

Agenda Item 9

Funding of Projects and Activities

Progress of Projects Supported by
ASCOBANS

Document Inf.9.1.a

Project Report: Necropsy Protocol

Action Requested

- Take note
- Comment

Submitted by

Secretariat / ZSL



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

Secretariat's Note

The Rules of Procedure adopted at the 19th Meeting of the ASCOBANS Advisory Committee remain in force until and unless an amendment is called for and adopted.

Web-Accessed Database for Marine Mammal Stranding and Necropsy Data



**ASCOBANS Small scale funding agreement
Reference SSFA 2015-1 and SSFA 2017-02**



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Introduction

Cetacean strandings have occurred throughout recorded history around European coastlines, but the drivers of these events have sometimes been poorly understood. With the advent of strandings based research programmes in Europe, significant advances in the understanding of the causes of cetacean morbidity and mortality have occurred and by extension, of the potential threats that these species face (e.g. Jepson *et al.* 2016, Peltier *et al.* 2016, Unger *et al.* 2016, Brownlow *et al.* 2015, Jepson 2013, Leopold *et al.* 2014 and Haelters *et al.* 2013).

The Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS, <http://www.ascobans.org>) was concluded in 1991 under the auspices of the Convention on Migratory Species (CMS or the Bonn Convention) and entered into force in 1994. In February 2008, an extension of the agreement area came into force, which changed the name to "Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas" (Figure 1).

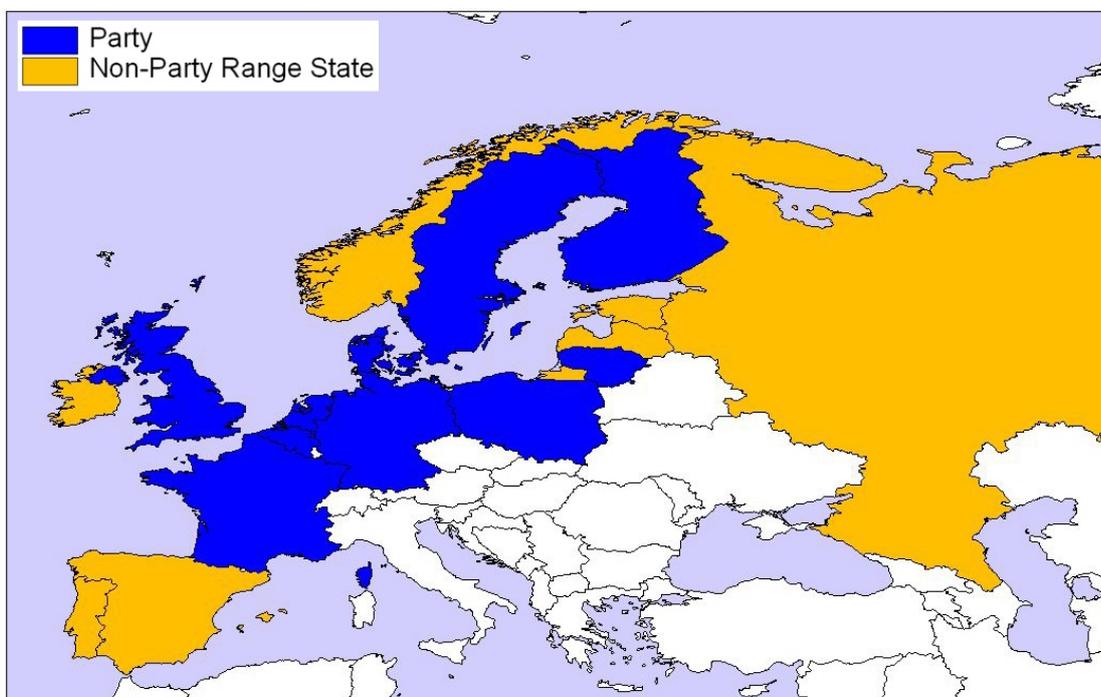


Figure 1 ASCOBANS Agreement Parties and Non-Party Range States

The aim of the Agreement is to promote close cooperation between countries, with a view to achieving and maintaining a favourable conservation status for small cetaceans throughout the Agreement Area.

Across the ASCOBANS region, several long-term strandings monitoring and investigation programmes have been in place for several decades. Data that are collected during the course of such investigations are routinely recorded on national/local databases and in many instances, made available through reports and/or public release of information. However, no centralised point of access across the ASCOBANS region currently exists to facilitate the display of centralized data on both strandings and any necropsies that may have been carried out.

