Annex M

Report of the Sub-Committee on Small Cetaceans

Members: Porter, Trujillo (co-Convenors), Andrianarivelo, Archer, Atkins, Baker, Bjørge, Braulik, Brownell, Castro, Charlton, Cipriano, Collins, Currey, Debrah, Donovan, Ferriss, Frisch-Nwakanma, Gallego, Genov, Goetz, Gonzalez, Hall, Herr, Hoelzel, Holm, Hubbell, Ingram, Iñíguez, Jiménez, Keith-Diagne, Kitakado, Lang, Lee, Lent, Lundquist, Mallette, Marcondes, Minton, Mora, Mwabili, Naylor, Nelson, Palka, Panigada, Parsons, Plön, Reyes Reyes, Ridoux, Ritter, Rojas-Bracho, Rose, Santos, Scheidat, Sharp, Simmonds, Slooten, Smith, Stachowitsch, Stockin, Suydam, Svoboda, Tarzia, Tiedemann, Trejos Lasso, Urbán, van de Water, Vermeulen, van Waerebeek, Weller, Willson, Wilson, Yaipen-Llanos, Zerbini.

1. INTRODUCTION

1.1 Opening remarks

Porter and Trujillo welcomed the participants to the meeting and provided an introduction to the work methods of the IWC Scientific Committee and the focus of work of the Small Cetacean (SM) sub-committee. Porter thanked Scheidat for her valuable contributions to SM and noted the excellent progress made on many initiatives during her term as Convenor and Chair. Porter introduced Trujillo as SM co-Convenor and noted his ongoing contributions to several ongoing IWC SC initiatives.

1.2 Election of Chair and appointment of Rapporteurs

Porter and Trujillo were elected as co-Chairs and Cipriano and Jiménez were appointed as rapporteurs.

1.3 Adoption of Agenda

The adopted Agenda is given as Appendix 1.

1.4 Review of available documents

The following available documents contained information relevant to the work of the sub-committee: SC/68A/SM/01-03; SC/68A/SM/05-06; SC/68A/CMP/19-20; Baldwin *et al.* (2018); Bolaños-Jiménez *et al.* (2014); Braulik and Stern (2019); Braulik *et al.* (2017a); Braulik *et al.* (2018); Collins *et al.* (2013); Collins *et al.* (2017); de Boer *et al.* (2016); Fielding (2018); Filatova *et al.* (2014); IWC (2015); IWC (2019); Metcalfe *et al.* (2017); Minton *et al.* (2017); Nature Tropicale NGO (2018); Plön *et al.* (2016); Southall *et al.* (2013); Taylor *et al.* (2019); van Waerebeek *et al.* (2008); Vermeulen *et al.* (2018).

2. A REVIEW OF SMALL CETACEANS OF AFRICA

The years priority topic was tackled, in part, during the Aquatic Wildmeat Workshop held immediately prior to SC/68A. A summary of Workshop information for West African countries is summarised under agenda Item 3. A significant challenge identified by all West African countries was the paucity of resources, the vast extent of current data gaps and the necessity to rapidly deliver relevant information to management authorities for small cetacean populations that are already in crisis. Several case studies were presented that provided some solutions to this challenge.

2.1 Tackling data gaps through rapid assessment and collaborative efforts

A cetacean rapid assessment was presented as an approach to fill knowledge gaps and target conservation across large data deficient areas (Braulik *et al.*, 2017a). Even basic information on cetacean species presence is unknown for tens of thousands of kilometres of coastline, particularly in Africa, Asia and South America, which is a major hurdle to conservation and management in these areas. A survey approach that can generate broad-scale, quantitative, baseline data on cetacean communities and potential threats, that can be conducted rapidly and cost-effectively across whole countries, or regions, was described. A pilot rapid assessment study in Tanzania was conducted in one year with field costs less than $50,000, and integrated collection of data on cetaceans from visual, acoustic, and interview surveys with existing information from multiple sources, to provide low resolution data on cetacean community relative abundance, diversity and threats. Four principal threats were evaluated and compared spatially using a qualitative scale: cetacean mortality in fishing gear (particularly gillnets); cetacean hunting, consumption or use by humans; shipping-related collision risk and noise disturbance; and dynamite fishing. The most important area for cetaceans in Tanzania was the Pemba Channel, a deep, high-current waterway between Pemba Island and mainland Africa, where the highest relative cetacean diversity and a high relative abundance were recorded, but which is also subject to threats from fishing activities. This area is now being surveyed regularly for cetaceans and bycatch mitigation and has been proposed as an Important Marine Mammal Area by the IUCN Cetacean Task Force. A rapid assessment approach can be applied in data deficient areas to quickly provide information on cetaceans that can be used by governments and managers for marine spatial planning, management of developments and to target research activities into the most important locations.

With the Rapid Assessment Framework, Tanzania moved from a situation of having little information in a small area, to having country-wide species information and topics for prioritisation in under two years. It is important to highlight that a rapid assessment is an initial investigation and is not an end point, rather as the first step from which focused studies or actions are applied. The sub-committee **welcomed** this initiative as a useful general framework to be applied in other regions that require broad scale data collection with a reduced budget. During discussion, the sub-committee noted that information obtained from the interviews during this case study was not reliable for species identification, and that the by-catch evaluation can be customised to take into account threats in different areas, particularly so risks to cetaceans associated with fishing activities could be better addressed. Thus, focal areas or action prioritisation can be easily identified. The sub-committee recognised the importance of this work as a case study that can be applied to other areas in Africa, a useful approach to quickly provide broad-scale information on relative occurrence of cetacean species, and the threats they face, across large data-deficient areas. Such data is valuable to management authorities and may provide a catalyst for conservation planning or the development of research priorities.

Table 1
Current African and west Indian Ocean consortia and organisations.

Name of Consortium	Contact
Indian Ocean Network for Cetaceans Research (IndoCet)	*http://indocet.org/; info@indocet.org*
Arabian Sea Whale Network	*https://arabianseawhalenetwork.org/*
Northern Indian Ocean Killer Whale Alliance	*https://niokillerwhales.wixsite.com/niokwa/about-the-alliance*
SouSA Consortium	Els Vermeulen *(elsvermeulen5@gmail.com)*
Kenya Marine Mammals Network	Michael Mwangombe *(michael.mwangombe@watamumarine.co.ke)*
Tanzania Whale Network	Gill Braulik *(gillbraulik@downstream.vg)*
Western Indian Ocean Marine Science Association (WIOMSA)	Julius Francis *(secretary@wiomsa.org)*
The Nairobi Convention	Dixon Waruinge, Head of the Secretariat Nairobi Convention*; (dixon.waruinge@un.org)*
World Wide Fund for Nature (WWF); the SWIO Regional Fisheries Programme, Regional Fisheries Programme	Edward Kimakwa *(ekimakwa@wwfafrica.org)* Manuel Castiano *(mcastiano@wwf.org.mz*
South West Indian Ocean Fisheries Commission (SWIOFC)	Luca Garibaldi *(Luca.Garibaldi@fao.org)*
The IUCN Regional Office for Eastern and Southern Africa, Nairobi	*https://www.iucn.org/esaro (info.esaro@iucn.org)*
TRAFFIC, South Africa and Tanzania Office	Richard Thomas *(richard.thomas@traffic.org)*
South African Killer Whale Consortium	A South African Killer Whale Consortium is currently being setup. Research activities have already begun with institutions collaborating on telemetry efforts off the south coast of South Africa

Boat surveys off Gabon were conducted under a collaborative agreement between the Oil and Gas Industry, the Government of Gabon and two international NGOs (Minton *et al.*, 2017). The survey aimed to support both a Government monitoring and compliance programme as well as gathering information on the distribution of and threats to marine megafauna. The dual nature of the survey also led to increased collaboration between government agents and local scientists. During 22 days of survey effort over a two-year period, humpback whales (*Megaptera novaeangliae*), bottlenose dolphins (*Tursiops truncatus*), Atlantic humpback dolphins (*Sousa teuszi)* and common dolphins (*Delphinus delphis*) were documented. Bottlenose dolphins were present year-round and photo-identification was able to confirm that at least part of the population was resident. Small open-decked fishing vessels with gillnets were observed concentrated around river mouths within 2km of shore, while commercial trawlers were at least 10km offshore; all were confirmed to be registered and legal. This multi-stakeholder collaboration serves as a model by which funding and logistic support from private industry paired with technical expertise from NGOs and academic institutions can benefit marine and coastal conservation. This model can be particularly effective to obtain baseline data on both cetacean distribution and threats where resources, funding and logistics are limited. It may be particularly well suited in many African countries where marine protected areas or coastal parks have rangers in place and surveillance activities are regularly conducted.

The sub-committee **noted** the value of a multi stakeholder approach and acknowledged that similar approaches could be applied across other countries, especially where resources are limited.

Vermuelen summarised the formation and activities of the SouSA Consortium, a national South African collaboration for the scientific research and conservation of Indian Ocean humpback dolphins (SC/68A/SM/03). It had been previously recognised that there is a general lack of rigorous scientific data and knowledge on the species in South African waters, specifically those data which are not obtainable by individual research groups or from a limited geographical area. Therefore, a nation-wide research collaboration to address these issues was established in May 2016 between 18 partners from 15 different institutions. The consortium established specific recommendations to progress work, including ongoing development of relationships between consortium partners and a continuous effort to improve scientific knowledge on the species in South African waters. Other recommendations related to policy, including the development of a mitigation strategy to reduce bycatch in shark nets, the establishment of multiple-use management areas, and the design and implementation of strategies to reduce noise impact on the species. It was also noted that better educational outreach was essential, especially for those groups where improved knowledge might have immediate benefits to the species, such as recreational boaters.

The sub-committee **welcomed** this initiative and **encouraged** its continued efforts for studies of *Sousa plumbea* in South African waters.

The consortium's first publication was summarised (Vermeulen *et al.*, 2018). All existing photo-identification data of humpback dolphins in South Africa was collated in a common database. Results of the matching process indicated movements of individuals between most study areas, with distances ranging between 30-500km. All photo-identification data were organised into a national catalogue. Current available data suggest national abundance may be well below the previous estimate of 1,000 individuals, with numbers probably closer to 500. This study clearly indicates the importance of scientific collaboration when studying highly mobile and endangered species and thus this group effort was able to more easily identify threats across the species range in South Africa. The paper concluded with a series of recommendations which the sub-committee agreed to endorse.

It was further highlighted that there are multiple regional consortia and the sub-committee **acknowledged** the value of the contributions these groups made to research and conservation (Table 1).

Following positive outcomes from the establishment of SouSA Consortium, and the demonstrated success of other network, the sub-committee discussed the feasibility of extending or replicating the SouSA consortium into other countries specifically to address immediate threats to both Atlantic and Indian Ocean humpback dolphins. The available scientific evidence indicates that populations of humpback dolphins in Africa are facing severe and increasing threats to their conservation. The Atlantic humpback dolphin (*Sousa teuszii*) is listed as Critically Endangered on the IUCN Red List (Collins *et al.*, 2017) and the Indian Ocean humpback

dolphin (*Sousa plumbea*) as Endangered (Braulik *et al.*, 2017b). This sub-committee has provided recommendations for scientific work and conservation actions for the genus *Sousa* at several Scientific Committee meetings since 1993. These included specific recommendations for the Atlantic humpback dolphin and various recommendations for the genus *Sousa* in Africa. Some of these recommendations have led to much needed work, but most current evidence suggests that both Atlantic and Indian Ocean humpback dolphin are in decline and in some areas, populations are at critically low levels. The primary cause of these declines is bycatch in coastal gillnets, although directed hunts and habitat loss are also important factors. These threats are increasing and will likely be exacerbated by current rapid coastal development that inadequately assesses threats posed to *Sousa* species.

