UN environment

CMS

CONVENTION ON MIGRATORY SPECIES

Distribution: General

UNEP/CMS/COP12/Inf.12
21 June 2017

Original: English

12th MEETING OF THE CONFERENCE OF THE PARTIES
Manila, Philippines, 23 - 28 October 2017
Agenda Item 24.2.3

REPORT OF THE AQUATIC MAMMALS WORKING GROUP ON AQUATIC WILD MEAT

(Prepared by the Aquatic Mammals Working Group of the Scientific Council)

Summary:

As requested by the 1st Meeting of the Sessional Committee of the Scientific Council, the Aquatic Mammals Working Group has developed a briefing document on the impact of the harvest of aquatic wild meat on selected CMS-listed species in West and Central Africa, the Indian Ocean, South-east Asia, the Caribbean, Pacific Islands Region and Latin America.

The related draft resolution and decision are available in UNEP/CMS/COP12/Doc.24.2.3.

REPORT OF THE AQUATIC MAMMALS WORKING GROUP ON AQUATIC WILD MEAT

Background

1. Increased demand for aquatic wild meat (bushmeat) is a significant and immediate threat to aquatic wildlife in many regions around the world (Alfaro and Van Waerebeek, 2001, 2013; Clapham and Van Waerebeek, 2007; Robards and Reeves, 2011).

2. Hunting for the meat of wild animals is a significant and immediate threat to the future of wildlife in many regions around the world (e.g. Brashares *et.al.,* 2004). This form of hunting is mostly for subsistence and traditional uses by coastal communities. The meat is often consumed by the hunter household, their immediate community, or sold in local markets. While some species are locally traded, the international trade is often quite limited.

3. For generations, terrestrial bushmeat consumption has been sustainable, but modern pressures and growing human population has changed the balance. (Milner-Gulland and Bennett, 2003; Brashares, *et.al.,* 2011; Cawthorn and Hoffman, 2105, 2016) A changing climate, scarcity of other meat sources and community displacement by industrial mining, commercial forestry, palm oil plantations and distant water industrialized fisheries has forced many communities into marginal areas, and their reliance on bushmeat and more recently on aquatic wild meat has grown. For instance, distant-water fleets' overexploitation of West Africa's fishery resource has produced devastating social, economic and human consequences. The artisanal fishers' livelihoods are being destroyed, a vital source of protein is being lost, and opportunities for the development of regional production and trade are disappearing. (Watson and Brashares, 2004; Daniels *et.al.,* 2016)

4. In some areas, there is evidence that the opportunistic use of bycatch has developed into directed catch. (Van Waerebeek and Reyes, 1994; Clapham and Van Waerebeek, 2007). This trend may reflect general declines in fish stocks. Several studies have demonstrated correlations between the availability and price of fish in markets and the demand for terrestrial bushmeat (Brashares *et.al.,* 2004; Nasi *et.al.,* 2008) with increasing evidence of similar links to aquatic species (e.g. Van Waerebeek and Reyes, 1994).

5. Policy effort to date has focused mainly on terrestrial bushmeat. While the concept of bushmeat (wild meat) applied to aquatic (estuarine, coastal and marine) wildlife was introduced some years ago (Alfaro and Van Waerebeek, 2001; Van Waerebeek *et.al.,* 2002) it has yet to receive the attention it requires given the likely scale of the issue. There is emerging evidence of a conservation problem on a scale similar to that documented for terrestrial bushmeat now affecting aquatic wildlife species, including cetaceans, sirenians, turtles and crocodiles.

6. The subsistence and traditional harvest of CMS Appendix I and II listed cetaceans, sirenians, turtles, and crocodiles is an issue of direct relevance for six the CMS Strategic Plan targets:

    a. Target 2: Multiple values of migratory species and their habitats have been integrated into international, national and local development and poverty reduction strategies and planning processes, including on livelihoods, and are being incorporated into national accounting, as appropriate, and reporting systems.

    b. Target 5: Governments, key sectors and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption, keeping the impacts of use of natural resources, including habitats, on migratory species well within safe ecological limits to promote the favourable conservation status

of migratory species and maintain the quality, integrity, resilience, and ecological connectivity of their habitats and migration routes.

c. Target 6: Fisheries and hunting have no significant direct or indirect adverse impacts on migratory species, their habitats or their migration routes, and impacts of fisheries and hunting are within safe ecological limits.

d. Target 11: Migratory species and their habitats which provide important ecosystem services are maintained at or restored to favourable conservation status, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

e. Target 13: Priorities for effective conservation and management of migratory species, their habitats and migration systems have been included in the development and implementation of national biodiversity strategies and action plans, with reference where relevant to CMS agreements and action plans and their implementation bodies.

f. Target 14: The traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of migratory species, their habitats and migration systems, and their customary sustainable use of biological resources, are respected, subject to national legislation and relevant international obligations, with the full and effective participation of indigenous and local communities, thereby contributing to the favourable conservation status of migratory species and the ecological connectivity and resilience of their habitats.