Several international initiatives are currently being pursued that have lead or will lead to such data portals on strandings e.g. the Mediterranean Database for Cetacean Strandings (MEDACES) in the ACCOBAMS region (Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area)¹ and the 'Marine Mammal Health Monitoring and Analysis Platform'² in the USA (Simeone *et al.* 2015).

The creation of a web-accessed database of data on strandings in the ASCOBANS region would help facilitate the delivery of a long-standing objective of the Conservation and Management Plan of the Agreement;

"3. Use of by-catches and strandings

*Each Party shall endeavour to establish an efficient system for reporting and retrieving by-catches and stranded specimens and to carry out, in the framework of the studies mentioned above, full autopsies in order to collect tissues for further studies and to reveal possible causes of death and to document food composition. **The information collected shall be made available in an international database.**"*

In addition, public display of data collected throughout the ASCOBANS region along with a qualitative overview of information on both strandings and research carried out by strandings networks (e.g. species found stranded, reporting arrangements, causes of death and conservation threats etc) would help facilitate another objective;

"5. Information and education

Information shall be provided to the general public in order to ensure support for the aims of the agreement in general and to facilitate the reporting of sightings and strandings in particular; and to fishermen in order to facilitate and promote the reporting of by-catches and the delivery of dead specimens to the extent required for research under the agreement."

To this end, and following small project funding from ASCOBANS (reference SSFA2010-2), a workshop was held at the European Cetacean Society conference in Cadiz in 2011, leading to the production of a feasibility study report (Deaville and Jepson, 2012).

Summary of 2011 ECS (Cadiz) workshop

Fifty-three individuals from eleven countries attended the workshop on 19th March, 2011, with presentations delivered by representatives of nine stranding networks.

- There was near unanimous approval amongst attending networks for the concept of a centralised web-accessed database

¹ ACCOBAMS-MOP1/2002/Res.1.10 (2002) Cooperation between national networks of cetacean strandings and the creation of a database.

www.accobams.org/new_accobams/wp-content/uploads/2016/06/ACCOBAMS_MOP1_Res.1.10.pdf

MEDACES- http://medaces.uv.es/home_eng.htm

² Marine Mammal Commission Marine Mammal Health M.A.P.

<https://www.mmc.gov/priority-topics/marine-mammal-health-and-strandings/marine-mammal-health-and-monitoring-analysis-platform-marine-mammal-health-map/>

<http://axiomdatascience.com/maps/ioos/mbon/#map?lg=a4b0bec0-b9be-11e3-835f-00219bfe5678>



- A number of candidate fields were identified that could be included in a putative database (See **Table 2** for more detail).
- Data would ideally be uploaded at periodic intervals to the portal by contributing networks and data display would take place through a portal that either mirrored the current ASCOBANS design or one that had a specifically designed appearance.
- Selected data would also be directly mapped through the front-end interface via Google Maps capability.
- Different levels of access would be set, allowing different users to view and interrogate the data as appropriate.
- Caveats were raised that the intellectual property rights of national networks and/or funding bodies to data need to be maintained and that existing arrangements are not affected e.g. where countries like France, Spain and Portugal may also contribute data to any ACCOBAMS strandings database/s.
- It was felt that an initially simple approach would be most appropriate, allowing the display of temporal and spatial data (i.e. what species stranded where and when), with cause of death and pathology data to follow. The system should ideally be expandable however, to allow future inclusion of other data as well as data from other networks.

Project Aims (SSFA 2015-1 and SSFA 2017-02)

In this current project, we aimed to progress work previously carried out under small project funding SSFA2010-2. The project had the following aims;

- Discussion and liaison with European stranding networks in the ASCOBANS region.
- Development of a fully costed proposal for the delivery of a web-accessed database, designed to periodically capture and display data on strandings and necropsies carried out in the ASCOBANS region.

The project should therefore deliver a structured proposal with associated costs, that would help lead towards the construction of a database (back end) and website (front end), that would be capable of displaying data on strandings and necropsies across the ASCOBANS region to a variety of possible users.



Proposal outline

As stated in the 2012 project report, it is still believed that ‘an initially simple approach would be most appropriate’ (Deaville and Jepson, 2012). We would propose that this should be a phased process, with delivery of a simple extract of strandings data in an initial phase, followed by the delivery of post-mortem/cause of death data in a later phase, following detailed discussions between contributing network pathologists etc. See **Table 1** and **Figure 2** for more detail on the proposed phased delivery of this project.