Attention: CG, R, CC

*The Committee **reiterates** its previous concerns over the status of the genus* Sousa *and its recommendations to improve the situation (IWC, 2019). The Committee stresses the need to identify high priority areas and populations of* Sousa *in Africa to obtain better information on status and mitigation. To assist in this, the Committee:*

*(1) **encourages** a wider collaboration among researchers who work on the genus* Sousa*, which include international collaboration for funding and capacity building, the development of regional and sub-regional research projects and co-ordination of data collection;*

*(2) **recommends** the establishment of an Africa focused '*Sousa *Task Team' to: (a) facilitate and coordinate work in response to IWC recommendations; (b) start working towards developing a comprehensive framework of conservation actions; and (c) to report back to the SM Convenors by September 2019; and*

*(3) **recommends** that South Africa develops a mitigation strategy to: (a) reduce bycatch of* Sousa *in shark nets; (b) establish multiple-use management areas; and (c) design and implement strategies to reduce the impacts of noise.*

2.2 Updates on small cetacean status in Africa

2.2.1 Equatorial Guinea, São Tomé and Príncipe, Gabon, the Republic of Congo, the Democratic Republic of Congo and Angola

Collins provided information on cetacean mortality from Central African coastal areas, including Equatorial Guinea, São Tomé and Príncipe, Gabon, the Republic of Congo, the Democratic Republic of Congo and Angola (SC/68A/SM/05). Data were collected sporadically across an approximately ~17 year period spanning 2002-19, although the authors also considered previously published records and reports. Most records were not linked to dedicated field effort except those in the Republic of Congo, where beach surveys were conducted over a seven-year period between 2009-16. A total of 113 records were considered. Although records were sparse, bycatch is highlighted as the most prevalent cause of cetacean mortality in the Central African region; confirmed (n=41) and suspected (n=6) in 47 cases (41.6% of all records), where the cause of death could be attributed. When 'unknown mortality' was removed from the analysis, bycatch represented 64.4% of the total. Of these, many were subsequently utilised or traded by local communities for food and, likely, also as bait in fishing operations. The use of bycaught small cetaceans as food was documented in each of the countries considered, where such practises are likely well-established. Datasets for Gabon (n=46, 40.7%) and the Republic of Congo (n=48, 42.5%) were the largest and show clear differences in the levels of identified bycatch. This is likely a result of the quality of reporting and the limited scope of surveillance. Inshore gillnet fisheries occur in both countries, except along the coasts of southern Gabon. In Gabon, overt or suspected instances of bycatch are relatively rare, with only six confirmed or suspected instances recorded. In the Republic of Congo, instances of overt or suspected bycatch were much higher, with 34 confirmed (n=31) or suspected (n=3) bycatches. In Gabon, there were four instances of the non-targeted salvage of carcasses for food or bait (4 of 46 carcasses). In the Republic of Congo, there were 30 instances of small cetacean carcasses being used as wildmeat (30 of 34 bycatches, or 88.2% of cases); Atlantic humpback dolphins (n=18) and bottlenose dolphins (n=7). A five-year programme of intensive monitoring, enforcement, and cooperative and incentivised surveys, was conducted in Conkouati-Douli National Park. This resulted in the documentation of 19 bycaught dolphins, across 14 landing sites over a 60km stretch of protected beach. Of the specimens recorded, 10 were Atlantic humpback dolphins and the testimony of fishermen indicated that all were caught in gillnets, less than 1km from shore (Collins *et al.*, 2013). Records for São Tomé and Príncipe are relatively few but indicate that dolphin meat is consumed when available and that this is likely a growing trend, as evidenced by new trade specifically for small cetacean wildmeat. In some communities on the north and west coasts of the island of São Tomé, interview surveys suggested that dolphins were occasionally harpooned for food and subsequently traded. The need to engage with local communities for research endeavours was highlighted and a case study was discussed that demonstrated how such trust can quickly lead to useful research outcomes. Fishing effort was reliably collected by installing low cost GPS tracking devices onto fishing vessels on a voluntary basis (Metcalfe *et al.*, 2017). It took time to engender trust; once established, the fishermen engaged willingly. This study also revealed that artisanal fishermen disliked catching small cetaceans as net repairs were more costly than any profit made from selling the carcass and that the trawling fleet were responsible for most of the observed bycatch.

Attention: R, CG

*The Committee **welcomes** the new data from six Central African countries provided in SC/68A/SM/05 and **encourages** further work to improve information from these data poor areas. The high mortality of Atlantic humpback dolphins in the Conkouati-Douli National Park, Republic of Congo, is of **particular concern,** given the likely small population size and restricted range of the population. The Committee **recommends** that the Government initiates high priority research and management actions.*

2.2.2 Liberia

The presence of cetaceans off northwestern Liberia was studied for the first time during a 3D seismic survey from 21 January to 4 May 2009 (SC/68A/SM/06). There were 126 sightings of cetaceans reported, of which ten were mixed species assemblages. Eight odontocetes (and two mysticetes) were confirmed. Eight of these identifications were new records for Liberia. The habitat covered included the outer continental shelf, slope and offshore trenches (depths ranging 100-3,000m). Three species of small cetaceans were frequently encountered (>5 sightings); pilot

whale (*Globicephala macrorhynchus*), spotted dolphin (*Stenella attenuata*) and Indo-Pacific bottlenose dolphin (*Tursiops truncatus*). Occasionally encountered species (≤4 sightings) included spinner dolphin (*Stenella longirostris*), rough-toothed dolphin (*Steno bredanensis*), Risso's dolphin (*Grampus griseus*) and *Delphinus* sp. Of the nine sightings of bottlenose dolphins, four were mixed sightings with pilot whales (*G. macrorhynchus*), pointing to an offshore ecotype. Two small groups of sperm whales were mixed with 50 and 100 unidentified dolphins. The absence of sightings of melon-headed whales (*Peponocephala electra*) and Fraser's dolphin (*Lagenodelphis hosei*), common species in Ghanaian waters, is notable. In discussion, the absence of these species' was hypothetically attributed to a gap in distribution along the coast of Liberia, as these species have both been confirmed from adjacent waters. Those species are more sensitive to noise and may have been avoiding the area, possibly as Liberian waters are subject to intense seismic survey effort. Mass stranding of melon-headed whales (*P. electra*) have subsequently been shown to be associated with seismic survey effort (de Boer *et al.*, 2016; Gray and Van Waerebeek, 2011; Southall *et al.*, 2013; van Waerebeek *et al.*, 2008). With regards to the release of seismic survey data concerning only biological observations, it was noted that some seismic exploration companies do not provide marine mammal data until a decade or more after it was collected.

The sub-committee **noted** that increased liaison between the research community and the companies that conduct such surveys, specifically to facilitate the release of marine mammal, and other biological, data in a more timely manner, would be extremely beneficial. It was highlighted that in South Africa, there is a formal understanding between seismic survey companies and academic institutions to release marine mammal data immediately. This could be used as a precedent in other countries, particularly when no other data are available.

2.2.3 Madagascar

Andrianarivelo provided a review of several studies that have assessed cetacean diversity, dolphin hunting and fisheries bycatch in ten villages in the southwest (Toliara) and southeast (Fort Dauphin) regions of Madagascar (SC/68A/SM/07). The papers summarises socio-ecological interview data gathered between 1975-99, and a combination of boat-based surveys and community interviews, conducted between 2000-18. This study documented 18 cetacean species (five whales and 13 small cetaceans) in the southwest region of Madagascar. From interview surveys alone, 14 species (six whales and eight small cetaceans) were reported in the waters of the southeast region, off Fort Dauphin. Socio-ecological surveys identified several stressors on cetacean populations, including hunting and fisheries bycatch for five species of small cetaceans: bottlenose dolphins (*T. truncatus*), spinner dolphins (*S. longirostris*), Risso's dolphins (*G. griseus*) and Indo-Pacific humpback dolphins (*S. plumbea*) and pilot whales (*G. macrorhynchus*). Two types of fishing gear, harpoon and gillnet, as well as opportunistic drive hunts, were recorded in both regions as a means to obtain cetaceans. In the Befandefa/Bevohitse community drive hunts are planned in advance (targeted hunts). Between 2000-18, at least 2,750 cetaceans were deliberately taken and 25 strandings were recorded across both regions. The small cetaceans obtained were used locally as food and were also traded outside the community. Conservation efforts involving community engagement in two separate villages in the southwest yielded drastically different outcomes. In the Anakao community, a self-sustaining conservation programme was established, resulting in the near-cessation of hunting, whereas in the Befandefa community, a similar program was launched but then abandoned midway, and resulted in the community returning to large scale drive hunts of small cetaceans. These outcomes underscore the potential success of effective community engagement, the critical importance of sustained conservation efforts and emphasises the need to comprehensively evaluate the consequences of stopping projects before they are complete.

It was noted that the stranding data differences between the two study areas might be due to misreporting and/or difference in interview effort. Although hunters were asked to report direct take separately from strandings, the interpretation of 'strandings' and the distinction between the two was not always clear. It was noted that no direct takes were recorded from southwest Madagascar. In Madagascar, small cetaceans are legally protected, however, fishermen are either ignorant of these regulations, or choose to ignore them, but do adhere to and respect community decreed rules – Dina, or local, laws.

The sub-committee **welcomed** this update and **commended** the good progress this programme had achieved, albeit partially, by reducing hunting pressure on small cetaceans in a specific area.

Attention: CG, R, CC

The Committee notes the large-scale (ca. 3,000 animals in 18 years) hunting of small cetaceans in southwest Madagascar although they are formally protected. The sustainability of these hunts is doubtful. Effective community engagement has been shown to be successful in markedly reducing hunting in one community (Anakao) and the Committee ***encourages*** *similar efforts to be resumed in the community of Befandefa, along with efforts to monitor catches and abundance of the affected populations.*

2.2.4 Kenya

A summary of the Kenya Marine Mammal Network (KMMN) was presented (SC/68A/CMP/20). The network is coordinated by the Watamu Marine Association in partnership with Kenyan government agencies, including the Kenya Wildlife Service, Kenya Marine and Fisheries Research Institute, and other coastal stakeholders. Prior to 2011, research on Kenyan marine mammals was mostly limited to a coastal aerial survey, conducted in 1996, by the Kenya Wildlife Service. This survey reported eight species of cetaceans. From 2011-18, KMMN efforts have compiled data on 24 species of marine mammals, both inshore and offshore, that total a database of 1,406 sightings. This has enabled KMMN to determine 'hotspots' for inshore cetacean populations. This information has also assisted in increasing public awareness of marine mammals in Kenya and the growth and popularity of dolphin and whale watching. This has resulted in economic benefits to both the tourism industry and to impoverished coastal communities. KMMN has succeeded in developing national conservation management strategies for marine mammals, boosting eco-tourism activities and addressing the increase of anthropological threats in Kenya waters and the Western Indian Ocean. It also highlights the value of data collected through citizen science which brings diverse communities closer together and promotes marine mammal research and effective conservation efforts in Kenya. It was noted that the IWC will hold an Entanglement Training Program in May 2019, for boat operators, fishermen and government staff.

The sub-committee **commended** the authors for initiating this new work **encouraged** the programme to be both continued and expanded to other areas in Kenya. It was noted that this might include a programme to train a broader network of cetacean observers, the implementation of a strandings network (using standardised protocols) to improve the understanding of cetacean mortality and the regulation of whale and dolphin watching guidelines. It was also highlighted that an in-depth investigation of threats to small cetaceans would be beneficial, particularly with regards to stressors associated with ports, shipping and offshore exploration. The sub-committee concluded that updates on the work of the KMMN would be welcomed at future Scientific Committee meetings.

2.2.5 Adjacent Indian Ocean Areas

A report on recent surveys for cetaceans off the coast of Fujairah in the United Arab Emirates (UAE) was presented (Baldwin *et al.*, 2018). Although not strictly Africa, the report provides new information from a data-poor region and some populations of small cetaceans may be shared by African states. The Fujairah Whale Research Project began in February 2017 and has incorporated dedicated vessel and aerial surveys. The majority of sightings were recorded in relatively deep water (500m+) and a concentration of small cetacean sightings is noted in the southeast UAE waters. Species recorded so far include pantropical spotted dolphin (*Stenella attenuata*), striped dolphin (*S. coeruleoalba*), roughtoothed dolphin (*Steno bredanensis*), common bottlenose dolphin (*Tursiops truncatus*), Indo-Pacific common dolphin (*Delphinus delphis tropicalis*), Risso's dolphin (*Grampus griseus*) and spinner dolphin (*Stenella longirostris*).

