

Annex J

Report of the Sub-Committee on Non-Deliberate Human-Induced Mortality of Cetaceans

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1. INTRODUCTORY ITEMS

1.1 Opening remarks

Leaper welcomed participants and highlighted the key areas of work of the sub-committee, bycatch and ship strikes. The bycatch work is closely coordinated with the IWC’s Bycatch Mitigation Initiative (BMI) and the ship strike work with the IWC Ship Strikes Working Group. He also paid tribute to Bill Perrin who chaired the Bycatch sub-committee for several years.

1.2 Election of the Chair and Rapporteurs

Leaper and Minton were elected as co-Chairs of the meeting. Mattila volunteered to rapporteur.

1.3 Adoption of Agenda

The Agenda was adopted. Leaper noted the request from the Scientific Committee Chair to include consideration of Commission Resolution 2022-1 on Marine Plastic Pollution in sub-committee agendas. This Resolution requests the Scientific Committee to develop an approach to assess the current knowledge of the impact of marine plastic pollution on cetaceans and to provide a global risk assessment that identified hotspots of cetacean exposure to plastic debris. The Scientific Committee has had an intersessional group on marine debris which will report back to the Environmental Concerns sub-committee. However, of particular relevance to the HIM sub-committee would be plastic pollution associated with fishing and shipping activities. There are specific elements of the request to the Committee in terms of identifying hotspots of plastic pollution that could be informed by the discussions including fishing effort, gear loss and gear marking as well as density and distribution of shipping.

1.4 Available documents

The documents available for discussion included: SC/69A/HIM/01-15 and 17 and BUND *et al.* (2023); Rae *et al.* (2023), Leaper *et al.* (2022), ICES (2023), Portal *et al.* (in press), Miller *et al.* (2023), MMHSRP-US (2022), Daume *et al.* (2023), Manlik *et al.* (2022), Bonizzoni *et al.* (2022), Ambie *et al.* (2023), Anon (2022a), Anon (2022b), WCFC (2022).

2. BYCATCH AND ENTANGLEMENT

2.1 IWC’s Bycatch Mitigation Initiative

SC/69A/HIM/13 provided an overview of progress made by the IWC Bycatch Mitigation Initiative (BMI) over the past year. The Initiative welcomed a new Chair to the Standing Working Group on Bycatch (Svoboda). The membership of the Expert Panel on Bycatch is currently under review and a call for new members was open until 15 May 2023. The Scientific Committee (SC), Contracting Governments and observers were encouraged to nominate new members to the Expert Panel, particularly candidates from Central and South America or the western South Pacific, or those with expertise in fisheries economics, social science and community engagement, cetacean biology and behaviour, cetacean population monitoring and assessment, fisheries science and technology, and fisheries management.

Activities conducted in the past year by the Bycatch Coordinator with support and input from the Expert Panel include the following.

- The production of factsheets illustrating and promoting the FAO 'Guidelines to prevent and reduce bycatch of marine mammals in capture fisheries (2021)'. A consultative process that included a joint workshop with the IWC Expert panel and representatives of the FAO resulted in 12 illustrated 'Marine mammal bycatch mitigation' factsheets aimed primarily at fishery managers, fishers and researchers which can be accessed on the FAO website¹.
- Planning and preparation for the FAO Common Oceans Programme Tuna project: the IWC Secretariat has signed a Letter of Agreement to formalise a four-year project that will provide \$320K for the IWC Secretariat to improve the understanding and management of cetacean bycatch in tuna fisheries in the Indian Ocean and the western Pacific Ocean. This work will include collaborative work with RFMOs, national governments, experts and the fishing industry to conduct a gap analysis on cetacean bycatch and fisheries data, as well as a spatial risk assessment in both areas, and awareness-raising.
- Formalisation of engagement with the Indian Ocean Tuna Commission (IOTC): Following recommendations from the SC and CC (SC1878, SC2095, SC20106, BMI906 and BMI1919) a Cooperation Agreement (CA) was drafted by the IWC and IOTC Secretariats and was approved by consensus by the 30 parties to IOTC in September 2022 and endorsed at IWC68. The CA between the IWC and IOTC was signed in March 2023. The IWC BMI contributed to a multi-taxa virtual workshop organised by the IOTC in collaboration with the World Wide Fund for Nature (WWF) in August 2022.
- Participation in Western and Central Pacific Fisheries Commission (WCPFC) Scientific Committee and document review, including documents on cetacean diversity, status and threats, best practices for safe handling and release of cetaceans (WCPFC-SC18-2022/EB-IP-12, see WCPFC, 2023), and data collection: In late 2022, the IWC was granted observer status to participate in WCPFC meetings.

Planning continues for the implementation of pilot projects in countries previously identified as priorities: Peru, Republic of Congo, Kenya, Pakistan, India, Thailand, Malaysian and Indonesian Borneo. These pilot projects are locally led with IWC support and aim to monitor, mitigate and manage bycatch on small-scale fisheries using gillnets. The BMI has been working with the Peruvian Government to develop the Terms of Reference for the first consultancy related to the Peru pilot project. Once these are agreed, the IWC will issue a call for tenders.

In addition to pilot projects, the BMI provides support and, where possible, advice and expertise to affiliated projects, including the CIBBRINA Life project (see Agenda Item 12.3) and the Marine Mammal Bycatch Risk Assessment in Chile (Lenfest Ocean Program). SC members who are interested in collaborating with the BMI on Pilot projects or Affiliated Projects, particularly in the Indian or Western Pacific Oceans are encouraged to contact the BMI Coordinator. The BMI is also engaged in planning for a formal capacity building programme and the development of a 'library' of bycatch mitigation and monitoring equipment, as well as external fund raising to enable implementation of the BMI work plan. The Bycatch Coordinator will work with the Chair of the Bycatch SWG and the Chair of the VCF fund to consider applications to the VCF funding.

The sub-committee commended the impressive work of the IWC's BMI and its coordinator (Passadore) and welcomed the new Chair of the Standing Working Group on Bycatch.

2.2 Collaboration on bycatch mitigation with IGOs

In a report commissioned by the South Pacific Regional Environment Programme (SPREP), Miller (2021) identifies bycatch by commercial oceanic purse seine and longline vessels fishing within the EEZs of Pacific Island countries and territories as the most serious threat to cetaceans based on reports from on board fisheries observers. Although the widespread use of inshore gillnets in the region could be a significant source of mortality, there is little reliable information on the bycatch of cetaceans in subsistence and coastal fisheries. The study, based on data from the Regional Observer Program for the purse seine and long line fisheries of the Western Central Pacific Fishery Council, represents an initial analysis from publicly accessible data covering 2013-20 and extracted data from summary reports produced by the Pacific Community. The species with highest reported rates of occurrence of interactions were false killer whales, short-finned pilot whales, rough-toothed dolphins, bottlenose dolphins and spinner dolphins in purse seine fisheries and false killer whale, and bottlenose dolphin in long line fisheries.

In discussion, the author noted that the false killer whale was the species most often bycaught in these fisheries. Recognising the substantive effort that the USA is investing on the bycatch issue for the population of false killer whales around the Hawaiian archipelago, it was noted that this work may lead to a better understanding and mitigation efforts

¹ <https://www.fao.org/fishery/en/bycatch-mitigation-mammals/search>.

that can be applied elsewhere throughout the South Pacific. It was also recognised that depredation may play a significant role in the bycatch of some species in some fisheries, meriting more focused collaborative research involving fishers and scientists to understand how to more effectively reduce target catch loss as well as bycatch risk. Although SPREP has not identified funding for further analyses of these data, SPREP will be partnering with the IWC BMI under the Common Oceans Project. The Committee has established a South Pacific Islands Small Cetacean ICG (see Annex Q (SM), agenda item 4) to assist with further work on this issue.

SC/69A/HIM/06 describes collaboration between CCAMLR (specifically, SC-CAMLR's Working Group on Incidental Mortality Associated with Fishing; WG-IMAF) and the IWC Scientific Committee on whale entanglement in the Southern Ocean krill fishery. In response to a report of the incidental mortality of three juvenile humpback whales in the Antarctic krill trawl fishery in Subareas 48.1 and 48.2 during the 2021 calendar year, SC-CAMLR approached IWC-SC to help better understand potential reasons for these bycatch events and to avoid them in the future, with a specific request to provide scientific feedback on these circumstances associated with these incidents and to nominate scientists to attend the WG-IMAF meeting (Welsford *et al.*, 2022). The Committee established an ICG at SC68D on whale entanglement/entrapment in the krill fishery and subsequently developed a report detailing advice on a range of topics, from data collection needs when whale entrapments occur through to several recommendations for mitigation measures which include avoidance of whales by fishing vessels, technologies such as excluder devices, and management measures such as 'move-on' rules (Leaper *et al.* 2022). This report was reviewed by WG-IMAF which requested further assistance from IWC-SC, in particular for refining additional data to be collected by observers and crew when whale entrapments occur and, in the longer term, provision of advice for krill trawling operators to minimise whale entrapments (including development of technology to study how whales are interacting with krill trawling nets, move-on rules), and on refining designs of the marine mammal exclusion device, considering a convex shape to the exclusion mesh to deflect whales (and seals) away from the net mouth.

Parker noted the invitation by the IMAF to continue communication with the Committee and highlighted three primary areas where the IWC SC might provide useful advice: (a) what to monitor and/or what whale data to collect in the area around the vessels; (b) assistance with the design and implementation of the excluder device at the opening of the net; and (c) how best to avoid high risk situations (e.g. move-on protocols). He also noted that along with the data identified for fisheries observers to collect, some data may be collected through the vessel's logbook, when observers are not present.