Management and delivery- in this project proposal, the ZSL Information and Communication team (ZSL ICT) will lead on the technical delivery of the database (back end) and on the design and creation of the associated website (front end). The Institute of Zoology (IoZ) will be responsible for ensuring delivery of the project objectives and for liaison with/between various project stakeholders.

Database- the proposed database (back end) should;

- Be able to display agreed data on strandings and cause of death information to a variety of potential stakeholders. Data held within the proposed database to be add/view/delete only and not editable. Master versions of data to remain within national database systems
- Be able to facilitate periodic upload of relevant data by partner networks
- Be capable of being amended/upgraded in the future as required

Website- the website (front end) interface should;

- Be appropriately ASCOBANS badged/branded and mirror existing ASCOBANS website. Appropriate background information on ASCOBANS and Parties/Range States to be included
- Contain sub-pages for each contributing network/country, using a standard agreed format which may contain logos, links, background and metadata (on both strandings/necropsy data and on national tissue archives); information on data provision/intellectual property rights to national data; national network contact details for reporting of strandings and/or data/sample requests. Possibly accessed via a map of ASCOBANS Agreement Parties and Non-Party Range States (as per **Figure 1**)
- Facilitate simple data display and summary statistics e.g. how many common dolphins in a region/country, between set date points etc
- Allow geographic mapping of data to a variety of levels (ASCOBANS, national, regional etc)
- Facilitate password-protected access to wider dataset. Downloads only possible by contributing networks and ASCOBANS parties. Requests for access to data by third parties to be directed to relevant national network/s by automated email forms

Frequency of updates- initially, data upload/s are proposed to take place annually at a point to be determined. If data upload is triggered after the end of each financial year, this should help avoid any potential conflict with annual release of data via national reporting. This could also help facilitate any inclusion of strandings data within national reports to ASCOBANS. Timings of uploads may be adjusted at a later date (e.g. quarterly) if this is felt to be appropriate.



Data Ownership- any data provided to the putative database would remain the intellectual property of contributing networks. This would be made clear within the introductory sections and within the relevant networks associated metadata.

Work programme/timetable for delivery- **Table 1** details the likely work programme and timetable for delivery of the project

Table 1 Programme of work associated with delivery of the project

Project Phase	Work package
Phase 1 (Month 1-6)	<ul style="list-style-type: none"> • Discussion between contributing networks • Liaison with ASCOBANS Secretariat and current website providers, to establish existing parameters, requirements etc
Phase 2 (Month 4-12)	<ul style="list-style-type: none"> • Design and build of database/API • Website build (front end data display) • Metadata provided by contributing networks to help populate associated sub-pages within front end • Initial population of the database with strandings data only • Testing of system by contributing networks • Direct output to stakeholders as system goes live
Phase 3 (Month 10-18)	<ul style="list-style-type: none"> • Troubleshooting Phase 2 • Discussion between contributing networks on post-mortem (cause of death) data, to reach a consensus on data display • Update of back/front ends to accommodate the outcomes of these discussions • Population of database with Phase 2 data (cause of death categories etc) • Testing of system by contributing networks • Direct output to stakeholders
Phase 4 (Ongoing)	<ul style="list-style-type: none"> • Troubleshooting Phase 3 • Further refinement and redevelopment of system (as required) • Annual maintenance and hosting