The sub-committee **welcomed** this new information from a UAE state and **encouraged** further updates on the activities and results of the research coalition that produced this paper.

3. POORLY DOCUMENTED TAKES FOR FOOD, BAIT OR CASH AND CHANGING PATTERN OF USE

A priority topic of the Scientific Committee is to better document the take of small cetaceans for consumptive and non-consumptive purposes. The products from small cetaceans are referred to as 'aquatic wildmeat' and this defined as:

> '*the products derived from aquatic mammals and reptiles that are used for subsistence food and traditional uses, including shells, bones and organs and also bait for fisheries. Aquatic wildmeat is obtained through unregulated, and sometimes illegal, hunts as well as from stranded (dead or alive) and/or by caught animals.'*

Three types of acquisition have been defined:

'Non-Targeted-Salvage' acquisition is neither planned nor intentional but is the utilisation of an aquatic mammal which is already dead and usually found: (a) stranded; or (b) accidently drowned in a net, trap, or line (bycatch).

'Non-Targeted-Deliberate' acquisition is the intentional killing of an aquatic mammal when it is: (a) found live-stranded on a beach; (b) caught alive in fishing gear; or (c) entrapped by natural phenomena (e.g. sea ice in high latitudes, changing water levels in rivers and channels).

'Targeted' acquisition is the deliberate killing of free ranging aquatic mammals that are either encountered during the course of other activities (opportunistic) or are the main target and purpose of an expedition (directed).

In 2015, the Scientific Committee established an Intersessional Correspondence Group (ICG) which was tasked with developing a toolbox of techniques that could guide and co-ordinate research into this topic, at both regional and global levels. A series of Workshops were funded by the Government of the Netherlands, which aimed to gather existing information on this issue from three key areas: Asia; South America and Africa. The multiple different methods with which existing data are gathered were discussed and potential new tools were also introduced, e.g. standardised questionnaire surveys, smartphone applications, forensic testing kits. The potential for analysing data at a regional and global scale were also debated. The first Workshop took place in Thailand in 2016, covering southeast Asia and this Workshop also incorporated the first IWC Large Whale Entanglement Training Programme in Asia. A second Workshop, that integrated both the issue of aquatic wildmeat in South America and a detailed analysis of the use of the Amazon River dolphins as bait in the piracatinga fishery, was held in Brazil in 2018. And the third and final Workshop in this series was held immediately prior to this meeting (SC/68A) in Nairobi, Kenya.

The Workshop series aimed to:

(1) identify threats, past and present, with respect to 'wildmeat', and discuss which techniques can be utilised to better understand this issue;
(2) gain a better understanding of the magnitude of small cetacean use as aquatic wildmeat, both nationally and regionally in the three areas, and to determine how aquatic wildmeat is usually acquired; and
(3) increase coordination and cooperation between countries as well as unify efforts with the Aquatic Wildmeat Working Group of the Convention on Migratory Species (CMS) who also work on this issue.

3.1 Summary of the Workshop of Poorly Documented Take of Small Cetaceans: West Africa

During the Workshop conducted immediately prior to SC/68A, information was presented by experts both from the region and by those who worked in it. Information was presented from eight countries: Benin, Cameroon, Ghana, Republic of Guinea, Mauritania, Nigeria, Senegal and Togo. The information provided focused on the species of cetaceans that were at risk, the other threats these species faced and the status of available data. The challenges of gathering data in remote and often hostile environments were highlighted. In general, information is scarce and in many countries was collected some decades ago. Consumption of cetaceans is reported in all countries, with some variations between countries in the way the cetaceans are obtained (i.e. bycatch, stranding, deliberate killing). In some countries, it is unusual for coastal communities to consume aquatic wildmeat themselves, and the majority of wildmeat is smoked or cured and distributed via the same marketing channels as terrestrial wildmeat to the interior of the African continent. In Africa, all wildmeat, be it of an aquatic or terrestrial origin, is referred to as 'bushmeat' when its primary purpose is for consumption.

The Workshop recognised that the existing ambiguity in the wildlife legislation of all countries but one is a major stumbling block to proper reporting and documentation of the magnitude of small cetacean use as aquatic wildmeat. Benin is an exception where the law specifies that it is illegal to 'possess' cetaceans, however, a comprehensive review of the relevant laws of all countries has not yet been conducted.

Discussion on how new commercial whale watching operations, in Benin in particular, took place within a joint session of WW/SM with particular reference to accelerate data collection on the occurrence and distribution of small cetaceans (Annex N, item 3).

3.1.1 Overarching recommendations

There is a growing number of reports of small cetaceans being deliberately hunted and utilised for food and non-food purposes throughout West Africa. As a result of this and other pressures, populations of small cetaceans, particularly those restricted to coastal areas, are either diminished or may have already disappeared. The Workshop also made seven overarching recommendations that can only be achieved in the longer term and with the active and dedicated participation of management authorities and government. The recommendations as agreed by the Workshop participants were circulated and are provided below. The sub-committee **agreed** to complete its review at next year's meeting when the full report is available for consideration.

Attention: CG

*The Workshop **expresses grave concern** over the use of small cetaceans as aquatic wildmeat – or 'bushmeat' – in West Africa. Given the high mortality of small cetaceans in western African waters, through both bycatch and deliberate take, the Workshop:*

*(1) **recommends** that the Contracting Governments of Benin, Cameroon, Côte d'Ivoire, Gabon, the Gambia, the Republic of Ghana, the Republic of Guinea, Guinea-Bissau, Mauritania, Senegal and Togo formally recognise the utilisation of small cetaceans, either from bycatch or deliberate take, as a serious, ongoing and potentially escalating issue in their respective countries and, in addition;*

*(2) **urges** that monitoring programmes already in place that gather fisheries data, also collate information on the occurrence of cetacean bycatch and availability in markets and that such information is incorporated into the National Progress Reports to the International Whaling Commission Scientific Committee.*

*Further, the Workshop **encourages** these Contracting Governments to establish a regional mechanism which is able to co-ordinate scientific efforts and to ensure effective cooperation among them. This may include utilising existing frameworks, such as the CMS Memorandum of Understanding concerning the Conservation of the Manatee and Small Cetaceans of Western Africa and Macaronesia.*

Attention CG; S

*Given the grave consequences of the current mortality levels noted for several West African small cetacean populations, the Workshop **recommends** that the Executive Secretary writes to the countries of Equatorial Guinea, Liberia, Nigeria and Sierra Leone, **to draw attention to** the Workshop report and the concerns and recommendations expressed therein, and to consider escalating efforts in their countries to fully investigate this issue.*

Attention: SC; S; IWC Strandings Expert Panel

Given the general lack of capacity in West African countries with regards to marine mammal specific knowledge and expertise, the Workshop:

*(1) **requests** the Secretariat communicate with CITES and enquire if marine mammal species identification training programmes can be made available to fisheries observers, scientists, and NGOs in Benin, Cameroon, Côte d'Ivoire, Gabon, the Gambia, the Republic of Ghana, the Republic of Guinea, Guinea-Bissau, Mauritania, Morocco, Senegal, Togo, Equatorial Guinea, Liberia, Nigeria and Sierra Leone; and*

*(2) **requests** the IWC Strandings Expert Panel Working Group include scientists and government officials from West Africa in the current IWC Strandings network initiative, starting with the Workshop participants listed in this report.*

Attention: CG; G; SC; CC

*There were common issues identified which, if addressed, would greatly increase the level of regional knowledge of aquatic wildmeat incidence and assist in identifying species or populations of small cetaceans at risk. The Workshop **recommends** that the Contracting Governments of Benin, Cameroon, Côte d'Ivoire, Gabon, the Gambia, the Republic of Ghana, the Republic of Guinea, Guinea-Bissau, Mauritania, Morocco, Senegal and Togo and the range states of Equatorial Guinea, Liberia, Nigeria and Sierra Leone:*

(1) review and strengthen national legislation pertaining to marine mammals to address the legality of, specifically, the use of any bycaught or beach-cast carcasses and, subsequently, undertake outreach and awareness campaigns to widely publicise updated legislation, concomitant with an increase in compliance and enforcement activities;

(2) create a national platform for researchers, NGOs and industry to provide a co-ordinated national approach to research, education, public awareness, anthropogenic impacts and conservation, highlighting as a priority the issue of non-sustainable use of small cetacean for aquatic wildmeat;

(3) recognise the potential adverse implications to human health of consuming aquatic wildmeat and, where possible, analyse aquatic wildmeat for pathogens and contaminants;

(4) consider the negative impacts on African marine life by distant water fishing fleets and take all appropriate steps with the foreign fleet governments to ameliorate destructive and unsustainable fishing activities in national waters;

(5) develop a priority list of regional, sub regional and national projects which address small cetacean issues, including specific issues, such as their use as aquatic wildmeat, species of most concern and populations that are at high risk of extirpation;

(6) conduct Environmental Impact Assessments/ Environmental Statements in line with international best practices, e.g. IUCN Guidelines, and include, as a matter of standard practise, local scientists and experts as an integral part of these assessments so that marine mammal impacts are properly and fully incorporated;

(7) incorporate marine wildlife and habitat sections into national education curriculums to inform and engage students in marine awareness and conservation issues; and

(8) support public awareness campaigns that highlight the diversity and importance of regional and national marine wildlife and resources.

3.1.2 Country specific recommendations

The Workshop also developed a series of recommendations aimed at specific countries or high priority species or areas.

Given the grave nature and the decline of small cetacean populations in all of west African waters, this Workshop urges that the following recommendations be acted upon in as timely a manner as possible by the named states.

3.1.2.1 MAURITANIA

Attention: CG
*Given the reported high mortality of small cetaceans in Mauritania, particularly harbour porpoise (Phocoena phocoena) the Workshop **encourages** the Government of Mauritania to conduct an in-depth investigation of small cetacean mortality, particularly with regards to anthropogenic activities, such as seismic exploration and fisheries. If useful, this Workshop will provide expert assistance in developing such an investigation.*

3.1.2.2 BENIN

Attention: CG
*The Workshop understood that few dedicated surveys for marine mammals had been conducted in Benin waters. As whale watching tours have recently commenced in Benin and particularly as these activities are conducted by Benin Naval vessels, the Workshop **encourages** the Government of Benin to initiate a year-round research program in collaboration with the Benin Navy so that comprehensive data sets on marine mammal occurrence in Benin waters can be collected from whale watching vessels.*

3.1.2.3 GHANA

Attention: CG; R
*As fishing communities may be unaware of the importance of the scientific study of cetaceans, and the work of scientists in the field may be hindered by the misunderstanding of these communities, the Workshop **encourages** the Government of Ghana to consider implementing a personal accreditation scheme, such as an ID card endorsed with government permission and contact details, similar to the system in place in neighbouring countries, so that scientists may more easily collect critical scientific data.*

3.1.2.4 SENEGAL

Attention: CG
*Given the reported high mortality of small cetaceans in Senegal, particularly harbour porpoise (Phocoena phocoena) in northern waters, the Workshop **encourages** the government of Senegal to conduct an in-depth investigation of small cetacean mortality, particularly with regards to anthropogenic activities, such as seismic exploration and fisheries. If useful, this Workshop will provide expert assistance in developing such an investigation.*

3.1.2.5 GUINEA

Attention: CG
*Given the growing number of coastal infrastructure projects (particularly ports developed for mineral exportation), the Workshop **encourages** the Government of Guinea to fully address the importance of critical habitat and travel corridors for cetaceans in Environmental Impact Assessments and to follow international best practices, e.g. IUCN, to mitigate negative impacts to these species.*

*In addition, the Workshop **draws attention to** the northern waters of Guinea, specifically the Tristao Islands Marine Protected Area, as a critical habitat for a transboundary population of endangered Atlantic humpback dolphin (*Sousa teuszii*) and **recommends** that this habitat is effectively protected from encroachment, as it is in Guinea-Bissau, and that research be conducted into the humpback dolphin population as a priority.*

