

(A) Assembly of the available information on the entanglement issue *inter alia* to provide a rationale to officials and managers for the need for an entanglement response network and to provide a context and idea of the scope of the problem. [This will be considerably easier for those cases where a government or governments have requested assistance].

(B) Development of the response structure with relevant local authorities and stakeholders in which disentanglement activities will occur, including improved documentation to assist with improving *inter alia* future prevention efforts (prevention is the best solution) as well as to enhance disentanglement efforts.

(C) Training by approved trainers of proposed members of disentanglement team or teams, taking fully into account the local situation.

The outline capacity building and training programme **adopted** by the Workshop (after reviewing an initial document developed by a subgroup) can be found in Annex F. The Workshop **strongly commended** this to the Commission (and see Item 8).

The outline covers a number of issues including: criteria for proposed trainees; the need for assessment of competence and accreditation; the need for leader apprenticeships; the need for refresher courses; equipment and resources.

7. PREVENTION

The Workshop **agreed** that the ultimate solution to the issue of large whale entanglements is prevention. However, the issue of prevention of entanglements (or at a minimum reducing the injury and mortality resulting from entanglements) was not the major topic of this Workshop and was only briefly reviewed. The need for a future Workshop devoted to this subject is discussed under Item 8.

7.1 Overview of present approaches

The Workshop briefly reviewed the various methods used to promote entanglement prevention including:

- working with fishermen to ensure fishing guidelines and regulations are followed;
- take reduction planning with stakeholders to decrease the marine mammal injury or mortality from commercial fishing practices;
- methods for diverting or deterring whales away from gear;

- gear modifications to reduce the number or severity of entanglements;
- seasonal fishing changes and/or closures (effort reduction); and
- gear characterisation and identification guides to better understand local fishing practices.

There was a short discussion among Workshop participants regarding which prevention techniques could be promoted, due to the lack of quantified information on the effectiveness of gear modifications promoted to date. The essential requirement for adequate monitoring was stressed (both compliance monitoring to see that proposed methods are being used and effectiveness monitoring to determine the success or otherwise of prevention/reduction methods and to determine if there are non-anticipated negative side effects for the ecosystem).

7.2 Information requirements

Numerous workshops have recommended that developing methods of gear identification is vital to determining when, where and how entanglements occur. As noted under Item 3, information obtained from entanglement response teams is a major input to understanding the source of entanglements, their effects and as such is also vital to developing preventative measures.

7.3 Research priorities

The United States Large Whale Take Reduction Team has developed research matrices in collaboration with fishers that identifies research priorities for reducing large whale mortalities⁴. Several of these priority projects have been funded. The Workshop **recommended** identifying, should they exist, areas where populations of whales overlap with fishing gear, but where there are minimal to no entanglements reported despite reasonable effort, and attempt to determine why the interactions are not occurring. The Workshop recognised the importance of analysing all available data sources at both the local, national and international level to further work on entanglement prevention.

8. AN INTERNATIONAL LARGE WHALE ENTANGLEMENT RESPONSE ASSOCIATION AND THE ROLE OF THE IWC

The Workshop recognised the great benefits to entanglement response efforts of continued international collaboration and the establishment of a global network of recognised entanglement response operations. Given the global nature of the IWC, its work on many fields related to conservation and management, and in particular its developmental and supporting role for the recent

⁴ <http://www.nero.noaa.gov/whaletrp/plan/gear/index.html#gear>

two workshops, there is great potential value in these international efforts being undertaken under the general auspices of the IWC. It noted that this will not preclude and can strengthen the great contribution that is being and can continue to be made outside as well as within IWC member nations (e.g. the major contributions from Canada at this workshop). It **requested** that the Commission endorse the global network of entanglement response operations (listed in Annex G), the Guidelines and Principles for Disentanglement Response (given in Annex E) and the Recommended Approach to Capacity Building and Training (given in Annex F) and consider the following approach.