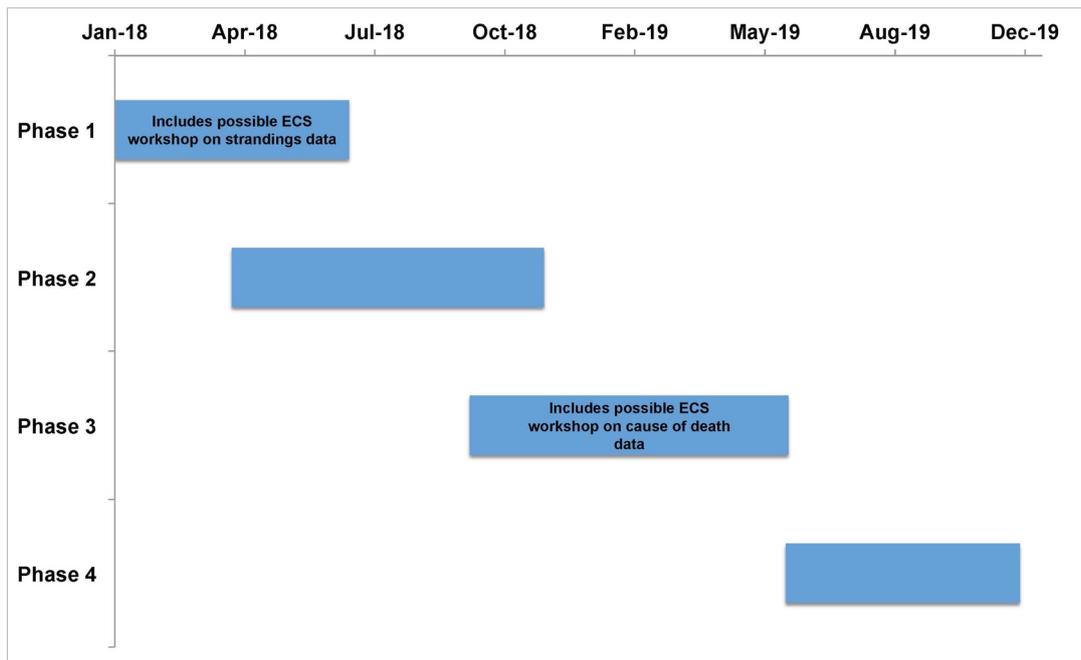
For further technical detail on Phases 2 and 3, see following section “ZSL ICT Department technical/development quote”.

From the point of any funding approval, it is estimated that delivery of the project could take place over ~24 months, with inclusion of contingency for any troubleshooting during Phase 4 (see **Table 1** and **Figure 1**) e.g. if the project was signed off in January 2018, final delivery would take place between July-December 2019. Depending on the potential start point of the project, it may be possible to coincide discussions during Phase 1 and Phase 3 at existing forums, such as European Cetacean Society conference workshops, which tend to be held during March-April. This will help to reduce costs of proposed meetings, as many potential partners may already be attending. **Figure 2** shows an illustrative Gantt chart for this project, with potential ECS workshops marked accordingly.

Data quantity- Data on approximately 3,000 individual strandings (estimated) could potentially be uploaded every year.



Figure 2 Potential project delivery Gantt chart (with example start date of 01/01/18)



Currently, stranding networks that have expressed interest in contributing to such a system are largely from the North Sea and Atlantic coast regions (**Figure 3**). It is anticipated that as the project proceeds, networks from other regions (particularly those from the Baltic Sea and Scandinavia) will also wish to collaborate and contribute data.