*In addition, the Workshop **recognises** the important work already being conducted by Guinean authorities and **encourages** the Government of Guinea to continue the observer program of artisanal and commercial fisheries.*

3.1.2.6 CAMEROON

Attention: CG; CMS; IUCN
*The Workshop **commends** the Government of Cameroon for its existing and ongoing engagement with the Convention for Migratory Species (CMS) and **urges** the Government to sign the CMS Memorandum of Understanding Concerning the Conservation of the Manatee and Small Cetaceans of Western Africa and Macaronesia as soon as possible.*

*Further, the Workshop notes that the existing national legislation pertinent to marine mammals does not reflect the recently upgraded international status of several species and **requests** that the Government of Cameroon review existing legislation and harmonise it with species' status in accordance with the IUCN Red List.*

3.1.2.7 CAMEROON AND NIGERIA

Attention: CG; G; S
*The Workshop discussed the importance of the transboundary area between Cameroon and Nigeria for Atlantic humpback dolphins (Sousa teuszii) and **recommends** that the Government of Cameroon develops a comprehensive monitoring and habitat management plan at the border area of Cameroon and Nigeria, in consultation with regional and national scientists, and **requests** that the Secretariat communicates with the Government of Nigeria and highlights the importance of the Nigeria-Cameroon border area for Atlantic humpback dolphins and the desperate need for habitat protection and monitoring.*

3.1.2.8 TOGO AND BENIN

Attention: CG; R
*The Workshop discussed the importance of the transboundary area of Togo and Benin for Atlantic humpback dolphins (Sousa teuszii) and inshore bottlenose dolphins (Tursiops truncatus) and **recommends** that a comprehensive monitoring and habitat management plan is developed at the border between Togo and Benin, in consultation with regional and national scientists.*

3.1.2.9 NIGERIA

Attention: G; S
*The Workshop recognised the paucity of legislative protection for the marine mammals of Nigeria and **requests** that the Secretariat communicates with the Government of Nigeria, through the National Institute for Ocean and Marine Research (NIOMR), to establish appropriate legislation that allows for the establishment of national marine protected areas, noting that collaboration with national marine mammal experts and Nigerian NGOs will be beneficial as these groups can provide critical information on the marine mammal species and habitats that require urgent protection.*

*The Workshop also noted that ongoing oil and gas exploration and extraction surveys within the waters of Nigeria gather extensive information on marine mammal occurrence and distribution. The Workshop **requests** that the Secretariat include in communication with the Government of Nigeria the value of these data for marine mammal research and management and suggest that the immediate release of these data from the oil companies conducting the surveys would rapidly improve knowledge of marine mammals within Nigerian waters and will allow more timely management and protective measures to be put in place.*

3.2 Summary of Aquatic Wildmeat Workshop series

Attention: SC
*The Committee **thanked** the organisers and participants of the successful third Workshop on poorly documented takes for food, bait or cash and changing pattern of use that covered West Africa. It **agrees**:*

(1) that it will review the final report of the Workshop and discuss endorsement of the recommendations at the 2020 Annual Meeting; and
(2) that a synthesis of the results of the three Workshops should be developed for discussion at the 2020 Annual Meeting.

4. UPDATES FROM INTERSESSIONAL GROUPS

Progress on intersessional work was received from four groups.

4.1 Small Cetacean Task Team: South Asian River Dolphin (AG44)[1]

The Ganges and Indus river dolphins (South Asian river dolphins: Platanista) are categorised as 'Endangered' by the IUCN Red List, and continue to face numerous threats across their range countries; mortality from fisheries interactions, habitat loss from altered river flows by dams and barrages, and water pollution, at multiple spatial scales. Even with increased scientific understanding of these threats, relatively limited mitigation efforts mean that the prognosis for these species' remains poor. Large-scale threats related to water control are strongly linked with the geo-politically complex, contested, and volatile relationships between the South Asian range countries of Platanista: India, Pakistan, Bangladesh and Nepal. To deal with these challenges, it is also important for scientists from all range countries to co-ordinate their efforts and learn from each other's experiences. Indeed, threats which are perceived as localised, such as hunting or bycatch in fisheries, may have similar cultural and behavioural foundations and thus may benefit from a co-ordinated conservation effort. Diverse perceptions of these threats and impact on river dolphin populations, may provide a deeper understanding of effective solutions to reduce such threats, improved coordination between management authorities and facilitate knowledge exchange among scientists working to conserve Platanista.

In view of these needs, in 2017, this sub-committee **agreed** to establish a Task Team to coordinate research and conservation efforts for South Asian river dolphins across all range countries. Towards this goal, it is proposed to organise a Workshop in July 2019, in Kuala Lumpur, Malaysia. The Workshop will in part attempt to fill the information gaps identified by the intersessional correspondence group in 2017-18. Primary information gaps are related to: (1) identifying conservation strategies and effective actionable plans, and finding ways for their wider implementation; and (2) sharing insights from methodological and conceptual approaches for science and conservation practice across range states.

Anticipated Workshop outcomes include: (1) a report to this sub-committee at SC/68B on Workshop finding and conclusions; (2) provision of new information and population status updates for future IUCN Red List Assessments; (3) collaborative research projects proposals tackling trans-boundary regions (especially related to water sharing and flow management); and (4) coordinated proposals aimed at tackling conservation issues that may be similar across range countries (e.g. bycatch risk, compliance with environmental legislation, improved enforcement, entrapped dolphins in canals, pro-active management of isolated sub-populations).

4.2. Franciscana (ICG23)

Progress on this initiative was presented at the Conservation Management Plan sub-committee (SC/68A/CMP/19).

4.3 *Sotalia* Workshop (SG45)

Trujillo presented an update on activities of the Guiana dolphin (*Sotalia guianensis*) Intersessional Correspondence Group. The group held an informal Workshop in Lima, Peru in October of 2018, during the SOLAMAC meeting. Unfortunately, the attendance was limited and only nine researchers were present, mostly from southeastern Brazil and one from Colombia. During the Workshop, records of the occurrence and distribution of various populations of *Sotalia guianensis* were scored as: (i) resident population; (ii) frequent sightings but not enough effort to estimate occurrence patterns; and (iii) occasional sightings. In addition, the group compiled a list of institutes involved in research efforts. The group also discussed anthropogenic activities, stressors and potential threats that might affect the species and its habitat. The participants agreed that continued efforts to compile available knowledge on the Guiana dolphin and the threats it faces, would be useful for future assessment, however, the effort would benefit from increased participation. The group **agreed** to develop an online data gathering form, to be disseminated to all institutes working on this species, with the aim of improving understanding of available ecological and demographic data as well as identifying potential threats to different populations.

It was noted that that ongoing and large-scale coastal development is widespread within the regions that Guiana dolphins inhabit. The sub-committee **agreed** to explore the establishment of a task team to more quickly address the multiple pressures that this species faces.

4.4 Aquatic Wildmeat Database (ICG43)

The Aquatic Wildmeat Database Intersessional Correspondence Group presented a summary of its activities (SC/68A/SM/02). The group was initiated in 2018, following presentations at both SC/67a and SC/67b on an online data entry platform intended to collate information on Aquatic Wildmeat. The primary aims of the correspondence group were to address questions raised during discussion on the applicability of the resultant database to the work of this sub-committee and to assess the best approach to data validation and quality control.

The 'Aquatic Wildmeat Database' is an independently developed online data entry platform[2] that aims to centralise

[1]Codes here refer to SC/67b e-mail groups.

[2]See: *https://aquaticbushmeat.shinyapps.io/wildmeat/*.

available data on small cetacean use, collating data from both standard research methods and from other sources. The data is displayed via an online application, where users can view summaries of data per country and per species in the form of interactive maps, graphs and tables. Although the database is not freely downloadable, requests can be made to the database managers who may facilitate collaborations. The target audience for the database includes researchers, non-governmental organisations (NGO's), policy makers and members of the public. Given the nature of the data, especially coming from third party, online or anecdotal sources, the correspondence group determined that the best approach to data validation is by manual checking by one of the project managers. The group welcomed any comments from the sub-committee and inquired if the database might be useful to the work of other sub-committees, e.g. the Working Group on Non-Deliberate Human-Induced Mortality of Cetaceans (HIM). The group also wished to encourage IWC member countries to contribute to the database.

The Committee thanked the Aquatic Wildmeat Database Intersessional Correspondence Group and ***agrees*** *that it should continue its work and the final report should be discussed at the 2020 Annual Meeting.*

5. PROGRESS ON PREVIOUS RECOMMENDATIONS

5.1 Vaquita: update on CIRVA progress

Rojas-Bracho introduced the report of the eleventh meeting of the Comité Internacional para la Recuperación de la Vaquita (CIRVA-11), which was held at the Southwest Fisheries Science Center in La Jolla, CA from February 19-21, 2019 (see Appendix 3). Because of a recent change in the government of Mexico, the CIRVA-11 report begins with an executive summary letter to the new officials in charge - Mtra. Josefa González Blanco, Secretaria de Medio Ambiente y Recursos Naturales (SEMARNAT) and Dr. Víctor Manuel Villalobos Arámbula, Secretario de Agricultura y Desarrollo Rural (SADER). The letter explains that no more than 22 vaquitas remained alive during the summer of 2018, that each year, half of the remaining vaquitas are killed in illegal fishing nets set for another endangered species, the totoaba, and that the only remaining hope for the vaquita is to eliminate all gillnet fishing in the area where the last few vaquitas remain. CIRVA calls on the Mexican government to mobilise assets to ensure that nets are removed from this zero-tolerance area within hours of deployment, to prosecute violators, and that every effort be made to develop alternative livelihoods, as sustainable fisheries are the key to maintain support from local communities for the protection of the vaquita (SC/68A/SM/01, fig. 1).

Between Nov.-Dec. 2018 32 CPODS were lost to theft and damage at a cost close to $32,500 dollars. Despite these setbacks, the acoustic survey results combined with the 2017 photo-identification study show that the catastrophic decline of 50% per year continues, with only 6 individuals photographed in 2018, so that it is clear that the vaquita population has continued to decline and its range has contracted into a small area near the southwestern border of the Vaquita Refuge. CIRVA recommendations include: that the acoustic monitoring program continue and that the regular 46-site acoustic monitoring grid be sampled again in 2019, as in previous years, to continue the data series on population trend and provide information on distribution and occurrence; that the opportunistic use of smaller CPOD arrays be continued to assess vaquita presence and to support possible periodic photo-identification and visual monitoring efforts outside the regular summer sampling period; that the photo-identification program be properly equipped with enough boats and equipment to obtain information on the minimum number of animals alive and to use capture-recapture analysis for abundance estimation; and train local scientists so they can participate in that effort so that rapid deployment of the photo-identification team is possible when weather conditions are suitable.

The key and critical component to save the vaquita from extinction is the effort to locate and remove active and derelict totoaba nets and reduce the threat this fishing gear represents to vaquitas, other marine mammals, birds, fish and invertebrates in the upper Gulf of California. These efforts are led by the Secretariat of Environment and Natural Resources (SEMARNAT), in collaboration with the National Institute of Ecology and Climate Change (INECC), the Mexican Navy (SEMAR), other government agencies, fishers' organisations and Museo de la Ballena y Ciencias del Mar, Sea Shepherd Conservation Society and other Mexican and international NGOs. In total, 659 pieces of fishing gear were removed in 2018, most (67%) were active illegal totoaba gear, with a very high overlap between the locations where gear was found and the habitat of vaquitas. Monthly reports of net removal activities during the totoaba spawning season (December through May) are available on the IUCN Cetacean Specialist Group website: *iucn-csg.org*. These data clearly demonstrate an increase in illegal fishing for totoaba, which constitutes an ongoing threat to the existence of the vaquita. Given the continued high level of setting of illegal totoaba gillnets, as evidenced by the large numbers of nets removed in 2018, there is no question that illegal totoaba fishing and the risk it poses to the survival of vaquitas continued unabated during 2018. This illegal totoaba fishing continues at high levels in 2019. Enforcement efforts have been completely ineffective in reducing the illegal totoaba fishery in the Upper Gulf of California. Violent attacks on 19 January and 31 January 2019 by large numbers of individuals in dozens of pangas disrupted net removal efforts being conducted in the presence of Mexican Navy vessels, one of which also came under attack.

