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Bycatch Mitigation Initiative strategic assessment and outline of strategic plan

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IWC Bycatch Mitigation Initiative- strategic assessment of potential work on bycatch & outline of strategic plan [DRAFT]

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IWC BYCATCH MITIGATION INITIATIVE (BMI)

Over the past three decades, there has been widespread acknowledgement within the IWC of the significance of bycatch as a threat to cetaceans. More recently, consideration of the need for IWC engagement and action has taken place at several IWC Scientific Committee (SC) and Commission meetings. This led to an agreement at IWC66 from the Commission to establish the Bycatch Mitigation Initiative (BMI)¹.

The BMI is made up of three interrelated components; a bycatch coordinator in the IWC Secretariat; a Standing Working Group (SWG) on Bycatch under the Conservation Committee (CC) and an Expert panel to advise the coordinator and the SWG on bycatch issues and actively assist in the development and implementation of a workplan to tackle cetacean bycatch.

Within the IWC, the Scientific Committee has long-standing and well-developed expertise in relation to the field of bycatch and stranding research, and therefore has an important role within the initiative under its Working Group on Non-Deliberate Human-Induced Mortality of Cetaceans (HIM) and the Standing Working Group on Environmental Concerns Working Group and the Stranding Initiative. The work of the BMI is also of relevance to the Working Group on Whale Killing Methods and Welfare Issues, particularly under its Global Entanglement Response Network (GERN) programme.

The IWC, as the leading international body addressing cetacean science, conservation and management, can play a significant role in addressing bycatch in a coordinated and collaborative approach with others. The IWC has a wealth of technical experience, through its scientific committee, and programmes such as the Global Entanglement Response Network provide effective models for 'on the ground' capacity development to tackle relevant conservation issues.

Tackling bycatch at a global level is a potentially vast undertaking, therefore in order to be effective it is important to set clear and strategic priorities and understand why certain actions are potentially more important than others in bringing about change. To address this need, the SWG has requested that a strategic assessment be undertaken to evaluate which areas of work would enable the IWC to have the greatest impact.

PART 1. STRATEGIC ASSESSMENT

Purpose of document

Part 1 of this document outlines the steps followed and the preliminary outcomes of the BMI strategic assessment process. A range of possible mechanisms available for tackling bycatch at international level are outlined. These have then been evaluated in relation to which mechanism and work area(s) the IWC is best placed to focus its attention to achieve maximum impact and influence.

Once complete, the assessment will be used to inform the development of the BMI strategic plan (2018-2024), and the costed workplan (2018-2020) and the existing BMI Terms of Reference if

¹ IWC 66. Summary of main outcomes, decisions and required actions from the 66th annual meeting. Unintended Anthropogenic Impacts Item 11. Resource ID: 6360

appropriate. Actions and roles of individual bodies within the IWC will be defined thoroughly during the work planning process.

The strategic assessment requires further discussion before it is finalised. Discussion took place during the 2018 Scientific Committee (SC67) meeting, particularly focused on the recommendations to the SC. The expert panel is currently reviewing the document, and the CCPG's feedback will also be vital in defining the strengths, weaknesses, opportunities and challenges available to the IWC in undertaking particular work areas.

The CCPG is requested to consider the questions highlighted in yellow in sections 1 and 2, and to comment on the prioritisation of work areas in the strategic assessment and the suggested roles and actions for the CC.

Strategic assessment steps

The strategic assessment has followed the steps outlined below, in detailed consultation with experts and review of background material (**NB. some steps are not finalised**)²:

1. A global mapping exercise was undertaken to examine existing national activities on mitigation research, bycatch monitoring/assessment, capacity development.
2. A global mapping exercise was undertaken to examine existing international efforts (including private sector) on bycatch mitigation and management within fisheries management, conservation, or activities which will have international consequences.
3. Theory of change framework followed to identify mechanisms and work areas for effecting change on bycatch management/mitigation (regardless of the organisation).
4. The identified mechanisms and work areas were then evaluated. Assessment looked at the possibility of filling current gaps, whether the work area had a potential for high global impact, and whether the IWC could play a significant role (based on strengths, weaknesses, opportunities). Potential priority work areas, and activities were identified- providing a direct link to the work plan to be drafted.
5. Priority mechanisms, work areas and associated activities were selected as forming the basis for IWC engagement through the BMI.

Theory of change

Identifying how the IWC could best influence international efforts on bycatch requires an understanding of the principal mechanisms which could bring about a genuine global change. A theory of change³ framework was used to map out the potential mechanisms, outcomes and actions needed to bring about change at global level, as well as the conditions needed to enable their successful implementation (Annex 1).

In order to develop the theory of change framework, an ideal 'final outcome' was identified for ultimately tackling bycatch as follows: ***Effective cetacean bycatch mitigation measures (technical gear, gear switching or management) are demonstrated and systematically implemented at local, national and international scale. Coastal communities continue to have a thriving fishery***

² The bycatch coordinator has undertaken detailed discussions with individual members of the SWG, SC, IWC Secretariat and expert panel members; Background material includes published scientific literature, IWC published reports; grey literature etc.

³ Theory of change, is a planning framework which requires the mapping of a final ideal outcome (the change that is sought after), and clear consideration of the actions and intermediate outcomes needed in order to bring about that change. Theory of change, and the outcome framework used to illustrate it, work to also explicitly map the enabling conditions which would be necessary to bring about the actions and outcomes, and the assumptions of how an action can lead to a desired outcome. When reading the diagram, look at the final goal and follow the logic for how to get there.

sector, with monitoring and mitigation of marine mammal bycatch such that population-level impacts are reduced, with stocks maintained or recovering.

The actions where the IWC could bring about the most influence (determined during the assessment) are indicated on the diagram (Annex 1) and in the sections below.

Main global mechanisms identified for tackling bycatch

The main mechanisms (see Annex 2 for more detail) for effecting global change on cetacean bycatch mitigation and management (irrespective of the organisation), have been identified as:

- Information gathering/analysis & prioritisation- Identify where the top priority fisheries/locations/cetacean species are in order to focus targeted work there
- Testing & demonstrating effective solutions- collaboration within pilot studies for development and demonstration of effective and affordable monitoring and mitigation solutions for different fishing gears
- Bring about change in attitudes within fishing communities by engaging the fishery operators, processors and traders in process, design, and implementation. Incentivize with niche marketing or eco-labels. Start small then scale up from pilot studies to fleets.
- Raise awareness & capacity within national governments to tackle bycatch- national governments have the knowledge/capacity/political will to deal with the issue effectively
- Raise awareness within regional and international fisheries management- fisheries management organisations have the knowledge, capacity and political will to deal with the issue effectively via the Regional Secretariat Network and other fora.
- Ensure sufficient funds available for tackling bycatch (e.g. monitoring, innovation, demonstration, capacity development, sharing of best practice)

These mechanisms- and work areas sitting below them- were used as the basis for evaluating whether the IWC could play a significant role in influencing progress to tackle bycatch.

Question to CCPG: Are there any mechanisms missing here that should be included?

Enabling conditions necessary for success

A number of important 'enabling' conditions were identified during the theory of change process, which can be considered as vital for the success for the BMI, in bringing about progress in the different mechanisms. This includes:

- National governments, RFMOs and FAO have the political will to tackle bycatch, and national governments act cohesively between Fisheries & Environment departments on the issue.
- National governments, RFMOs and FAO willing to accept IWC advice on bycatch monitoring/mitigation/management
- Multi-disciplinary collaboration and effective coordination between different initiatives, organisations, researchers etc working on bycatch.
- Data made available on fishing effort, bycatch etc to evaluate priority fisheries/gears/species/populations
- Buy-in and active engagement of national governments in focal countries (for pilot studies, rapid assessments etc)
- Funding is available to carry out pilot studies
- Sufficient funds available for tackling bycatch (e.g. monitoring, innovation, demonstration, capacity development, sharing of best practice)
- Collaboration with existing bycatch projects possible for pilot projects

- Funding is available to assist in driving innovation on mitigation solutions
- Fishing industry in target countries willing to collaborate and incentivised to use mitigation measures in pilot studies
- Wider fishing industry willing and incentivised to adopt proven mitigation gear.

Many of the identified enabling conditions are so important- and indeed relevant to the role of the IWC and contracting governments- that specific actions will be needed in the BMI workplan in order to bring about these conditions.

Question for CCPG: Are there any other enabling conditions which you think could be included here, particularly where you think that the CC could have an important role?

Assessment of priority work areas

The detailed, full assessment of each mechanism, and the underlying work areas can be found in (Annex 2). The section below summarises and justifies the prioritisation of each work area for the BMI.

In carrying out the assessment it was found that each mechanism had the opportunity to significantly influence global efforts to tackle bycatch, and that the IWC could potentially have a role within each mechanism- focused on specific work areas- which could prove vital for bringing about change. Within each mechanism, specific work areas were prioritised as high, medium and low priority for the BMI.

MECHANISM 1. INFORMATION GATHERING/ANALYSIS & PRIORITISATION- IDENTIFY THE TOP PRIORITY FISHERIES/LOCATIONS/SPECIES TO DEVELOP PILOT STUDIES AND FOCUS TARGETED WORK

Four main work areas were identified under this mechanism (identified high priorities for the role of the IWC are highlighted in red and underlined).

- 1.1. Mapping of fishing gears and fishing effort (VMS/AIS/others) & overlay with important areas for cetacean species/populations (*Medium priority*)
- 1.2. Compile existing information on fisheries/sites/species/populations where bycatch is known. Identify priority species/populations/fisheries/sites to carry out pilot studies. Establish bycatch baselines (*High priority*)
- 1.3. Carry out small-scale fisheries bycatch assessments/rapid risk assessments; (*High priority*)
- 1.4. Improve on-board monitoring programmes & capacity to systematically collect & share standardised and scientifically accurate bycatch data through on-board observers &/or electronic/self-reporting monitoring programmes (*Medium priority*).

Justification for prioritisation of work areas & potential role of IWC.

1.2. The compilation of existing information on bycatch to identify priority species/populations and fisheries to carry out pilot studies (& determine bycatch baselines) was prioritised for the IWC because of the existing expertise and capacity of the IWC's Scientific Committee, and the need to focus immediate efforts on case studies where there is a strong conservation case. In addition to identifying areas/fisheries to focus work, information on bycatch baselines will be fundamental for the evaluation of success for the mitigation focused pilot studies- and therefore of vital importance to the BMI. The identification of priority populations/species/sites could be led by the Scientific Committee, with the BMI expert panel and coordinator using this information to define and determine pilot studies alongside the Bycatch Standing Working Group and identified governments.

1.3. Carrying out rapid assessments for small-scale/artisanal fisheries was a prioritised work area for the IWC. It is estimated that 90% of the world's fishers are operating in small scale fisheries⁴, and yet this sector poorly understood in relation to fishing capacity and effort, bycatch risk and socio-economic factors. The available evidence suggests a strong reliance in many countries' small-scale fisheries on gillnets and mixed fishing gear (which includes nets)⁵, therefore understanding these fisheries would provide opportunities for tackling fishing gear with the highest intensity of bycatch. Rapid assessment methodologies have already been developed, so the role of the IWC could be to promote/facilitate standardised methodologies in country (through direct technical assistance or pilot studies) to examine bycatch risk in small-scale fisheries. The expert panel and coordinator could lead this work area, with members of the Scientific Committee and Conservation Committees playing a vital role in rolling out the approach in various countries and (for the SC specifically) in evaluating methodologies and results.