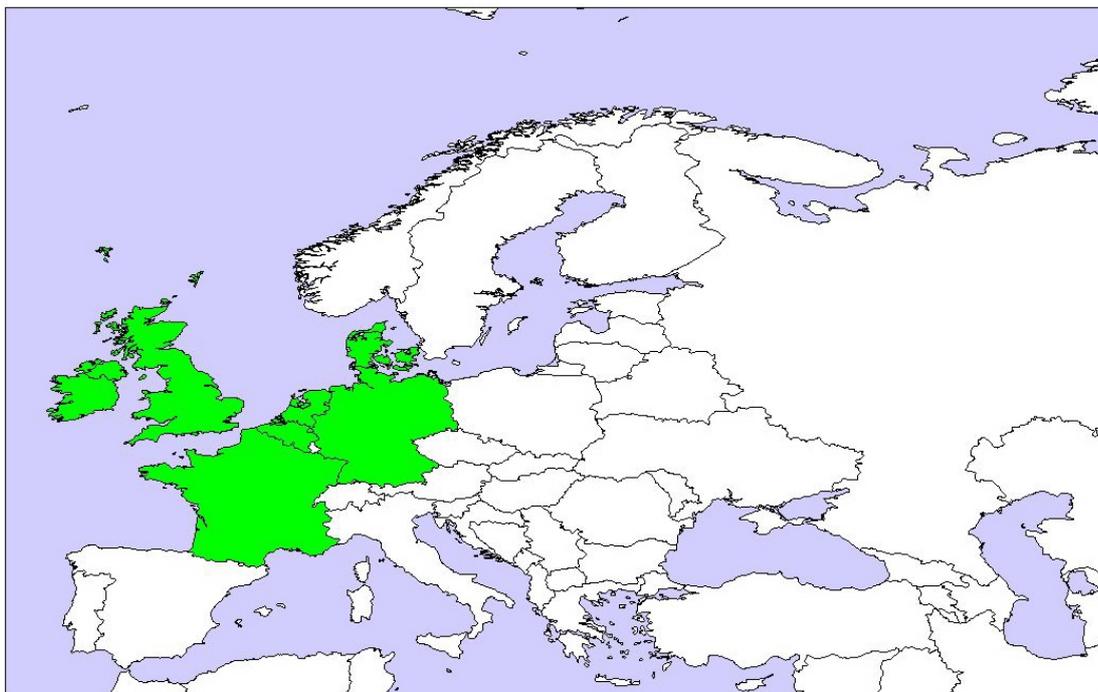


Figure 3 Stranding networks in the ASCOBANS region that have expressed an interest in provision of data to a putative strandings database

Belgium- Royal Belgian Institute of Marine Sciences and Université de Liège

Denmark- Miljøministeriet Naturstyrelsen/FIMUS

France- Centre de Recherche sur les Mammifères Marins

Germany- Schleswig-Holstein regional network

Ireland- Irish Whale and Dolphin Group

Netherlands- Naturalis and others, including Utrecht University

UK- Cetacean Strandings Investigation Programme

Data/Fields- Fields which have been earlier agreed could be displayed in the putative database (Deaville and Jepson, 2012) are shown in **Table 2**. Additional information on the potential fields is also included.

Table 2 Fields that could be used to populate a putative ASCOBANS region strandings database (as agreed during the 2011 Cadiz workshop)

Field	Type	Note	Phase
Reference number	Text	Network/country central reference	Phase 2
Event	Text	Single/Multiple stranding event	Phase 2
Species (scientific)	Text	Defined list	Phase 2
Species (common)	Text	Defined list	Phase 2
Sex	Text	Male, female, unknown	Phase 2
Length	Numeric	cm	Phase 2
Length Uncertain	Logic	Y/N	Phase 2
Date Found	Date	DD/MM/YY	Phase 2
Year	Date	YYYY	Phase 2
Date Certainty	Logic	Y/N	Phase 2
Location	Text		Phase 2
Local Authority	Text		Phase 2
Country	Text		Phase 2
Latitude	Numeric	To 8 digits	Phase 2
Longitude	Numeric	To 8 digits	Phase 2
Euthanased	Logic	Y/N	Phase 2
Stranding Type	Text	Live, dead, entangled/at sea etc	Phase 2
Condition Found / Stranding Outcome	Text	As Kuiken and Hartmann, 1991	Phase 2
Sent for PM	Logic	Y/N	Phase 2
PM Date	Date	DD/MM/YY	Phase 3
Frozen	Logic	Y/N	Phase 3
Condition at PM	Text	As Kuiken and Hartmann, 1991	Phase 3
Age Group	Text	Neonate, juvenile, subadult, adult	Phase 3
Age	Numeric		Phase 3
Cause of Death	Text	TBD (Phase 3)	Phase 3
Cause of Death Category	Text	TBD (Phase 3)	Phase 3
Samples (Y/N)	Logic	Y/N	Phase 3
Images (Y/N)	Logic	Y/N	Phase 3
Source organisation	Text	Partner organisation	Phase 2

NB Strandings fields will be output during Phase 2 of this proposal; post-mortem/cause of death fields (red) will be output during Phase 3 of this proposal (see **Table 2**).

An example of data that could be displayed in the putative dataset (taken from the UK strandings network) is also displayed in the additionally attached file '**ASCOBANS database fields example (UK).xls**'.



ZSL ICT Department technical/development quote

1) Development language and technologies

The current website (<http://www.ascobans.org>) appears to be using **Drupal 7** (a common CMS, Content Management System). The most common **DBMS** (Database management system) for a PHP/Drupal environment is a **MySQL** database. The proposed database would be created using similar technologies.

2) Tasks and developments

a) The first step in the development would be to design and create a new database (or new tables in the existing database used by the ASCOBANS website) specifically made to store data that will be used by the future interfaces and pages (see **Table 2**).

Time- 1-3 days.