CIRVA-11 recommended that efforts to develop and implement the use of alternative fishing gear be continued and accelerated, as part of the effort to encourage alternative livelihoods for the fishing communities of the Upper Gulf. An important part of this is finding markets for shrimp and fish obtained using vaquita-safe methods. CIRVA-11 also recommended that every method be used to strengthen and incentivise involvement and conversion to alternative gear, and development of vaquita-safe markets - this includes 'culinary conservation' efforts aimed at ensuring better prices for fishery operators who adopt best practices for fishery bycatch reduction, by linking them to retailers who are willing to pay a premium for this 'marine mammal friendly' product. Such incentivising approaches can enhance efforts to modify fishing gear and/or deployment by adding to the probability of uptake and adoption of the new measures – including compliance if there are regulatory measures. On the legal side, on December 21, 2017 a group of conservation NGO petitioners filed a suit under the US Marine Mammal Protection Act, in the US District Court and on March 21, 2018, the petitioners filed suit before the US Court of International Trade (CIT). Pending final adjudication of the merits, the United States accordingly implemented an embargo on curvina, sierra, chano, and shrimp caught with gillnets within the vaquita's range.

The sub-committee welcomes the new Initiative for Sustainability of the Northern Gulf of California launched by the Ministry of the Environment and Natural Resources (SEMARNAT) and the Ministry of Agriculture and Rural Development (SADER), which recognises that improved governance, sustainability, and responsible fishing using alternative gear, are all essential components to ensure the involvement of the communities in the conservation of the vaquita and the health of the Upper Gulf of California. This sub-committee **encourages** the Government of Mexico to fully develop and implement this progamme and to provide periodic progress reports to CIRVA and the IWC Scientific Committee.

In 1975, the IWC Scientific Committee first expressed its concerns about incidental mortality of vaquita in the totoaba fishery and in 1991, recognised that 'considering the low population size and relatively high rate of incidental take in fisheries... the vaquita is in immediate danger of extinction' (IWC, 1991, p.182). Recent evidence conclusively demonstrates that the cause of the last five years catastrophic decline – increasing use of large-mesh gillnets in the illegal totoaba fishery – continues, making extinction even more likely. The sub-committee **expressed grave concern** over the continued decline and the reports of escalating violence of illegal fishermen directed at net removal vessels and crews, legal fishermen, and even the Mexican Navy. The widespread removal of research equipment and the blatant disregard for the laws and restrictions currently in place to protect the vaquita, underscores the continued failure of enforcement efforts and the lack of respect for Mexican law by illegal fishermen. The Scientific Committee is deeply concerned about reports of the escalation of violence related to the situation of the vaquita and respectfully requests that the Mexican government does all in its power to expeditiously protect all concerned, including vessel crew and fishermen.

The sub-committee **encourages** the Government of Mexico to fully consider the CIRVA-11 findings and adopt the recommendations therein, and respectfully **requests** that reports continue to be provided annually to the IWC Scientific Committee on actions and progress towards preventing the vaquita from becoming extinct.

Attention: CG

*The Committee **expresses grave concern** at the violence directed towards scientists, legal fishermen, NGOs and law enforcement agencies from those involved in the illegal totoaba fishery, which is responsible for the continued bycatch of the vaquita.*

*The Committee also **commends** the considerable contributions made by Rojas-Bracho and his Mexican colleagues on the vaquita issue and their regular expert updates to this Committee and other key fora across many years Independent advice is of fundamental importance to the work of the Committee. Given the escalating violence in the Gulf of California, Mexico, the Committee **requests** that the Government of Mexico and all in appropriate positions of power ensure that independent scientists are able to provide data, advice and their expertise free from the threat of violence and other intimidation or retribution.*

Attention: SC; CC; CG-R

*The Committee yet again **expresses its disappointment and frustration** that, despite almost three decades of repeated warnings, the vaquita's rapid decline to extinction continues because of ineffective management measures. As such, it **re-emphasises the concerns** it has raised on the status of the vaquita over many years, **reiterates the urgent recommendations** of the past three Committee meetings, and endorses and adopted the recommendations in the CIRVA-11 report (SC/68A/SM/01).*

*The precipitous decline of the vaquita reported previously has continued in 2018. As monitoring is critical for evaluating the effectiveness of conservation actions, the Committee **strongly recommends** that:*

(1) the CIRVA-11 acoustic monitoring programme be continued as in previous years to provide an annual empirical estimate of population trend, and that opportunistic use of smaller CPOD acoustic arrays be continued to assess vaquita presence and to support possible periodic photo-identification and visual monitoring efforts outside the regular summer sampling period; and

(2) photo-identification efforts proposed in CIRVA-11 be conducted as soon as possible, to obtain information on the minimum number of animals alive, [and to refine understanding of life history parameters including survival rates].

*In addition, the Committee **recommends** that the CIRVA-11 proposal to use photographic capture-recapture techniques to obtain an estimate of minimum abundance be explored (which is preferable to relying on simple single day counts of different individuals) and that: (a) local marine mammal scientists, and naturalists with training and experience in photo-identification techniques, organise rapid-response teams to take advantage of weather conditions suitable for such monitoring work; and (b) more local personnel be trained and equipped to maximise the number of opportunities to obtain photographs and potentially biopsies.*

*The Committee also **strongly endorses** the recommendations made in CIRVA-11 and:*

*(1) **advises/recommends** that the Government of Mexico fully mobilise its enforcement assets to eliminate illegal fishing in the area where the last few vaquitas survive, a small area henceforth referred to as the 'Zero Tolerance Area' (where the goal will be to remove any illegal net within hours of its deployment).*

In this Zero Tolerance Area, particularly during the totoaba season:

*(2) **urges** the Government of Mexico to:*
- *fully fund and expand net-removal efforts to maintain the area as a net-free zone;*
- *provide 24-hour surveillance and monitoring;*
- *take all necessary measures to protect net-removal teams from harm or intimidation; and*
- *arrest and prosecute illegal fishermen, for example, by placing an FGR agent on net removal ships and Navy vessels to facilitate arrests.*

*With regards to the advice of the Expert Committee on Fishing Technology (ECOFT) reported in previous CIRVA reports, the Committee **reiterates** previous recommendations (IWC, 2018) to:*
- *develop a transparent, multi-year work plan;*
- *require INAPESCA to consult and inform ECOFT before conducting new field tests or proposing the approval of new gear;*
- *implement the use of Electronic Monitoring Systems (EMSs) with video in all gear-testing and fishing operations in the Upper Gulf of California (UGC);*

- *issue fishing permits (from CONAPESCA) for small trawls by commercial vessels equipped with EMSs; and*
- *prohibit the use of monofilament or multi-monofilament nylon line in the construction of alternative gear, including purse seines and suriperas.*

While recognising that the commitments embodied in the 'Plan for the Comprehensive Care of the Upper Gulf of California and the Comprehensive Program for the Protection and Recovery of the Vaquita' were made by the previous administration, the Committee:

(1) ***urges*** *the present Government of Mexico to implement, fully and expeditiously, the commitments made in the Plan; and*
(2) ***strongly approves*** *the continued role of CIRVA with regards to their assistance in:*
- *reviewing monthly reports of enforcement efforts;*
- *participating in an enforcement contact group; and*
- *providing advice on implementation of the plan for alternative gear.*

With regards to strengthening direct linkages between the fishermen using alternative gears and the seafood buyers as a way of incentivising the conversion of the fleet to gillnet-free operations, this sub-committee:

(1) ***reiterates*** *its previous recommendation that Mexico work with gear-testing partners to conduct rigorous cost-benefit analyses on the new gears and to test markets for the vaquita-safe products and that Mexico work with producers and buyers to develop and implement a comprehensive chain of custody and traceability system for vaquita-safe products from the Upper Gulf of California, noting that it is critical that this system be in place before legal shrimp fishing resumes in September 2019 and that information is accessible to producers, buyers, and consumers.*

Finally the Committee ***reiterates*** *its previous recommendations that the Mexican enforcement agencies: (a) efforts to remove gillnets from vaquita habitat be continued and enhanced and the numbers and locations of new nets recovered be published monthly; (b) also publish monthly the number of inspections, interdictions, arrests, sentences, and other enforcement actions, together with information on observed levels of illegal activities obtained from intelligence operations, for example from drones; (c) ensure that successful prosecution and subsequent penalties be sufficient to deter illegal fishing; and (d) development of gillnet free fisheries be enhanced and linkages to incentivise the conversion of the fleet to gillnet-free operations be strengthened.*

5.2 Māui's and Hector's dolphins

The government of New Zealand presented a technical document on a newly developed Spatial Risk Assessment of Threats to Hector's and Māui dolphins (*Cephalorhynchus hectori*) (Roberts *et al.*, 2019). These issues were tackled in joint sessions of SM/ASI/HIM and is reported on by the Working Group on Non-Deliberate Human-Induced Mortality of Cetaceans (HIM) (Annex J).

5.3 International Workshop on the Status of Harbour Porpoises in the North Atlantic

Bjørge presented a brief summary of the report of Workshop on the status of North Atlantic harbour porpoise (*Phocoena phocoena*), that took place in Tromsø, Norway in December (NAMMCO/IMR, 2018). The Workshop was funded by the Institute of Marine Research and organised by NAMMCO. The Workshop was well attended by experts from USA, Canada, UK, Continental Europe and the NAMMCO countries. The Workshop discussed population structure, assessment units, abundance and bycatch estimates. Threats other than bycatch were also discussed but the Workshop concluded that the available information was insufficient for inclusion of other threats in the assessment.

The Workshop divided the North Atlantic harbour porpoises into eighteen 'assessment units' (shown in fig. 2 of the report). Input data for the assessment were time series of abundance, bycatch estimates, median estimates of r_{max}, and the posterior distribution of K' (K' is the abundance at the beginning of the time series). The outcome of the assessments were the current depletion level and the depletion level in 2025 relative to K' given that the current bycatch level continues.

The Workshop did not have equally good data from all assessment units but were able to conduct assessment for ten of the eighteen assessment units.

The Workshop also discussed harbour porpoise ecology and life history. Good life history data are important for future refinement of r_{max}.

The report provides several recommendations and Bjørge highlighted that the main message from the Workshop was that bycatch is currently the most severe threat to harbour porpoise in the North Atlantic. The Workshop therefore, recommended that it is imperative to: construct more reliable time series of bycatch data from different fisheries in the different areas; modify the database on fishing effort in such a way that the data are consistent and reliable; include bycatch data from small vessels in reporting; and conduct more reporting of bycatch by different types of gear.

The sub-committee **expressed thanks** to Bjørge for bringing forward such a significant and complete piece of work and noted that other Scientific Committee members (including Palka and Tiedemann) had also played a large role in the Workshop and completion of the North Atlantic harbour porpoise assessments. Tiedemann noted that a complete analysis of harbour porpoise stock delimitation across the entire North Atlantic was valuable in itself, although some regions (Faroes and East Greenland) had little supporting data. The distinctiveness of the East Greenland and Baltic proper subpopulations was confirmed.

Attention: SC; R; ICES; CG (range state Governments in the North Atlantic)
The Committee ***welcomes*** *and* ***draws attention*** *to the report of the International Workshop on the Status of Harbour Porpoise in the North Atlantic (NAMMCO and IMR, 2019). The Committee* ***endorses*** *its recommendations. In particular, it highlights one of the recommendations regarding bycatch made by the NAMMCO Workshop and notes that given the challenges that exist for accessing reliable bycatch data and estimates, and the importance of this information for generating scientifically sound assessments, the Committee* ***recommends*** *that it is imperative to:*

(1) construct more reliable time series of bycatch data for the different fisheries in the different areas;
(2) modify the fishing effort database in such a way that the data is consistent and reliable;
(3) include bycatch data from small vessels in reporting; and
(4) conduct more reporting of bycatch by different types of gear.