1.1 & 1.4. These work areas were given a medium priority. Mapping fishing effort using VMS/AIS/other technology (1.1) is currently being done by several different researchers/organisations, and so whilst the outputs would be extremely useful for the BMI, it is likely that they will be undertaken by others without the need for strong IWC participation. If opportunities for collaboration arise these should be considered however and the IWC could consider bringing in information on cetacean distribution (and important areas) to complement the fisheries information. There is the potential to use the Important Marine Mammal Areas or other types of tools to identify important areas as a starting point to focus efforts nationally or regionally for mapping fishing effort.

The improvement of monitoring programmes (1.4) is an extremely important, long term work area, however as the IWC is not a fisheries management organisation it is not best placed to directly bring about improvements at national level. The IWC could provide assistance, through the coordinator and expert panel to improve national monitoring programmes as part of a capacity development programme. Through national reporting of contracting governments within the SC it might be possible to evaluate the types of monitoring programmes underway within countries, and this could form the basis of future advice or suggestions for improving coverage or information collected within monitoring programmes.

MECHANISM 2. TESTING & DEMONSTRATING EFFECTIVE SOLUTIONS- COLLABORATION WITHIN PILOT STUDIES FOR DEVELOPMENT AND DEMONSTRATION OF EFFECTIVE AND AFFORDABLE MONITORING AND MITIGATION SOLUTIONS FOR DIFFERENT FISHING GEARS

Three main work areas were identified under this mechanism (identified high priorities for the role of the IWC are highlighted in red and underlined).

- 2.1. Share information, knowledge & best practice advice on existing solutions (toolkit of solutions & practical demonstrations) with fishing industry, fisheries managers, governments etc. (High priority)
- 2.2. Test, adapt & demonstrate existing solutions with fishermen (using a rigorous scientific method to ensure replicability to other species/populations/fisheries) (High priority)

⁴ Béné, C., 2005. Small-scale Fisheries: Assessing Their Contribution to Rural Livelihoods in Developing Countries. FAO Fisheries Circular No. 1008. FAO, Rome.

⁵ Stewart, K.R., Lewison, R.L., Dunn, D.C., Bjorkland, R.H., Kelez, S., Halpin, P.N., Crowder, L.B., 2010. Characterizing Fishing Effort and Spatial Extent of Coastal Fisheries. PLoS ONE 5, e14451. <https://doi.org/10.1371/journal.pone.0014451>

2.3. Help drive innovation for mitigation & testing with fishers, in partnership between scientists, conservationists, fisheries managers, fishing technologists, fishing industry.
(High priority)

Justification for prioritisation of work areas & potential role of IWC.

All the work areas within this mechanism were identified as priority work areas for the IWC, allowing for work at site specific/mitigation measure level and scaling up to dissemination of international best practice.

2.1. The ongoing review and dissemination of best practice for mitigation measures is essential for promoting the uptake of solutions to bycatch. Existing work is already underway (through the FAO, and through online platforms like bycatch.org and BMIS) that the IWC can collaborate with to effectively share best practice. The IWC can bring the technical expertise (through the SC and the expert) to evaluate mitigation measures and provide new information on mitigation studies. There is a strong need to communicate identified best practice to governments, fisheries managers, RFMOs and the fishing industry and the IWC is well placed to communicate this information widely through the SC and the CC.

2.2. This is an important work area, where little global coordination exists. Many mitigation trials have only been tested in one location or fishery, and once the project or funding is complete there is little incentive for others to develop the work further. The IWC as the leading international body addressing cetacean science, conservation and management, can play a major coordination role through the BMI, promoting the need for further testing of mitigation measures (e.g. As defined in the new FAO list of mitigation measures), with the SC and the expert panel promoting this through academic channels, and the CC and SWG channelling this through fisheries departments and research agencies.

2.3. There is a strong need to drive the mitigation innovation agenda, particularly in relation to some specific gears (egg gillnets) where existing solutions are not feasible, or unlikely to be effective due to the species involved. The IWC- and the SC in particular- can play a unique role in raising the awareness of the broader scientific community in focusing research efforts on mitigation and developing novel solutions. Innovation could also include considering social/economic/cultural ways of dealing with bycatch, as well as research on gear modification/switching/management etc. The BMI could potentially consider working with foundations/funding sources to provide awards for leading bycatch work etc- or other ways of raising the profile and need for further mitigation work.

MECHANISM 3. BRING ABOUT CHANGE IN ATTITUDES WITHIN FISHING COMMUNITIES BY ENGAGING THE FISHERY OPERATORS, PROCESSORS AND TRADERS IN PROCESS, DESIGN, AND IMPLEMENTATION. INCENTIVIZE WITH NICHE MARKETING OR ECO-LABELS. START SMALL THEN SCALE UP FROM PILOT STUDIES TO FLEETS.

Three main work areas were identified under this mechanism (identified high priorities for the role of the IWC are highlighted in red and underlined).

3.1 Engage & collaborate with fisheries communities in pilot projects (and/or in countries asking for assistance). Pilot projects can include bycatch risk assessments, mitigation and management trials, incentive based approaches etc. Outreach and train fishermen on how to operate mitigation gear (proven as effective) & adapt solutions for vessels & raise awareness of solutions & best practice (High priority)

- 3.2 Work with fisheries economists, technologists, scientists & conservationists & fishermen to ensure solutions are economically viable (*Low priority- but captured as part of pilot project work*)
- 3.3 Determine and test a set of tools/methods for incentivising the implementation of bycatch mitigation alongside socio-economic experts & fishing industry (*High priority*)

Justification for prioritisation of work areas & potential role of IWC.

3.1. This work area is a high priority as it will enable the IWC to effectively work at both local scale and international scale through coordination of pilot projects and provision of advice to national governments. The fishing industry is at the heart of the issue of bycatch, and in order to effectively bring about change there is a need for dedicated outreach and engagement with the sector on how best to solve specific bycatch problems. By gaining expertise 'on-the-ground' the BMI can then effectively transfer experience to other countries and locations experiencing bycatch issues.

3.3. As described above, engaging fishermen to properly implement mitigation solutions (including respecting spatial/temporal management) is intrinsic to tackling the bycatch issue. Whilst regulation, enforcement and compliance are likely to be effective in some circumstances, incentivising the fishing industry to comply with mitigation measures is an important aspect which is often not considered. Defining and testing tools alongside fishing industry will enable lessons to be learnt over what is effective under different circumstances and applied to other countries and fisheries where relevant.

3.2. This work area was identified as low priority for the IWC, as it is likely to be led by those developing the technology. Furthermore, it is likely to be tackled as part of driving forward the innovation agenda and working alongside fishermen on solutions during the pilot studies, so it will be considered and facilitated wherever appropriate, without needing to be a driving force of the IWC's BMI.

MECHANISM 4. RAISE AWARENESS & CAPACITY WITHIN NATIONAL GOVERNMENTS TO TACKLE BYCATCH- NATIONAL GOVERNMENTS HAVE THE KNOWLEDGE/CAPACITY/POLITICAL WILL TO DEAL WITH THE ISSUE EFFECTIVELY

Seven main work areas were identified under this mechanism (identified high priorities for the role of the IWC are highlighted in red).

- 4.1. Effective regulations exist at international, and national level (*Low priority*)
- 4.2. Cohesion improved between other international bodies (FAO, RFMOs, CMS, ACCOBAMS, ASCOBAMS, NAMMCO, ICES) on advice on tackling bycatch (*High priority*)
- 4.3. Improve national capacity for enforcement and monitoring at local/national level so that mitigation measures are implemented & national & international regulations are enforced (*Medium Priority*)
- 4.4. National fisheries managers implement and enforce national & international regulations (*Low priority*)
- 4.5. National fisheries managers etc. trained in bycatch monitoring and mitigation measures and have the capacity to determine the scale of the issue & how to implement & enforce technical solutions & best practice (*High priority*)
- 4.6. National governments develop action plans NPA for cetaceans (*Low priority*)

4.7. The profile of bycatch as a conservation & management issue is raised nationally & political will builds to tackle bycatch (High priority)

Justification for prioritisation of work areas & potential role of IWC.

4.2. This work area is considered a high priority for the IWC. Although it is unlikely to provide the highest global impact for tackling bycatch, it is a key responsibility of the IWC to coordinate and collaborate with other international bodies working on similar issues. This will bring about improved efficiency and help provide strong and clear messaging at national and international level on bycatch. The IWC can bring about improved coordination on this topic through its existing network and through the development of new collaborations.

4.5. This work area was assessed as high priority, as part of a comprehensive capacity development programme- beginning with pilot studies and expanding out to other countries (as governments request advice). The IWC would be well placed with the expertise provided by the expert panel across different aspects of bycatch, and the coordinator, to facilitate a capacity development programme. This could potentially be done in partnership with other bodies (including FAO, NGOs, other governments etc).

4.7. The IWC is well placed to communicate about cetacean bycatch, mitigation solutions and the need for action- with a global reach extending to contracting governments, international organisations and the scientific community. By using existing communication channels and developing new strategies to communicate on this topic the IWC has the potential to raise the profile at both national and international level and provide the right enabling conditions for increased political will and action on this issue.

4.3. This work area is considered a medium priority as it is potentially more strategically important to develop countries' capacity for understanding the scale of bycatch within their country, the solutions which could work and engage with the fishing sector in key fisheries. The next step going forward could be to focus on developing capacity and enforcement. It will therefore likely be a higher priority in the future. Opportunities to collaborate on work focused on compliance and enforcement should be actively considered however.

4.1 & 4.4 & 4.6. These work areas were assessed as a low priority, as it sits outside of the IWC's scope- given the IWC does not manage fisheries. However, policy advice could be drafted on various aspects to assist in improving fisheries management, provided this was requested by governments to the IWC.

MECHANISM 5. RAISE AWARENESS WITHIN REGIONAL AND INTERNATIONAL FISHERIES MANAGEMENT- FISHERIES MANAGEMENT ORGANISATIONS HAVE THE KNOWLEDGE, CAPACITY AND POLITICAL WILL TO DEAL WITH THE ISSUE EFFECTIVELY VIA THE REGIONAL SECRETARIAT NETWORK AND OTHER FORA.

Four main work areas were identified under this mechanism (identified priorities for the role of the IWC are highlighted in red).

- 5.1. Collaboration with other international bodies (FAO, RFMOs, CMS etc) to streamline national reporting of bycatch and improve sharing of data (*Medium priority*)
- 5.2. Effective regulations exist at international level (e.g. potentially through an FAO instrument- FAO Guidelines for cetacean bycatch mitigation; International Plans of Action) (*Medium priority*)

- 5.3. RFMOs implement standardised data collection on bycatch and the implementation of best practice bycatch mitigation/management measures. (*Medium priority*)
- 5.4. Raise awareness of the profile of the issue of bycatch internationally (*High priority*)

Justification for prioritised actions & potential role of IWC.

5.4. As for work area 4.7 above, the IWC is well placed to champion the issue of cetacean bycatch within an international setting. Whilst CMS and its regional sister agreements (ACCOBAMS and ASCOBAMS), and other international bodies such as NAMMCO are working on bycatch the IWC is the only organisation with a combined cetacean focus at global scale. By using existing communication channels (e.g. COFI, Regional Secretariat Network; RFMO meetings; the IWC meetings etc) and developing collaborations with international organisations the IWC has the potential to raise the profile of cetacean bycatch at international level and provide the right enabling conditions for increased political will and action on this issue.

