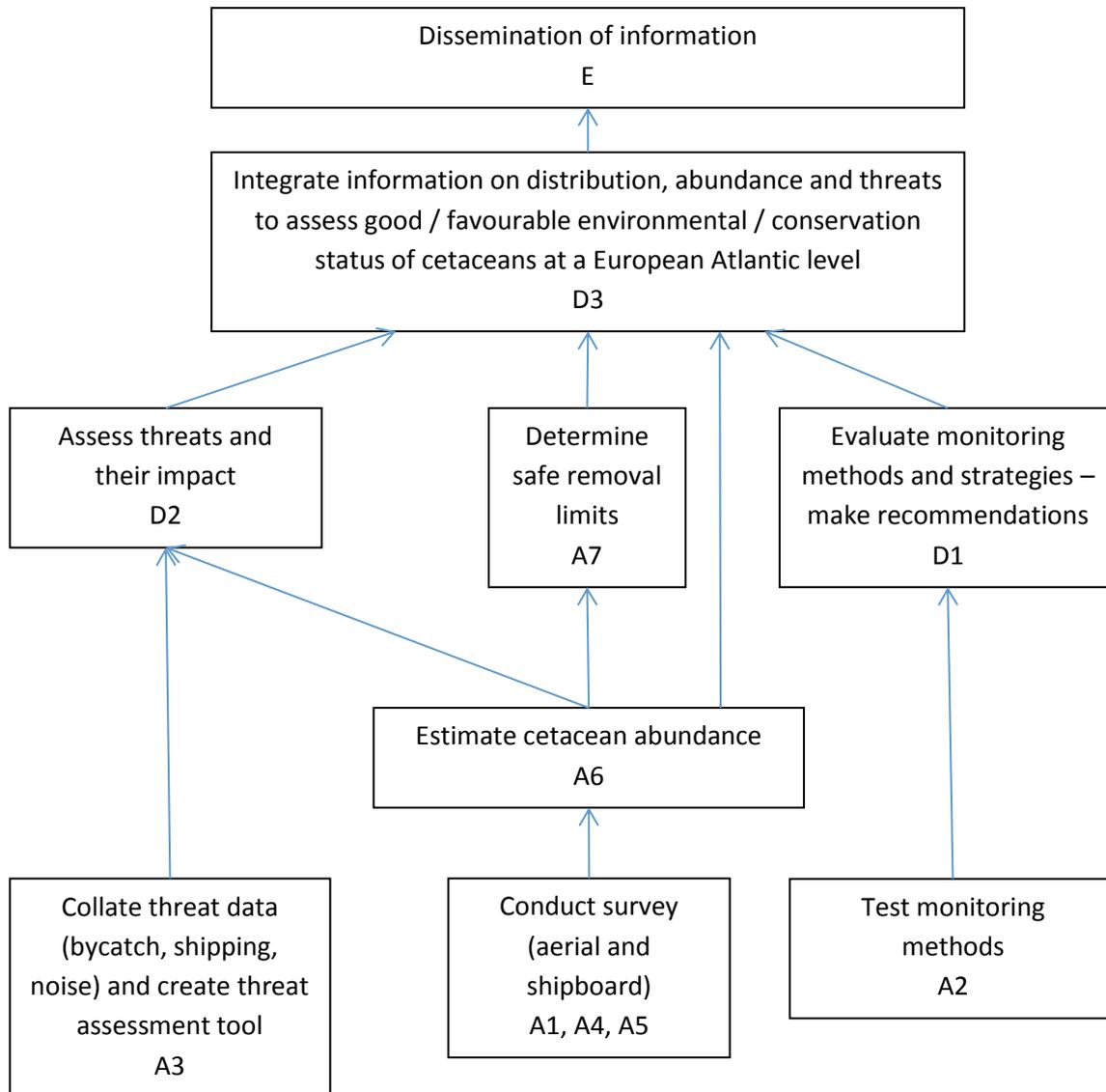
- ***Objective 5 – Integrate information on cetacean abundance and threat assessments***

This will collate information gathered in all previous objectives and use this to assess Favourable Conservation Status (FCS) and Good Environmental Status (GES) at a European Atlantic scale by bringing together the new information obtained during the SCANS III project. It will provide a robust basis for national reporting as well as for the identification of any conservation action necessary to achieve GES or FCS for these species.