Biuw provided some observations from a study in January/February 2023 onboard one of the Norwegian krill trawlers around the South Orkney Islands. This work included drone-based morphometric measurements of humpback and fin whales, and investigations of the density and distribution of whales around fishing vessels. Hourly point transect observations to assess whale density and distribution were conducted around the vessel which was moving at very slow speeds of 1-2 knots when fishing. The results confirmed that: (a) humpback whales were by far the most commonly species observed at close range of the vessels and were frequently observed actively approaching the vessels or following vessels at distances apparently consistent with the distance from the vessel to the trawl mouth; and (b) all individuals observed following vessels for extended periods were small, suggesting they were juveniles. This is also consistent with the entanglements that have been reported.

He also noted that a strengthened and tensioned exclusion net now in use onboard the Norwegian vessels appears very strong and is located right at the mouth of the trawl. The exclusion net currently does not have a convex shape, as has been suggested by the Intersessional Correspondence Group and during CCAMLR-IMAF. However, he noted that it would be difficult to accomplish a convex excluder without making the already extremely complex operational procedures for deploying and recovering the trawls overly complex and potentially dangerous to the deck crew. Any modification of the configuration would need to be considered in close collaboration with the industry. He also noted that at the very slow towing speeds he believed that the current configuration may not pose a serious risk despite some sagging of the exclusion net. He also noted that the vessels now have video cameras pointing aft towards the nets and these also showed young humpback whales following and approaching the net.

There was some discussion about whether the current excluder net is likely to be effective for humpback whales. The general consensus was that the tighter the net the better, but that humpback whales do often become entangled in static, taught nets (e.g. shark exclusion nets around Australia and tuna pen excluder nets). If young whales are actively approaching the nets, other mitigation measures may need to be considered as well.

The sub-committee considered a draft data form for recording data on whale entanglements/entrapments that had been prepared by Lauri Leach at the US Marine Mammal Commission and made a number of suggestions for how this could be refined for the krill trawl situation. The final edited version of this form will be made available to the CCAMLR Secretariat by July 2023.

An ICG was formed with Terms of Reference as in Table 2. The sub-committee also noted the potential for video taken from the vessels to contribute to an understanding of whale behaviour around the trawl and encouraged the intersessional group to consider this.

2.3 Review new methods and estimates of bycatch and entanglement rates, risks and mortality

SC/69A/HIM/10 used the Bycatch Risk Assessment (ByRA) tool (Hines *et al.*, 2020, Verutes *et al.*, 2020) to map areas of bycatch risk for three species of small cetaceans around the island of Chiloé, Chile. A coastal fishery, generally no more than 200m from the coast overlaps with the distribution of Chilean dolphins, Burmeister's porpoises and Peale's dolphins, whose distributions are strongly associated with coastal environments (Molina-Schiller *et al.*, 2005, Ribeiro *et al.*, 2007, Viddi *et al.*, 2016, Heinrich *et al.*, 2019), creating a high risk of bycatch. The ByRA model is an important tool to address risk assessment in fisheries and species with little information available, as it allows different approaches, such as the knowledge of experts and other relevant actors, to be used to obtain risk maps and contribute to fisheries management and species conservation (Costanza *et al.* 2021). ByRA provides opportunities to truly engage fishers in the bycatch mitigation process, encourages their conversation and representation through the exchange of information, and for fishers to influence outcomes (Costanza *et al.* 2021).

The bycatch risk assessment toolkit (ByRA) is also being used in Chile as part of a larger project to assess the risk of marine mammal bycatch in Chilean fisheries in collaboration between local and international marine mammal scientists and Chilean fisheries agency scientists and managers. SC/69A/HIM/12 focuses on two of the major artisanal fisheries along the northern and central Chilean coast, the artisanal swordfish gillnet fishery and the northern anchovy purse seine fishery. The species most at risk and at the highest consequence of bycatch to local populations were dusky dolphins and Burmeister's porpoises in both fisheries and fin whales in the swordfish gillnet fishery. The ByRA results will provide Chilean fisheries agencies with information on areas and seasons of bycatch risk for ongoing monitoring, as well as the levels of risk for various fishing gear at those times and locations, which can support precautionary actions, policies and inform carefully designed research and management.

The sub-committee commended the extensive work reported in both SC/69A/HIM/10 and SC/69A/HIM/12, and in particular congratulated the authors on the broad range of stakeholders engaged. The trust and collaboration between stakeholders is particularly valuable in settings like these fisheries in Chile where bycatch is illegal, where fisheries competition and potential export restrictions are involved.

SC/69A/HIM/17 describes measures developed and implemented in Chile since 2012, for assessment, monitoring, reduction and control of discards and incidental bycatch in its national fisheries. This involves the implementation of a fisheries management strategy with an ecosystem approach, following the recommendations of FAO and other fisheries forums, aimed at sustainability and food security. The process has involved the joint efforts of the regulatory, research and control agencies along with collaborative work with the fishers. In 2021 specific marine mammal bycatch reduction measures were implemented for industrial purse seine fisheries, artisanal traps, industrial trawling and artisanal gillnets. These measures include, but are not limited to, the mandatory use of acoustic deterrent devices on gillnets and weighted ground lines on traps, along with protocols to for the safe handling and release of live marine mammals, codes of good practices and logbook reporting. These components differ depending on the target fishery, gear, and type of fleet. Finally, considering the challenges of monitoring and registering discards and incidental bycatch at sea, the mandatory use of electronic monitoring systems (Image Recording Devices - DRI and Electronic Logbook System - SIBE) was introduced to monitor compliance, together with the maintenance and enhancement of observer programs for scientific purposes.

The sub-committee welcomed this review and assessment of fisheries regulations in Chile, and commended the clear descriptions and graphics used to present them, especially as the regulations cover multiple fishery types. The author noted that the regulations reported and reviewed here were for industrial fisheries with vessels larger than 18m in length, but that a change in regulation will soon ensure that these measures apply to vessels longer than 15m, and, in addition, some of these regulations may be applied to artisanal fisheries in the future.

The cost for equipment on vessels is currently borne by the vessel owners and some financial assistance may be needed to support smaller artisanal vessels to comply with these measures. Analyses of the monitoring, bycatch and compliance data is the responsibility of the Under-secretariat of Fisheries and Aquaculture of Chile (SUBPESCA), and it is anticipated that preliminary results can be presented in next meeting. The sub-committee commended regulations aimed at improving monitoring and mitigation and looks forward to an update and an assessment of the effectiveness of the regulations at future meetings.

Willson described recent progress with developing multi-taxa bycatch risk and mitigation studies off the Arabian Sea coast of Oman. The studies are focused on critical habitat for the Endangered Arabian Sea humpback whale and Critically Endangered loggerhead turtles. Interaction with fisheries present a known threat to both of these populations within the Indian Ocean. Stakeholders in Oman have prioritised evaluation of fisheries interactions and formed three projects

to address this. The ByRA toolkit (see above) was used to evaluate risk using satellite telemetry occurrence data together with fishing vessel distribution data compiled from satellite imagery and vessel-based surveys. Remote electronic monitoring and fishing vessel crew-based observations are being used to evaluate fishing effort and bycatch rates of artisanal vessels that are experimenting with subsurface setting of gillnets. The latter two measures have been implemented through collaboration with WWF Pakistan following recommendations of the Committee at SC68B to replicate fisheries-led measures throughout the Arabian Sea humpback whale range (SC2141). New studies are planned to evaluate Arabian Sea humpback whale body condition in relation to fishing effort and evidence of previous entanglement.

Willson also noted that the Ministry of Agriculture and Fisheries of the Sultanate of Oman has announced that no new fishing licenses for gillnets will be issued to the Oman dhow fleet. This is expected to result in a shift to new gear types for this fleet and reduce cetacean bycatch. Fisheries for bottom fish like groupers would likely shift to increased use of bottom-set wire fish traps, while pelagic fisheries might switch to long lines. The extremely basic conditions aboard local fishing vessels prohibit the widescale deployment of external on-board observers, making the training of fishing captains and crew as observers coupled with electronic vessel tracking devices a more viable approach to monitoring of these fleets.

The sub-committee commended Oman for these positive steps toward mitigating bycatch of endangered species and extends an offer of support to authorities should any assistance be required to evaluate alternative gear types to replace gillnets and/or assess interactions between fisheries and cetaceans as a result of changes in gear types.

Manlik *et al.* (2022) describe a population modelling approach for estimating sustainable limits to human-caused mortality and applied it in a case study of bottlenose dolphins affected by capture in an Australian demersal otter trawl fishery. The approach, termed sustainable anthropogenic mortality in stochastic environments (SAMSE), incorporates environmental and demographic stochasticity, including the dependency of offspring on their mothers. The SAMSE limit is the maximum number of individuals that can be removed without causing negative stochastic population growth. In the case study examined, the difference between the deterministic PBR calculation and the SAMSE limits showed that deterministic approaches may underestimate the true impact of human-caused mortality of wildlife.

The sub-committee welcomed the approach described in the paper and recognised that there is a considerable amount of ongoing work on bycatch reference points, and particularly in Europe there is a need for threshold values in order to implement legislation. However, it was noted that this is a difficult and complex issue. The Committee has had extensive discussions on the implications of environmental variability on estimating MSYR, with similar implications for R_{max} (see Agenda Item 12.7). Thus, it was not possible to evaluate the approach in Manlik *et al.* (2022) in detail.