5.1. Engagement with FAO, individual RFMOs and other international bodies to streamline and improve the availability of bycatch and fishing effort data was assessed as a medium priority. This is a work area with the potential for a high global impact- allowing the future identification of areas/fisheries that have the highest bycatch. The IWC can play an important role by engaging with each of the organisations (particularly FAO and individual RFMOs) and working to improve the sharing of data between organisations and the collection of more relevant and useful information on bycatch. This work area is likely to develop over time, and it could take many years of slow and steady engagement before results are achieved- therefore this is considered an important part of the BMI but it is suggested that this should not be the top priority focus. In developing the work plan, specific opportunities to engage with FAO and individual RFMOs should be carefully considered in order to maximise the effectiveness of IWC engagement.

5.2. The IWC could play an important role in raising awareness of cetacean bycatch and the need for FAO engagement on bycatch monitoring, reporting, and mitigation (e.g. production of guidelines etc). There are potentially important opportunities coming forward to work with FAO on this, and through engagement of the IWC in COFI and the Regional Secretariat Network. This is likely to be a slow-moving work area that will likely develop over time.

5.3. This work area has the potential to bring about changes within individual RFMOs, leading to improvements on bycatch monitoring, reporting and mitigation requirements. Many of the RFMOs are not actively working on cetacean bycatch, in comparison to work on seabird and turtle bycatch, therefore it is a gap that does require filling. It is likely that the IWC could play an important role in raising the profile of cetacean bycatch within individual RFMOs, bringing in the experience gained through the pilot studies etc. It might be most effective for the IWC to engage with only a few RFMOs initially to develop experience without over-committing. This is likely to be a slow-moving work area, and further scoping of this action is required as is consideration of how best to coordinate with IWC members attending RFMO meetings to assist in promoting cetacean bycatch work.

RECOMMENDATIONS FOR THE BMI

The following summarises the preliminary findings of the strategic assessment and recommendations for the initiative for the development of the strategic plan and workplan:

- Each of the main mechanisms has the potential to be very important in bringing about change, globally, on how cetacean bycatch is tackled. The IWC could potentially have a role within each of the mechanisms, with specific work areas identified as high priority under each.

- Given the broad scope of the different mechanisms, there will be a need to further prioritise the actions of the workplan and the pilot studies in order for the BMI to remain targeted and focused. This could include a focus of the BMI within specific regions, or specific species of conservation concern, or specific gears. For example, within the work on small scale fisheries, the work could focus specifically on one or two fishing gears (e.g. gillnets)- carrying out risk assessments, trialling of innovation (gear and incentive approaches) in 2-3 pilot studies before scaling out to other small-scale fisheries.
- One of the most important work areas appears to be the development of capacity development programmes, which could cover rapid risk assessments, monitoring and mitigation, incentives and enforcement/compliance. The capacity development programme could begin through specific pilot projects, developing IWC experience, then scale out to provide training and workshops upon government requests. This on the ground work would then form the basis of the technical expertise of the BMI (in addition to the expert panel and SC) in dealing with different aspects of bycatch management.
- There is a high degree of linkage between the bottom-up and top-down work areas identified as a high priority for the BMI (e.g. the linkage between using results of pilot studies to help inform positions at RFMOs, FAO, and with advice/capacity development programmes to governments), and this suggests that the strategic plan and work plan should ensure that both aspects can work together.
- In order to effectively deliver such a varied work programme, the initiative will need to rely on the support of many different bodies within the IWC (in addition to the Bycatch Coordinator, the SWG and Expert Panel) including: the Conservation Committee, Scientific Committee, the GERN and stranding programmes, as well as individual contracting parties. There will therefore need to be a wide consultation with these different bodies during the drafting of the workplan, in order to have a clear understanding of roles and capacity. The roles of different bodies for each work area and activity will be identified in the workplan presented to IWC67.
- Furthermore, consideration is needed in relation to how to build up regional IWC structures and expertise on bycatch mitigation and management. Developing a coordinated regional structure for the BMI would enable a deeper understanding of local and regional bycatch issues, capacity needs, culturally appropriate and more 'local' advice mechanisms, and potentially allow for engagement of regional experts in RFMO discussions on IWC's behalf. There is potentially some similarity with the Conservation Management Plan Structure, with individuals/countries acting to coordinate others across specific regions.
- Consideration of the actions (including by contracting governments where appropriate) needed to bring about the identified 'enabling conditions' is extremely important and should be elaborated within the workplan.

RECOMMENDATIONS FOR SCIENTIFIC COMMITTEE

The following work areas & potential actions could be led fully or in part by the SC (ordered by priority):

The SC (within the Sub-Committee on Non-Deliberate Human-Induced Mortality of Cetaceans HIM) was particularly invited to comment on the identified work areas outlined below. Feedback would be useful on whether there are any aspects missing where the SC could have

a major role and the scope and appropriateness of these actions in relation to existing or planned work within the SC (& individual researchers) on bycatch:

Work area 1.2. (High priority). The SC could lead the compilation and review of existing bycatch data to identify the priority fisheries/sites/species/populations to be considered for pilot projects based on conservation need and establish bycatch baselines for relevant cetacean populations where mitigation is to be trialled. **Timeframe:** May-July 2018- to allow for development of pilot project concepts in workplan to be presented at IWC67. Periodic review thereafter. NB. Once priorities were identified the feasibility of working within these locations/fisheries would be assessed by the Coordinator, Expert Panel and SWG.

Work area 1.3. (High priority) Assist the expert panel and coordinator in evaluating the small-scale fisheries risk assessments and in providing advice on methodologies put forward. **Timeframe:** September 2018-September 2019.

Work area 2.3. (High priority) Lead in communicating the need for increased research on mitigation measures/management approaches for cetaceans to the broader scientific community. Identify opportunities (workshops, conferences) within and beyond cetacean scientific circles to communicate the need for research. Assist the expert panel and coordinator in developing key research questions that need to be answered (e.g. In relation to gillnet mitigation, sensory ecology approaches etc). **Timeframe:** Ongoing- with action potentially to begin from May 2018.

Work area 2.1. (High priority) Annual review of mitigation measure tables (e.g. New FAO tables of mitigation measures, or through existing IWC tables or collaboration with online platforms), and assessment and inclusion of new information coming from the BMI & other sources. **Timeframe:** beginning in 2018 (pending submission to SC/HIM of tables developed through March 2018 FAO workshop)

Work area 2.2. (High priority) Provide technical assistance to the coordinator and the expert panel in the development of scientific trials/monitoring programmes to evaluate mitigation measures. Evaluate the results of the trials (as per work area 2.1) **Timeframe:** beginning in 2019

Work area 1.1. (Medium Priority) Collaborate with researchers identifying fishing effort using vessel monitoring and tracking systems and assess bycatch risk, with a particular focus on small scale fisheries. Potentially consider the use of Important Marine Mammal Areas or other types of areas identified as important for cetaceans, as a focal point for evaluating the extent of fishing effort and bycatch risk. **Timeframe:** 2018-2020, and on-going provided opportunities exist for collaboration.

Work area 1.4. (Medium priority) Continue to acquire data on bycatch through national reporting of IWC contracting governments & map out which countries have bycatch observer programmes and which ones do not. Consider developing guidance for improving monitoring schemes. **Timeframe:** 2018-2020 (guidance potentially considered as a product in 2020)

RECOMMENDATIONS FOR CONSERVATION COMMITTEE

The following work areas & potential actions could be led fully or in part by the CC (ordered by priority):

- The members of the CC could play a crucial role in facilitating the enabling conditions needed for success of the BMI, including working towards increased national level engagement to tackle bycatch; improved cohesion between environment and fisheries departments (on bycatch data collection, reporting, management and mitigation); implementation nationally of best practice and where appropriate of regulations and management.

- The members of the CC could produce recommendations (policy/management/best practice guidance) based on information and tools produced through the BMI.
- The members of the CC that actively attend RFMO meetings (particularly those RFMOs that are prioritised under the BMI) could consider being part of a coordinated effort amongst IWC Contracting Members to promote improved bycatch monitoring, reporting and mitigation within technical and commission meetings.
- The members of the CC that actively attend FAO and COFI meetings could assist with inputting IWC advice and recommendations into FAO work on marine mammal bycatch
- In addition to potential regional coordination for RFMO meetings, this could also extend to individual countries/members of the CC playing a key role in a more regionalised BMI structure- for example leading efforts to identify capacity development needs across a region and actively assisting in growing regional expertise to tackle bycatch- in collaboration with the coordinator and the expert panel.
- Members of the CC could identify their own needs for technical advice and assistance from the BMI, either volunteering to be part of a pilot study or requesting IWC assistance as part of the capacity development programme.
- Work area 2.1. The CC could help promote any best practice identified by the BMI (or developed as part of a collaboration- e.g. with FAO) at national level or through regional networks.

Question to CCPG: Feedback on identified areas where the CC's role will be extremely important. Are there any actions missing that could be instrumental?

PART 2. OUTLINE OF BMI STRATEGIC PLAN

Part 2 of this document presents an example outline of the Bycatch Mitigation Initiative strategic plan, based on the preliminary findings of the BMI strategic assessment. This is a very early version and is to be considered, at this stage, as a living document subject to a change (including the focus of the objectives and prioritisation of actions)- pending feedback from the Conservation Committee, Scientific Committee, Standing Working Group on Bycatch and the Expert Panel on the strategic assessment.

Introduction

Bycatch- the incidental capture of non-target species in fisheries- or bycatch- is a global conservation crisis, impacting many aquatic animals across different taxonomic groups in all the world's oceans, and many of its rivers. It has been coarsely estimated that over 300,000 cetaceans die each year- as a result of incidental capture in fishing gears⁶.

Bycatch threatens the existence of several cetacean populations and despite being an issue that has been identified for many years as a major conservation and welfare concern, only limited progress has been made, and predominantly in the fisheries of developed countries. Despite the identification of bycatch as a significant threat for cetaceans over the past three decades, a concerted global effort focusing on effective methods for avoiding and mitigating bycatch has been lacking. A coordinated global effort is now urgently needed to address this chronic threat.

The IWC, as the leading international body addressing cetacean science, conservation and management, can play a significant role in addressing bycatch in a coordinated and collaborative approach with others. Over the past three decades, there has been widespread acknowledgement within the IWC of the significance of bycatch as a threat to cetaceans. More recently, consideration of the need for IWC engagement and action has taken place at several IWC Scientific Committee (SC) and Commission meetings. This led to an agreement at IWC66 from the Commission to establish the Bycatch Mitigation Initiative (BMI).

The BMI is made up of three interrelated components; a bycatch coordinator in the IWC Secretariat; a Standing Working Group (SWG) on Bycatch under the Conservation Committee (CC) and an Expert panel to advise the coordinator and the SWG.