(1) The establishment of a dynamic entanglement response component of the IWC website with a layered capacity.

- A general public section which *inter alia* includes an introduction to the bycatch issue (including the need for prevention), general information on what to do (and not to do) if an entangled whale is seen (including a link to the USA video discussed under Item 4), highlights the agreed principles and guidelines for entanglement response (Annex E) along with information (links, contact details) to accredited entanglement response networks around the world. This will also provide an opportunity for entanglement response team members and networks to refer the media and the public to internationally-recognised and agreed guidelines and principles when explaining their work and the difficulties it entails.
 - A public but more scientific area that provides quantitative information on the large whale bycatch issue (particularly with respect to numbers, species, geographical and temporal distribution) obtained from *inter alia* the national progress reports and papers (published and working papers submitted to the IWC Scientific Committee – the IWC is already working on an online database for such information (see below).
 - A secure section for accredited members of the global network of entanglement response teams that *inter alia* allows exchange of ideas and data, including provision of information and requests for and inclusion of comments on particular entanglement situations, potential new gear and approaches, safety considerations, training techniques etc, with the facility to share videos and photographs as well as reports, and allow comments to be made.
- With respect to the website, the Workshop **nominated** a small group (Coughran, Landry, Lyman, Rowles, Smith and Wilkin) to work with the IWC Secretariat on the development of both the public and private segments of the website.
- (2) **Review the value of different database models** (e.g. single international, metadatabase, online etc.) with the aim of submitting a formal recommendation for a database system that will assist in the collection, recording and dissemination of data related to data on entanglements and entanglement response (including human issues) to allow a better quantitative understanding of the issues and in particular to assist in developing solutions to entanglement prevention. The Workshop **nominated** a small group (Gales, Moore, Lyman, Robbins and Smith) to work with the IWC Secretariat to: (1) review existing methods of collecting and storing data; and (2) consider options for a possible standard relational database (objectives, fields, methods of populating etc), a metadatabase linked to existing databases or some combination of the two, in the light of the data collection discussions that have taken place at this workshop and within the Scientific Committee of the IWC.
- (3) **Facilitate the exchange of information** using the model of the IWC Scientific Committee’s Data Availability Agreement as well as the possibility of periodic workshops of the global network.
- (4) **Promote the development of entanglement response networks** in regions where none currently exist, in the light of conservation priorities developed in conjunction with *inter alia* the IWC Scientific Committee, following the approach agreed for capacity building and training outlined in Annex F.
- (5) **Provide advice** to Governments and others on entanglement response issues through the global network.
- (6) Recognising that the only long-term solution to entanglement is prevention, develop a full proposal for a **future international workshop on prevention of large whale entanglements** after reviewing recent developments and experiences around the world. This will include objectives, documents and data requirements, potential participants, timeframe, costs and venue. Mattila agreed to take the lead with this effort.
- (7) Continue to promote an **IWC managed fund** for issues related to entanglement response and bycatch mitigation and prevention. Applications for monies from the fund will follow expert review and recommendations in the usual IWC manner.

9. ADOPTION OF REPORT

Bjørge thanked the rapporteurs for their hard work. Mattila thanked Bjørge for chairing, PCCS for hosting the meeting, and NOAA and IWC for providing funding. The IWC thanked all of the participants for their hard work, particularly in achieving the primary objectives of developing international principles and guidelines for

entanglement response and a capacity building and training strategy.

The outline report was adopted at 2:35 PM on 26 October 2011. The final report was agreed by correspondence on 31 December 2011. The edited version was circulated on 25 January 2012.