7. There are high-level policy discussions on terrestrial bushmeat that provide overarching guidance, including the Collaborative Partnership on Sustainable Wildlife Management (CPW), coordinated by the Convention on Biological Diversity (CBD), the Food and Agricultural Organization (FAO), and the Convention on International Trade in Endangered Species (CITES). While there is focused attention on international trade of aquatic species, these discussions are, so far, silent on managing aquatic wild meat harvest. The default assumption has been that management of aquatic species is achieved through fisheries management regimes (domestic fisheries agencies and also regional fisheries management organisations). CMS holds a unique and vital perspective given the number of harvested CMS Appendix I and II listed species.

8. This document establishes the initial information able to be gathered through the Aquatic Mammals Working Group (AMWG) about the impact of aquatic wild meat on CMS-listed species in West and Central Africa, the Indian Ocean, South-east Asia, the Caribbean, Pacific Islands Region and Latin America. Species experts outside of the AMWG also contributed. The AMWG believes that other expert input is needed for turtles, sharks and rays, and seabirds.

9. The extent of harvest is so significant, the issue so widespread, and the cross-taxa nature of the problem is evident, that establishing a thematic Aquatic Wild Meat Working Group of the Scientific Council, with a working group coordinator, is crucial.

10. The AMWG believes and is aware that the engagement of local and rural communities is critical to the management of aquatic wild meat harvests, especially those which are traditionally dependent on CMS-listed species for their livelihood. This fundamental principle has been recognised in other fora. (CITES, 2013; CBD, 2016; ABC, 2017)

11. The proposed Aquatic Wild Meat Working Group should contribute to the six Strategic Plan targets, and work closely with the relevant CMS Agreements and Memorandum of Understanding, including:

a. Western African Aquatic Mammals MOU
b. Dugongs MOU
c. IOSEA Marine Turtles MOU
d. Atlantic Turtles MOU
e. Pacific Cetaceans MOU
f. AEWA

12. The Aquatic Wild Meat Working Group will establish an aquatic wild meat knowledge base to support CMS Parties to reach Targets 2, 5, 6, 11, 13 and 14 of the Strategic Plan for Migratory Species 2015-2023 and will also serve as an expert resource for CMS to contribute to the bushmeat/wild meat discussions within the CPW and CITES, and where international coordination and cooperation is required.

Defining Aquatic Wild Meat

13. This paper focuses on specific groups of CMS-listed aquatic species, including cetaceans, sirenians and reptiles (sea turtles and crocodiles).

14. Within the scope of this paper, aquatic wild meat (also known as aquatic or marine bushmeat) is 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 wild meat is obtained through unregulated, and sometimes illegal, hunts as well as from stranded (dead or alive) and/or bycaught animals. This definition may need to be broadened to include seabirds, sharks and rays.

15. Seabird harvest is an issue of particular importance, and anecdotal information suggests the harvest is high in some regions. Collecting and presenting information about seabird harvests should be an early priority of the proposed Aquatic Wild Meat Working Group.

16. While this document has assumed that most fish species are encompassed by fisheries management regimes, and therefore sit outside of the document's definition for aquatic wild meat, the hunting of sharks and ray species, particularly CMS Appendix I species, requires further consideration. The inclusion of sharks and rays within the definition of aquatic wild meat species is complicated by their harvest methods, which include subsistence hunting and shark fining (commercial fisheries). The AMWG did not consider there was sufficient expertise within its membership to provide this answer. The CMS Parties or the proposed Aquatic Wild Meat Working Group may determine that protected sharks and rays should be included in the definition of aquatic wild meat species.

Quantifying Aquatic Wild Meat Trade

17. While attention has tended to focus on control of international trade (legal and illegal) as a threat to biodiversity, much of the world's commerce in aquatic wildlife is domestic or local, and largely unregulated. Markets in many parts of the world include local wild meat and bushmeat intermingled with domesticated species (Milner-Gulland *et.al.,* 2003; Baker *et.al.,* 2006; Baker, 2008).