The issue

The cetacean bycatch issue can be broadly summarised as follows:

- Global estimate of >300,000 cetaceans caught as bycatch each year, threatening both large whales and small cetaceans.
- Different gears pose different threats to large/small cetaceans. Many large whales are particularly susceptible to becoming entangled in static gear, such as pots and traps. Available evidence suggests that gillnet fishing gear has the highest overall intensity of cetacean bycatch, with smaller cetaceans most vulnerable. , - this is particularly

⁶ Read, A.J., Drinker, P., Northridge, S., 2006. Bycatch of Marine Mammals in U.S. and Global Fisheries: Bycatch of Marine Mammals. Conservation Biology 20, 163–169. <https://doi.org/10.1111/j.1523-1739.2006.00338.x>

significant given the wide-spread usage of the gear and its prevalence in poorly mapped and monitored coastal fisheries.

- Where information exists on bycatch rates of some threatened cetacean species, the evidence demonstrates bycatch rates are not sustainable.
- There is a general lack of data on fishing effort, gear use and animal abundance/demographics/distributions (all seasonally and spatially) & bycatch (of all taxa) & fishing effort by gear type is poorly monitored and quantified, making it difficult to identify the top priority places for targeted action.
- Effective technical solutions for minimising cetacean bycatch are not available for most gears, and where solutions have been found they are not necessarily effective for all species.
- Low-cost and effective mitigation is particularly lacking for small-scale and artisanal sector in developing countries
- In most of the world, fishing industry participants, fisheries managers, and seafood processors/traders are unaware of the need for mitigation, the options for monitoring and mitigating, and/or how to implement them. As such,- incentives, regulation and proper enforcement lack are lacking in order to facilitate a change in fishing activity/behaviour in relation to bycatch
- Lack of effective solutions, capacity & political will restricts action globally

Legal and international framework

To be completed

Strategic Plan 2018-2024

Scope and structure

The Strategic Plan sets out objectives and actions designed for collective work under the BMI to bring about changes at national, regional and international scale in the management of cetacean bycatch. The plan is for a six-year period, extending to 2024, however given the scale and complexity of dealing with bycatch, it is important to note the likely need for long-term engagement in this topic.

The framework is structured as an iterative process, building up from pilot projects and targeted engagement specific bodies and broadening over time to use the gained experience to provide advice in bycatch situations around the world.

Success of the BMI strategic plan will be measured by considering the timely development and delivery of pilot projects, products and tools under the Strategic Plan; and outcomes – requests for advice, uptake and adoption of best practice in pilot projects and by Contracting Parties, non-contracting Governments, Regional Fisheries Management Organisations and international bodies responsible for fisheries.

The Strategic Plan will be subject to iterative review (with a mid-term assessment) The first iteration of the workplan will be for a two-year period (2018-2020) and future versions of the workplan will be adjusted in line with the principles of adaptive management every two years.

Question for CCPG: Should the timeframe of the strategic plan be for 6 years, or for a longer period (eg. 10 years).

Vision 2018-2024

Effective cetacean bycatch mitigation measures (technical gear, gear switching or management) are demonstrated and systematically implemented at local and national scales.

Focal coastal communities continue to have a thriving fishery sector, with monitoring and mitigation of marine mammal bycatch such that population-level impacts are reduced, with stocks maintained or recovering.

National capacity to understand and tackle the issue effectively, particularly in developing countries is increased. Bycatch is actively and effectively dealt with within targeted international fisheries management bodies.

Question for CCPG: As above in relation to the timing of the plan. Should the vision be a long term- 10 year vision, or something shorter and potentially more 'achievable' over the mid-term?

Do you have any comments on the vision- is this realistic/too ambitious/in line with CC work?

Objectives

In order to work towards the achievement of this vision, five equally important objectives have been identified through the strategic assessment process as the key components of the BMI Strategic Plan. These objectives include a variety of complementary actions and approaches, including those with a bottom up-approach (working within pilot projects at local level), and top-down actions focused on regional and international processes.

Within the framework provided by these objectives, the Strategic Plan identifies a suite of short and medium-term actions, which [will be] are fully described in the BMI workplan. Short-term actions are taken to be those which can be delivered within two years of the adoption of the Strategic Plan, with medium-term actions delivered over six years.

Question for CCPG: Do you agree with taking the high and medium priority actions identified in the strategic assessment as the basis of the objectives and actions for the strategic plan? Actions specifically identified as being national led are not included in the plan, but it is suggested that these could be included in the workplan- particularly where they relate to enabling conditions.

Objective 1- Identify cetacean species/populations and locations affected by particular fisheries/bycatch issues, and subsequently prioritise these situations for the development of targeted pilot studies for mitigation work.

Action XX. Compilation of existing information on fisheries/sites/species/populations where bycatch is known, and evaluation of conservation priority, and feasibility for the development of pilot studies. Establish bycatch baselines for selected pilot studies, where information is available.

Action XX. Assess bycatch risk in data poor, small scale and artisanal fisheries through a rapid risk assessment approach. Identify priority small-scale fisheries/locations/populations to work with in pilot studies and assess their feasibility;

Action XX. Collaborate with ongoing research to map fishing gears and fishing effort (VMS/AIS/VTs) & overlay with important areas for cetacean species/populations to inform potential areas of high bycatch risk and future pilot study work areas, or areas of focus for the IWC.

Objective 2- Test and demonstrate effective bycatch mitigation and monitoring solutions alongside fishing industry, experts and local stakeholders. Begin with pilot studies and scale up and out over time.

Action XX. Share information, knowledge & best practice advice on existing solutions (toolkit of solutions & practical demonstrations) with fishing industry, fisheries managers, governments etc.

Action XX. Test, adapt & demonstrate existing solutions with fishermen (using a rigorous scientific method to ensure replicability to other species/populations/fisheries)

Action XX. Help drive innovation for mitigation and management approaches, through testing and adaptation of experimental solutions alongside fishers, and experts in mitigation, management, economics and social science. Raise awareness in the broader scientific and conservation community for the need for research in cetacean bycatch mitigation and management.

Objective 3- Bring about change in attitudes within fishing communities by engaging the fishery operators, processors and traders in process, design, and implementation. Incentivize with niche marketing or eco-labels. Start small then- scale up from pilot studies to fleets.

Action XX. Engage & collaborate with fisheries communities in pilot projects (or in countries asking for assistance). Outreach and train fishermen on how to operate mitigation gear (proven as effective) & adapt solutions for vessels & raise awareness of solutions & best practice

Action XX. Determine and test a set of tools/methods for incentivising the implementation of bycatch mitigation alongside socio-economic experts & fishing industry

Objective 4- Raise awareness & capacity within national governments to tackle bycatch- national governments have the knowledge/capacity/political will to deal with the issue effectively

Action XX. Improve the coordination internationally on cetacean bycatch between other international bodies (FAO, RFMOs, CMS, ACCOBAMS, ASCOBAMS, NAMMCO, ICES), including through coordination of provision of advice on tackling bycatch.

Action XX. Develop and implement a national capacity development programme, based on experience acquired through pilot studies. National fisheries managers etc. trained in bycatch assessment and monitoring and mitigation measures and have the capacity to determine the scale of the issue & how to implement & enforce technical solutions & best practice

Action XX. The profile of bycatch as a conservation & management issue is raised nationally & political will builds to tackle bycatch

Action XX. Improve national capacity for enforcement and monitoring at local/national level so that mitigation measures are implemented & national & international regulations are enforced

Objective 5- Raise awareness within regional and international fisheries management- fisheries management organisations have the knowledge, capacity and political will to deal with the issue

Action XX. Collaboration with other international bodies (FAO, RFMOS, CMS etc) to streamline national reporting of bycatch and improve sharing of data (Medium priority)

Action XX. Effective regulations exist at international level (eg. potentially through an FAO instrument- FAO Guidelines for cetacean bycatch mitigation; International Plans of Action) (Medium priority)

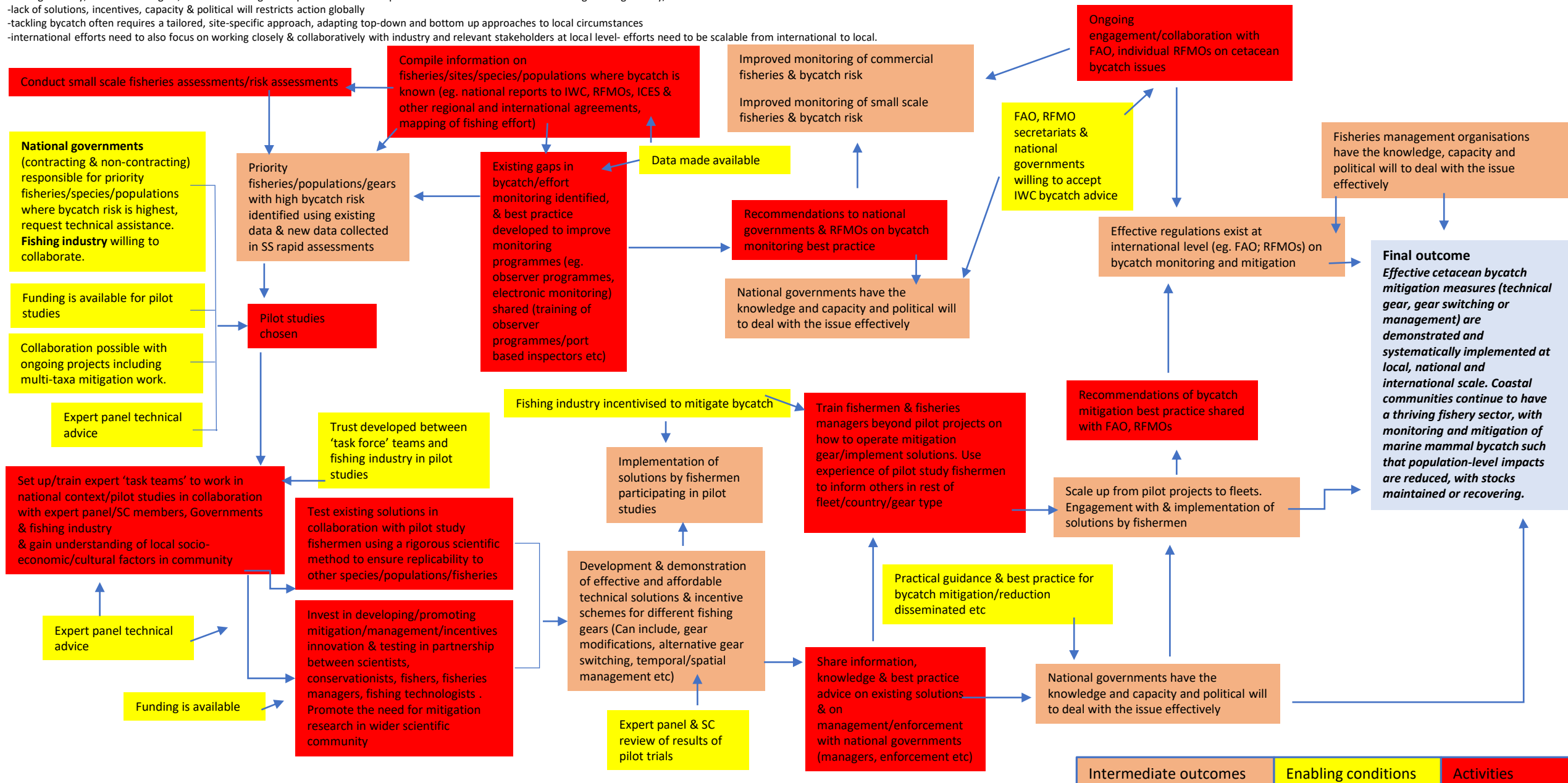
Action XX. RFMOs implement standardised data collection on bycatch and the implementation of best practice bycatch mitigation/management measures. (Medium priority)

Action XX. Raise awareness of the profile of the issue of bycatch internationally (High Priority)

Annex 1. Bycatch Mitigation Initiative- Theory of Change- Strategic Assessment

Problem context

- Estimated <300,000 cetaceans caught as bycatch each year (Read et al. 2006)
- Threatened populations of some cetacean species are not able to cope with high bycatch rates
- There is a general lack of data on fishing effort, gear use and animal abundance/demographics/distributions (all seasonally and spatially) &
- bycatch is poorly monitored and quantified, making it difficult to identify the top priority places to work
- effective technical solutions are not available for all gears, or which work for all species. Low-cost and effective mitigation particularly lacking for small-scale artisanal vessels/gears.
- Fishing industry, fisheries managers, unaware of mitigation options or how to implement them- or lack incentives to change fishing activity/behaviour
- lack of solutions, incentives, capacity & political will restricts action globally
- tackling bycatch often requires a tailored, site-specific approach, adapting top-down and bottom up approaches to local circumstances
- international efforts need to also focus on working closely & collaboratively with industry and relevant stakeholders at local level- efforts need to be scalable from international to local.