## Description of project actions

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The SCANS-III Project will be made up of multiple actions, which together will achieve the overall objectives. These relationships between these are detailed in Figure 1.



**Figure 1: Graphical representation of the project Actions which will complete the five objectives making up the SCANS-III project. Actions are described below.**

## Timetable of key dates

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Proposal submission to LIFE:	16 October 2014
Earliest possible start date if LIFE funding provided:	17 July 2015
Experimental survey field work:	Late Summer 2015
Main SCANS-III Survey	July 2016
Project end	December 2017

## Action A1 – Ship Survey Development

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The objective of this action is to provide all the survey vessels with equipment and software that facilitates accurate data collection for the main ship survey (Action A5). This includes accurate measurement of critical data items such as distances and angles to sightings, together with software to allow data to be validated at sea on a daily basis.

The primary aims of the ship survey development action for SCANS-III are to:

1. Maintain the essential functionality of the SCANS-II system in terms of providing accurate measurement of sighting times, bearings and distances from the Tracker team while improving the overall reliability of the system.
2. Replace as much bespoke cabling and junction boxes from SCANS-II with smart devices connected using Wireless LAN technology. We believe this will make the system more reliable and also easier to build allowing others to replicate and reconfigure.
3. Replace the validation software that was hard coded to the design of the SCANS-II survey with a more flexible package that mirrors the flexibility in design of the Logger data collection software making this a much more useful tool for future surveys.
4. Conduct experiments with multiple fixed cameras to try and capture images of naked eye sightings from the Primary team that are suitable for distance and angle measurement.

## Action A2 - Testing Monitoring Methods

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Monitoring methods will be tested in an two-phase experimental survey. Phase I is planned to take place in both the Great Belt in the inner Danish waters. This is a high density area for harbour porpoises and also a Danish Natura 2000 site. The area is protected from strong winds, which increase the chance for a successful survey with high effort. The survey will take place during the summer of 2015, and the aim is to test new techniques and assess the reliability of multiple different methods to estimate absolute abundance.

Phase II will be aimed at conducting similar comparison work but focussed on a delphinid species, and will be conducted at a site off the north coast of England with a relatively high occurrence of white-beaked dolphins.

This will provide a unique opportunity to compare four different survey methods in the same area at the same time so that they can be evaluated directly, which has never been done before. Testing will include a comparison of aerial and vessel based data collection; a comparison of towed and static passive acoustics and comparison of digital aerial and traditional observer based aerial surveys.

Outputs of this experimental phase will be used to inform protocols for the main survey (Actions A4 and A5) as well as produce a set of Best Practice Monitoring guidelines which can form the basis of national monitoring standards (Action D3).

## Action A3 – Threats database

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Cetacean populations are threatened by a range of anthropogenic activities. Some of these threats cause direct mortalities e.g. hunting, incidental catch in fisheries (bycatch), ship strikes and naval sonar (Reeves et al. 2003). Other threats may indirectly cause mortalities through cumulative or long-term exposure or in combination e.g. noise (from seismic surveys, offshore infrastructure &

shipping), chemical pollutants (e.g. DDT/DDE, PCBs & PAHs) and climate change related effects. Data on both direct and indirect mortality of cetaceans are patchy over time and space and there is a clear need to collate and analyse these data from all available sources to assess health status of cetacean populations.

SCANS-III will collate the available data from as many threat sources as possible and create layers of threat in time and space for mortality inflicted by fisheries, shipping, noise and other indirect threats to assess their potential impact on cetacean populations. The objective is to create a database and GIS framework for threats to cetaceans within the SCANS III proposed survey area. The information from the action will provide the necessary data to conduct the threat assessment in Action 11.