SC/69A/HIM/05 describes a multi-stakeholder marine mammal reporting network that was established for collecting data on strandings and cetacean landings in Ghana. Systems using mobile phone and web-based applications for collecting, transmitting, analysing, visualising and monitoring data in a centralised database were developed. The collected data were used to engage relevant stakeholders on designing cetacean conservation actions. Over the period from April 2022 to March 2023 the project documented a total of 254 individual cetaceans (249 landings from artisanal fisheries and 5 strandings) of 18 species across nine sites. Drift gill nets were the main fishing gear involved. The newly initiated Ghana marine mammal by-catch and strandings programme and the data collection approach may serve as a model for replication in similar data-deficient countries in the region.

The sub-committee welcomed this work, which exemplifies the value of collaboration between a wide range of stakeholders from government agencies, academic institutions and civil society, and noted the utility of the approach, particularly for areas with difficult-to-monitor artisanal fisheries and encouraged further information from the region.

SC69A/HIM/11 describes ongoing work with fishing communities in Hong Kong, aimed at identifying areas of bycatch risk for finless porpoise (*Neophocaena phocaenoides*). Three fishing communities participated in the project that included a combination of tracking devices on fishing vessels and autonomous acoustic devices (AAD) on active fishing gear to monitor cetacean presence and interactions with fishing effort. Participating vessels were coastal fishing vessels, locally known as 'P4s', that deploy mixed gear types, particularly gill nets. In addition, one purse seine fishing vessel took part. A total of 817 discrete fishing trips over 355 fishing days were recorded between January 2022 and March 2023. The majority of fishing activity was concentrated along the western side of Cheung Chau (Island). Fishing activity compared with finless porpoise sightings identified areas of overlap. AAD deployments on gillnets revealed that finless porpoise occur in areas where they had not been sighted previously. This project is ongoing and is hoped to expand into other fishing communities in Hong Kong and a project using the same framework has been initiated in Sarawak, Malaysia.

The sub-committee welcomed this information and congratulated the authors on the meaningful involvement of fishers in the study. The author noted that developing this trust over four years was critical to the project and was fostered by personal contacts as well as clear agreements to protect individual fisher's identities and not to share fishing effort data

with others. The sub-committee also commended the plans to continue and expand this work to other regions with similar fisheries and bycatch species.

Bonizzoni *et al.* (2022) provides a review of odontocete cetacean interactions with different types of trawlers across 13 Food and Agriculture Organization (FAO) fishing areas around the world. The authors reviewed knowledge gaps, the effects on odontocete ecology, distribution, behaviour and social organisation, the main mitigation options and some management avenues that could help reduce incidental mortality. Several odontocete populations, including at least 19 species, have been shown to modify their behaviour and adapt to foraging in association with trawlers. Coastal delphinids such as bottlenose dolphins, *Tursiops* sp., and humpback dolphins, *Sousa* sp., were reported more frequently than other delphinids as foraging behind trawlers, likely due to a concentration of research effort in the near shore habitats preferred by these species, making their behaviour more likely to be observed and described. Common dolphins and killer whales were the next most frequently reported species interacting with trawlers, with remaining delphinids reported less frequently. Reported cetacean behaviours included venturing into a moving trawl net to feed on the organisms trapped in the net, feeding on fish stirred up by the net, extracting fish from the outer mesh, feeding on catch lost during hauling and scavenging on discarded catch. Foraging behind trawlers facilitates access to prey, but also exposes the animals to potential injury and mortality in trawl gear. The combined effect of facilitated foraging and bycatch on the status and trends of odontocete populations is unknown. Attempts to reduce depredation and/or bycatch in trawl gear have included acoustic deterrents and exclusion devices installed in nets, although neither technique has proven to be consistently effective.

The sub-committee noted that such a global review of multiple data sources on a particular type of fishery or gear can provide valuable insights into trends and the circumstances that may increase bycatch risk. It was noted that there are far fewer reported cases of baleen whale interactions with trawls, but that this review of odontocete interactions may help to inform mitigation approaches to prevent the entrapment of young humpback whales in krill trawls in the Antarctic (see Item 12.2).

2.4 Reporting of bycatch and entanglements, including National Progress Reports

Entries into the Progress Reports database for the past year with respect to bycatch and ship strikes is available at: <https://portal.iwc.int/progressreportspublic>.

2.5 Review mitigation measures for preventing bycatch and entanglement

SC/69A/REP/01 reports on a workshop held in Brazil in June 2022 to finalise the review of the franciscana (*Pontoporia blainvillei*) in order to update the CMP. The workshop considered updated information on incidental takes and mitigation measures in the range states. Recommendations included that the incidental capture of franciscana should be reviewed for all FMAs. Given the effectiveness of acoustic deterrent devices in reducing incidental captures of franciscana, it was recommended that these continue to be tested in all FMAs, in addition to the continuation of the testing of plastic bottles as acoustic reflectors on gillnets (see below) as a further method to reduce franciscana bycatch. It was also recommended that fishing exclusion zones within the FMAs be evaluated, particularly in the Albardão region. Other threats to franciscana were considered, including sewage, chemical, marine debris, noise pollution, maritime and coastal infrastructure. The actions of the CMP that are expected to be adopted during 2023 were updated in accordance with these workshop recommendations (see Annex F (CMP), agenda item 2.4).

SC69A/HIM/01 evaluated the effectiveness of upcycled 250ml plastic bottles as echolocation reflectors as a low-cost mitigation method to reduce franciscana bycatch in bottom set trammel nets. Observed trials with plastic bottles (treatment) and without (control) in trammel nets were conducted between November 2020 and December 2022, in southern Brazil. A total of 108 sets (59 control and 49 treatment) resulted in the bycatch of two franciscana dolphins and two bottlenose dolphins (*Tursiops* sp.) in control sets and no dolphin bycatch in treatment sets. Results showed a statistically non-significant negative effect on dolphin bycatch using plastic bottles, combined with a statistically significant positive effect on target fish catch. These preliminary results require continued trials with additional sets to confirm these trends.

The sub-committee welcomed the results and was encouraged that such a simple and cost-effective mitigation was showing positive results. The authors are planning to expand testing of the plastic bottles in the gillnet fishery in order to have more robust results. The observation that the catch of target species was slightly increased may be due to the buoyancy of the bottles stretching and expanding the net's catching surface. Future studies will use data loggers on the gillnets to better understand how their configuration is affected by the bottles. It was also suggested that arrays of acoustic recorders could be used to study animal behaviour around the nets.

The sub-committee was pleased to hear that a special knot developed by fishers to attach the bottles securely to nets resulted in no bottles being lost and no contribution to marine debris. The sub-committee encouraged this work to continue.

SC6/9A/HIM/15 describes a research program conducted in collaboration with fishers to evaluate the bycatch of franciscana and test, under commercial fishing conditions, the effectiveness of acoustic deterrent devices, or acoustic alarms (pingers), to reduce its bycatch in Uruguay. In Uruguay, the artisanal gillnet fleet and, to a lesser extent, the industrial pair trawl fleet, are the main fisheries affecting this species. Pingers were evaluated on artisanal gillnet vessels operating in the Río de la Plata and the Atlantic coast of Uruguay. Treatment and control groups were created either by pairing two vessels, one using fishing nets with pingers and the other without pingers, or on a single vessel that used sets of nets with pingers and others without pingers. Pingers that emit higher intensity sound signals are being evaluated in the industrial pair trawl fleet. In each participating pair, one of the vessels trawls its net with pingers, while the other does it without pingers. The results obtained present convincing evidence that pingers significantly reduce the bycatch of franciscana in the artisanal gillnet fishery, while in the industrial fleet they suggest a moderate reduction, and further research effort is required.

The sub-committee welcomed the encouraging results of this study. The authors plan to continue the study but expand the numbers of both gillnet and trawl vessels to increase the sample sizes. With that expansion they hope to demonstrate the efficacy of pingers on gillnets sufficiently to achieve acceptance across the fishery. In response to a question about the impact of shorter soak times on the ratio of target species to cetaceans caught, the authors noted that there may be other seasonal factors in deployment and soak times that affect cetacean bycatch.

Barreto reported on an unexpected increase in the first months of 2023 in franciscana stranding rates along the south and southeast Brazilian coasts. Data from previous years show a seasonal fluctuation in the number of stranded franciscanas, peaking in October-November and decreasing afterwards. However, in the first three months of 2023 there was no reduction of stranding frequency in São Paulo, with approximately 40 strandings a month, compared to fewer than 10 animals a month in previous years. Stranding rates in areas further south did not show a similar increase. It is thought that this continued high stranding rate could be linked to a different small-scale fishery that is starting to operate in the area.

The sub-committee thanked Barreto for this summary and reiterated the valuable role that stranding data can play in monitoring bycatch and particularly as a first indicator of local changes that increased bycatch risk.

Secchi described a detailed analysis of new estimates for Potential Biological Removal (PBR) for franciscana in FMAs I to IV. In this analysis, he and others had treated FMA Ia and Ib as discrete conservation units (Cunha *et al.*, 2014), and extended the FMA III northern limit to Santa Catarina Island (Ott *et al.*, 2015). Abundance was estimated from aerial line-transect surveys for all areas (SC/69A/ASI/01). Bycatch estimates were based on a number of different approaches including 1) gillnet fishing fleet monitoring and 2) both uncorrected (absolute counting) and corrected (using the mark-recapture estimates of the fraction of franciscana carcasses caught in gillnet that end washed ashore based on Prado *et al.*, 2013) numbers of stranded animals. It was assumed that all stranded animals were caught in fisheries. Bycatch ranged in orders of magnitude, from a few tens in FMA Ia to thousands in FMA III. Using a recovery factor (Rf) of 1.0, estimated bycatch mortality exceeded the PBR from nearly double in FMA Ia to about fivefold or more in other FMAs. The authors suggested that these new estimates confirm that this species cannot sustain the current levels of non-natural mortality and immediate and severe restrictions on fishing practice and effort are necessary to avoid the collapse of franciscana.