Annex 2. Strategic Assessment

Evaluation of different mechanisms for tackling bycatch, identification of gaps, opportunities and strengths of IWC & challenges to undertake.

Key- evaluating potential impact & potential for IWC role

Mechanism 1: Information gathering/analysis & prioritisation- Identify the top priority fisheries/locations/species in order to develop pilot studies and focus targeted work

<div>Medium</div> <div>Low</div>														
Work area	Existing gaps	Relevant to IWC existing work area/ strength of IWC	Details of potential weakness for IWC to work on this	Challenges	Opportunities in 2018-2024 to work on this	Others working on this? Potential for collaboration/complementary work from IWC?	Potential global impact of this action for tackling bycatch	Enabling factors necessary to achieve outcome	Assumptions	Potential for IWC role to be instrumental (High/Medium/Low) based on strengths/weaknesses/challenges/opportunities	Suggested priority for IWC?	Justification for prioritisation	Potential Activities of IWC in bringing this forwards	Potential IWC lead (eg. Committee/working group/Expert Panel)
Mechanism 1: Information gathering/analysis & prioritisation- Identify the top priority fisheries/locations/species in order to develop pilot studies and focus targeted work														
1.1. Mapping of fishing gears and fishing effort (VMS/AIS/VTS) & overlay with important areas for cetacean species/populations	Large gaps in knowledge on spatial distribution of fishing activity and different fishing gear in both national waters & high seas. Different data systems are available to monitor vessels of different size (eg. VMS, AIS, Vessel Tracking Systems) although little effort has been done to map at global scale yet. Biggest gap is on small scale & artisanal fishing effort. Significant gaps exist in detailed temporal and spatial distribution of cetacean species, making an overlay of areas of potentially high risk difficult.	SC currently looking at AIS data in relation to shipping lanes/ship strikes etc. Transferable expertise to assist in interpreting AIS data for bycatch risk	Analysis of fishing effort is not an area of direct IWC expertise	Accessibility of VMS data beyond national governments. Assumptions & data gaps of AIS- AIS data analysis (eg. global fishing watch & other groups) still in early stages of defining activity. AIS not a perfect data source & can be switched off. Some gears (eg. demersal longlines, gillnets) more difficult to define. Aside from EU vessels, only used on board larger fishing vessels. Artisanal/small scale vessels worldwide are currently not mapped with vessel tracking monitors although new start ups (Pelagic Data Systems) looking at this. ; artisanal monitoring very novel concept. Fishing effort does not always correspond to highest bycatch risk; time constraints in participating in lengthy analysis	Fishing effort is starting to be mapped using innovative tools. Examining fishing effort by gear type and associated bycatch risk is only just starting to be discussed. There is an opportunity to engage with data analysts, scientists, fisheries managers etc to identify areas of likely high bycatch risk. Potentially scientific papers/reports with those working on different taxa. Potential to engage with IMMA process (or other initiatives) as a focal starting point for areas that are particularly important for cetaceans, and evaluate fishing effort within these areas as a priority	Others working on determining fishing effort- including Global Fishing Watch; Pelagic Data Systems; NAVAMA; Pew; National Governments with VMS; RFMOs? Existing "hotspot" mapping- eg. Lewison et al. 2014; Young work on US MMC import rule data	High	Data sharing of VMS/AIS/etc by national fisheries managers/fishers/scientists. Collaboration with scientists. Information availability on cetaceans	1. Filling gaps on fishing effort will help identify some key areas of high bycatch risk 2. Assume that data will be available- & that gear types can be accurately distinguished 3. Assume a level of accuracy in data 4. Assume fishing effort experts able to assist/willing to collaborate 5. Assume that high fishing effort will be a useful proxy for estimating bycatch risk	High	Medium	Opportunity for BMI to gain a lot of information from participating with others on this. Identification of areas where problematic fishing gear are being used in high intensity- potentially posing a high bycatch risk to cetacean populations. Future prioritisation can take place for targeted work on mitigation measure testing/management & for engagement with specific countries & RFMOs. The IWC could collaborate with others leading this work. Small scale fisheries effort mapping would be particularly crucial	Collaborate with experts analysing AIS/VMS/mobile tracking data & provide the information on cetacean presence/high use areas	SC/expert panel members
1.2. Compile existing information on fisheries/sites/species/populations where bycatch is known. Identify priority species/populations/fisheries/sites to carry out pilot studies. Establish bycatch baselines	Bycatch monitoring programmes assumed to be missing in many countries/fisheries, or at least bycatch data is not reported at national/International level. Large gaps remain where information is not available on exposure to risk, or on bycatch rates, although some threatened cetacean populations already identified as being particularly vulnerable/susceptible to bycatch.	IWC SC strength in identifying key populations & species where bycatch is occurring	Lack of wide-spread national reporting & potential sensitivity in reporting high bycatch rates to IWC		US Import Rule final list of fisheries	Too big to ignore; World Small Scale Fisheries Partnership; ICES- WGBYC, NAMMCO, RFMOs, ASCOBAMS, ACCOBAMS. Potential for using data collected under US Import Rule, and to leverage more information from fisheries impacted by US Import Rule.	High	National Governments/RFMOs/Fisheries need to be willing to share existing data for baselines and willing to collect data on fishing effort and bycatch in a standardised manner.			High	Important action to identify the top priority fisheries or cetacean populations to work with. IWC's role could be to compile and evaluate available (& new information) on prioritisation of work for bycatch- eg. a specific cetacean species, or specific fishery in a location and develop case studies with willing governments to tackle the issue in country.	Work with FAO, RFMOs, individual countries who report to IWC & US with their final list of problematic fisheries to compile information on which fisheries are known to have high bycatch.	SC members for compilation & prioritisation and establishment of bycatch baselines.
1.3. Carry out small scale fisheries bycatch assessments/rapid risk assessments- eg. Collect new data to inform 1.2.	Large gaps in knowledge. Very few small-scale fisheries have been adequately assessed. Data is lacking for fisheries in most developing countries. Data is lacking on fishing effort/fishing gear types/bycatch risk etc. Socio-economic data is also missing	Recent work on Conservation Management Plans for populations with high bycatch risk?	Will require new structures for carrying these out on the ground/in country	rolling out a standard approach to multiple countries. Understanding fishing effort/distribution. Accessing fisheries to carry out the assessment. Getting funding	SOLAMAC (Latin American Aquatic Mammal Specialists- Meeting in November in Peru)	Too small to ignore; World Small Scale Fisheries Partnership; Individual researchers (e.g. E.Hines; P.Beggren). Potential to use the IMMAs as a priority focus for rapid assessments	High	Use existing methodologies for carrying out rapid assessments; National Governments & local stakeholders willing to participate in rapid assessment of small scale fisheries and provision of data where appropriate; Relevant RFMOs requiring the reporting of data on effort and bycatch for small scale fisheries;	If replicated across a large number of small scale fisheries, this could provide insights into most problematic and unknown fisheries for bycatch		High	There is existing work in individual countries, but the IWC could play a major role in facilitating the roll out of this work across more countries- particularly developing countries. Therefore role would be in creating the right enabling conditions and providing capacity/technical assistance to carry out the assessments, providing the right conditions for pilot study work in country.	Work with expert panel members on existing rapid assessment models (Adapting if necessary), seek funding (external and IWC funding), seek government agreement and collaboration with national stakeholders; undertake rapid bycatch assessments	Expert panel & coordinator- with help from SC members in key countries?

1.4. Improve on-board monitoring programmes & capacity to systematically collect & share standardised and scientifically accurate bycatch data through on board observers &/or electronic/self-reporting monitoring programmes	Information gaps exist as to which countries/fisheries have bycatch monitoring programmes/ data, where programmes exist the monitoring protocols are not standardised etc meaning that collected data is difficult to compare at regional and global scales (eg. different metrics for effort or bycatch). In general Data is poorly recorded and reported. Best practice guidelines for monitoring have been developed in some countries/regions (eg. some RFMOs) but needs a detailed review	National Reporting through the SC on bycatch and sharing of statistics on bycatch with FAO.	Many IWC contracting government representatives are from Environment Ministries rather than fisheries- if best practice guidelines were produced for cetacean bycatch monitoring it would need to be communicated & taken up by fisheries departments; Very few countries produce a national report on bycatch to IWC- so it may be best placed to assist others & collaborate in sharing information on bycatch recording.	Building guidance on monitoring programmes suitable for small scale and industrial fisheries & different economies. Getting that guidance taken up and implemented getting the information from monitoring programmes to a shared place where data can be compared	1. EU data collection regulation (in force from 2019) 2. Mediterranean RFMO- GFCM (with ACCOBAMS) developing best practice monitoring guidelines for bycatch of multi-taxa 3. US MM Import Rule will potentially incentivise collecting data to prove that bycatch is not an issue in specific fisheries 4. Others?	Potential for using data collected under US Import Rule, and to leverage more information from fisheries impacted by US Import Rule. Potential to work with RFMOs & FAO to try and strengthen and standardise data (eg. GFCM).	High	1. Governments have the capacity to implement monitoring programmes, including funds, technical skill, access to best practice, clear guidelines for reporting. 2. RFMOs, FAO, ICES, IWC, NAMMCO & other bodies receiving monitoring information should be asking for standardised information to streamline process- and data should be shared between groups to build regional/global picture of bycatch 3. Data on fishing effort (not just bycatch) is accessible and able to be compared to bycatch- to enable a scaling up of bycatch- across un-monitored fleet segment	Higher monitoring coverage of individual fisheries & the production of standardised data on bycatch and effort, will enable a more precise understanding of bycatch risk, potential impacts on populations and the long-term assessment of mitigation effectiveness.		Medium	Over time this action could see improvements in availability of standardised data on bycatch- & indication of priority areas to work. Most likely that highest bycatch is just not being monitored or recorded, rather than being lost in dispersed reporting to various international bodies. This action likely requires further scoping to evaluate the opportunities and IWC's role.	Map out which countries (& fisheries) have active bycatch observer programmes and which ones do not through national reporting to IWC SC? Evaluate where capacity needs might be in developing monitoring programmes (Coordinator)	National Reporting (Secretariat & SC) Evaluation of capacity needs (Coordinator; Expert Panel; SWG)
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Evaluation of different mechanisms for tackling bycatch, identification of gaps, opportunities and strengths of IWC & challenges to undertake.