Annex A**List of Participants**

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Annex B

Agenda

1. Introductory items
 - 1.1 Welcoming remarks
 - 1.2 Objectives of the workshop
 - 1.3. Election of Chair and rapporteur(s)
 - 1.4 Adoption of agenda
 - 1.5 Material available
2. New information since 2010 workshop
 - 2.1 Overview of new participating national networks
 - 2.1.1 New Zealand
 - 2.1.1 Canada (British Columbia)
 - 2.1.3 Argentina
 - 2.2 Reports from relevant workshops in 2010-2011
 - 2.2.1 The role of large whale behaviour, sensory abilities and morphology in entanglements
 - 2.2.2 Cetacean Entanglement Mitigation Innovation Workshop
 - 2.2.3 Dynamics of Large Whale Entanglements in Fishing Gear
 - 2.2.4 Euthanasia methods for stranded cetaceans
 - 2.3 New or unusual relevant cases since Maui
 - 2.3.1 North Atlantic right whale
 - 2.3.2 Eastern gray whale
 - 2.4 New tools or techniques
 - 2.4.1 Tools
 - 2.4.2 Techniques
 - 2.5 Safety protocols and risk assessment guidelines
 - 2.6. Examples of current training components and curricula for international capacity building
3. Improvements in documentation of entanglement response events
 - 3.1 Documentation of procedure/event
 - 3.2 Other information
 - 3.3 Conclusions
4. Communications and outreach
 - 4.1 Developing and maintaining the awareness of ocean users (professional mariners, non-cetacean researchers and the recreational community) on what to do when encountering an entangled whale
 - 4.2 Working with media
 - 4.3 General public
5. Recommended principles and guidelines for entanglement response
6. Recommended approach to capacity building and training
7. Prevention
 - 7.1 Overview of present approaches
 - 7.2 Information requirements
 - 7.3 Research priorities
8. Consideration of an international disentanglement association and the role of the IWC
9. Adoption of report

8. DOCUMENTATION AND DE-BRIEFING

Documentation gathered during disentanglements offers one of the best and only opportunities to understand the scope and extent of regional entanglement issues.

Documentation may include:

- (a) Photographs of operations and of the animal before, during, and after a response
- (b) Video from point-of-view cameras mounted to safety helmets
- (c) Collection and documentation of gear removed
- (d) Biological sampling (biopsy, skin in gear)
- (e) Field observations (operational log, behavioural log, etc)

This information should be assembled into a full disentanglement case study and shared with regional and international entanglement response networks.

Every attempt should be made to build documentation/data gathering into operational procedures. Data should identify species, individual, level of injuries, disentanglement activities and state of the animal and its entanglement at the end of an operation.

Effort should be made to monitor post-disentanglement behaviour and survival through the use of telemetry, genetics and or photo identification of individual animals.

Follow-up of an entanglement response is an opportunity to discuss the level of preparedness, the equipment, the process, and identify any changes to procedure or equipment that could be made to improve future disentanglement attempts.

NB: As discussed under Items 3 and 8 of this report, there is work underway on consideration of standardising to the extent practical data that are collected, methods of storing these and facilitation of sharing data.

Annex F

Recommended approach to capacity building and training

INTRODUCTION

The details of training will vary from country to country and depend on a number of factors including the level of knowledge of the entanglement issue, the level of government involvement, whether there are existing networks to build upon such as stranding networks, the extent of the coastline, the level of resources available etc. It is also important to recognise the primary objective(s) motivating the instigators that may include one or more of public safety, animal welfare, population level conservation, public concern, retrieval of fishing gear, conflict with fisheries, and conformity with national legislation or matters related to international trade (e.g. export of fish). That being said, the fundamentals of the training will remain the same and this document presents an outline of for training programmes, within which the details will need to be tailored to the specific cases.

For countries for which there is no existing entanglement response network, there will need to be three levels of 'training' in the broadest sense. At each stage it is essential that appropriate local stakeholders are involved.

(A) Assembly of the available information on the entanglement issue *inter alia* to provide a rationale for the need for an entanglement response network and to provide a context and idea of the scope of the problem. [This will be considerably easier for those cases where a government or governments have requested assistance].

(B) Development of the structure within which disentanglement activities will occur, including improved documentation to assist with improving *inter alia* future prevention efforts (prevention is the best solution) as well as to enhance disentanglement efforts.

