

REPORT OF THE JOINT ACCOBAMS AND ASCOBANS WORKSHOP ON HARMONISATION OF THE BEST PRACTICES FOR NECROPSY OF CETACEANS AND FOR THE DEVELOPMENT OF DIAGNOSTIC FRAMEWORKS

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Location: Padua, Italy

Background

During the last ASCOBANS AC in Vilnius, two different protocols/best practices for the post-mortem analyses on cetaceans were presented. The two initiatives, developed independently in the ACCOBAMS and ASCOBANS agreements, use the same multi-tiers approach but need a harmonisation and a coordination in order to develop an European best practice on cetacean necropsy. Furthermore, specific procedures targeting well defined problems should be also developed in order to standardise analyses and subsequent interpretation. ACCOBAMS already discussed these practices. Finally, these procedures should be developed and discussed with other European scientists working in this field in order to be the common European best practices. Within these practices also specific procedures to evaluate and assess main threats due to human activities on cetaceans conservation would be developed: a diagnostic framework built on most relevant post-mortem techniques and process would be collected and discuss in order to identify proper analyses to diagnose by-catch, ship-strikes, sound-related mortalities, marine debris effects and other issues causing marine mammals' fatalities. These best practices should be based on a multi-tiers approach and on evidence-based medicine.

Terms of references for the workshop

a) Harmonised multi-tiers best practice for basic necropsy procedure

AIMS: create an accessible document, also for those stranding networks with limited resources, as a reference for veterinarians, as a guide for new researchers, as a harmonisation of existing post mortem procedures within the two agreement areas.

b) Setting up diagnostic frameworks for specific threats

AIMS: define and harmonize specific diagnostic approaches and interpretation of findings among the veterinary pathologists and other scientists performing necropsies within the two agreement areas.

c) Composing a list of experts/laboratories for technical support and advice

AIMS: provide appropriate contacts for specific issues, methodologies and techniques within the two agreement areas.

Work plan

A first harmonisation of the multi-tiers best practice for basic necropsy procedure from the two conventions was conducted and the document sent to the workshop participants on **May 6th** for their reviewing along with the ToR of the workshop, list of participant and a first draft agenda to be adopted (Annex I). Comments and suggestions were received within June **6th**. Due to the amount and type of comments and suggestions to be incorporated, the final document was circulated **June 21st** for final comments to be discussed in the morning session on Monday 25th along with a second draft agenda (Annex II) since a longer discussion on this document was requested.

Both the two proposed agendas included three major topics (interaction with fisheries, debris and contaminants, and underwater noise) which needed to be discussed among the participants, after dividing them in three break-out working groups during the workshop according to their expertise, chaired by one of the three co-conveners. Within these working groups, the participants should have filled in the diagnostic framework, containing specific questions on current knowledge and best practices, as well as to identify research needs and knowledge gaps. Outcomes from these break-out groups were expected to be discussed during the plenary. Other issues were proposed to be summarized by the co-conveners and/or with selected experts.

A final draft document was then finalized by August 13th waiting for final comments and revision by other participants who gave back their contribution on September 6th in order to release the final document on Friday 13th. This document should be presented to the next ASCOBANS Advisory Committee (Stralsund, September 17th-19th) as document ASCOBANS/AC25/Inf3.2. Further work has to be done in the following week to finalize the final list of reference center/laboratories and a repository including all the best practices (protocols and peer review papers) listed for specific issues within October 4th.

Participants

The selection of the expert was based on their provenience, their skills and expertise, their track record on cetaceans' strandings investigations and/or pathology as well as on their institutional role. It should be noted that the two protocols merged during the process above described came from a long period of sharing and revision through workshops and peer review process and also the last part of review described in the previous paragraph included other scientists who had participated to initial meetings who were not invited during this workshop due to budget limitation.