18. For sea turtles, wild meat trade is both domestic and international. Domestic markets provide meat, eggs and other products within and to neighbouring countries. For instance, the Coral Triangle region of South-east Asia is a hotspot for sea turtle poaching, often involving hundreds of animals in a single operation. Intensive poaching at sea is mainly conducted by Chinese and Vietnamese operations focusing on waters of Indonesia, Malaysia and the Philippines (Lam *et.al.,* 2011; Stiles, 2008; Pilcher *et.al.,* 2009). Concerns over the scale of this illegal trade are highlighted in an Information Paper at the 66th meeting of the CITES Standing Committee, January 2016 (CITES, 2016a).

19. While the documentation surrounding sea turtles is relatively well developed, identifying the scale and impact of other aquatic wild meat trade (cetaceans, sirenians and other

reptiles) is difficult given that many of the processing occurs illicitly, at sea or away from centralised food markets. This difficulty is compounded by the fact that there is usually lack of data available to make credible assessments. Additionally, research so far has mainly focused on documenting prevalence rather than estimating the extent to which species and populations are impacted. For many species, mortality is higher than previously thought, and the concern is greater in West and Central Africa, Latin America and South/South-east Asia.

20. Quantifying the extent of aquatic wild meat trade was not completed for this document. There is an urgent need to develop methods to assess the impact of local, intranational and international trade in aquatic wild meat. The proposed Aquatic Wild Meat Working Group can help inform priorities for investigating these methods or opportunities for collaboration with the same goal.

Aquatic Wild Meat: Impact on CMS-listed Species

21. The following section summarises the available information by region. A table of the CMS-listed aquatic species that are suspected to be subject to utilization as aquatic wild meat is presented at the end of the document.

West and Central Africa

22. Many West and Central African countries have large coastal communities with limited protein supplies, which have grown in recent decades as people move from other regions to coastal areas seeking employment opportunities. There is evidence of the use of small cetaceans in most countries in the region, with meat and other body parts used both for human consumption and as shark bait (Weir, *et.al.,* 2010; Weir and Pierce, 2012; Cosentino and Fisher, 2016).

23. Ghana currently is responsible for most captures in West Africa, with 16 cetacean species affected and over a thousand animals landed each year (e.g., Debrah *et.al.,* 2010; Ofori-Danson *et.al.,* 2003; Van Waerebeek *et.al.,* 2009, 2014). As an example, the most affected species in Ghana during the period 1998-2010 were (in decreasing order) Clymene Dolphin (*Stenella clymene*), Pantropical Spotted Dolphin (*Stenella attenuata*), Melon-headed Whale (*Peponocephala electra*) and Common Bottlenose Dolphins (*Tursiops truncatus*). Other important species include Short-finned Pilot Whale (*Globicephala macrorhynchus*), a long-beaked form of Common Dolphin (*Delphinus* sp.) and Rough-toothed Dolphin (*Steno bredanensis*). Another nine species are occasionally landed (each <5 per cent) (Van Waerebeek and Ofori-Danson, 1999; Debrah *et.al.,* 2010; Van Waerebeek *et.al.,* 2014).

24. The likelihood of cetaceans regularly being utilized as aquatic wild meat throughout the region appears high (Van Waerebeek *et.al.,* 2003; 2015; Clapham and Van Waerebeek, 2007; Robards and Reeves, 2011; Leeney *et.al.,* 2015; Weir *et.al.,* 2014; Collins, 2015; Collins *et.al.,* 2015; Cosentino and Fisher, 2016). Dolphins are landed as bycatch from drift gill-nets and occasionally other fisheries, but directed captures also occur. In some cases, the meat is used as shark bait. (Van Waerebeek and Ofori-Danson, 1999; Ofori-Danson *et.al.,* 2003; Weir *et.al.,* 2008; Van Waerebeek *et.al.,* 2009, 2014; Debrah *et.al.,* 2010). There is an urgent need for risk assessments of cetacean mortality in fisheries within the northern Gulf of Guinea (de Boer *et.al.,* 2016).

25. There are recent records from several countries in the region where cetaceans are commonly consumed, e.g. Togo (Segniagbeto *et.al.,* 2014), Benin (Sohou *et.al.,* 2013), Cameroon (Ayissi *et.al.,* 2014), Nigeria (Uwagbae and Van Waerebeek, 2010). Moreover, smoked cetacean wild meat is traded as far away as northern Togo, Burkina Faso, Niger and Mali (Segniagbeto *et.al.,* 2014). The majority of artisanal fishers operating in Togolese coastal waters are of Ghanaian origin and are thought to promote trade and consumption of cetacean wild meat (Segniagbeto, *et.al.,* 2014).