There was considerable discussion of these estimates, and it was noted that when viewed in conjunction with current abundance estimates, the estimated annual mortality estimates of franciscana in Southern Brazilian waters should have led to a complete extirpation of the local population. It was proposed that animals from the genetically identical and contiguous habitats in Uruguay were replacing the losses of the Southern Brazilian population. The sub-committee agreed that further review of the bycatch estimates was needed and this might be best achieved, for the case of franciscana and other situations, through a process similar to that established by the Scientific Committee for reviewing abundance estimates.

Attention: SC

The Committee noted that although there was uncertainty regarding the levels of bycatch, these estimates exceeded PBR in all FMAs. It re-iterated previous concerns that the bycatch of franciscana was not sustainable.

*The Committee agreed that it could provide better advice on bycatch mitigation and particularly where measures should be prioritised, if more information on bycatch estimates and methods was provided. In light of the review of the status of the franciscana, the Committee **recommended** that estimates of franciscana bycatch be presented and reviewed at next meeting.*

SC/69A/HIM/08 describes modifications to gillnets to reduce bycatch based on improving their acoustic visibility, providing an update on a number of studies by Kratzer *et al.*, (2022, 2021, 2020). This study systematically identified

small, passive reflective objects ('pearls') that can improve the acoustic visibility of gillnets across a broad range of frequencies used by different odontocete species. To further verify the improved acoustic visibility of the modified gillnets, sonar images of a gillnet equipped with the identified objects were compared to sonar images of a conventional gillnet. Additionally, two trials were conducted in commercial fisheries. One trial in the turbot fishery in the Black Sea gathered information on bycatch rates, while a second trial in a gillnet fishery in the Baltic focused on the target species catch efficiency. The authors noted that the approach could benefit from evaluation of the effectiveness of other materials such as nylon that could allow for more efficient end of use recycling and identification of a net manufacturer willing to produce nets with 'pearls' attached during manufacture which would greatly save on cost. The authors also welcomed collaboration with cetacean researchers willing to trial PearlINets in their study areas.

The sub-committee noted that trials to evaluate bycatch reduction require relatively high bycatch rates. C. Bell noted that a similar study on acoustic visibility was currently underway in UK waters with acoustically reflective floats. Stepputtis noted that data from an acoustic array on harbour porpoise behaviour around the nets had been collected, but still needed to be analysed. The importance of the behavioural observations was noted in the context of discussions last year of a study by Macaulay *et al.* (2022) which had found porpoises feeding in close proximity to unmodified gillnets. In response to questions of increases in cost and handling, Stepputtis noted that there were few handling issues with acrylic nets but there had been some issues with cotton nets used in the Black Sea. Currently the modified nets cost about twice as much as nets not outfitted with pearls. However, if the modified nets were found to be effective, there may be funding schemes (such as the European Maritime and Fisheries Fund) that could cover the additional costs and there would also be cost reductions with economies of scale.

SC69A/HIM/09 described the implementation of bycatch mitigation measures in Matang, Peninsular Malaysia to address previously identified bycatch of Indo-Pacific humpback dolphins (*Sousa chinensis*) and Irrawaddy dolphins (*Orcaella brevirostris*) in inshore gillnets and driftnets and Indo-Pacific finless porpoises (*Neophocaena phocaenoides*) in off-shore trawls (Kuit *et al.* 2021). One project is trialling the use of acoustic pingers on driftnets targeting threadfins to mitigate bycatch of Indo-Pacific humpback dolphins (primarily) and Irrawaddy dolphins. Another project involves collaboration with the Department of Fisheries Malaysia to develop and test prototypes of a Bycatch Reduction Device (BRD), similar to Turtle Excluder Devices (TEDs), mainly to reduce bycatch of finless porpoises in trawl nets. Trials of both pingers and BRDs will include assessment of impacts on target catch as well as bycatch, and will use acoustic recorders and time-lapse cameras to monitor cetacean behaviour around the (modified) gear.

In discussion the authors clarified that the reported change in catch of non-target species did not coincide with pinger use. So far, no impact of pingers on target fish species has been documented, but more extensive use of pingers will confirm or refute that observation.

The sub-committee welcomed the update on this work and encouraged collaboration with scientists in Korea who have had some success developing finless porpoise excluder devices for finless porpoises in stow nets off their coast.

SC69A/HIM/03 describes U.S. Government efforts to develop innovative on-demand fishing technology that avoids using static buoy lines affixed to fishing traps. The U.S. is currently working to develop on-demand systems as well as geolocation and broadcasting capabilities for the systems. The paper describes how the U.S. has built a 'gear library' with 270 systems from 8 different manufacturers for fishermen to borrow and provide feedback to improve functionality. These efforts represent an important advance toward implementing these systems. The focus of this work is to reduce human impacts on North Atlantic right whales off the east coast of the USA. The Committee has expressed serious concern over the status of this species and these systems have the potential to substantially reduce the risk of entanglements in fishing gear.

The sub-committee welcomed this update on the status of 'on demand' fishing gear recovery systems and the establishment of the gear library. Long noted that in 2022 the gear functioned as intended approximately 90% of the time, and that this was high enough to be acceptable to many fishers, but not all. However, the financial costs remain as an impediment to full acceptance. She noted that one of the biggest challenges was the development of the electronic systems to provide information on the location of the gear in order to avoid gear conflicts between trap fishers and also with fishers using mobile gear.

Choi summarised the research activities being conducted by National Institute of Fisheries Science, Korea (NIFS) to reduce the bycatch of marine mammals in Korean fisheries. These cover a number of fisheries including stow nets, trap nets, set nets and trawls. There was no bycatch documented during monitoring of 282 stow net vessels equipped with marine mammal bycatch reduction device developed by NIFS. Further simulations are being conducted to improve the design of this device, with adaptations scheduled to be tested in 2024. Research is now being conducted to minimise the loss of target catch in the fishing gear where this device is installed, in order to achieve greater acceptance in the use of this device. Research has also focused on a zipper-type mechanism to allow nets to be opened under the waterline while they are being hauled in to allow entrapped animals escape. This can only be effective in situations where marine

mammals can still reach the surface to breathe and thus survive for a long time even if they are caught in the stationary trap net. The zero bycatch rate reported for the red crab pot/trap fishery encouraged research to examine the characteristics of materials used in the lines from these traps which might inform bycatch reduction strategies for other pot/trap fisheries. Finally, NIFS have conducted tests with the use of acoustic deterrent devices and the response of finless porpoise due to concerns over habituation and effects of these devices on other marine organisms.

The sub-committee welcomed this update on the broad range of bycatch mitigation initiatives currently being developed and tested in Korea. In particular, the sub-committee commended the authors on the apparently high success of the excluder device for finless porpoises in stow nets, and look forward to results from expanded use and to the trials with trawls.

In response to a question about modifications to the gear most associated with bycatch of minke whales, it was noted that the set net fishers now have a high success rate at releasing cetaceans from the 'chamber', and NIFS is hoping to improve the success rate by incorporating underwater, zippered slots that can be opened to allow cetaceans to escape. With regard to pot and trap gear, the primary focus has been on reducing the risk of buoy lines. Initial first steps are to reduce the length of buoy lines when fishers move from deep to shallower water, therefore eliminating excess slack line. But NIFS is also testing 'on demand' buoy line release systems. Pingers in gillnets appear to deter finless porpoise, but it is not known if this reduces minke whale interactions.

The authors noted that they were specialists in fishing gear design rather than marine mammals. The sub-committee noted the importance of dialogue with and involvement of gear technologists and encouraged the authors to engage with the IWC BMI coordinator and Bycatch Expert Panel.

2.6 Review of topics related to Hector's and Māui dolphins in New Zealand

Fortuna presented the report (SC/69A/REP/04) of the pre-meeting Workshop on Hector's and Maui Dolphins in New Zealand: Consideration of spatial risk assessment of threats, which had been held in Bled from 22-23 April 2023.

The sub-committee thanked all those involved for a very comprehensive review. The sub-committee agreed that the general approach of SEFRA to incorporate a spatial approach to risk assessment was valuable. The sub-committees endorsed the recommendations in SC/69A/REP/04 for ways to refine and improve the implementation of the approach by Roberts *et al.* (2019). However, there were different views on whether the results of Roberts *et al.* (2019) were suitable to inform the spatial extent of management measures to reduce impacts on Māui dolphins.

Wade noted that a more complete justification of choices made for prediction variables in the spatial model are essential before the results can be considered to provide a best estimate of the prediction of Maui dolphin distribution. Specifically, this refers to use of a model which the diagnostic statistics indicated that the model used had far less support from the data than the best model as selected by AIC (delta AIC of 60), and no figure was provided showing the predicted distribution for the best model so that sensitivity can be evaluated (i.e., sprat for fish instead of Ahuru). In light of this, and also because of several other modelling issues identified in SC/69A/REP/04, some members supported the view that the model did not provide acceptable results for providing management advice for spatial planning to minimise anthropogenic effects on Māui dolphins. Other members continued to support the conclusions outlined in SC/69A/REP/04 regarding the use of this model to inform spatial aspects of current management.

The sub-committee agreed that there is considerable uncertainty about the extent of the presence in harbours and offshore distribution of Māui dolphins. In light of this uncertainty, further research into the distribution of Māui dolphins, including, for example, the use of acoustic recorders, drones and other technology, is needed.