#### Action A4 – Aerial Survey

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Aerial surveys are the preferred method of surveying in areas with convoluted/geographic complex coastlines that are difficult to access via ship and in areas with short windows of acceptable weather. Aircraft can cover a large area in a short time and, in general, are more cost effective than shipboard surveys because aircraft are less expensive to charter. However they are restricted by distance to a safe landing runway, endurance, and most survey aircraft lack the range and speed to operate in far offshore waters.

It is important that the survey takes place over as short a time period as possible. Seven aircraft are needed to cover the area in one month. The aerial survey will take place in July 2016. As for the ship survey (Action A5), July is the most appropriate survey month because of the higher probability of good sighting conditions, the distribution of the animals, and so that estimates are directly comparable with previous abundance estimates from SCANS 1994 and SCANS II 2005.

#### Action A5 - Shipboard Survey

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The aim of this action, in conjunction with Action A4, is to conduct the surveys required to collect data necessary to estimate the abundance of all cetaceans in shelf and oceanic waters of the European Atlantic (Figure 2). This action will deal with data collection carried out by vessel in the waters to the west of the continental shelf.

Shipboard surveys will be conducted to collect data to estimate absolute abundance of cetaceans in European Atlantic continental shelf waters. The surveys will be carried out in July 2016 for a period of one month. Suitable ships will be chartered and modified for cetacean data collection.

The area to be covered by ship survey corresponds to and extends the area covered during the CODA (2007) surveys which were conducted using comparable methodology. The continental shelf will be covered by aerial surveys as described in Action A4. Four ships will be required to cover the survey transects for this area.

The shipboard survey methodology will be developed in Actions 1 and 2 informed by the experimental survey (Action 4) and resolved by Action 5. The survey area will be stratified into survey blocks; pre-determined cruise tracks will be designed to ensure representative coverage of each block. Line transect sampling fine-tuned for the collection of data on small cetaceans will be used, similar to the methods employed during SCANS II (Hammond *et al.* 2013) but with methodological advances incorporated as determined under Action 2.

## Action A6 – Abundance Estimation

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This action will be conducted in three steps:

1. Validate data sets collected from aerial surveys (Action A4) and shipboard surveys (Action A5)

This time-consuming but essential process will ensure accuracy and consistency in all datasets.

Standard and purpose written software will be used. All modifications to the data will be documented.

2. Analyse datasets to generate estimates of absolute abundance for cetaceans in European Atlantic waters for summer 2016

Analyses will include design-based abundance estimation (e.g. Hammond *et al.* 2013) and density surface modelling using methods similar to those used to analyse SCANS-II and CODA data (Hedley *et al.* 1999; Hammond *et al.* 2013; SCANS-II 2008; CODA 2009). Using model-based methods, abundance can be predicted for any appropriate defined area and not just for designed survey blocks. This is important in the context of using the estimates to inform area-based management and for use in the framework for determining safe removal limits (Action A7).

3. Compare estimates of abundance with those from 1994 and 2005/07

As part of the SCANS-II project, the new design-based estimates for 2005 were compared with those for 1994 from SCANS (Hammond *et al.* 2002; Hammond *et al.* 2013). Similarly, the new estimates for 2016 from this project will be compared with those from 1994 and 2005 and also those from offshore waters in 2007 (CODA 2009).

Data from SCANS were re-analysed using model-based methods as part of the SCANS-II project to allow modelled density surfaces to be compared between 2005 and 1994 (Hammond *et al.* 2013). A similar re-analysis will be undertaken in this project.

## Action A7 – Safe removal limits

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This action is based on work initially undertaken during the SCANS-II project for harbour porpoise (SCANS-II 2008), continued under the CODA project for common dolphin (CODA 2009). These previous projects have developed management frameworks for determining safe limits to bycatch removal as described in detail in Winship (2009).