The Committee has previously expressed serious concerns regarding the status of the harbour porpoise sub-population of the Baltic Proper (IWC, 2019). The Workshop **confirmed** that the East Greenland and Baltic proper subpopulations are distinct. The Baltic Proper population is estimated at under 500 individuals and high levels of bycatch continue. Recent evidence suggests that bycatch remains the primary threat to this population (as well as the species as a whole).

The Committee was informed that the ASCOBANS Advisory Committee (ASCOBANS, 2018) had supported listing the Critically Endangered Baltic harbour porpoise sub-population population in Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals (CMS). It was noted that the German authorities announced that they will not propose listing the Baltic Sea harbour porpoise since they believed that harbour porpoise populations are increasing, the Baltic harbour porpoise is not a distinct species and thus not threatened by extinction; and that an inclusion of the Baltic harbour porpoise population in Appendix I of CMS might necessitate a closure of set net fisheries.

In discussion, it was noted that: (a) there are no data supporting an increase in either the North Sea or the Baltic Sea populations; (b) this Committee and Commission has always considered conservation and management at the level of populations as well as species; and (c) assignment of conservation status should be independent of the feasibility of mitigation.

Attention: CG, I
*The Committee **reiterates** its previous serious concern about the status of the population (IWC, 2019) and **agrees that** listing the harbor porpoise population of the Baltic Proper in Appendix I of CMS can greatly assist in conservation efforts. The Committee therefore:*

***(1) encourages** a member state of CMS to consider submitting a listing proposal for the upcoming COP of CMS in early 2020, noting that such proposals must be submitted by 19 September 2019; and*

***(2) recommends** that the Executive Secretary convey the Committee's views on this issue to the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the Federal Ministry for Food and Agriculture (BMEL) encouraging a reconsideration of their decision not to submit a proposal.*

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6. REVIEW OF TAKES OF SMALL CETACEANS

6.1 New information on directed catches

Information presented at SC/68A on the takes of small cetaceans was updated based on data compiled from online sources and data presented in the progress report on small cetacean research (Appendix 2). It summarises data on small cetacean fisheries in calendar year 2017, as well as research conducted during April 2017 to March 2018 by the National Research Institute of Far Seas Fisheries. The data and information on small cetaceans from online sources are not included in the 'National Progress Report' submitted by Japan to the SC/67b meeting. Direct catches of small cetaceans are given in the table by prefecture and type of fisheries. These data have been collected by the International Affairs Division of the Fisheries Agency of the Ministry of Agriculture, Forestry and Fisheries of the Government of Japan (FAJ), based on reports from prefectural governments. It was noted that catch statistics in the Japan Progress Report on small cetacean cover catches in the calendar year, that is, from 1 January to 31 December, following the guidelines for IWC National Progress Report, while the catch quota of small cetacean fisheries is set seasonally. Thus, in some cases, the calendar yearly catch may exceed the seasonal (yearly) catch in appearance, but in such cases, the actual seasonal catch is aligned with the allocated catch quota.

The sub-committee thanked Jimenez and Japanese participants at SC/68A for compiling these data. It was **agreed** that an assessment of takes of small cetaceans would be conducted intersessionally.

Rose presented information from a recent book (Fielding, 2018) detailing the history and practice of small cetacean hunts in St. Vincent and The Grenadines. Fielding (2018) represents a new compilation of catch data from 1949-2017 based on five separate datasets, including personal records maintained by a current whaler. The data show the predominant target species changed from the short-finned pilot whale (*Globicephala macrorhynchus*) to other dolphin species, including killer whales (*Orcinus orca*), of which 60 have been killed since 2007. Takes of dolphin average 210.6 a year but exceeded 1,000 in 2009. This high number of removals has potentially severe implications for the killer whale, as populations are generally small, have strong social bonds and it is not known what impact removals may have on demographic structure.

Attention: CG
*Given the lack of regulation of the hunt and the poorly known status of short-finned pilot and killer whale in the waters of St. Vincent and The Grenadines, available information (Fielding, 2018) raises concern that current takes are unsustainable and underscores an urgent need for research into the status of these species in national and adjacent waters. The Committee **reiterates its concern** and over-arching recommendation (IWC, 2019) that no small cetacean removals (live capture or directed harvest) should be authorised until a full assessment of status has been made.*

*In addition, given the paucity of information on tropical killer whales, it **reiterates** (IWC, 2019) that additional research is required, particularly as takes of these species regularly occur.*

Rose and Brownell provided an update on live captures in the Russian Federation. At SC/67b, it was reported that, after a two-year hiatus (2016 and 2017) in live captures for killer whale (*Orcinus orca*) and white whale (*Delphinapterus leucas*) in the Okhotsk Sea, Russian authorities proposed a total allowable catch (TAC) of 13 live killer whales for summer 2018 (IWC, 2019); this TAC and one for white whales were issued. From July to September 2018, at least 11 killer whales and 90 white whales were live-captured for trade to dolphinariums, primarily in China. The captures took place in the Shantar (killer whales) and Sakhalin Bay-Amur River (white whales) areas and the whales were moved to a holding facility in Srednyaya Bay in Nakhodka, Russia. Based on the physical characteristics of some of the white whales, it appears that several were very young and still dependent on their mothers for nutrition. Due to at least two violations of the permit conditions, involving both species, Russian authorities determined in December 2018 that the captures were illegal. Russian authorities halted exports; as of early April 2019, 87 white whales and 10 killer whales remained (it appears that four whales either escaped or died over the winter).

It was noted that at SC/65a, Shpak and Glazov (2013) presented potential biological removal (PBR) levels ranging from 29 to 42 (depending on the recovery factor used) for the Sakhalin Bay-Amur River feeding aggregation of white whales (IWC, 2014, p.351). Given these data, it was noted that removing 90 individuals in a single summer season is unsustainable.

The sub-committee further discussed that for the Okhotsk Sea population of killer whales, where takes do not consider stock structure and ecotype differences between populations, it is unknown what the impacts of these removals have on demographic structure.

Attention: CG

In light of the live capture of at least 11 killer whales between July to September 2018 in the Shantar region of the Okhotsk Sea, and information received at this meeting that Russian authorities may consider future live takes of killer whales from this region, the Committee ***strongly reiterates*** *its long-standing recommendation (IWC, 2019) that no small cetacean takes (live captures or hunts) should be authorised until a full assessment of the sustainability of these takes has been conducted.*

The Committee also expressed ***grave concern*** *regarding the removal of 90 juvenile white whales, some with potentially poor survival prospects, from the Sakhalin Bay-Amur River feeding aggregation in summer 2018; this level of removal is unsustainable. The Committee* ***recommends*** *that no more removals are authorised from the Sakhalin Bay-Amur River feeding aggregation.*

Furthermore, given the stated intention of the Russian Federation to reintroduce into the wild both the killer and white whales that were captured during the summer of 2018, the Committee ***recommends*** *that reintroductions should only be carried out with appropriate caution and with the advice of international experts on rehabilitation, so as to maximise the likelihood of individual animal survival.*

The Committee requests that the Secretariat contact the Government of the Russian Federation drawing attention to the concerns of the Committee on these matters and that the Government be requested to provide an update to the 2020 Annual Meeting of the Scientific Committee.

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7. STATUS OF THE VOLUNTARY FUND FOR SMALL CETACEAN CONSERVATION RESEARCH

7.1 Status of funds and review progress of funded projects

In 2018, donations for the Voluntary Fund for Small Cetacean Conservation Research totalling GBP£30,869.00 were received from the Government of Italy, the Government of Netherlands, the Government of the United Kingdom, Campaign Whale, Centro de Conservacion de Cetacea, Cetacean Society International, Dolphin Connection, Environmental Investigation Agency, Humane Society International, IFAW, OceanCare, ProWildlife and the Whaleman Foundation. At the end of the financial year 2018, this brought the total of the fund to GBP£72,123.00.

The sub-committee **expressed** its sincere gratitude for all of the contributions and noted that these funds support critical conservation research projects of direct relevance to the work of this sub-committee, including supporting Invited Participants to attend the Scientific Committee. Of the five projects funded from the 2016 call for proposals, all have been completed, except one which is due for completion in August 2019. Full reports will be posted on the IWC website in due course (*https://iwc.int/sm_fund*).

It was noted that, at this time, the fund was insufficient to make a call for new proposals through the usual processes of the 'Small Cetacean Conservation Research', however, it would be desirable to use the existing funds within the next year. It was noted that the funding process maintains its current transparency but that the development of a 'priority list' might assist in guiding applicants as well as focusing the work of this sub-committee. The sub-committee **agreed** to discuss a process, with the Scientific Committee Chair and the Head of Science, that is more strategic and targeted to utilise available funds more immediately, with the intention of identifying projects to fund this year.

8. WORK PLAN

The sub-committee discussed ongoing priorities and **agreed** to continue the development of new priority topics intersessionally. The work plan for period 2018-20 is shown in Table 2. For details of intersessional groups, see Annex T.

9. BUDGET REQUESTS FOR 2019-20

There are no new budget request following on from 2018 and the budget request for 2018-20 stands as shown in Table 3.

10. ADOPTION OF THE REPORT

The report was adopted at 10:20 on 18 May 2019.

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Table 2

Work plan for Small Cetacean (SM) sub-committee.

Topic	Intersessional 2018/19	2019 Annual Meeting (SC/68A)	Intersessional 2019/20	2020 Annual Meeting
Franciscana CMP	ICG to co-ordinate outcomes of CMP across sub-committees	Report to Scientific Committee	ICG to synthesis actions from 2019 SC report and develop a work plan	Report to sub-committee
Wildmeat	ICG to plan and conduct African Workshop.	Report to sub-committee	Email group to summarise workshop series and develop future work plan.	Report to sub-committee
Small Cetacean Task Team	Intersessional Workshop on South Asian river dolphins.	Report to sub-committee	Act on recommendations from 2018/19 river dolphin Workshop	Report to sub-committee
Sotalia	ICG to plan and conduct workshop no.1 (at SOLOMAC)	Report to sub-committee	ICG to plan and conduct final Workshop and liaise with Simmonds (Task Team) to explore the possible development of a *Sotalia* Task Team	Report to sub-committee
Small Cetacean Task Team: Sousa	-	-	ICG to establish an Africa-focused 'Sousa Task Team' by September 2019 and thereafter start working towards developing a comprehensive framework of conservation actions for African Sousa that considers previous IWC recommendations	Report to sub-committee

Table 3

Summary of the 2-year budget request for Small Cetacean Sub-Committee.