Attention: CG (New Zealand)

*Noting the agreed population estimate of 48 Māui dolphins in SC/69A/REP/04 the sub-committee **recommended** that highest priority should be assigned to management actions that immediately eliminate bycatch of Māui dolphins, including closures of any fisheries within the range of Māui dolphins that are known to pose a risk of bycatch to dolphins (i.e. set net and trawl fisheries). It re-emphasises that the critically endangered status of this subspecies and the inherent and irresolvable uncertainty surrounding information on most small populations point to the need for precautionary management.*

2.7 Review progress on definition of r_{max} for small cetaceans for use by the Scientific Committee

An ICG was established at SC68D to develop a list of potential methods for estimating/setting r_{max} and an evaluation of the data requirements, strengths and weaknesses of each approach. The sub-committee agreed to re-establish the group with the same terms of reference and looked forward to a report at SC69B.

2.8 Review proposals for best practice protocols for releasing free-swimming, entangled small cetaceans

During SC68D, in response to a request from the IWC Human Impact Reduction Technical Advisor, who noted that the IWC is receiving an increasing number of requests for advice on releasing free-swimming, entangled, small cetaceans, an intersessional group was formed to formulate guidelines for the best response to these incidents as a complement to the IWC's principles and guidance for large whale disentanglement. In parallel, NOAA developed and published a comprehensive set of guidelines that the ICG recognised met many of the Terms of Reference for the ICG.

Wilkin presented the NOAA Fisheries Small Cetacean Entanglement Response Best Practices, (MMHRSP, 2022)². This Best Practices document was developed to provide guidance for responders and other interested partners in the subject of response to entangled small cetaceans with a national scope for the United States. It is available to be adapted for other countries or to be shared as an international guidance document. Importantly, the authors note that reading this document does not provide the necessary training or authorisation to qualify the reader to take specific actions. However, it does provide a helpful overview of options and considerations. The document contains a section on planning for responses, prioritising human and animal safety, considering risks and mitigation, and including example decision matrices and flowcharts for determining if a response should be conducted. The methods for conducting a disentanglement include remote methods using specialised equipment (knives on poles, grapples) and hands-on methods for capture and restraint. Gaps and research needs for future priorities are also identified, and existing resources including Frequently Asked Questions, forms and checklists are provided in appendices. Wilkin noted that, as with the large whale guidance, animal and human safety comes first, and the best practices are not a manual, but a guidance document for trained responders, and that this is why the 'go' or 'no go' calculations are quite conservative.

The sub-committee welcomed this document, and noted that the decision trees, illustrations and focus on safety for both humans and animals is exemplary. Although useful in its current format for stakeholders with similar levels of resources, facilities and trained personnel to the US, the document length and the (appropriate) focus on species and regulations specific to the USA may render it less immediately accessible to users in countries with fewer resources, equipment or facilities. After discussion, the sub-committee agreed that a modified and streamlined adaptation of the document might be more helpful to responders in countries with differing levels of available resources. Therefore, the sub-committee established an ICG work to adapt the USA document for a broader, global audience.

Minton noted that this guidance for disentanglement of *free-swimming* cetaceans carrying or trailing gear, was different from, but complementary to the CMS best practices for releasing bycaught cetaceans by personnel aboard the fishing vessel that caught them (Hamer and Minton, 2020), and that survivorship from the two scenarios was likely to be different as well. The sub-committee encouraged members to bring forward new information on the survivorship of small cetaceans released from either type of entanglement.

2.9 Progress on previous recommendations

The Committee has repeatedly stated its serious concern for the survival of the Critically Endangered Baltic Proper harbour porpoise. The Baltic Proper harbour porpoise is genetically and morphologically discrete and numbers only a few hundred individuals.

BUND *et al.* (2023) describes two Joint Recommendations to reduce bycatch that have been submitted by the Baltic Sea regional fisheries body BALTFISH to the European Commission. In February 2022, a Delegated Act based on those two Joint Recommendations came into force, closing static net fisheries in important harbour porpoise Marine Protected Areas, some all year round and some part of the year, depending on their location in relation to the known seasonal distribution of the population. The Delegated Act also stipulates mandatory pinger use in some areas. However, based on ICES (2020) the measures in the Delegated Act are not sufficient to prevent bycatch from exceeding the threshold of 0.7 animals per year. The ICES advice was that bycatch must also be mitigated throughout the entire population range. This could be achieved through obligatory use of pingers in all static net fisheries within the population range where no closures are in effect. BUND *et al.* (2023) suggests that the only other viable option if pingers cannot be used throughout the population's range, is to drastically reduce or completely suspend fishing effort with gear that presents a risk of porpoise bycatch. The authors identify a number of areas of important porpoise habitat where permanent or seasonal closures are recommended. In addition, they propose an increase of the pace in research, development, testing and implementation of alternative gear, so that static nets can be fully replaced by alternative gear in both recreational and commercial fisheries.

Last year the Committee discussed the apparent impasse with regards to the deployment of pingers in the region due to concerns that pingers could interfere with military operations and established an ICG to further investigate and provide advice on this issue. The members of the ICG noted there had been no progress on the pinger issue with the governments in question and the responses to the letters from the Secretariat to Baltic Member States did not offer any prospect of a solution or fully explain why pingers would not be acceptable. Carlen noted that a study was planned

² also available at: <https://repository.library.noaa.gov/view/noaa/48557>.

in Finland on the potential of pingers to interfere with military sonar, but this was a civilian study and the military may not be responsive to any of the results. She also noted that the process to list the population on CMS Appendix I which the Committee had recommended last year, was now underway.

The sub-committee referred to the discussion at SC68D and noted that the proposals being considered for real time (dynamic) closures were unlikely to be feasible. It was also suggested that the IWC Extinction Initiative should include messaging focusing on the Baltic harbour porpoise to try and encourage greater political will to implement mitigation options such as those described in BUND *et al.* (2023).

Attention: CG, S

Given its serious concerns, the sub-committee:

- (1) **Reiterates** its previous recommendations (SC2097, SC2218) that, as a matter of urgency, all Baltic Sea range states should act immediately to implement long-term bycatch mitigation measures for the Baltic Proper harbour porpoise until recovery is achieved. In lieu of large-scale implementation of pingers in static net fisheries in the Baltic Proper, further closures of fisheries with high bycatch risk, primarily static net fisheries, should be urgently implemented.*
- (2) As the Committee has noted a number of concerns about the effectiveness of dynamic management areas that rely on responding to detections of harbour porpoise presence. Hence, the sub-committee **recommends** further consideration of additional areas that have been suggested for closures of fisheries and is ready to offer technical advice on evaluating these.*
- (3) **Encourages** countries whose military forces cannot accept large-scale use of pingers to fully investigate the potential effect of pingers on military underwater acoustic activities as well as possible technical adaptations to pingers to minimise such effects. The sub-committee is ready to offer technical advice as required and has established an intersessional group to facilitate this.*
- (4) **Encourages** countries in the Baltic Sea Region to, as soon as possible, together initiate a new static acoustic survey to estimate the abundance and distribution of the Baltic Proper harbour porpoise to follow up on the results of the SAMBAH project.*
- (5) Again **encourages** the Baltic Sea range states to propose the Baltic Proper harbour porpoise for listing on CMS Appendix 1 at its conference of parties later this year and calls on all CMS Parties to support this listing.*
- (6) **Requests** the IWC Executive Secretary to maintain the ongoing dialogue with the range states and the EU Commission by writing to inform them of the Committee's ongoing concerns and recommendations.*

The Committee has previously expressed its concern over the bycatch of common dolphins in the Bay of Biscay and made a number of recommendations (e.g., SC2162, SC2163).

ICES (2022) provides new estimates of annual common dolphin mortality due to bycatch. The annual estimate inferred from French strandings in the Bay of Biscay and along the Western Channel was 9,040 (95%CI [6,640-13,300]) common dolphins between 2019 and 2021. In the Bay of Biscay and Iberian Coast (areas 8 and 9), the mean annual bycatch estimated from at-sea observations between 2019-21 across all métiers was 5,938 (95% CI 3,081-9,700). A number of scenarios involving different lengths of seasonal closures and pinger use were evaluated in relation to PBR, the quantitative conservation objectives of OSPAR and conservation objectives under EU legislation.

Peltier and Ridoux provided an update on available stranding data for the year 2022. A total of 1,374 small cetaceans have been reported stranded between 01/12/2022 and 01/04/2023 along the coasts of the Bay of Biscay. The common dolphin was the main species identified and daily stranding rates varied considerably. During the peak period of strandings (late December-early January) most carcasses were fresh with clear bycatch marks, while during the March peak most carcasses were putrefied, often preventing a reliable diagnosis of the likely cause of death. Nonetheless, by comparing this stranding peak with analyses of strandings in previous years, it seems reasonable to conclude that they correspond to bycatch mortalities that occurred at sea in the previous weeks or month. This is supported by the large number of floating carcasses observed at sea during the CAPECET aerial surveys conducted from January to March 2023 in the central Bay of Biscay.

It is too early to determine how the total count of stranded common dolphins in 2023 and the corresponding bycatch mortality estimate will compare with previous years, but the total number of stranded common dolphins and unidentified delphinids for January-March 2023 is already about 25% higher than the previous record year for the same three months. The authors concluded that recent common dolphin stranding data show no sign of reduction in bycatch mortality and that when this data set is fully validated, the winter of 2023 is likely to be another record-breaking

stranding season. They noted that a major three-year research programme launched in April 2022 aims to achieve better understanding of the mechanisms at the origin of common dolphin catches in the Bay of Biscay and evaluating the biological and socio-economic consequences of mitigation scenarios. Although there is a Government Action Plan for the reduction of common dolphin bycatches in the Bay of Biscay this is mainly focussed on monitoring actions with the main mitigation measure being compulsory pingers on pelagic trawls.