Key- evaluating potential impact & potential for IWC role

Mechanism 2: Testing & demonstrating effective solutions- collaboration within pilot studies for development and demonstration of effective and affordable monitoring and mitigation solutions for different fishing gears

High														
Medium														
Low														
Work area	Existing gaps	Relevant to IWC existing work area/ strength of IWC	Details of potential weakness for IWC to work on this	Challenges	Opportunities in 2018-2024 to work on this	Others working on this? Potential for collaboration/complementary work from IWC?	Potential global impact of this action for tackling bycatch	Enabling factors necessary to achieve outcome	Assumptions	Potential for IWC role to be instrumental (High/Medium/Low) based on strengths/weaknesses/challenges/opportunities	Suggested priority for IWC?	Justification for prioritisation	Potential Activities of IWC in bringing this forwards	Potential IWC lead (eg. Committee/working group/Expert Panel)
Mechanism 2: Testing & demonstrating effective solutions- collaboration within pilot studies for development and demonstration of effective and affordable monitoring and mitigation solutions for different fishing gears														
2.1. Share information, knowledge & best practice advice on existing solutions (toolkit of solutions & practical demonstrations) with fishing industry, fisheries managers, governments etc	Current gaps include info for technologists/scientists/managers on what mitigation measures haven't worked effectively. Gaps also exist for effective info transmission to fishing industry directly on how to use the gear/solutions.	SC have already developed a table of effective mitigation for large whales. SC Planned to develop a table for small cetaceans in 2018 meeting (potential to collaborate with FAO on their table)	No apparent weaknesses-	Need to ensure collaboration between different entities developing best practice guidance, otherwise risk is that each will develop separate guidance. Material produced for fishing industry will need to be culturally and linguistically appropriate & translated into different languages/dialects etc.	SC potentially to be asked to regularly review FAO table of mitigation measures. If a capacity development programme is developed then there is the potential to roll this out in priority countries/fisheries.	FAO, Bycatch.org; BMIS, Conservation Evidence; [New work being done to develop tables of best practice (eg. FAO), factsheets and regularly updated technical info (bycatch.org/BMIS).] Individual RFMOs may also be developing guidance. Potential to collaborate on reviewing best practice/info on new mitigation measures (eg. the new table produced by the FAO workshop). Potential to take these best practice tables and develop work in priority countries/pilot studies to improve dissemination at national level.		Global network of collaborating researchers/technologists/managers to assess best practice. Coordination structure to bring this knowledge together	If best practice information is made available then the fishing industry, fisheries managers at local/national/international level will make use of it and implement it		High	Existing work is already underway (through the FAO, and through online platforms like bycatch.org and BMIS) to share best practice. The IWC can bring the technical expertise (through the expert panel and the SC) to evaluate mitigation measures. There is a strong need to communicate this to governments, fisheries managers, RFMOs and the fishing industry and the IWC is well placed to communicate this information widely.	1. Annual/bi-annual review of FAO mitigation table of best practice (8 mitigation not found to be effective) by SC; 2. Collaboration with others (Eg. NOAA, Bycatch.org; BMIS; Conservation Evidence) to promote best practice table including development of material for fishing industry 3. Dissemination of material explaining best practice to the fishing industry and fisheries managers through capacity development and outreach programmes (including potentially workshops with fishermen in collaboration with others)	SC & Expert panel to review mitigation measures, including FAO newly developed list. Bycatch coordinator to assist in the promotion of the list through SWG, CC and SC and external channels, including within capacity development programmes and with countries requesting assistance
2.2. Test, adapt & demonstrate existing solutions with fishermen (using a rigorous scientific method to ensure replicability to other species/populations/fisheries)	Replication of trials of experimental mitigation measures in different fisheries. Many experimental mitigation measures developed and tested in 1 fishery/in relation to 1 species/population. Often data is lacking to prove/disprove mitigation effectiveness. Little coordination once funding finishes to test the same mitigation in a different fishery.	A new area for the IWC- although individuals in SC are already involved in testing mitigation & SC has strong skills & experience in advising on scientific method for testing solutions. From a practical perspective parallels exist with the GERB programme in training/testing solutions at sea & developing a network of trained individuals to carry out this work		1. Accessing ongoing projects where mitigation testing is possible 2. Accessing sufficient funds to start up experimental testing in new locations 3. Not testing measures which have been sufficiently proven to work for specific species (eg. unnecessary testing) 4. Getting fishing industry to agree to trialling gear 5. Training local task teams (or getting expert panel time) to assist in on the ground testing	Need to identify ongoing projects willing to collaborate & test mitigation. (eg. GFCM/ACCOBAMS MAVA project in Tunisia, Morocco, Turkey & Cyprus is looking to trial mitigation measures for cetaceans. Possibility to explore opportunities through expert panel members active in mitigation trials, eg. T.Werner, P.Beggen, A. Bjorge, S.Northridge, R.Enever, T.Collins, U.Shahid.	see opportunities column. Also Norwegian pinger trials- others? Many different examples of this sort of work exist for mitigation of other taxa- eg. seabirds (BirdLife International work), shark & turtle initiatives (WWF, Shark Trust etc); SSF training of fishermen; Fisheries technologists with new products etc		1. Funding; 2. national governments & fishing industry willing to allow pilot projects for testing; 3. Researchers/project managers willing to collaborate with expert panel/IWC	Testing of solutions identified for one fishery/species will provide additional evidence of effectiveness of mitigation (eg. larger sample size, more confidence that it works for multiple species/locations etc), and that this will lead to more widespread uptake of mitigation solutions by fishers, managers, governments. Assumes that fishermen will be more willing to implement gear once it has been tested and adapted to their fishing conditions, and they can see that it works without compromising catch		High	This is an important work area, where little global coordination exists. Many mitigation trials have only been tested in one location or fishery, and once the project or funding is complete there is little incentive for others to develop the work further. The IWC as the leading international body addressing cetacean science, conservation and management, can play a major coordination role through the BML, promoting the need for further testing of mitigation measures (eg. As defined in the new FAO list of mitigation measures), with the SC and the expert panel promoting this through academic channels, and the CC and SWG channelling this through fisheries departments and research agencies.	1. Identify pilot sites (using information gathered under 1.1. and 1.2.) and assessment of feasibility 2. Secure funding & government and fishery buy-in for pilot study work (collaborate with others where possible, existing projects including multi-taxa) 3. Set up pilot studies to trial existing mitigation (proven or measures that need further testing) with monitoring programmes 4. Continued outreach and engagement with fishers in pilot study	Coordinator & Expert panel for identification of final pilot sites (once national agreement secured) & submission of funding proposals. Evaluation of results of trials/proposals for best practice (SC)

2.3. Help drive innovation for mitigation & management approaches- testing novel ideas with fishers, in partnership between scientists, conservationists, fisheries managers, fishing technologists, fishing industry, social scientists/economists	Innovation currently being undertaken by individual researchers/organisations, but little coordination exists to drive forward most of the innovation agenda (although workshops have been held to bring together technologists/scientists to discuss approaches and new ideas). Promotion of bycatch mitigation research needed within international cetacean conferences and other conferences. Updated research on alternative/sensory ecology approach to mitigation aside from acoustic deterrents is also lacking. Consideration of socio-economic factors are also rarely considered during the design of innovative experimental solutions, & this is necessary when considering innovation for developing countries and small scale fisheries in particular. Innovation in using incentive based approaches also lacking/rarely linked to technical solutions.	SC work reviewing mitigation measures	Not able to do the actual innovation- but able to promote the need & bring together experts who can help drive innovation	developing effective solutions; designing/undertaking experiments of sufficient duration/scientific rigour to get statistically significant results; designing effective mitigation that will not cause displacement of bycatch to another taxa. Getting fishers willing to trial mitigation.		Individual researchers (e.g. P.Beggren, others?); fishery technologists		Funding: collaboration with existing ongoing projects; multi-disciplinary collaborations? Series of workshops???	potentially new innovative measures could be found to effectively reduce bycatch of cetaceans; Coordinating efforts will mean less 're-inventing' of the wheel by different groups		High	There is a strong need to drive the mitigation innovation agenda, particularly in relation to some specific gears (eg gillnets) where existing solutions are not feasible, or unlikely to be effective due to the species involved. The IWC- and the SC in particular- can play a unique role in raising the awareness of the broader scientific community in focusing research efforts on mitigation and developing novel solutions.	1. Promote the need for mitigation research within the broader cetacean scientific community through SC, conferences, website etc. Clearly indicate clear questions that need further research on mitigation (Coordinator; SC, Expert Panel) 2. Consider setting up a bycatch prize in similar manner to WWF's 'smart gear' competition- in collaboration with willing funder/donor/other groups.	SC for promoting need through academic channels. Coordinator for other external methods of raising awareness/promotion. Individual countries to act as champions?
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Evaluation of different mechanisms for tackling bycatch, identification of gaps, opportunities and strengths of IWC & challenges to undertake.

Key- evaluating potential impact & potential for IWC role

Mechanism 3: Bring about change in attitudes within fishing communities by engaging the fishery operators, processors and traders in process, design, and implementation. Incentivize with niche marketing or eco-labels. Start small then- scale up from pilot