Aims- discussion with existing ASCOBANS website hosting providers to establish database/website structure and how this may relate to delivery of this project

b) A second step would be to determine how to import and merge the data from the various external sources (countries) into the newly created database. For this purpose it is necessary to develop new administrative interfaces/pages on the website, to be able to view/add/delete the database records and/or to be able to import data by creating a PHP script that would read and import each line of a structured file (e.g. a CSV file) that would be uploaded.

- Flat file structure, CSV File. See **Table 2** and example dataset '**ASCOBANS database fields example (UK).xls**' for more detail. Most likely to be initially manually imported annually. Each import would be a historical reload of the entire dataset, to allow for any amendments made by collaborating networks on master versions of national datasets. ZSL ICT to wipe down the previous data from that source and refresh with the new dataset.

Time- 10-25 days.

Aims- to agree a generic import structure, i.e. which fields to load

Options- a) Partners to provide the files to ZSL; ZSL will then load data into the database b) Partners to directly load files to a workspace on the database, which will then be loaded onto the database

c) One or more new front-end pages can then be developed in order to let visitors to the website visualize the data contained in the database. These pages could display statistics and data in tables or interactive maps and could be filtered on specific criteria (by country/region/date/species, for example).

- Will need to be appropriately ASCOBANS branded
- Will need to finalise agreements with contributing networks, on which features will be displayed to various end users and what reports may be required
- Sub-pages for each contributing network, containing appropriate metadata, contact details etc



- Geographical map displaying strandings data (e.g. Google Maps based). Click on stranding location for drill down of data

Time- 8-15 days

Aims- Work with ZSL ICT web-team to design the front end, in consultation with other stakeholders

d) Creation of pages to administer the data (as in section b). Could potentially require the creation of different types of users and/or permissions. These requirements have to be analysed and the resulting development could vary depending on whether everything can be integrated with the existing Drupal CMS or not.

Time 1-5 days

Aims- Design of Administrative function pages

e) Logins & Security. Possibly two (or more) types of user logins, with different permissions allowed.

- Normal User: Allow access to view strandings data
- Power User: Can click through to the drill downs, plus have functionality to export data

Time 1 day

Aims- Creation of variety of user logins

Hosting

- Hosted via ZSL ICT central contract with Awesem (<http://www.awesem.co.uk/development/web-hosting>). Awesem currently host the ZSL EDGE programme (www.edgeofexistence.org) and other ZSL initiatives.

Timeline and costs

ZSL ICT Department stage 1 (linking into Phase 2 of the overall project proposal- see Table 1):

- Initial creation of a basic facility, with manual import of CSV Files (annually initially, potentially moving to quarterly if required). Strandings data only initially.
- Output and display to a website- to incorporate display via e.g. Google Maps and simple interrogation of data to generate summary statistics (e.g. how many common dolphins, in this region, over this timeframe etc)

Tasks:

- Create Database – ZSL ICT
- Create Import Facility – ZSL ICT
- Build new ASCOBANS website, or modify existing – ZSL Digital
- Develop front-end public facing map based on static data – MySql database linked to map/s (Google Maps etc). ZSL Digital/ICT
- Create Admin Functionality- ZSL ICT
- User Acceptance Testing- Contributing networks



Effort;

- Analysis / Development / Database 12 Days
- Import Facility 15 Days
- Website 12 days
- Admin Functions 3 days
- Logins 1 day
- Testing 2 days
- Documentation 1 day
- Contingency 20%
- **Total Effort 56 days**

ZSL ICT Department stage 2 (linking into Phase 3 of the overall project proposal- see Table 1):

- Import of cause of death/post-mortem data following discussion between partner networks
- Include functionality for real time data importing by users

Tasks:

- Update database and website accordingly- ZSL ICT/ZSL Digital
- Feature for user to directly upload files to the database - ZSL ICT

Effort;

- Approximately 5 days developer/web designer time

ZSL ICT Department- ongoing

- Annual maintenance of site/database - ZSL ICT
- Any proposed development of new functionality- ZSL ICT/ZSL Digital
- Possible additional functionality to use data, as yet unknown - ZSL ICT/ZSL Digital

Table 3 Summary of ZSL ICT work plan, staff requirements and costs

	Stage 1	Stage 2	Total	Ongoing
Database/API	Zero ¹	£600	£600	£600
Website Development	£3600	£900	£4500	Zero
Support	£200	£200	£400	£200
Hosting	£200	£200	£400	£200
Total	£4000	£1900	£5900²	£1000
ZSL ICT Staff time	56 days	5 days	61 days	~2-3 days/year
Delivery ³	Year one	Year two		Ongoing

¹- NB Phase 1 database/API work effectively carried out for free, through donation of ZSL ICT staff time as Central Project costing.