26. At least 20 countries across West and Central Africa also record trade of the West African Manatee (*Trichechus senegalensis*) for food and other uses with a high incidence noted in a few countries (Powell, 1996; Dodman *et.al.,* 2007; Reeves *et.al.,* 1988; Ayissi *et.al.,* 2014; Bachand *et.al.,* 2015). Direct capture of Manatees is usually done by specialised hunters, while bycatch and subsequent consumption occur widely, both in coastal regions and far inland, noting the wide distribution of this species into the upper reaches of main rivers.

27. Marine turtles are intentionally hunted, regularly caught in local fisheries, and the meat sold in the market in Mauritania, Cabo Verde, Senegal, Côte d'Ivoire, and Guinea. (UNEP/CMS, 2000) The harvest of turtles is particularly intensive on the island of Bioko, Guinea (Castroviejo, *et al*., 1994; UNEP/CMS, 2000; Tomás, *et al*., 2010). It has been estimated that catch rates of turtles in Nigeria are in the thousands. High numbers of turtle nests are harvested, and thousands of nesting females are hunted each year. (Fa, *et al*., 2006; Lewison and Moore, 2012) Marine turtles are occasionally hunted and the meat consumed at home or parts used for traditional medicine in the Gambia, Guinea-Bissau, Sierra Leonne, Ghana, Togo, Benin (UNEP/CMS, 2000). The shells are used for sale to tourists and eggs are harvested throughout the region (UNEP/CMS, 2000). Further detailed information about marine turtle harvest was not gathered, but it is presumed to be a similar intensity to that of West Africa. Central African turtle harvests should be quantified by the proposed Aquatic Wild Meat Working Group.

28. Significant numbers of crocodiles are harvested as meat to be sold in markets in Nigeria (Fa, *et al*., 2006).

The Indian Ocean and rivers, Arabian Gulf and the Red Sea

29. Humpback whales and some small cetaceans species are intentionally hunted in Madagascar. Direct exploitation of small cetaceans is commonly reported along the western coast of Madagascar, mostly targeting Indo-Pacific Humpback Dolphins (*Sousa chinensis*), Bottlenose Dolphins and Spinner Dolphins (*Stenella longirostris*) (Andrianarivelo, 2001; Razafindrakoto *et al.,* 2004; Cerchio *et al*., 2009a, b). During a workshop to design the National 2004-2007 Fishery and Aquaculture Plan, by-catch was identified as an important threat to many cetacean, sirenian and turtle species in Madagascar's waters. Direct takes of dolphins have been reported around the Seychelles (despite cetaceans being fully protected by a national legislation); over the Mahe Plateau and the outlining islands of the Seychelles group (de Lestang, 1993).

30. Direct hunting is not as widespread as bycatch in Sri Lanka, the use of a hand-held harpoon to kill small cetaceans has been documented off the south coast of Sri Lanka (Ilangakoon, 2012). Within the past two decades, this practice has spread to other areas on the west and south-west coast, and the numbers of small cetaceans being killed annually in this manner continue to increase. The availability of dolphin flesh originally derived from accidental bycatch has led to a newly acquired taste for this non-traditional source of protein for some parts of the human population, and this demand-driven market for dolphin flesh is now fed by a growing direct take (Ilangakoon, 2012).

31. In India, Ganges River Dolphins (*Platanista gangetica*) that become entangled in nylon gillnets may be killed by fishermen to extract oil from the carcases, rather than released from the nets (Sinha 2002). In Pakistan, there is reported use of dolphin and porpoises for shark bait, food, medication and sexual gratification (Gore *et.al.,*. 2012). In Oman, dolphin meat is eaten in some communities and is also used for shark bait (Salm *et.al.,* 1993).

32. Across their range Dugongs (*Dugong dugon*) are caught for meat, oil, traditional medicines, amulets and other products. In many countries around the Indian Ocean rim hunting Dugongs is banned, and they are no longer hunted deliberately. However, Dugong products are still highly valued and stimulate direct takes. Kenyans traditionally use different parts of the Dugong for food, medical and ornamental purposes (Marsh, 2002).

33. Dugong meat has been popular in Kenya (Wamukoya *et.al.,* 1995). There is evidence of a 4,000-year-old culture of hunting Dugongs in the Arabian Gulf and the Red Sea. Dugongs are not actively hunted in Saudi Arabia. However, incidental catches in gill-nets occur. These Dugongs are eaten only by the fishers as there is no demand for Dugong meat from the town people (Preen 1989a). Dugong meat occasionally appears for sale in Eritrea. In the Gulf of Kutch, Dugong oil is valued as a preservative and conditioner for wooden boats, and the meat is believed to have medicinal value (Jones, 1967; Frazier and Mundkur, 1990; Marsh, 2002).