RP no.	Title	2019 (£)	2020 (£)
Meetings/Workshop			
Task Team Workshop	Intersessional Workshop of the task team on South Asian river dolphins	6,283	
Small Cetacean Workshop	Guiana dolphin pre-assessement (*Sotalia guianensis*) by the IWC Scientific Committee		6,993
Modelling/Computing			
Research			
Database/Catalogues			
Total request			13,276

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Appendix 1

AGENDA

1. Introduction
   - 1.1 Opening remarks
   - 1.2 Election of Chair and appointment of Rapporteurs
   - 1.3 Adoption of Agenda
   - 1.4 Review of available documents
2. A review of small cetaceans of Africa
   - 2.1 Tackling data gaps through rapid assessment and collaborative efforts
   - 2.2 Updates on small cetacean status in Africa
     - 2.2.1 Equatorial Guinea, São Tomé and Príncipe, Gabon, the Republic of Congo, the Democratic Republic of Congo and Angola
     - 2.2.2 Liberia
     - 2.2.3 Madagascar
     - 2.2.4 Kenya
     - 2.2.5 Adjacent Indian Ocean areas
3. Poorly documented takes for food, bait or cash and changing pattern of use
   - 3.1 Summary of the main outcomes of the Workshop of Poorly Documented Take of Small Cetaceans: West Africa
     - 3.1.1 Overarching recommendations
     - 3.1.2 Country specific recommendations
   - 3.2 Summary of Aquatic Wildmeat Workshop Series
4. Updates from intersessional groups
   - 4.1 Small Cetacean Task Team: South Asian River Dolphin (AG44)
   - 4.2 Franciscana (ICG23)
   - 4.3 *Sotalia* Workshop (SG45)
   - 4.4 Aquatic Wildmeat Database (ICG43)
5. Progress on previous recommendations
   - 5.1 Vaquita: update on CIRVA progress
   - 5.2 Māui's and Hector's dolphins
   - 5.3 International Workshop on the Status of Harbour Porpoises in the North Atlantic
6. Review of takes of small cetaceans
   - 6.1 New information on directed catches
7. Status of the Voluntary Fund for Small Cetacean Conservation Research
   - 7.1 Status of funds and review progress of funded projects
8. Work plan
9. Budget requests
10. Adoption of the Report

Appendix 2

SHIP STRIKES AND BYCATCH OF SMALL CETACEANS REPORTED IN THE 2019 PROGRESS REPORTS

Ship strikes of small cetaceans

Species	Large Area	Local area	Year	Individuals*	Submitted to IWC or National Ship Strike Database	Source of information
Australia						
Indo-Pacific bottlenose dolphin	Indian Ocean	Busselton	2018	0	Unknown	National collator
Netherlands						
Harbour porpoise	Atlantic Ocean – North	Dutch North Sea	2018	0	Unknown	National collator
Spain						
Pygmy sperm whale	Atlantic Ocean – North	-	2018	0	No	Marisa Tejedor
UK						
Harbour porpoise	Atlantic Ocean - North	-	2018	0	Unknown	UK_CSIP
USA						
Common bottlenose dolphin	Atlantic Ocean - North	-	2017	0	Unknown	NMFS Southeast Fisheries Science Center
Common bottlenose dolphin	Atlantic Ocean - North	-	2017	0	Unknown	NMFS Southeast Fisheries Science Center
Harbour porpoise	Atlantic Ocean - North	-	2017	0	Unknown	National collator
Common bottlenose dolphin	Atlantic Ocean - North	-	2017	0	Unknown	National collator
Common dolphin	Atlantic Ocean - North	-	2017	0	Unknown	National collator

*This column has been aggregated.

Fishery Bycatch of Small Cetaceans

Species	Large Area	Local area	Year	Individuals*	Targeted species	Gear type
Australia						
Spinner dolphin	Pacific Ocean - Coral Sea	-	2018	1	White, bull, tiger sharks	[NSC]
Common dolphin	Pacific Ocean - Coral Sea	-	2018	4	White, bull, tiger sharks	[NSC]
Indo-Pacific bottlenose dolphin	Pacific Ocean - Coral Sea	-	2018	1	-	[NSC]
Indo-Pacific bottlenose dolphin	Pacific Ocean - Coral Sea	-	2019	2	-	[NSC]
Indo-Pacific bottlenose dolphin	Pacific Ocean - Coral Sea	-	2018	2	Recreational line fishery	-
Indo-Pacific bottlenose dolphin	Pacific Ocean - Tasman Sea	Clarence River, NSW	2018	1	-	[MIS]
Common dolphin	Pacific Ocean - South	-	2018	1	-	[NK]
Indo-Pacific bottlenose dolphin	Indian Ocean	Perth Swan River	2018	1	-	[RG]
Indo-Pacific bottlenose dolphin	Indian Ocean	Perth Swan River	2018	1	-	[RG]
Indo-Pacific bottlenose dolphin	Indian Ocean	Perth Swan River	2018	2	-	[RG]
Indo-Pacific bottlenose dolphin	Indian Ocean	Perth - Hillaries Shark Barrier Area	2018	5	-	[NSC]
Indo-Pacific bottlenose dolphin	Indian Ocean	Perth Swan River	2018	1	-	[RG]
Common dolphin	Southern Ocean	Gulf St Vincent	2018	1	-	[NK]
Common bottlenose dolphin	Pacific Ocean - South	-	2018	1	-	[TBB]
Common dolphin	Pacific Ocean - South	-	2018	1	-	[TBB]
Unidentified dolphin	Pacific Ocean - South	-	2018	2	-	[TBB]
Unidentified dolphin	Pacific Ocean - South	-	2018	1	-	[SDN]
Common dolphin	Pacific Ocean - South	-	2018	1	-	[OT]
Common bottlenose dolphin	Pacific Ocean - South	-	2018	4	-	[GNS]
Common dolphin	Pacific Ocean - South	-	2018	23	-	[GNS]
Unidentified dolphin	Pacific Ocean - South	-	2018	22	-	[GNS]
Unidentified dolphin	Pacific Ocean - South	-	2018	1	-	[LLD]
Long-finned pilot whale	Indian Ocean	-	2018	1	-	[LLD]
Short-finned pilot whale	Pacific Ocean - South	-	2018	1	-	[LLD]
Short-finned pilot whale	Pacific Ocean - South	-	2018	1	-	[LLD]
Korea, Republic of						
Dall's porpoise	Pacific Ocean - Sea of Japan/East Sea	Gyeongsangbuk- do	2018	1	-	[FIX]
Pacific white-sided dolphin	Pacific Ocean - Sea of Japan/East Sea	Gangwon-do	2018	13	-	[FIX]; [GN]
Pacific white-sided dolphin	Pacific Ocean - Sea of Japan/East Sea	Gyeongsangbuk- do	2018	35	-	[FIX]; [FPO]; [GN]
Pacific white-sided dolphin	Pacific Ocean - Sea of Japan/East Sea	Busan	2018	7	-	[GN]
Pacific white-sided dolphin	Pacific Ocean - Sea of Japan/East Sea	Ulsan	2018	39	-	[GN]
Finless porpoise	Pacific Ocean - Yellow Sea	Incheon	2018	215	-	[FSN]
Finless porpoise	Pacific Ocean - Yellow Sea	Jeollanam-do	2018	13	-	[NK]; [FSN]
Finless porpoise	Pacific Ocean - Yellow Sea	Jeollabuk-do	2018	37	-	[FSN]

Cont.

Species	Large Area	Local area	Year	Individuals*	Targeted species	Gear type
Korea cont.						
Finless porpoise	Pacific Ocean - Yellow Sea	Chungcheongnam-do	2018	282	-	[NK]; [FSN]; [GN]
Finless porpoise	Pacific Ocean - East China Sea	Gyeongsangnam- do	2018	4	-	[GN]
Finless porpoise	Pacific Ocean - East China Sea	Busan	2018	1	-	[GN]
Finless porpoise	Pacific Ocean - East China Sea	Jeollanam-do	2018	2	-	[FIX]; [FPO]
Finless porpoise	Pacific Ocean - Sea of Japan/East Sea	Gyeongsangbuk- do	2018	1	-	[GN]
Harbour porpoise	Pacific Ocean - Sea of Japan/East Sea	Gangwon-do	2018	14	-	[FIX]; [GN]
Common dolphin	Pacific Ocean - Sea of Japan/East Sea	Gangwon-do	2018	51	-	[FIX]; [FPO], [GN]
Common dolphin	Pacific Ocean - Sea of Japan/East Sea	Gyeongsangbuk- do	2018	317	-	[LL]; [FIX]; [FPO]; [GN]; [TM]
Common dolphin	Pacific Ocean - Sea of Japan/East Sea	Busan	2018	1	-	[GN]
Common dolphin	Pacific Ocean - Sea of Japan/East Sea	Ulsan	2018	9	-	[GN]
Risso's dolphin	Pacific Ocean - Sea of Japan/East Sea	Gangwon-do	2018	4	-	[FIX]
Risso's dolphin	Pacific Ocean - Sea of Japan/East Sea	Gyeongsangbuk- do	2018	4	-	[FPO]; [GN]; [TM]
Mexico						
Vaquita	Pacific Ocean – Gulf of California	Sea of Cortes, Upper Gulf of California	2019	1	Totoaba	[GEN]
Netherlands						
Harbour porpoise	Atlantic Ocean – North	Dutch North Sea	2018	8	-	-
New Zealand						
Long-finned pilot whale	Pacific Ocean - South	-	2018	1	Bigeye tuna	[LLD]
Common dolphin	Pacific Ocean - South	-	2018	1	Snapper	[TBB]
Hector's dolphin	Pacific Ocean - South	-	2018	5	Rig	[GNS]
Common bottlenose dolphin	Pacific Ocean - South	-	2018	1	Swordfish	[LLD]
Common bottlenose dolphin	Pacific Ocean - South	-	2018	1	Snapper	[TBB]
Common dolphin	Pacific Ocean - South	-	2018	1	Tarakihi	[TBB]
Common dolphin	Pacific Ocean - South	-	2018	1	Jack mackerel	[TM]
Unidentified dolphin	Pacific Ocean - South	-	2018	1	Swordfish	[LLD]
Common dolphin	Pacific Ocean - South	-	2019	1	Tarakihi	[TBB]
Common dolphin	Pacific Ocean - South	-	2018	1	Tarakihi	[TBB]
Long- or short-finned pilot whale (*Globicephala* sp.)	Pacific Ocean - South	-	2018	1	Hoki	[TBB]
Common dolphin	Pacific Ocean - South	-	2018	1	Tarakihi	[TBB]
Dusky dolphin	Pacific Ocean - South	-	2018	4	Hapuku and bass	[GNS]
Killer whale	Pacific Ocean - South	-	2018	1	Southern bluefin tuna	[LLD]
Common dolphin	Pacific Ocean - South	-	2018	1	School shark	[GNS]
Dusky dolphin	Pacific Ocean - South	-	2018	1	Hoki	[TBB]
Dusky dolphin	Pacific Ocean - South	-	2018	3	Hoki	[TM]
Common dolphin	Pacific Ocean - South	-	2018	1	Tarakihi	[TBB]
Common bottlenose dolphin	Pacific Ocean - South	-	2018	1	Snapper	[TBB]
Common dolphin	Pacific Ocean - South	-	2018	1	Rig	[GNS]
Hector's dolphin	Pacific Ocean - South	-	2018	1	Elephant fish	[TBB]
Common dolphin	Pacific Ocean - South	Unknown	2018	1	Unknown	-
Hector's dolphin	Pacific Ocean - South	-	2018	3	Gurnard	[TBB]
Dusky dolphin	Pacific Ocean - New Zealand	Marlborough Sounds	2018	1	Salmon	[MIS]
Unidentified dolphin	Pacific Ocean - New Zealand	Marlborough Sounds	2018	1	Salmon	[MIS]
Hector's dolphin	Pacific Ocean - New Zealand	Nelson	2018	1	Unknown	-
Hector's dolphin	Pacific Ocean - New Zealand	Christchurch	2018	1	Unknown	-
Unidentified dolphin	Pacific Ocean - New Zealand	Wellington	2018	1	Unknown	[GN]
Spain						
Commerson's dolphin	Atlantic Ocean - North	Mar de Galicia	2018	1	-	[TBN]
Commerson's dolphin	Atlantic Ocean - North	Enseada de Feás, Ortigueira	2018	1	-	[LL]
Common dolphin	Atlantic Ocean - North	Praia de Queiruga, Porto do Son	2018	1	-	[NK]
Common dolphin	Atlantic Ocean - North	Punta Lariño sur, Muros	2018	1	-	[NK]

Cont.