(C) Training of a disentanglement team or teams.

(A) RATIONALE FOR NEED FOR ENTANGLEMENT RESPONSE

This primarily involves working with governments and managers. As noted above where this is driven by a request from a government or governments, this may be a relatively straightforward step; if it is driven by a conservation-related need (perhaps suggested by the IWC Scientific Committee) then it is essential that the evidence and potential solutions are provided to the relevant government in a concise and balanced manner; it is essential that governments are part of the process. One approach would be to hold a short seminar with the appropriate government officials. Where IWC member nations are involved, this could be organised in conjunction with the relevant Commissioner.

Information provided should include what is known about the local situation with regard to entanglement and examples of how such issues have been dealt with elsewhere in the world.

(B) DEVELOPMENT OF THE STRUCTURE WITHIN WHICH DISENTANGLEMENT ACTIVITIES OCCUR

Disentanglement activities cannot exist in isolation. Entanglement response requires a structure that covers all aspects from outreach and reporting to responding, verification of reports and decisions on the appropriate response including disentanglement, follow-up and documentation. Developing this requires involvement of managers, biologists (and stranding networks where these exist), fishermen and other marine users, including the coast guard and the navy, with assistance from international experts. It is important to stress the pre-eminence of human safety issues, the need to focus on achievable objectives and the need to work towards prevention. This phase will almost certainly entail at least one meeting.

This stage requires knowledge of the local entanglement situation (including species, likelihood of events, gear that might be involved, potential 'hot spots', resources that may be made available, the existing legal framework) and an overview of how experiences and structures elsewhere (including the Incident Control System approach) can assist in designing a workable and efficient local structure and all aspects of communication including dealing with the media. It is important to recognise that the entanglement issues may involve more than one country given the migratory behaviour of large whales.

(C) TRAINING DISENTANGLEMENT TEAMS

Trainers should be chosen from the accredited global network of entanglement response operations, by its members, using criteria they develop including, but not limited to: thorough knowledge of all aspects of the curricula, experience training in existing networks, experience disentangling the species involved, communication skills, availability.....etc.

Trainees should be identified within the local structures developed under (B) above. There are a number of roles to be fulfilled within a disentanglement team ranging from boat handling in the presence of whales, data

recording and direct disentanglement efforts. Criteria to be considered include previous experience with whales, with small boats, with fishing gear, gear under tension, availability and likelihood of remaining with the programme for a number of years, level headedness and communication skills.

There are a number of examples of existing training programmes (e.g. from the USA and Australia) and these were reviewed and the main components are listed below. Details will of course need to be tailored to particular situations, with relevant examples provided from elsewhere and will follow the agreed Principles and Guidelines for Entanglement Response Efforts (Annex E).

Much of the background information (e.g. legal context, what is known about local entanglement issues, basic biology of local populations) is best presented by local experts. Parts 1 and 2 (of the example outline for a training course given below) could usefully be attended by others than the trainees (e.g. managers, fishermen and other stakeholders). In addition to the training itself, the trainer, in collaboration with the trainees and managers, should aim at identifying potential leaders to undertake apprenticeships with established disentangling teams (see below).

Example outline of a training course

Part 1 – Background information with emphasis on local situation and relevant examples from elsewhere

1. International (IWC) perspective
2. Safety issues – stressing that this is the over-riding concern
3. Legal issues
4. Background and biology
 - 4.1. Local knowledge on entanglement events (and trends) in country - occurrence, geographical and temporal distribution, gear type/species
 - 4.2. Brief summary of biology of the large whales of the region that have been or may be involved in entanglements (particularly temporal and geographical distribution, status and behaviour related to entanglement and entanglement response
 - 4.3 Where, when and how do whales become entangled?
 - 4.4 The importance of prevention

Part 2 – Overview of the emergency response (this should be based on agreements and approaches that will already have been developed under component (B) above. i.e. the structure within which disentanglement activities occur

5. Components of response (general overview of what it takes to respond and the components of response). The agreed decision tree (IWC/62/15, Figure one) will be used to go through the next items.