The sub-committee thanked Ridoux and Peltier for bringing this update and new information. In discussing the possible reasons for the increase in bycatch since 2015, it was suggested that this was most likely related to a shift in dolphin distribution because there was no evidence of an increase in fishing effort.

Ridoux also noted that following the recent decision of the Conseil d'Etat, (highest level court of administrative justice in France) requesting that the Government implements spatio-temporal closures, fishermen's representatives have decided to withdraw from all working groups and collaborative projects. It is unclear how this will affect the implementation of the Government Action Plan. The sub-committee was discouraged to hear that the situation surrounding stakeholder negotiations had deteriorated and had become caught up in larger issues causing a breakdown in communications between fishers and other stakeholders, which could hinder further urgent mitigating actions.

Vazquez welcomed the documents from France and pointed out that Spain also participated in the ICES workshop. He drew attention to legal and scientific initiatives that Spain has actively been implementing in the last 3 years in order to mitigate cetacean bycatch. In 2020, the Ministry of Agriculture and Fisheries of Spain approved a ministerial order (APA/1200/2020) by which bottom trawling vessels that operate in the national fishing area of the Cantabrian Sea and Bay of Biscay must use acoustic deterrent devices. In January 2022, the Spanish Ministry for Ecological Transition jointly with the Ministry of Agriculture and Fisheries endorsed the National Plan for the reduction of bycatch in fishing activities, focusing on marine mammals, sea birds and marine turtles.

Since 2020 the Spanish Ministry of Fisheries and Agriculture, has implemented an on-board observer programme focused on the assessment of cetacean bycatch in pair trawlers, gillnets and purse seiners operating in ICES Divisions 8abd, 8c and 9a. During the second cycle of the Marine Strategy Framework Directive (MSFD) the Ministry for Ecological Transition conducted an aerial survey (as part of the SCANS IV project) and photo ID capture-mark-recapture cetacean monitoring programs to obtain abundance estimates of different cetacean management units in Spain. In addition, an analysis of accidental capture risk is being carried out by the Spanish Institute of Oceanography throughout the Spanish fleet in order to determine the most problematic fisheries and be able to act accordingly. Lastly, in the framework of an agreement between the Ministry of Agriculture, Fisheries and the Spanish Institute of Oceanography, MERMACIFRA project (2021-2023) focuses on promoting fisheries research as a basis for sustainable fisheries management. This project includes a comprehensive testing of the effectiveness of acoustic deterrent devices (pingers) and dolphin excluder devices in nets to mitigate cetacean bycatch in paired bottom trawling.

Attention: CG, S

*The Committee noted that bycatch levels of common dolphins in the Bay of Biscay remain a concern with no evidence of any decrease in bycatch. Therefore, the Committee reiterates and reinforces its previous concerns. The Committee **recommends** urgent action by the European Commission and relevant member states to implement the advice for combinations of temporal closures of all fishing métiers of concern and application of pingers on pair trawlers that ICES (2022) evaluated as necessary in order to achieve the quantitative objectives agreed by OSPAR and to be fully consistent with conservation objectives under EU legislation.*

The Committee also requests the IWC Executive Secretary to maintain the ongoing dialogue with the range states and the EU Commission by writing to inform them of the Committee's ongoing concerns and recommendations.

At SC68D the Committee recommended trials using sinking ground line in Scottish creel fisheries. SC/69A/HIM/02 describes the current typical configuration using floating ground line that can result in loops up to 9m off the seabed. Estimates from the Scottish Entanglement Alliance project, which included reports from strandings, live disentanglements and interviews with Scottish inshore fishers were that six humpback whales and 30 minke whales become entangled in Scottish waters each year (Leaper *et al.* 2022). The project also found that 83% of minke and 50% of humpback whales (where entanglement type was reported) were caught in ground lines. The authors report on the trials which comprise a collaboration with fishers on Scotland's west coast, who are re-rigging gear with sinking line to assess its practicality, understand any difficulties that might arise from its use, and suggest possible solutions. The trial is currently underway with promising results and enthusiastic participation from the fishers involved.

The sub-committee commended those involved for the positive working relationship and particularly welcomed the proactive involvement from the fishers and their willingness to engage with the trial and report their experiences.

In response to presentations of bycatch assessment work conducted in Sarawak, Malaysia in 2016 (Peter *et al.*, 2016) and 2020 (Ambie *et al.*, 2020), the Committee encouraged further collaboration between the authors and the BMI to determine whether the data can be used to extrapolate mortality rates for local cetacean populations, and to test bycatch mitigation methods in these fisheries. Based on data from interviews conducted with 286 fishers from eight fishing communities surrounding Kuching Bay, Ambie *et al.* (2023) estimated that between 19 and 30 cetaceans are caught in artisanal fisheries from these 8 villages each year. Because a significant proportion of gillnets are attended while they are set, over 50% of entanglements are reported to result in live releases, leading the authors to promote training for fishers in safe handling and release practices. The most conservative approach to estimating mortality from these fisheries interactions indicates that a minimum of 7 Irrawaddy dolphins are killed each year, a number that exceeds Potential Biological Removal (PBR), indicating that bycatch reduction measures are needed to prevent decline of this Endangered Species. The authors recommend further collaboration with the IWC BMI to conduct trials on mitigation measures.

The sub-committee welcomed information on the follow-up to this study that was partially funded through the IWC Small Cetacean Voluntary fund and looks forward to future reports on bycatch mitigation trials and training conducted in collaboration with the IWC BMI.

Svoboda presented an update on the 'Coordinated Development and Implementation of Best Practice in Bycatch Reduction in the North Atlantic region' (CIBBRiNA) project. CIBBRiNA's aim is to work jointly with 45 partners ranging from fishers, scientists, fisheries and environment ministries of thirteen European countries in the Northeast Atlantic, Baltic and Mediterranean Sea to improve knowledge on bycatch in different fisheries, to minimise bycatch of priority ETP species and to work towards science-based assessments of the impacts of bycatch on their populations. It is a six-year project, with eleven work packages building on, and feeding back into eight case studies, covering gillnets, longlines, pelagic and demersal trawl fisheries. There is a focus on participation of, and collaboration with, international organisations, including the IWC and five fisheries Advisory Councils, ICES, HELCOM, OSPAR, EAPO and EFCA. In March 2023, the CIBBRiNA proposal was approved by the EU LIFE office, and the Grant Agreement preparations have started. The project should be able to start in September 2023. Total budget is 12.5M euro, of which 8.3M euro is eligible for funding from the EC. Unfortunately, a lower funding rate of 67% (instead of 75%) was approved by the European Commission, due to some species, such as the harbour porpoise and common dolphin, not qualifying as priority species according to the criteria of LIFE.

The sub-committee thanked Svoboda for this update and commended her on the significant effort it represented. The sub-committee noted that the proposed project was affiliated with the IWC's BMI and therefore looks forward to collaboration and further updates in the future. As a beneficiary partner in the CIBBRiNA project, the IWC will work on joint solutions for incidental bycatch, as well as bringing experience and experts on this issue, in particular on the areas of stakeholder participation, socio-economic aspects, mitigation toolkit, governance and communication, via its Expert Panel on Bycatch and the Scientific Committee.

Attention: CG, S

*The sub-committee noted that the European Commission's criteria for priority species were problematic for projects seeking EU funding for work on cetacean populations that the Committee has identified as of particular conservation concern. The sub-committee therefore **recommends** that the European Commission consider revising its criteria for funding thresholds to facilitate projects addressing critical cetacean conservation issues.*

The sub-committee requests the IWC Executive Secretary to write to the EU Commission to explain the issues that have been identified.

Following consideration of many of the studies at this meeting, the sub-committee noted that in the last decades, the Committee has evaluated an ever-increasing number of studies highlighting the central role of gill and trammel nets in the bycatch of a variety of cetaceans in all parts of the world. Often these interactions appear to be unsustainable and may eventually lead to the extinction of populations or species.

Attention: CG

*Deeply concerned by the negative impact of gill and trammel nets on the conservation status of many cetacean populations, the Committee **strongly encourages** Member States to invest in the development and adoption of alternative fishing gears that would enable sustainable fisheries while ensuring a good conservation status of cetacean populations.*

In response to this discussion and recommendation, the sub-committee was reminded that the IWC BMI currently has an open call for new members to the IWC Bycatch Expert Panel.

2.10 Workplan

The workplan for HIM bycatch is below in Table 1. For details of intersessional correspondence groups see Annex V.

Table 1
Workplan for HIM - bycatch.

Topic	2023 Annual meeting	Intersessional 2023/24	2024 Annual meeting
Bycatch Mitigation Initiative	Review progress on the Bycatch Mitigation Initiative; aspects relevant to the Committee and requests for advice.		Continue to review and provide input on pilot projects as required.
Rates and risks	Review new estimates of bycatch and entanglement rates, risks and mortality.		Continue to review. More detailed review of franciscana bycatch estimates if information is available.
Mitigation	Review new information on mitigation measures for preventing bycatch and entanglement		Continue to review. Studies on the use of alternative gears to gill and trammel nets will be particularly encouraged.
Bycatch and entanglement in critically endangered populations	Review new information on		Continue to review.
Collaboration on bycatch mitigation	Continue to review	Continue collaboration with FAO, IOTC and others	Continue to review
Collaboration with CCAMLR on bycatch in Southern Ocean krill fishery	Review progress from intersessional group and any new information from CCAMLR	Continue collaboration on bycatch issues as required through ICG. Provide finalised data form to CCAMLR secretariat.	Review progress
Collaboration with Baltic range states and European Commission on technical issues associated with acoustic interference of military activities by pingers.	Review any intersessional developments.	Re-convene ICG to provide advice as needed.	Review progress
Reviews of topics related to spatial risk assessment for Hector's and Maui dolphins in New Zealand.	Complete review process	No further action.	
Continue developing a list of potential methods for estimating/setting R_{max} and an evaluation of the data requirements, strengths, and weaknesses of each approach.	Review report from intersessional group.	TBD	
Develop best practice protocols for releasing free-swimming, entangled small cetaceans	Review proposals from intersessional group.	Adapt NOAA Small Cetacean Entanglement Response Best Practices for use in countries with fewer resources in terms of personnel and equipment/facilities	Review proposals from ICG.