Species	Large Area	Local area	Year	Individuals*	Targeted species	Gear type
Spain cont.						
Common dolphin	Atlantic Ocean - North	Porto de Vilaxoán, Vilagarcía de Arousa	2018	1	-	[NK]
Common dolphin	Atlantic Ocean - North	Praia de Langosteira, Fisterra	2018	1	-	[NK]
Common dolphin	Atlantic Ocean - North	Praia de Estorde, Cee	2018	1	-	[NK]
Common dolphin	Atlantic Ocean - North	Praia de Gandarío, Bergondo	2018	1	-	[NK]
Common dolphin	Atlantic Ocean - North	Praia de Area Maior, Malpica	2018	1	-	[GN]
Pygmy sperm whale	Atlantic Ocean - North	Porto de Porto do Son, Porto do Son	2018	1	-	[GND]
Harbour porpoise	Atlantic Ocean - North	Praia de Canido, Malpica	2018	1	-	[NK]
Common bottlenose dolphin	Atlantic Ocean - North	Praia de Fuchiños, Vigo	2018	1	-	[NK]
Common bottlenose dolphin	Atlantic Ocean - North	Enseada de Cabo de Cruz, Boiro	2018	1	-	[NK]
Common bottlenose dolphin	Atlantic Ocean - North	Praia Mexilloeira, O Grove	2018	1	-	[GN]
Striped dolphin	Atlantic Ocean - Mediterranean Sea	Gulf of Valencia	2018	2	-	-
Common bottlenose dolphin	Atlantic Ocean - Mediterranean Sea	Gulf of Valencia	2018	1	-	[PT]
Common dolphin	Atlantic Ocean - North	Canary Islands	2018	2	-	-
UK						
Common dolphin	Atlantic Ocean - North	-	2018	10	-	[NK]
Harbour porpoise	Atlantic Ocean - North	-	2018	2	-	[NK]
USA						
Risso's dolphin	Atlantic Ocean - North	-	2016	2	Pelagic swordfish, tunas and billfish	[LL]
Long- or short-finned pilot whale (*Globicephala* sp.)	Atlantic Ocean - North	-	2016	15	Pelagic swordfish, tunas and billfish	[LL]
Short-finned pilot whale	Atlantic Ocean - Gulf of Mexico	-	2016	1	Pelagic swordfish, tunas and billfish	[LL]
Unidentified dolphin	Atlantic Ocean - North	-	2016	1	Pelagic swordfish, tunas and billfish	[LL]
Common dolphin	Atlantic Ocean - North	Northeast and Mid-Atlantic US	2016	87	-	[GN]
Harbour porpoise	Atlantic Ocean - North	Northeast and Mid-Atlantic US	2016	148	-	[GN]
Risso's dolphin	Atlantic Ocean - North	Northeast and mid-Atlantic US	2016	56	-	[TBB]
Long-finned pilot whale	Atlantic Ocean - North	Northeast US	2016	29	-	[TBB]
Common dolphin	Atlantic Ocean - North	Northeast and mid-Atlantic US	2016	193	-	[TBB]
Common bottlenose dolphin	Atlantic Ocean - North	Northeast and mid-Atlantic US	2016	41	-	[TBB]
Long-finned pilot whale	Atlantic Ocean - North	Northeast US	2016	3	-	[TM]

*This column has been aggregated.

FAO Gear types used in these tables

[FIX] TRAPS - Traps (not specified)
[FPO] TRAPS - Pots
[FSN] TRAPS - Stow nets,
[GEN] GILLNETS AND ENTANGLING GEAR - Gillnets and entangling gillnets (not specified)
[GN] GILLNETS AND ENTANGLING GEAR - Gillnets (not specified
[GND] GILLNETS AND ENTANGLING GEAR- Driftnets
[GNS] GILLNETS AND ENTANGLING GEAR – Set gillnets (anchored)
[LL] HOOKS AND LINES - Longlines (not specified)
[LLD] HOOKS AND LINES - Drifting longlines
[MIS] MISCELLANEOUS GEAR
[NK] GEAR NOT KNOWN OR NOT SPECIFIED
[NSC] SHARK CONTROL NETS
[OT] MIDWATER TRAWLS - Otter trawls (not specified)
[PT] MIDWATER TRAWLS - Pair trawls (not specified)
[RG] RECREATIONAL FISHING GEAR
[SDN] SEINE NETS - Danish seines
[TBB] TRAWLS - Bottom trawls
[TBN] TRAWLS - Pair trawls
[TM] MIDWATER TRAWLS - Midwater trawls (not specified)

Appendix 3

REPORT OF THE ELEVENTH MEETING OF THE COMITÉ INTERNACIONAL PARA LA RECUPERACIÓN DE LA VAQUITA (CIRVA), SOUTHWEST FISHERIES SCIENCE CENTER (SWFSC) IN LA JOLLA, CA, USA, FEBRUARY 19-21 2019: EXECUTIVE SUMMARY

Letter to Mtra. Josefa González Blanco, Secretaria de Medio Ambiente y Recursos Naturales and Dr. Víctor Manuel Villalobos Arámbula, Secretario de Agricultura y Desarrollo Rural

Dear Secretaries,

The members of the International Committee for the Recovery of the Vaquita (CIRVA), a group that has advised the Government of Mexico on the conservation of this species since 1997, welcome the opportunity to continue in your service. We have just concluded the eleventh meeting of CIRVA, held at the Southwest Fisheries Science Center in La Jolla, California from February 19-21, 2019; a full report from the meeting is given below. Given the gravity of the current situation, we are writing to request you take immediate action to save the vaquita species from extinction.

As you know, the vaquita is on the edge of extinction and, unless action is taken now, the species will be lost within a few months or years during your administration. No more than 22 vaquitas remained alive during the summer of 2018, prior to the current fishing season. Each year, half of the remaining vaquitas are killed in illegal fishing nets set for another endangered species, the totoaba. Poachers prize totoaba for their swim bladders, which are dried and smuggled by organised crime cartels to China, where they are sold on the black market for prices that can reach $46,000 USD per kg. The acoustic monitoring program indicates that the few remaining vaquitas inhabit a very small area, approximately 24*x*12km, most of which lies within the Vaquita Refuge. However, high levels of illegal fishing for totoaba occur in this area.

This precipitous population decline has continued despite the actions taken by the Government of Mexico. We emphasise that the only remaining hope for the vaquita is to eliminate all gillnet fishing in the area where the last few vaquitas remain. This is not an impossible task, as the area to be protected is not large. However, reports from the region suggest that the illegal fishery is growing, and there have been several recent episodes of violence by illegal fishermen directed at net removal vessels and their crews, legal fishermen, and even the Mexican Navy. These events illustrate the continued failure of enforcement efforts and the lack of respect for Mexican law by illegal fishermen.

We call on the Government of Mexico to fully mobilise its enforcement assets to eliminate illegal fishing in the area where the last few vaquitas remain (please see attached figure). In this Zero Tolerance Area, where the goal is to remove any illegal net within hours of its deployment, particularly during the totoaba season, we request that the Government of Mexico:

1. fully fund and expand net removal efforts to maintain the area as a net-free zone;
2. provide 24-hour surveillance and monitoring;
3. take all necessary measures to protect net removal teams; and

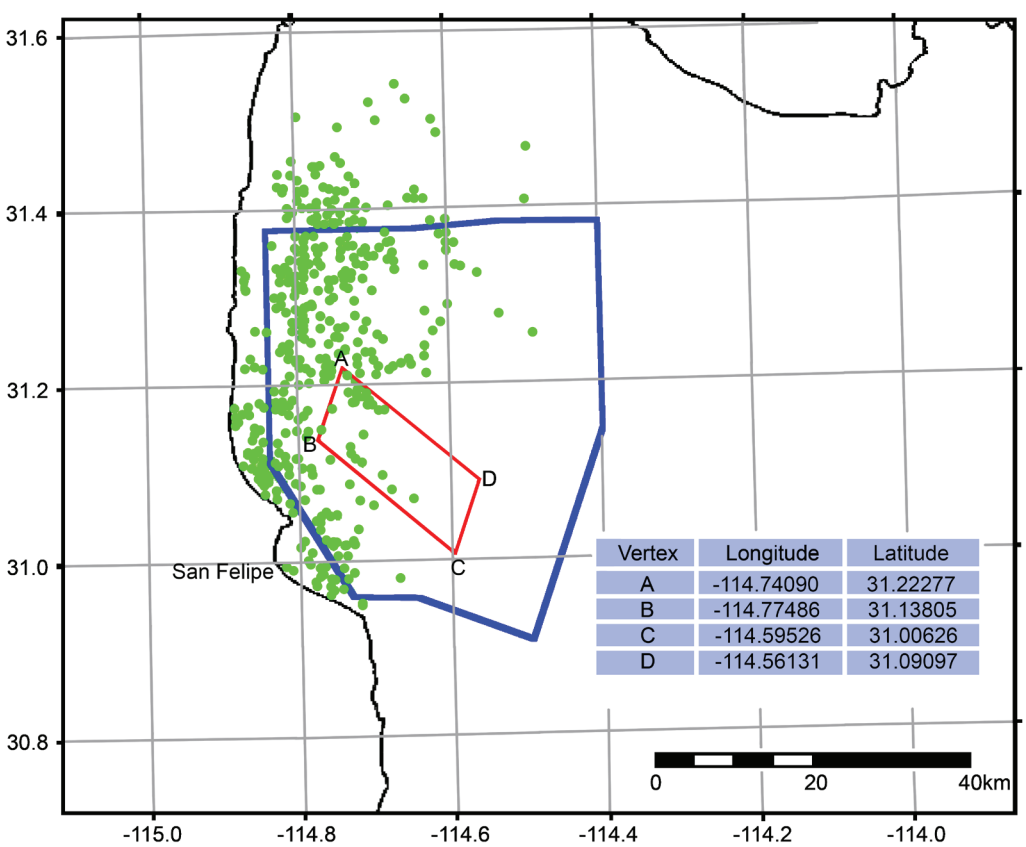

Fig. 1. The blue polygon is the 2018 Vaquita Protection Refuge. The red polygon is the recommended ZERO TOLERANCE AREA where nets must be removed within hours of being set. Green dots are active totoaba nets removed since 2016. Boundary coordinates for the Zero Tolerance Area are shown.]

4. arrest and prosecute illegal fishermen by, for example, placing an FGR agent on net removal ships and Navy vessels to facilitate arrests.

These actions must be taken immediately, as we are currently in the peak of the illegal totoaba fishing season, which extends throughout March and April. It is important to strengthen enforcement throughout the entire protected area, but CIRVA requests that net removal effort be focused on the Zero Tolerance Area at this critical time.

There is still hope. Vaquitas are still producing calves, and the remaining animals are healthy – their population decline is caused by entanglement in illegal fishing nets, not a result of issues with their habitat, disease, or a lack of food. But, without immediate, effective action on the part of the Government, the vaquita is doomed to extinction. Furthermore, continued illegal fishing will cause irreparable harm to other species in the Upper Gulf of California, to Mexico's biodiversity heritage, and to the human communities that depend on this ecosystem.

We respectfully offer to provide any assistance that will be useful in implementing these recommendations and in conserving the vaquita.

RECOMMENDATIONS – CIRVA 11

CIRVA recommends the following actions to prevent extinction of the vaquita.

Immediate - now through the end of May

We call on the Government of Mexico to fully mobilise its enforcement assets to eliminate illegal fishing in the area where the last few vaquitas remain (see attached figure). In this area of zero tolerance, particularly during the totoaba season, we request that the Government of Mexico:

1. fully fund and expand net removal efforts to maintain the area as a net-free zone;
2. provide 24-hour surveillance and monitoring;
3. take all necessary measures to protect net removal teams; and
4. arrest and prosecute illegal fishermen, for example, by placing an FGR agent on net removal ships and Navy vessels to facilitate arrests.

Near term - April through August

1. Fund and support photographic identification field efforts to take advantage of good weather 'windows' in spring.
2. Fund and continue acoustic monitoring during summer.
3. Continue and accelerate alternative efforts to develop and implement the use of alternative fishing gear.
4. Implement the *'Plan for the Comprehensive Care of the Upper Gulf of California and the Comprehensive Program for the Protection and Recovery of the Vaquita'*.

Medium term - June 2019 through the following shrimp season (September-February 2020)

1. Strengthen direct linkages between alternative gear fishermen and seafood buyers.
2. Conduct cost-earnings analyses on new gears and test markets for vaquita-safe seafood.
3. Work with producers and buyers to develop and implement comprehensive chain-of-custody and traceability methods and practices.

Long term (starting in 2019 but lasting at least several years)

CIRVA reiterates its long-standing recommendation that every effort be made to support vaquita-safe fisheries and to develop viable alternative livelihoods in the Upper Gulf of California.

Ultimately, successful vaquita conservation will depend on well-managed, sustainable fisheries that support, *and are supported by,* the local communities.