The list of participants is included in Annex I but it is necessary to clarify in details the participation of two different institutions whose participation was clearly relevant and contribute to modify the initial agenda:

a. **The OIE - World Health Organization (WHO) collaborating center for Health of Marine Mammals.** This center was established in May 31st under the resolution no. 30 of the World Assembly of Delegates of the OIE (Paris, May 30th, 2019). OIE Collaborating Centres are centres of expertise in a specific designated sphere of competence relating to the management of general questions on animal health issues ("specialty"). In its designated specialty, they must provide their expertise internationally:

- To provide services to the OIE, in particular within its region, in the designated specialty, in support of the implementation of OIE policies and, where required, seek for collaboration with OIE Reference Laboratories;
- To propose or develop methods and procedures that facilitate harmonisation of international standards and guidelines applicable to the designated specialty;
- To carry out and/or coordinate scientific and technical studies in collaboration with other centres, laboratories or organisations;
- To collect, process, analyse, publish and disseminate data and information relevant to the designated specialty;
- To provide, within the designated specialty, scientific and technical training to personnel from OIE Member Countries;
- To organise and participate in scientific meetings and other activities on behalf of the OIE;
- To identify and maintain existing expertise, in particular within its region;
- To establish and maintain a network with other OIE Collaborating Centres designated for the same specialty, and should the need arise, with Collaborating Centres in other disciplines;
- To place expert consultants at the disposal of the OIE.

b. Representatives of the **MARCET project** (Macaronesian Network for Cross-border Knowledge and Technology Transfer to protect, supervise and monitor cetaceans in the marine environment, and to explore and exploit the related tourism in a sustainable way), an Interreg Spain Portugal MAC 2014-2020 Project which involved the entire Macaronesian Region including some Atlantic Archipelagos and territories as Azores, Madeira, Canary Islands, Cabo Verde and Senegal not included in the ASCOBANS and ACCOBAMS Agreements.

Outputs of the workshop

The amount of comments, suggestions and remarks requested an adaptation of the original draft agenda and a second draft agenda were sent before the beginning of the workshop. Furthermore, the agenda was changed also during the workshop due to the discussions that arose on the document and the role of the personnel involved during post-mortem investigations. Substantially, the workshop was focused on aligning common definition to be used within the document, the targets of the documents and the real aim of the documents: in fact, the establishment of the OIE collaborating center at the end of May with their official role on all the veterinary aspects and health management at a governmental role partially changed the term of reference of the workshop. Another part of the workshop was spent in discussing technical aspects. Most of the decision achieved during the workshop has been summarized in the harmonized best practices but I'd like to report them here below.

a. Aim of the document

It was defined that the aim of the document was to update the protocol with the currently available techniques and knowledge agreed between all member countries of ACCOBAMS and ASCOBANS. It was underlined that this updated protocol could serve three overall aims:

- *To provide a reference document for veterinarians and biologists currently engaged in cetacean post-mortem investigation, summarising a recognised approach to stranding investigation across European networks;*
- *To highlight areas where harmonisation of data from existing networks could allow for analysis and inference to be made between networks, of particular relevance for the transboundary, mobile species;*
- *Provide a start-up guide for researchers attempting to instigate new stranding monitoring programmes, particularly in regions of the world with limited resources for extensive, top-down surveillance programmes.*

It was emphasised that the document was not designed to replace existing protocols, particularly those of longstanding and well-established laboratories and stranding networks, but offers a post mortem framework aiming for consistency across Europe when conducting examinations on dead cetaceans.

During the discussion, in particular from the OIE representatives, it was emphasized that the assessment of the cause of death and health status is a veterinary procedure requiring a full post-mortem investigation with additional examinations. The document provides also the opportunity to collect further data and tissues to gain information on possible threats menacing cetaceans conservation and biological information on the species.

b. Glossary

During the first harmonisation effort, terminology was not consistent throughout the text and there was also some discussion regarding words and definitions. Therefore, a glossary paragraph was added based on common terminology included in Annex I of the ACCOBAMS Resolution 6.22. This exists of a collection of common terms and definitions frequently used throughout the document, and general terminology used in stranding events and forensic human and veterinary medicine. Compared to the ACCOBAMS Resolution's terminology, during the workshop it was stressed the

relevant differences between necropsy and post-mortem investigations as reported here below from the text. Also the term “Health status” was clarify as a medical term for the single stranded individual.

DISSECTION/PROSECTION: Medical and/or biological procedure to dismember the body of a deceased animal according to specific protocols in order to study its anatomical structure and/or to evaluate and sample specific organs and tissues.

NECROPSY/AUTOPSY/POST-MORTEM/POST MORTEM EXAMINATION Synonyms for a specialised medical procedure comprising of a thorough examination of a carcass by dissection to determine the cause, the mechanism and manner of death through the collection of evidence. In the case of wild animals this requires the involvement of a veterinary pathologist or a veterinarian with specific training in animal pathology, diseases and assessment of health.