- 5.1. Outreach and reporting
 - 5.2. First response
 - 5.2.1. Verification and assessment
 - 5.2.2. Tracking the animal
 - 5.3. Action
 - 5.3.1. Tag
 - 5.3.2. Disentangle or monitor
 - 5.4. Document and follow up
 - 5.4.1. Fate of the animal
 - 5.4.2. Tracing the gear
 - 5.5. The Incident Control System (ICS) approach
6. The Network [This will be tailored to the agreed local network, thus some items may be redundant]
- 6.1. Hot spots

6.1.1. How far apart?

6.1.2. Resources available (e.g. stranding teams, biologists, fishermen, whalewatching operators, military)

6.2. Rapid response team or local personnel approach

6.3. Training and experience

6.3.1. Criteria for selecting candidates

6.3.2. Simulated training vs. actual experience

6.3.2.1. Apprenticeships

6.4. Communications

6.5. Role of the Navy or Coast Guard

Part 3- The disentanglement training itself

7. Disentanglement Procedures

7.1. Common misconceptions

7.2. Assessing the situation (decision tree, including euthanasia)

7.2.1. Condition of the animal

7.2.2. Assessment of gear and entanglement

7.2.3. What action is warranted given conditions (e.g. weather, time of day, resources at hand)?

7.3. Telemetry buoys (brief informational summary)

7.4. Freeing an anchored whale

7.5. Controlling a free-swimming whale

7.5.1. Attaching to the whale and assessing strength of gear and whale

7.5.2. Attaching buoys and sea anchors

7.6. Cutting the whale free

7.7. Some examples (case histories), examine mistakes made

7.8. Unsuccessful operation (discussion of euthanasia)

7.9. New and experimental techniques (i.e. sedation)

8. Documentation and follow-up

8.1 Debrief including mistakes

8.2 Close-up reports (provide examples)

8.3. Status of the whale (health and survival, limpet tags, etc.)

8.4. Origin of the gear

9. Safety

9.1. Safety gear (e.g. helmets, life vests, knives....etc.)

9.2. Support vessel and communications

9.3. Safe procedures

10. Dealing with the media

11. Examination and familiarisation with special gear (on land)

Items 1-11 will normally complete one day's training.

The second day (at least one day but ideally more) will comprise on water familiarisation with equipment and techniques training including such activities as one boat acting as whale towing rope and gear while the second

boat acts as a rescue boat, identified individuals practice attaching, controlling and cutting using specialised tools.

‘Leader’ apprenticeships, accreditation and levels of competence (including refresher courses and evaluations)

Clearly a 2-3 day course will not be sufficient to allow a new team to begin unsupervised disentanglement work. It is essential that part of the overall process is the identification of one or more individuals who have a medium-long-term expectation to be involved in the local effort as leaders. These should then visit established teams to gain experience of real disentanglement efforts. Both in the US and in Australia there are good examples of ways to evaluate the levels of experience (if appropriate, links to these can be included) and these will need to be developed within the local legal and administrative system and with advice from the global network of entanglement response operations via the IWC. It is important that provision is also made for refresher courses and evaluations.

Use of simulation programmes

The group was enthusiastic about the potential of the use of simulation programmes such as that being developed in Australia for aspects of training, as well as for exchanging information among teams about particular events. Of course, simulation programmes cannot replace at sea training but they can be a valuable supplement. It strongly encourages further development of the Australian programme and is happy to provide input into the types of parameters and scenarios to be incorporated.

Equipment

It is essential that trained teams are provided with the necessary equipment. Some of the equipment is standard and ‘merely’ requires appropriate funding. Other equipment is effectively custom-made and ways to ensure that this is made available or made locally must be developed.