The basis of these management frameworks is to determine limits to removals that enable specified conservation objectives to be met. This is achieved by performing computer simulations that assess the ability of removal limit setting algorithms to allow simulated populations under management to meet specified performance targets. The simulations incorporate a wide range of plausible uncertainties in population dynamics and structure, historical removals, abundance estimates, environmental change, etc, and the resulting removal limit algorithms are thus robust to lack of past, present and future knowledge.

The purpose of this action is to take the existing management frameworks and develop them further to allow their implementation for all cetacean species of conservation concern in the European Atlantic and to incorporate consideration of anthropogenic mortality additional to fisheries bycatch, including ship strikes. The aim is to generate safe limits to non-natural removals for all these species for Management Areas determined by ICES for a Habitats Directive/MSFD reporting period of 6 years.

### Action D1 – Best Practice monitoring

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There is a wide variety of management related questions that can be informed by the monitoring of cetacean populations; these occur at two spatial scales:

- 1) Regional monitoring where the requirement is to monitor the use of a specific area by one or more species, e.g. monitoring status through estimation of relative abundance between and within years in national waters, protected marine protected areas or construction sites;
- 2) Population level monitoring where the requirement is to monitor the status of a whole population.

The aim in both cases is to detect if abundance changes by more than a certain percent over a certain time period.

Using data collected both during the experimental survey (Action A2) and the main survey (Actions A4 and A5), a power analysis will be conducted to assess the abilities of the different methodologies to detect change in numbers of animals over time, and thus produce recommendations for monitoring.

The main output of this action will be a comprehensive report on best practice for monitoring cetaceans as required by the Habitats Directive and as input to common indicators under the MSFD.

### Action D2 – Assessment of threats

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Building on the work of Action A3, this action will populate the threats database with abundance data generated during Actions 7 & 8 to allow spatial and temporal assessment of threats to cetacean populations. The methods and results from this action will provide tools and information that will be very useful for management of fisheries, shipping, marine fossil and renewable energy developments and military sonar use, and for development of mitigation measures to prevent harm from these activities to cetacean populations. Combining spatial and temporal data on threats with cetacean species densities will facilitate member states' obligatory assessments of species' Good Environmental Status under the MSFD directive. Through this action, the SCANS III project will provide the tools and the first comprehensive compilation of threats to cetaceans in EU and adjacent waters.

### Action D3 – Assessment of Environmental Status

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This action will focus on the integration of information on distribution, abundance and threats to assess good/favourable environmental/conservation status of cetaceans at a European Atlantic level.

The Habitats Directive requires Member States to report every 6 years on the conservation status of all cetacean species under Article 17. Cetaceans are highly mobile species that move widely among the waters of the European Atlantic. Reporting at the national level and integration of national reports by the Commission is thus a poor way to assess conservation status of any of these species (with the possible exception of some resident coastal groups of bottlenose dolphins). In the UK, however, JNCC has noted the desirability of aggregating data at a level higher than Member State for all species (Jones 2002).

In contrast, the focus of the Marine Strategy Framework Directive is on cooperation and collaboration among Member States to achieve Good Environmental Status; for cetacean species,

such integration of approach is essential to informing the common indicators on distribution, abundance and threat levels used to assess GES.