POST MORTEM INVESTIGATIONS: All studies and investigations carried out on an animal’s carcass and/or samples taken after death, including those aimed to determine the cause of death.

HEALTH STATUS: Subjective assessment of diseases, conditions, or injuries that not only contributed to the proximal cause of death but which characterize the ante-mortem health status of the individual and the possible health status of cohort animals.

c. Multi-tiers approach

The multi-level approach included in the ACCOBAMS Resolution 6.22 overlapped with the multi-tiers approach of the document from ASCOBANS.

During the harmonization process we converged on a multi-tiers approach because *a tiered approach to carcass triage allows investigations to be conducted at a number of levels, depending on the resources, facilities or experience of the stranding network. Whilst the ‘gold standard’ centres around a thorough and detailed post-mortem investigation conducted by well-resourced and experienced veterinary pathologists, it is recognised that this capacity is often the exception rather than the rule. The tiered approach, outlined below, offers a framework for data collection and interpretation appropriate to the resources available.*

The very recent establishment of a WHO collaborating center for the health of marine mammals determined a large discussion since part of the workshop was strictly part of their institutional competence. For this reason, in the document it was stated that:

This document describes the best practices for cetacean post mortem investigations, and outlines basic best practice up to and including tier two. Guidance in cetacean post mortem examinations or causes of death at tier three is out with the scope of the basic protocol outlined below. For this level, it is recommended that a veterinarian with specific training in pathology is involved in the examination, and principles and protocols according to professional bodies such as the European College of Veterinary Pathology (ECVP) are followed.

In fact, during the discussion it was established that:

- . a necropsy is a diagnostic procedure which needs involvement of a veterinarian;
- . interpretation of post-mortem findings aimed to evaluate the cause of death is regularly conducted on other species from veterinary institutional and governmental bodies and/or by board certified veterinary pathologist, present in almost the Countries, which could be involved also for marine mammals;

. a specific expertise on marine mammals is warmly welcome but it could easily gain with proper training which is one of the task of the OIE reference center.

The discussion was then focused on the special section related to the diagnostic framework for specific threats. During this part of the workshop it was stressed that there are no shortcuts for diagnoses and a complete and throughout necropsy should always be done in order to evaluate and eventually rule out all the possible causes of death without bias. Sampling and testing should be complete and thorough, and interpretation should be based on the best existing literature and protocols already published and/or available. For these reasons, the specific part was rearranged as a list of the best papers and protocols commonly used from all the centers and laboratories. This is the reason why in the document it has been stated that:

..given the specialized nature of this work, this recognizes that not all analyses and ancillary tests are available in all countries. An additional section annexed to the document will list the detailed literature for specific issues, techniques and investigations aiming to help establish a mechanism for identifying specialized laboratories to share expertise and analyses at an international level. Finally, this approach enables information recovered from individual cases to be optimized depending on the resources available.

A list of laboratories and reference people/center has been also created even if the OIE collaborating center currently has institutionally these functions.

d. Technical aspects

During the discussion, some technical aspects were discussed, evaluated and standardized. In details, the following issues were harmonized:

- . decomposition condition code (DCC)
- . nutritional condition code
- . sampling procedures and samples preservation
- . sampling related to DCC

Conclusion

The workshop was then concluded at this state and additional work for the harmonization of the workshop was done during the following weeks. In fact, the workshop participants recognize the need to involve other expert that was not possible to include in this meeting. Furthermore, a further opinion will be asked to the International Whaling Commission Expert Panel within the ACCOBAMS MoP as a general assessment on the quality of the document. Finally, the document will be presented during the dedicated workshop of the World Conference on Marine Mammals in Barcelona next December. Finally, a doi number will be asked. Prof. Cristina Fossi stated that the present best practices could be adopted within the implementation of Marine Strategy Framework Directive.

During the discussion, it was also decided to prepare a position paper by all the participants to the workshop in order to stress the role of post-mortem investigations and the personnel involved in the implementation of some relevant European Directive on marine environment and species conservation.

In order to ensure proper dissemination and use of this document along with the list of reference centers and the repository of the best practices, protocols and literature, the workshop's participants recommend the publication of these products in a related page of the ACCOBAMS and ASCOBANS Agreement.