3. SHIP STRIKES

3.1 Review new methods and estimates of rates of ship strikes, risk of ship strikes and mortality (including review progress on ship strike database)

O'Loughlin (Ship Strikes and Strandings Data Manager) reported on progress and use of the IWC Ship Strike Database. There have been 30 new reports to the database and an additional 55 previously received reports have been processed. In addition, Australia provided data to be integrated into the IWC database. This resulted in over 200 ship strike reports which were either new to the database or updated existing reports. The next large dataset that needs to be acquired and integrated is the data held by NOAA in the United States. The Data Manager will continue reaching out to dataset holders. In addition to these data sets, there are still at least 40 reports to process that will need to be reviewed in the next year. She noted recent work to assess ship strikes involving sailing vessels, and examination of datasets related to those incidents. Future work will involve integrating the data collated by Ritter (2012) and additional data collated from yacht racing reports. Over the past year, there have been ten requests for data. These include requests for ship strike data in the Mediterranean, two in the Caribbean and one in the Northeast Atlantic. Species and region data were also provided to support work on Implementation Simulation Trials. Future work will consider a platform on the IWC website to facilitate access to high-level ship strike data. This could include a dashboard for data exploration and a graphical user interface.

Information from the IWC Database has contributed to the discussion on the NW Mediterranean PSSA and records in the database from this region have been updated. The sub-committee offered special thanks to Fortuna, and her colleagues in Italy, who conducted an in-depth review of ship strike data from the Mediterranean Sea. This review added previously unknown records and improved existing records in the database. Similar regional efforts to examine media archives and other sources in relevant languages in order to identify ship strike records could greatly enhance the IWC's ship strike database. The sub-committee **encouraged** SC members to offer assistance in these regional reviews.

O'Loughlin also reported on progress in establishing the IWC ship strike Expert Panel. Nominations were received in April and the Panel will be appointed during May 2023. The Expert Panel will cover the tasks of the current Ship Strikes Data Review Group and Ship Routing Group. The Expert Panel will also include those with expertise on shipping management and knowledge of the shipping industry. The Panel will report to the SSWG and the SC.

SC/69A/HIM/07 presents results of a commercial shipping ship strike risk assessment for Arabian Sea humpback whales (ASHW) and potential mitigation measures. The work was motivated by concern for the overlap of increasing shipping trade (an increase of approximately 5% per year, 2009-2018) with the known habitat of this Endangered population. The study used satellite tracking data from implant tags deployed between 2014 and 2017 to develop an ensemble ecological niche model across the ASHW suspected range in the Northwest Indian Ocean. Ecological niche model rasters were combined with satellite sourced shipping tracking data to produce a ship strike risk assessment. Model results showed the most suitable habitat is located around the periphery of the Arabian Sea, particularly along the continental shelf areas of Oman and Pakistan. Shipping traffic between regional nodes and ports was also concentrated around the periphery of the Arabian Sea with the highest areas of risk detected off the Arabian Sea coast of Oman, Sea of Oman in the approaches to the Straits of Hormuz and off the southwest coast of India in the Laccadives Sea. Simulations routing vessels 40 nm further offshore from the main route currently used by vessels off the Arabian Sea coast of Oman was found to reduce ship strike risk by as much as 88%.

The sub-committee commended the detail and scope of the analysis. As the risk reduction predicted by moving shipping a little further offshore appeared to be significant, much of the discussion centred on how best to present these data and options to range state governments and shipping. Given the status of Arabian Sea humpback whales, it was agreed that mitigation strategies might not need to wait for similar analyses of potential impacts on other whale species in the region. However, Willson noted that sufficient data for some other key species may already exist and could be included in the analysis.

SC/69A/HIM/04 describes a study using ship strike reports from offshore sailing races to calibrate a collision model that could also be applied in the broader context of commercial shipping. The study used a collision model that was adapted from Martin *et al.* (2016) and habitat models to estimate cetacean density. The model was applied to the Ocean Race 2022-2023, which started in the Mediterranean Sea, as a case study. The number of predicted collisions could then be compared with the number observed, since sailing races often have several reported collisions.

It was noted that the IWC had previously developed a guidance document (Ritter *et al.* 2014) for organisers of offshore sailing races to help reduce risks of collisions with whales. This guidance had proposed the use of virtual waypoints which were also investigated in the 'Share the Ocean' project described in SC69A/HIM/04 as a way of routing yachts away from areas of highest risk. It is sometimes possible to recover whale skin from sailing yachts that have hit a whale and it was noted that such samples could be valuable for species identification. The sub-committee recognised the value of this type of analysis that compares predictions with actual collision rates and noted that it could be valuable to expand to other types of vessels. The sub-committee looks forward to receiving new information on this work next year.

Portal *et al.* (in press) integrated telemetry and traffic data to assess vessel collision risk to humpback whales off the central coast of Brazil between 2016 and 2019. A state-space model was used to account for observation error and to regularise telemetry data. Residence time and proportion of time spent by whales in the upper 10m layer of the water column, combined with fleet-specific vessel density, were used as proxies to estimate the relative probability of vessels encountering whales at risk of a collision. Areas where potential encounters were most likely to inflict lethal injuries on whales, based on vessel length and speed, were also identified. The cargo fleet had the highest shipping density, and along with the tanker fleet, represents a substantial risk to humpback whales in Brazil. A high risk of collision was estimated for the Abrolhos Bank, the main breeding ground for this population.

The authors expressed their appreciation for the agreement between IWC and Marine Traffic that had provided access to AIS data. In discussion it was noted that it would be useful to have comparable metrics for risk to allow comparison between regions where ship strike risk assessments have been conducted. In particular, the whale distribution models used in Portal *et al.* (in press) and HIM07 were based on telemetry studies but other risk assessments have been based on observational data, and risk metrics are often calculated differently from one study to another. The sub-committee agreed to encourage analyses of common metrics that could allow comparison of risk assessments between areas for next year's meeting.

Rae *et al.* (2023) describes the first attempt to consider the severity of ship strikes on individual whale welfare. The methodology of the 'Welfare Assessment Tool for Wild Cetaceans' (WATWC) was used, which is itself based upon the Five Domains model. This approach had been developed further through a process initiated within the IWC and supported by the UK Government, which was also discussed by the Committee. Expert opinion was sought on six hypothetical but realistic case studies involving humpback whales struck by ships. Twenty-nine experts in the cetacean and welfare sector took part. Experts judged that whales may suffer some level (>1) of overall (Domain 5) harm for the rest of their lives following a ship-strike incident. The domains of 'Health', closely followed by 'Behaviour' were found to be the welfare aspects most affected by ship-strikes. This confirms ship-strike is a welfare issue of significance, even when it may not impact population viability. Overall, the WATWC allows a quick and effective assessment to be made and has potential to aid decision making on wild cetacean welfare.

The sub-committee thanked Simmonds for bringing this to its attention. It was noted although ship strikes are often assessed from a conservation perspective there are clear implications for the health and welfare of struck but surviving cetaceans and welfare considerations are often the motivation for stakeholders to implement mitigation measures.

Daume *et al.* (2023) describes an osteopathological analysis of the skeleton of a fin whale that revealed multiple healed fractures of ribs and a scapula. Moreover, the *processus spinosi* of several vertebrae were deformed and arthrosis was found. Together, the pathological findings provide evidence for large blunt trauma and secondary effects arising from it. Reconstruction of the likely cause of events suggests collision with a ship, inflicting the fractures and leading to post traumatic posture damage as indicated by skeletal deformations. The injured bones had fully healed before the fin whale was killed by a whaler in the South Atlantic in 1952. Herr noted that the skeleton provides evidence for survival of a ship strike by a fin whale with severe injuries causing long-term impairment.

3.2 Mitigation of ship strikes in high-risk areas

3.2.1 Review progress towards assessing and mitigating ship strikes in previously identified high-risk areas

Long described the results and conclusions from two reports that assessed the effectiveness of the US vessel speed requirements aimed at reducing ship strikes of North Atlantic right whales.

The first assessment was completed in 2020 and addressed biological efficacy, mariner compliance, impacts to navigational safety and economic cost to mariners³. With respect to biological efficacy, the report noted that in the 10 years after the speed rule was implemented, there has been a decline in the total number of documented right whale vessel strike mortalities but an increase in serious and non-serious injuries. This reflects progress made to date but also demonstrates that more effort is required to further reduce the incidence of vessel strikes. Overall compliance with the speed rule continued to improve over the past decade and exceeded 80% collectively across all Seasonal Management Areas for the 2018-2019 season. However, the report notes poor compliance with certain mandatory Seasonal Management Areas and generally with voluntary Dynamic Management Areas. The second report completed in 2022⁴ describes an encounter risk model to identify the primary regions and seasons where the highest risk of vessel strike mortality occurred. In general, the majority of vessel strike mortality risk occurred during cooler months (November-May) when NARW densities are predicted to be high in waters of the mid-Atlantic, southern New England and the southeastern U.S. The model results suggest that increasing the temporal and spatial coverage of vessel speed restrictions along the U.S. east coast would be an effective tool to reduce overall risk of vessel strike mortalities in North Atlantic right whales.