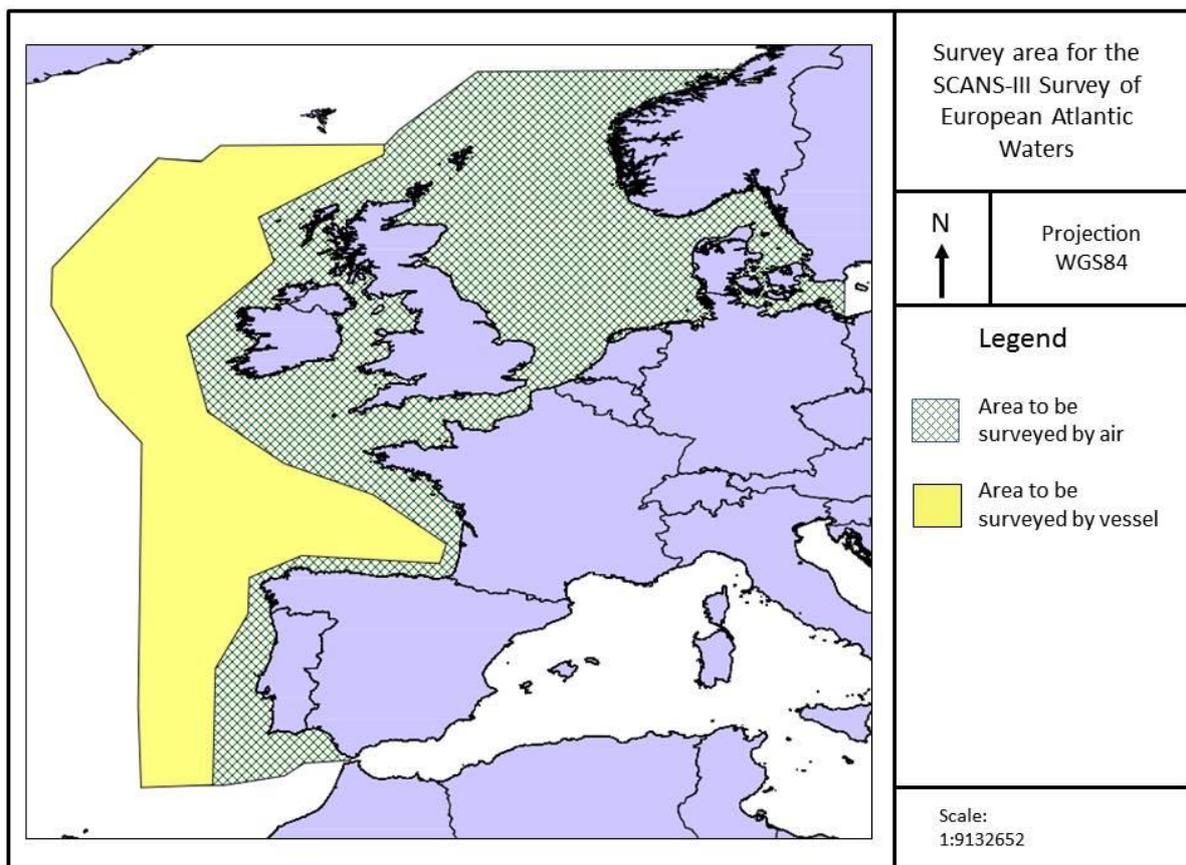
This Action will provide such integration by bringing together the new information obtained in SCANS-III on distribution, abundance and levels of threat for cetacean species to assess good/favourable environmental/conservation status of cetaceans at a European Atlantic level. It will provide a robust basis for reporting and for the identification of any conservation action necessary to achieve GES for these species.

### Action E – Dissemination of results

In order to facilitate dissemination of results as widely as possible, a series of sub-actions will be undertaken, including the use of a dedicated website, project information boards, technical and non-technical publications, and a final report to funders.

### Project Area

The SCANS-III study area will include waters covered by both the SCANS-II and the CODA projects (Figure 2) but extended to the 200nm limit in all waters. The SCANS-II areas (continental shelf) will be covered by aerial survey, whilst the CODA areas (off shelf) will be covered by ship survey.



## Target Species

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The SCANS-III initiative will collect data on all cetacean species encountered during surveys of European Atlantic Waters (Figure 2).

This will include, but is not limited to the following species:

Scientific name: *Phocoena phocoena*

Scientific name: *Tursiops truncatus*

Scientific name: *Delphinus delphis*

Scientific name: *Lagenorhynchus albirostris*

Scientific name: *Lagenorhynchus acutus*

Scientific name: *Balaenoptera acutorostrata*

Scientific name: *Stenella coeruleoalba*

Scientific name: *Globicephala melas*

Scientific name: *Balaenoptera physalus*

Scientific name: *Balaenoptera borealis*

Scientific name: *Physeter macrocephalus*

Scientific name: *Mesoplodon bidens*, *Ziphius cavirostris* and *Hyperoodon ampullatus*

## Expected results

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On completion of the project, Member States will have the means to assess favourable conservation status for cetacean species in the European Atlantic at the necessary large spatial scale, to prioritise mitigation measures to improve the status of these species, and to monitor them effectively in the future to ensure that good environmental status can be achieved in this context.