²- £5900 for delivery of database/website; £1000 annual hosting, support and development costs

³-See **Table 1** and **Figure 2** for more detail



Summary of Proposed Database Project Costs

Technical development (ZSL ICT)	£5,900	(€6,729)
Project Management (IoZ)	Zero	
Meeting attendance (Project partners- Phases 1 and 3)	£3,000	(€3,422)
Total	£8,900	(€10,151)

In an effort to keep costs as low as possible, the ZSL ICT department have offered to conduct the development of the database/API for free, by conducting it under core funded work. In addition, ZSL/IoZ will manage the project delivery of this proposal at no additional cost.

Maintenance costs of £1000/year (or €1141/year) would be payable on a prospective annual basis for support, hosting and troubleshooting/development from Year 3 onwards.

Conclusions

This proposal describes a potential process for the collaborative creation and phased delivery of a web-accessed database of cetacean strandings across the ASCOBANS region. It would initially allow periodic upload and display of data on strandings, followed at a later date by the upload and display of data on causes of death in animals where necropsies have been carried out. It would allow display to a variety of end users, with allocation of appropriate access levels. End users could include, but not be limited to the general public, media/press, policy officials, the scientific community and of course, stranding networks that contribute data.

The collective integration of stranding datasets across the region, leading to the production of a significant combined dataset on strandings over a 20+ year period, would create significant synergies between stranding networks and will hopefully help facilitate additional collaborations. The inception of such a system would also potentially enable more efficient investigation of issues that may be transnational in nature (e.g. Dolman *et al.* 2008, Unger *et al.* 2016, Peltier *et al.* 2017).

The putative web-accessed database would also help promote the roles of all stakeholders involved in the project, from ASCOBANS and Parties and Range States to national funders and of course, collaborating stranding networks. Finally, it would help educate and inform the public about the drivers behind cetacean stranding events and enable us to further our understanding of a wide range of issues, so that we can try to improve the long-term conservation status of these charismatic marine species.



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Annex 1- ZSL Background

Founded in 1826, the Zoological Society of London (ZSL) is an international scientific, conservation and educational charity whose mission is to promote and achieve the worldwide conservation of animals and their habitats. The Institute of Zoology (IoZ) is the scientific research division of ZSL, working at the cutting edge of conservation biology and specialising in scientific issues relevant to preserving animal species and their habitats (www.zsl.org/science/about-the-institute-of-zoology).

The ZSL ICT department have coordinated the production of several large-scale, publicly accessible databases. ZSL's web design team have also been instrumental in the creation of several internationally important conservation themed websites. Two examples are given below to illustrate the work that the ZSL ICT team have delivered recently.

Sustainable Palm Oil Transparency Toolkit (www.sustainablepalmoil.org)

The Sustainable Palm Oil Transparency Toolkit (SPOTT) promotes transparency and accountability to drive the implementation of environmental and social best practice for the sustainable production of commodities. SPOTT assessments score 50 of the largest palm oil producers and traders on the public availability of corporate information relating to environmental, social and governance (ESG) issues against recently revised indicators. The database currently includes data on over 22,000 assessments from over 50 partners and although it had an initial focus on palm oil production, the database and front end are in the process of being expanded to also include data on other industries, including timber, paper and pulp companies (delivery in October 2017).

EDGE (www.edgeofexistence.org)

Using a scientific framework to identify the world's most Evolutionarily Distinct and Globally Endangered (EDGE) species, the EDGE of Existence programme helps to highlight and protect some of the most unique species on the planet. EDGE species have few close relatives on the tree of life and are often extremely unusual in the way they look, live and behave, as well as in their genetic make-up. The aim of the EDGE programme is to put these species on the map and catalyse conservation action to secure their future. Each year a number of the most poorly known and neglected EDGE species are selected for conservation attention. Short-term surveys are carried out by ZSL staff, with longer-term surveys carried out by EDGE Fellows (in-country scientists that receive financial, institutional and logistical support from the EDGE programme) to determine the status of these species and identify appropriate conservation actions. The ultimate goal of the EDGE programme is to ensure that local stakeholders, governments, and in-country and international conservation organisations take ownership of these forgotten species and commit to ensuring their future survival.