Long noted that considerable outreach efforts with the maritime community had been undertaken in areas with poor compliance with speed reduction regulations. In addition, the issue of ship strikes has a fairly high media profile, so it was unlikely that lack of compliance was due to ignorance of the speed restrictions. There was some discussion of what might have caused the apparent contradiction of increased reported collisions but fewer mortalities in the decade after speed restrictions were introduced. One suggestion was to investigate whether shipping had increased in the area; alternatively, outreach may have resulted in collisions being more likely to be reported, particularly those that resulted in less serious injuries.

3.2.3 Review new research relevant to mitigation

Panigada provided an update on two ongoing ship strike mitigation projects funded by the European Union. The OCEAN project⁵ is focused on enhancing operator awareness in navigation, to reduce the frequency of severe accidents like collision and grounding, to mitigate ship-strike risks to marine mammals and to mitigate the risk presented by floating obstacles to ships. The OCEAN project will contribute to an improved understanding of the causes of accidents, and will strive to reduce the resulting human, environmental and economic losses through socio-technical innovations

³ https://media.fisheries.noaa.gov/2021-01/FINAL_NARW_Vessel_Speed_Rule_Report_Jun_2020.pdf?null.

⁴ https://media.fisheries.noaa.gov/2022-07/Right_Whale_Vessel_Strike_Risk_Assessment_NMFS-SEFSC-757_508.pdf

⁵ <https://ocean-navigaiton-awareness.eu/>

supporting ship navigators. The LIFE SeaDetect project⁶ aims to develop automated detection of marine mammals and obstacles and an anti-collision system for vessels. The SeaDetect project is composed of three systems: 1) a system installed on large vessels providing real-time detection of marine mammals and detections of other vessels and unidentified floating objects and related alerts; 2) a Passive Acoustic Monitoring network based on buoys that will detect and triangulate the position of cetaceans in real time; and 3) obtained detections will be shared through a dedicated application to inform other vessels of the risk of collision.

Members of the SC are involved with these projects and the sub-committee looked forward to updates on their implementation in coming years.

3.3 Co-operation with IMO Secretariat and relevant IMO committees

SC/69A/O/02 summarises co-operation with the IMO on noise and ship strikes including a number of meetings related to the proposed PSSA in the NW Mediterranean.

3.4 Progress on previous recommendations

Leaper summarised information provided by the IWC Ship Strikes Working Group (SC/69A/HIM16) on progress on mitigation measures in high-risk areas identified in the IWC Ship Strikes Strategic Plan. This follows up on Committee recommendations related to the following.

- The sub-Antarctic Island at 54°15'S 36°45'W. A voluntary slow down zone to keep speeds below 10 knots has been implemented by the relevant authorities for all cruise vessels visiting the island during the 2022/23 austral summer season.
- Traffic Separation Scheme (TSS) off Dondra Head, Sri Lanka. Shipping industry organisations continue to seek a solution that provides the safety benefits of a TSS established by IMO while avoiding the most important whale habitat. Analysis of recent AIS data shows 33% of all ships transiting this area and 50% of the ships travelling at greater than 17.5 knots are now choosing to sail south following the routing options identified by the Committee.
- Hellenic Trench, Greece. A number of major shipping companies have now voluntarily committed to slowing down or are re-routing their ships away from the area of highest risk identified by the Committee in previous recommendations.

IMO PSSA in the NW Mediterranean. France, Italy, Monaco and Spain submitted a full proposal to the IMO Marine Environment Protection Committee (MEPC) 79 in December 2022 on the 'Designation of a Particular Sensitive Sea Area (PSSA) in the North-Western Mediterranean Sea to protect cetaceans from international shipping' (MEPC79/10). The focus of this proposal was the designation of a PSSA and additional associated measures to minimise the risk of ship strikes to fin and sperm whales. This proposal was reviewed by a PSSA Technical Group, which both the IWC Secretariat, HIM Convenor and SSWG Chair attended. MEPC 79 agreed 'in principle' to the proposal, requesting additional work to refine the associated protective measures. The IWC offered its assistance with this and the future PSSA-related process and have had meetings with the co-sponsors to help refine the information on measures contained in the new documents submitted to the IMO Sub-committee on Navigation, Communications and Search and Rescue (NCSR), which will be held in May 2023.

The SC has also previously made recommendations related to the ship strike risk to sperm whales around the Canary Islands. Fernandez noted that during the period of Covid restrictions in 2020/21 there were no reported ship strikes but subsequently there had been one suspected sperm whale ship strike in 2021 and a fin whale and sperm whale in 2022 that had both been confirmed as ship strikes based on pathology. He noted that the collaboration between the national and regional administration on ship strikes had been maintained, with some projects that involved the Canary Islands' Universities. One of the fast ferry companies now collects whale sightings data on all its routes using onboard observers and also has a project developing the use of thermal cameras to detect whales. He noted the socio-economic importance of the marine transport sector to an insular region with more than 2 million people and 12 million tourists regularly moving between and around islands. He also noted that past IWC recommendations have supported multilateral collaboration and further attention from IWC could help with future policy decisions. The sub-committee encouraged the newly formed ship strikes Expert Panel to collaborate with relevant stakeholders in the Canary Islands.

At SC68D, the SC recommended continued work to undertake the necessary research and analysis required to identify potential new high-risk areas. Harrison *et al.* (2023) describes recent work to identify Biologically Important Areas (BIAs) for cetaceans in U.S. waters. BIAs represent areas and times in which cetaceans are known to concentrate. In this second (BIA II) effort, regional cetacean experts identified the full extent of any BIAs in or adjacent to U.S. waters, based on scientific research, Indigenous knowledge, local knowledge and community science. The new BIA scoring and labelling system improved the utility and interpretability of the BIAs by designating an overall Importance Score that considers

⁶ <https://life-seadetect.eu/>

both (1) the intensity and characteristics underlying an area’s identification as a BIA; and (2) the quantity, quality and type of information, and associated uncertainties upon which the BIA delineation and scoring depend.

The sub-committee noted that the approach used in Harrison *et al.* (2023) could be used with information on shipping to identify high risk areas and welcomed the improvements to the BIA process. It was noted that the improvements in methods to identify BIAs might offer helpful insights for other similar efforts, such as IUCN Key Biodiversity Areas (KBAs) and Important Marine Mammal Areas (IMMAs) and the CBD Ecologically or Biologically Sensitive Marine Areas (EBSAs)

3.5 Workplan

See Table 2. For details of intersessional correspondence groups see Annex V.

Table 2
Workplan for HIM – ship strikes.

Topic	2023 Annual meeting	Intersessional 2023/24	2024 Annual meeting
Rates and risks	Review new methods and estimates of rates of ship strikes, risk of ship strikes and mortality including progress on ship strike database		Continue to review. Analyses of metrics that could allow comparison of risk assessments between areas will be particularly encouraged.
Mitigation	Review new information related to mitigation methods		Continue to review
Reducing risks to fin and sperm whale populations in the Mediterranean		Collaborate with IWC Expert Panel to provide advice on measures on NW Mediterranean PSSA proposal, either to the proponents, should that be requested, or as part of the process of evaluation by IMO.	Review progress
Continued co-operation with IMO	Review cooperation	Secretariat to maintain dialogue with IMO Secretariat. Attend relevant IMO meetings. Collaborate with IWC Expert Panel to provide advice on any routing proposals as required.	Continue to review
Follow up on previous contacts offering IWC assistance regarding high risk areas	Review progress on identified high risk areas in IWC Ship Strike Strategic Plan		Continue to review

The report was adopted at 14:10 CEST on 2 May 2023.

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Appendix 1

Agenda

1. Introductory items
 - 1.1. Convenor's opening remarks
 - 1.2. Appointment of chair and rapporteurs
 - 1.3. Adoption of agenda
 - 1.4. Available documents
2. Bycatch and entanglements
 - 2.1 IWC's Bycatch Mitigation Initiative
 - 2.2 Collaboration on bycatch mitigation with IGOs (including FAO, Regional Fisheries Management Organisations, CCAMLR and others)
 - 2.3 Review new methods and estimates of bycatch and entanglement rates, risks and mortality
 - 2.4 Reporting of bycatch and entanglements (both small and large cetaceans) including National Progress Reports
 - 2.5 Review mitigation measures for preventing bycatch and entanglement
 - 2.6 Review of topics related to Hector's and Māui dolphins in New Zealand (with SM)
 - 2.7 Review progress on definition of rmax for small cetaceans for use by the Scientific Committee
 - 2.8 Review proposals for best practice protocols for releasing free-swimming, entangled small cetaceans
 - 2.9 Progress on previous recommendations
 - 2.10 Workplan
3. Ship strikes
 - 3.1 Review new methods and estimates of rates of ship strikes, risk of ship strikes and mortality (including review progress on ship strike database)
 - 3.2 Mitigation of ship strikes in high risk areas
 - 3.2.1 Review progress towards assessing and mitigating ship strikes in previously identified high risk areas
 - 3.2.2 Provide advice on routing measures
 - 3.2.3 Review new research relevant to mitigation
 - 3.3 Co-operation with IMO Secretariat and relevant IMO committees
 - 3.4 Progress on previous recommendations
 - 3.5 Workplan