1. Up-to-date, robust estimates of absolute abundance and summer distribution of cetaceans in the European Atlantic. Estimates are expected for 12 species: harbour porpoise; bottlenose, common, white-beaked, white-sided, striped and Risso's dolphin; pilot, sperm, fin, sei, and beaked (combined species) whales.
2. A set of "threat layers" describing cetacean mortality inflicted by fisheries and shipping in time and space.
3. A comprehensive assessment of the impact of human-induced mortality from fisheries and shipping on cetacean species in the European Atlantic and quantified safe limits to removals for key species.
4. An expert good practice guide for monitoring abundance between major decadal-scale surveys, based on rigorously tested experimental protocols.
5. A new generation of trained personnel and equipment that will enable abundance to be estimated, threats to be assessed, and status to be determined for cetaceans in European waters.

## Participating organisations (to date)

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Aarhus University, Denmark  
Management Unit of the North Sea Mathematical Models, Belgium  
University of Veterinary Medicine, Hannover, Germany  
University of La Rochelle, France  
University College Cork, Ireland  
Wageningen UR, Netherlands  
Instituto da Conservação da Natureza, Portugal  
Instituto Español de Oceanografía, Spain  
Newcastle University, UK  
University of Aberdeen, UK  
University of St Andrews, UK  
Joint Nature Conservation Committee, UK

## Funding

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The proposal will be submitted to EU LIFE funding in October 2014. Should the proposal be successful, LIFE may provide up to 60% of the required funding. The remaining 40% must be shown to be secured in advance of the proposal submission.

The following budget approximately outlines estimated costs of the actions outlined above. Overheads are estimated at 7% as per EU funding stipulations.

Action	Description	Estimated Cost (Euros)
A1: Ship survey development	Personnel	125,126
	Equipment	45,150
	Travel / Shipping equipment	3,600
	<b>Action total</b>	<b>173,876</b>
A2: Experimental survey	Personnel	129,000
	Equipment	616,900
	Travel / Shipping equipment	24,5000
	<b>Action total</b>	<b>990,900</b>
A3: Creation of threats database	Personnel	30,600
	Travel / meetings	2,500
	Equipment	3,500
	<b>Action total</b>	<b>36,600</b>
A4: Aerial survey	Plane charter	240,000
	Personnel	183,000
	Travel and subsistence	142,200
	Equipment	21,000
	<b>Action total</b>	<b>586,200</b>
A5: Shipboard survey	Vessel charter	1,200,000
	Personnel	300,000

	Travel to vessels	16,000
	Equipment	49,000
	<b>Action total</b>	<b>1,565,000</b>
A6: Abundance estimation	Personnel	162,000
	<b>Action total</b>	<b>162,000</b>
A7: Determination of safe removal limits	Personnel	44,000
	<b>Action total</b>	<b>44,000</b>
D1: Best Practice methodology	Personnel	44,000
	<b>Action total</b>	<b>44,000</b>
D2: Assessment of threats	Personnel	61,400
	Data purchase	5,000
	Travel / meetings	2,500
	<b>Action total</b>	<b>64,400</b>
D3: Assessment of consequences	Personnel	16,000
	Travel and subsistence	4,000
	<b>Action total</b>	<b>20,000</b>
E: Dissemination of project results	Personnel	48,000
	Website	1,500
	Publicity materials	2,000
	Conference / workshop	2,500
	<b>Action total</b>	<b>54,000</b>
Project management	Personnel	<b>144,000</b>
Financial administration support	Personnel	<b>144,000</b>
	<b>Subtotal</b>	<b>4,028,976</b>
	<b>Overheads @7%</b>	<b>282,029</b>
	<b>Total</b>	<b>4,311,005</b>

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