	High													
	Medium													
	Low													
Work area	Existing gaps	Relevant to IWC existing work area/ strength of IWC	Details of potential weakness for IWC to work on this	Challenges	Opportunities in 2018-2024 to work on this	Others working on this? Potential for collaboration/complementary work from IWC?	Potential global impact of this action for tackling bycatch	Enabling factors necessary to achieve outcome	Assumptions	Potential for IWC role to be instrumental (High/Medium/Low) based on strengths/weaknesses/challenges/opportunities	Suggested priority for IWC?	Justification for prioritisation	Potential Activities of IWC in bringing this forwards	Potential IWC lead (eg. Committee/working group/Expert Panel)
Mechanism 3: Bring about change in attitudes within fishing communities by engaging the fishery operators, processors and traders in process, design, and implementation. Incentivize with niche marketing or eco-labels. Start small then- scale up from pilot studies to fleets.												High		
3.1. Engage & collaborate with fisheries communities in pilot projects (or in countries asking for assistance). Outreach and train fishermen on how to operate mitigation gear (proven as effective) & adapt solutions for vessels & raise awareness of solutions & best practice (connected to 2.1. & 2.2.)	Current work is project/funding specific and more focused on testing mitigation gear then providing training to fishing industry/managers on the best way to use mitigation gear/solutions. Factsheets/info exists, but practical on-the ground training is missing from most countries/fisheries (as opposed to initiatives on seabird bycatch mitigation as e.g.)	New work area, but strong parallels with Global Entanglement Response Network programme and existing experience to create an effective capacity development programme		Need government & fisheries buy in, and develop a network of trainers to work on board or in port; need a clear understanding of what mitigation would be effective in order to train fishers in the most appropriate mitigation	New work area which needs to scope out existing work & potential collaborations/opportunities	ISSF for tuna fisheries, NGOs (eg. WWF, BirdLife- for seabirds; Pro-Delphinus; others?) particularly for other taxa/turtles/seabirds; GEF Common Oceans project http://www.fao.org/in-action/commonoceans/news/detail-events/en/c/1072426/ ; MAVA projects in Tunisia, Morocco, Turkey, Cyprus		Fishing industry willing to engage; national governments willing to seek assistance on issue; funding available to carry out capacity development programme; relevant expertise available from IWC to assist.	Allowing fishermen to adapt gear to their fishing gear, but still using it so that it will be effective will ensure that the fishing community will implement solutions (voluntarily or with gov regulation/enforcement);		High	This work area is a high priority as it will enable the IWC to effectively work at both local scale and international scale through coordination of pilot projects and provision of advice to national governments. The fishing industry is at the heart of the issue of bycatch, and in order to effectively bring about change there is a need for dedicated outreach and engagement with the sector on how best to solve specific bycatch problems. By gaining expertise 'on-the-ground' the BMI can then effectively transfer experience to other countries and locations experiencing bycatch issues	1. Build an outreach and capacity development programme on cetacean bycatch.Capacity development programme could cover rapid risk assessments, monitoring and mitigation and enforcement/compliance. Begin through pilot projects, developing IWC experience, then scale out to provide training and workshops upon government requests. (Coordinator & Expert Panel) 2. Potentially develop a regional network of people able to assist in providing capacity development/task teams to provide advice on mitigation measures to trial.	Coordinator, Expert Panel, SWG
3.2. Work with fisheries economists, technologists, scientists & conservationists & fishermen to ensure solutions are economically viable	[majority of work done in Europe, USA, Australia during innovation process. Little research available on what could be economically sustainable for different fisheries around the world- particularly for developing countries.]	new work area	new work area- will need to rely on others to help deliver this	economic feasibility will be highly variable, and potentially time consuming to determine it.	New work area which needs to scope out existing work & potential collaborations/opportunities	Fisheries technologists? Individual researchers eg. Per Berggren		Collaborations with experts & fishing industry	If mitigation is shown to be economically feasible then the measures are more likely to be properly implemented by fisheries and managers		Low	This work area is likely to be tackled as part of driving forward the innovation agenda. It is also likely to form a part of the pilot studies where testing and adapting potential solutions will be carried out. The IWC can help facilitate this where possible, but it does not need to be a focus of the BMI.	1. Work with relevant expert panel members in the scope of pilot projects & innovation development	Expert panel & Coordinator-
3.3. Determine and test a set of tools/methods for incentivising the implementation of bycatch mitigation alongside socio-economic experts & fishing industry	Toolkit for most appropriate approaches/incentives to use in different situations. Tools for small scale fisheries outside of scope of eco-labelling/ US Import Rule. Strengthening of existing eco-labels to take bycatch & effective mitigation fully into account	new work area	new work area- will need to rely on expert panel & external collaborations to help deliver this		Marine Stewardship Council standard review (2018-2020) US MMPA Import Rule (in force 2021) ISSF work	Marine Stewardship Council standard review (2018-2020) US MMPA Import Rule (in force 2021) ISSF work Individual researchers working on fisheries economics		Fishing industry willingness to engage in pilot studies on incentive based schemes; eco-labelling initiatives willing to consider improvement for bycatch considerations	Incentivising the fishing industry to make improvements for reducing bycatch will		High	This action is critical as getting fishermen to properly implement mitigation solutions (including respecting spatial/temporal management) is intrinsic to tackling the bycatch issue. Whilst regulation, enforcement and compliance are likely to be effective in some circumstances, incentivising the fishing industry to comply with mitigation measures is an important aspect which is often not considered. Defining and testing tools alongside fishing industry will enable lessons to be learnt over what is effective under different circumstances and applied to other countries and fisheries where relevant.	1. Work with relevant expert panel members in the scope of pilot projects & scale up to capacity development programme when enough experience gained	Expert panel & Coordinator-

Evaluation of different mechanisms for tackling bycatch, identification of gaps, opportunities and strengths of IWC & challenges to undertake.

Key- evaluating potential impact & potential for IWC role

Mechanism 4: Raise awareness & capacity within national governments to tackle bycatch- national governments have the knowledge/capacity/political will to deal with the issue effectively

High Medium Low														
Work area	Existing gaps	Relevant to IWC existing work area/ strength of IWC	Details of potential weakness for IWC to work on this	Challenges	Opportunities in 2018-2024 to work on this	Others working on this? Potential for collaboration/complementary work from IWC?	Potential global impact of this action for tackling bycatch	Enabling factors necessary to achieve outcome	Assumptions	Potential for IWC role to be instrumental (High/Medium/Low) based on strengths/weaknesses/challenges/opportunities	Suggested priority for IWC?	Justification for prioritisation	Potential Activities of IWC in bringing this forwards	Potential IWC lead (eg. Committee/working group/Expert Panel)
Mechanism 4: Raise awareness & capacity within national governments to tackle bycatch- national governments have the knowledge/capacity/political will to deal with the issue effectively												High		
4.1. Effective regulations exist at international, and national level	(many countries do not have specific regulations for bycatch) in some regions (eg. Europe) regulations have recently changed, potentially meaning that there will be less stringent requirements for reporting. Many RFMOs (particularly the non-tuna RFMOs) do not have regulations on bycatch monitoring or mitigation.	Conservation Committee expertise on policy etc.	IWC's role is not to regulate fisheries, so is more restricted to providing policy guidance/recommendations to national governments and RFMOs & promoting best practice where it exists;	Political will in country to create more effective regulations Capacity to develop & enforce regulations once in place	EU Technical Measures Regulation (delayed legislation- potential to work with others to ensure it is improved?); potential for national governments to move towards more regulation following the US MMPA Import Rule			US Import Rule RFMO monitoring, reporting & mitigation regulations need to be in place	Improved regulation will lead to better fisheries management (enforcement, monitoring) and implementation of bycatch management/mitigation.		Low	This work area is low priority, as it sits outside of the IWC's scope- given the IWC does not manage fisheries. However policy advice could be drafted on various aspects to assist in improving fisheries management, provided this was requested by governments to the IWC.	Drafting policy advice upon request or where relevant	CC & SWG, National governments
4.2. Cohesion improved between other international bodies (FAO, RFMOs, CMS, ACCOBAMS, ASCOBAMS, NAMMCO, ICES) on advice on tackling bycatch (linked to 5.1)	Some good linkages exist between different secretariats of existing bodies, but many are working on bycatch independently, meaning that there is currently not much collaboration between initiatives- and there is a great potential for increased effectiveness if work is streamlined and coordinated Not much coordination currently for bycatch positions to be brought forward at multiple meetings of different bodies to increase momentum on bycatch	IWC Secretariat has existing observer status to many of the RFMOs, CMS agreements, NAMMCO etc and SC members also sit on ICES working groups, and act as IWC observers for different meeting (Eg. RFMOs)	no apparent weaknesses- core to IWC	developing effective collaborations with others and capitalising on the synergies between different work programmes; Ensuring that collectively there is a distribution of work areas rather than replication; Engaging national governments (environment and fisheries departments) on the meetings and messages that they are promoting at different fora	COF/RSN meeting in 2018 to strengthen FAO/IWC work on bycatch FAO/NOAA/NEA workshop on mitigation 2018 IOTC opportunities to collaborate? CMS bycatch initiative ASCOBAMS/ACCOBAMS	all listed organisations/bodies are working on cetacean bycatch in some capacity- or could work on this topic. Additional organisations (eg. industry groups, NGOs) are working on bycatch. Coordination needed with many of them		Willingness between organisations to collaborate; opportunities for discussion/coordination (eg. meetings, workshops etc)	Improved coordination will mean that clear messages on cetacean bycatch management can be communicated at international forums, improving the clarity of direction and momentum towards tackling the issue effectively		High	Whilst this work area is unlikely to provide the highest global impact for tackling bycatch, it is a key responsibility of the IWC to coordinate and collaborate with other international bodies working on similar issues. This will bring about improved efficiency and help provide strong and clear messaging at national and international level on bycatch. The IWC can bring about improved coordination on this topic through its existing network and through the development of new collaborations.	1. Attendance and participation at FAO/COFI meetings & increased collaboration with key individuals in FAO 2. Regularly catch up calls and participation in meeting with CMS, ASCOBAMS, ACCOBAMS 3. Explore collaborations with ICES, NAMMCO & others on bycatch	Coordinator, IWC Secretariat
4.3. Improve national capacity for enforcement and monitoring at local/national level so that mitigation measures are implemented & national & international regulations are enforced	Where regulations exist for regulating bycatch there is an apparent gap in enforcement capabilities in many countries, meaning that vessels are not adequately monitored in port or at sea to ensure that they are complying with mitigation measures (gear or temporal/spatial management)	New work area, but strong parallels with GERN programme and existing experience to create an effective capacity development programme	IWC's role is not regulating fisheries, so is more restricted to providing best practice and training to assist countries/RFMOs	Infrastructure for enforcement may not exist in some countries	New work area which needs to scope out existing work & potential collaborations/opportunities	GEF Common Oceans Project, others?		National Government buy in to request assistance in improving capacity for enforcement and monitoring of bycatch	If enforcement is strengthened nationally then mitigation is more likely to be used/management complied with- with the potential to reduce bycatch		Medium	This is a medium priority as it is most important to develop countries' capacity for understanding the scale of bycatch, the solutions which could work and engage with the fishing sector in key fisheries. The next step going forward could be to focus on developing capacity and enforcement. It will therefore likely be a higher priority in the future.	1. Developing a capacity development programme, focused on pilot sites/countries, and then expanding out when advice sought by governments. Capacity development programme could cover rapid risk assessments, monitoring and mitigation and enforcement/compliance.	Expert panel & Coordinator
4.4. National fisheries managers implement and enforce national & international regulations		n/a	IWC role is not regulating fisheries, or ensuring that countries have adequate legislation.	Time & funds & political will to ensure adequate enforcement		National governments (fisheries & environment depts)		Political will; capacity & infrastructure for management bodies;	fisheries managers aware of the solutions and how to deploy them will lead to better enforcement of bycatch mitigation		Low	This work area is low priority, as it sits outside of the IWC's scope- given the IWC does not manage fisheries. However policy advice could be drafted on various aspects to assist in improving fisheries management, provided this was requested by governments to the IWC.	1. Drafting policy advice upon request or where relevant	CC, National governments
4.5. National fisheries managers etc trained & have the capacity to determine the scale of the issue & how to implement & enforce technical solutions & best practice	Many countries (particularly developing countries where monitoring has not been systematic) may not be aware whether bycatch of cetaceans is an issue. Management bodies may not have the current capacity to identify whether bycatch is occurring and if it presents a significant risk. This is particularly an issue with small-scale/artisanal fisheries, but can also include larger scale industrial operations where monitoring does not exist. Very few capacity development programmes for fisheries look to provide managers with the skills to identify the problem of cetacean bycatch.	New work area, but strong parallels with GERN programme and existing experience to create an effective capacity development programme	IWC's role is not regulating fisheries, so is more restricted to providing best practice and training to assist countries/RFMOs	Accessing relevant data to determine the scale of the issue.	New work area which needs to scope out existing work & potential collaborations/opportunities	GEF Common Oceans Project (for seabirds), others? FAO plans? GFCM		Political will; national government capacity; availability of information; identified solutions	If scale of issue at national level is better defined, then there is more incentive to act on finding and implementing bycatch solutions. If fisheries managers aware of the solutions and how to deploy them will lead to better enforcement of bycatch mitigation		High	This work area was assessed as high priority, as part of a comprehensive capacity development programme- beginning with pilot studies and expanding out to other countries (as governments request advice). The IWC would be well placed with the expertise provided by the expert panel across different aspects of bycatch, and the coordinator, to facilitate a capacity development programme. This could potentially be done in partnership with other bodies (including FAO, NGOs, other governments etc).	1. Developing a capacity development programme, focused on pilot sites/countries, and then expanding out to other countries when IWC advice sought by governments. Capacity development programme could cover rapid risk assessments, monitoring and mitigation and enforcement/compliance.	Coordinator

4.6. National governments develop action plans NPA for cetaceans	No international plan of action for cetacean bycatch; different countries have developed bycatch policies/plans for tackling bycatch- but further mapping needed to determine gaps		IWC role is not regulating fisheries, or ensuring that countries have adequate legislation. However technical assistance could be offered to assist in drafting national plans of action if requested	Acquiring sufficient information on bycatch & fishing effort & relevant solutions to build an effective plan	FAO technical guidelines on mitigation being developed;	USA Take Reduction Plans; IWC CMPs?		Political will; national government capacity; availability of information; identified solutions	National Plans could help focus attention on problematic fisheries and develop clear recommendations specific to fisheries/regions to tackle bycatch		Low/not IWC role	This was assessed as a low priority at the current time, due to it being outside of the IWC's role to lead on developing national plans of action. The IWC could, through a capacity development programme, assist countries in acquiring all the relevant information necessary for the drafting of a plan, but this would be a secondary step.	Assist interested countries in acquiring information relevant for drafting a national plan of action	Coordinator
4.7. The profile of bycatch as a conservation & management issue is raised nationally & political will builds to tackle bycatch (linked to 5.4)	Cetacean bycatch although acknowledged in academic papers and in international forums as the major source of mortality for cetaceans- remains a peripheral issue in most countries. The lack of information on the issue means that there is not a focus on solving the problem and other conservation/management issues are prioritised instead.	Past and ongoing work in the SC to build awareness of the issue & impact on cetacean populations. Remit of Conservation Committee to raise awareness of important conservation issues for cetaceans. Communication department of IWC		Ensuring that raising awareness of the issue allows for constructive progress rather than negatively singling out fisheries/countries for the issue.	Liaison with FAO work on this issue: potential to collaborate with USA through implementation of US MMPA import rule; Opportunities through the BMI to raise awareness (communication activities)	FAO; some RFMOs; NGOs; CMS/ACCOBAMS/ASCOBAMS, NAMMCO, ICES		a broad communication network willing to carry stories about cetacean bycatch & solutions; national groups willing to promote the issue nationally	Increased awareness and political will leads to more effective action nationally/within fisheries to tackle bycatch.		High	The IWC is well placed to communicate about cetacean bycatch to contracting governments, international organisations and the scientific community. By using existing communication channels and developing new strategies to communicate on this topic the IWC has the potential to raise the profile at both national and international level.	1. Website, circulars, potentially social media 2. Wide participation at fisheries and cetacean meetings and workshops and conferences- raising the profile of IWC work outside of the cetacean community.	Coordinator, IWC Secretariat

Evaluation of different mechanisms for tackling bycatch, identification of gaps, opportunities and strengths of IWC & challenges to undertake.

Key- evaluating potential impact & potential for IWC role

Mechanism 5: Raise awareness within regional and international fisheries management- fisheries management organisations have the knowledge, capacity and political will to deal with the issue

High														
Medium														
Low														
Work area	Existing gaps	Relevant to IWC existing work area/ strength of IWC	Details of potential weakness for IWC to work on this	Challenges	Opportunities in 2018-2024 to work on this	Others working on this? Potential for collaboration/complementary work from IWC?	Potential global impact of this action for tackling bycatch	Enabling factors necessary to achieve outcome	Assumptions	Potential for IWC role to be instrumental (High/Medium/Low) based on strengths/weaknesses/challenges/opportunities	Suggested priority for IWC?	Justification for prioritisation	Potential Activities of IWC in bringing this forwards	Potential IWC lead (eg. Committee/working group/Expert Panel)
Mechanism 5: Raise awareness within regional and international fisheries management- fisheries management organisations have the knowledge, capacity and political will to deal with the issue														
High														
5.1. Collaboration with other international bodies (FAO, RFMOs, CMS etc) to streamline national reporting of bycatch and improve sharing of data (linked to 5.3)	Individual organisations receive reports from national governments & NGOs involved in monitoring. The FAO compiles some level of data on bycatch. Data is not clearly accessible however, and there does not appear to a central repository with high resolution information on locations/effort/bycatch, which could be used to build an accurate picture of bycatch at international scales. No one seems to be leading a push for this, although opportunities exist to work with FAO to improve this	SC national reporting, provision of bycatch data to FAO; secretariat expertise compiling bycatch information; SC expertise on evaluating bycatch data & monitoring schemes			FAO,COFI meeting & RSN meeting. Opportunity to engage with IOTC			Willingness to collaborate between organisations; countries willing to provide bycatch information through a streamlined system that allows data sharing between organisations.	Improved collaboration with others receiving bycatch information will help elucidate fisheries/countries/regions of high bycatch risk and allow for improved, targeted action.		Medium	The IWC can play an important role by engaging with each of the organisations (particularly FAO and individual RFMOs) and working to improve the sharing of data between organisations and the collection of more relevant and useful information on bycatch. This work area is likely to develop over time, and it could take many years of slow and steady engagement before significant progress is made- therefore this is considered an important part of the BMI but not the core focus. In developing the work plan, specific opportunities to engage with FAO and individual RFMOs should be carefully considered in order to maximise the effectiveness of IWC engagement.	1. Attendance at COFI in 2018 & 2020 to push for improved monitoring and data reporting & accessibility of bycatch and effort data & opportunities for the IWC to assist using national reporting data etc. 2. Engagement with some specific RFMOs through attendance at meetings, drafting and submission of papers on bycatch (including work being done in pilot studies). Focus on pushing for increased reporting of bycatch monitoring data 3. Collaboration with CMS, ICES and other bodies on improving accessibility of data on bycatch and fisheries effort	Coordinator with potential development of a regional network of contracting governments willing to represent IWC at meetings.
5.2. Effective regulations exist at international level (eg. Potentially through an FAO instrument- FAO Guidelines for cetacean bycatch mitigation; International Plans of Action)	No international plan of action for cetacean bycatch currently in place; a number of RFMOs do not currently have bycatch mitigation requirements (mitigation/monitoring). No driving force as yet, in comparison to seabird IPOA etc.	new work area	IWC role is not regulating fisheries, or ensuring that countries/international bodies have adequate legislation. Role can be to collaborate/influence discussions	International discussions are time consuming and could take years	FAO,COFI meeting- production of technical guidelines on cetacean mitigation	FAO		COFI countries willing to endorse FAO developing technical guidelines & potentially going further in the future with an IPOA?	That FAO guidelines/IPOA will help focus countries on the issue of cetacean bycatch and identify bycatch issues & implement solutions to reduce bycatch		Medium	The IWC could play an important role in raising awareness of cetacean bycatch and the need for FAO engagement on bycatch monitoring, reporting and mitigation (eg. production of guidelines etc). There are potentially important opportunities coming forward to work with FAO on this, and through engagement of the IWC in COFI and the Regional Secretariat Network. This is likely to be a slow moving work area that will likely develop over time.	1. Attendance at COFI in 2018 & 2020- raising the profile of the need for action on cetacean bycatch 2. Attendance in 2018 of technical FAO workshop- collaboration with FAO and NOAA and NE on outputs of workshop	Coordinator, IWC Secretariat
5.3. RFMOs implement standardised data collection on bycatch and the implementation of best practice bycatch mitigation/management measures.	a number of RFMOs do not currently have bycatch mitigation requirements (mitigation/monitoring) for cetaceans. Unclear what bycatch is occurring with the fisheries covered by the RFMOs	SC national reporting, provision of bycatch data to FAO; secretariat expertise compiling bycatch information; SC expertise on evaluating bycatch data & monitoring schemes	time constraints to interact with all RFMOs, potentially challenging to influence discussions within RFMOs		IOTC potential for collaboration; GFCM; others?	CMS, NGOs		Political will in national governments to push this forward within RFMOs- including collaboration between env & fisheries departments attending IWC/RFMO meetings	Increased action by RFMOs on cetacean bycatch monitoring and mitigation will improve fisheries management and ensure that mitigation solutions are implemented where bycatch is found to be a problem		Medium	This work area has the potential to bring about changes within individual RFMOs, leading to improvements on bycatch monitoring, reporting and mitigation requirements. Many of the RFMOs are not actively working on cetacean bycatch, in comparison to work on seabird and turtle bycatch, therefore it is a gap that does require filling. It is likely that the IWC could play an important role in raising the profile of cetacean bycatch within individual RFMOs, bringing in the experience gained through the pilot studies etc. It might be most effective for the IWC to engage with only a few RFMOs initially to develop experience without over-committing. This is likely to be a slow-moving work area, and further scoping of this action is required as is consideration of how best to coordinate with IWC members attending RFMO meetings to assist in promoting cetacean bycatch work.	1. Engagement with some specific RFMOs through attendance at meetings, drafting and submission of papers on bycatch (including work being done in pilot studies). Focus on pushing for increased reporting of bycatch monitoring data. 2. Consider development of a regional RFMO network- pulling together the IWC members who also attend RFMO meetings. Potential for IWC members to represent IWC where IWC sec participation not possible	Coordinator, IWC Secretariat with potential for SWG

5.4. Raise awareness of the profile of the issue of bycatch internationally (as for 4.7)	Cetacean bycatch although acknowledged in academic papers and in international forums as the major source of mortality for cetaceans- remains a peripheral issue in most countries. The lack of information on the issue means that there is not a focus on solving the problem and other conservation/management issues are prioritised instead.	Past and ongoing work in the SC to build awareness of the issue & impact on cetacean populations. Remit of Conservation Committee to raise awareness of important conservation issues for cetaceans. Communication department of IWC		Ensuring that raising awareness of the issue allows for constructive progress rather than negatively singling out fisheries/countries for the issue.	Liaison with FAO work on this issue: potential to collaborate with USA through implementation of US NMMA import rule. Opportunities through the BMI to raise awareness (communication activities); Seafood Expo circuit as a means for communicating to wider commercial fishing industry & stakeholders	FAO; some RFMOs; NGOs; CMS/ACCOBAMS/ASCOBAMS, NAMMCO, ICES		National governments willing to take on board the messages on the need for action on bycatch	Increased awareness and political will leads to more effective action nationally/within fisheries to tackle bycatch.		High	The IWC is well placed to communicate about cetacean bycatch to contracting governments, international organisations and the scientific community. By using existing communication channels and developing new strategies to communicate on this topic the IWC has the potential to raise the profile at both national and international level.	1. Website, circulars, potentially social media 2. Wide participation at fisheries and cetacean meetings and workshops and conferences- raising the profile of IWC work outside of the cetacean community. 3. Side events at key meetings (eg COFI, CMS etc) to raise profile of issue alongside governments	Coordinator, Secretariat
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