34. Dugong meat has been highly prized in the gulf between India and Sri Lanka (Nair *et al*. 1975). The price of Dugong meat is high, and therefore the meat is much sought after. In the Andaman and Nicobar Islands, Dugong hunting occasionally occurs, although it has reduced in recent decades (Das, 1996; Marsh, 2002; Hines *et.al.,* 2012; D'Souza *et.al.,* 2013).

35. Marine turtle poaching in the Western Indian Ocean, especially in Kenya (Nzuki, 2005), Madagascar and Mozambique (Louro *et.al.,* 2012) seems to mostly be undertaken by local fishers. In south-west Madagascar in particular, the direct take of marine turtles is well documented notwithstanding national decrees prohibiting exploitation. Poaching at sea appears to be on the increase in other areas of the country (Muttenzer, 2007; Gough *et.al.,* 2009; Rakotondrazafy and Andrianasolo, 2012; Poonian and Whitty, unpublished) both through incidental and intentional catches, locally and internationally (IOSEA 7th Meeting Doc. 10.1).

36. There is limited information on turtle takes in the northern Indian Ocean. It is believed that Olive Ridley Turtles (*Lepidochelys olivacea*) have been targeted by fishermen for their meat in the Sundarbans, Cox's Bazar, and around St Martins and Sonadia Islands (IOSEA, 2011), although egg collection is reportedly decreasing (Hasan, 2009). Most of the information around India is anecdotal and based on arrests (e.g. of fishers operating in Sri Lanka and Tamil Nadu) (IOSEA, 2010c). Egg take is extremely high in some places, for example, nearly all Olive Ridley nests along a section of coastline in Tamil Nadu were poached in the January to March nesting season in 2011 (IOSEA, 2011c). Also in Sri Lanka, it is believed that locals have collected most turtle eggs laid in the past 40 years on Rekawa beach (Ekanayake, *et.al.,* 2002) with indications that it is still occurring (Rajakruna, 2009).

37. Turtle poaching occurs in varying intensities in the Maldives (IOSEA, 2012c; 2013c). It is believed that a turtle fishery exists in Pakistan's territorial waters and has been supplying neighbouring countries with turtle meat since 2011 (IOSEA, 2011d). Surveys indicate that up to 62 per cent of people in villages along the southern and western coasts may consume turtle meat and eggs (Rajakruna, *et.al.,* 2009). On the west coast, the butchery and open sale of live turtles have been observed (Kapurusinghe, 2006).

38. There have been reports of high rates of turtle poaching for meat on offshore islands of Eritrea and Iran. Egg poaching has been documented in Eritrea and Saudi Arabia. Small-scale poaching of Green Turtles (*Chelonia mydas*) by trawling and gill-nets is thought to have affected turtle populations, but this is to be quantified. An illegal market for turtle meat in the town of Assab remains with products being sold nationally and to Yemen (IOSEA NR, 2014).

39. In Comoros, Green and Hawksbill Turtles (*Eretmochelys imbricata*) caught by local fishermen are consumed or sold, and rarely released (Poonian and Whitty, unpublished). Turtle poaching is reportedly widespread in the Moheli Marine Park as of 2009 (Moheli Marine Park, 2009). In Kenya, it has been estimated that between 10 and 50 per cent of turtles nesting on beaches and their nests (i.e. eggs) are poached to supply underground markets (Nzuki, 2004). Illegal trade was identified as occurring in backstreet houses and fish markets (Zanre, 2005). About 10 per cent of turtle products in Tana Delta and Malindi were provided by foreign fishermen – mostly from Somalia and the United Republic of

Tanzania (Nzuki, 2005). In the United Republic of Tanzania, egg collection persists although ecotourism schemes may be having some effect (Sea Sense, 2012), for example, egg harvest fell from 100 per cent (2001) to 1 per cent (2004) and 4 per cent (2005) (Ferraro, 2007).

40. In south-west Madagascar, a study estimated between 10,000 and 16,000 turtles were being caught per year by Vezo fisherman (IOSEA 2010d; 2010e). Also, another study found that the incidental fisheries bycatch of turtles in the same area was about 3,656 per year (Frontier-Madagascar, 2003). In 2003, the sale of turtle meat was thought to be common, involving an integrated chain of fisherman, dealers and traders (Walker *et.al.,* 2004), although by 2011 turtle products had proportionally declined in the curio markets (Gibbons and Remaneva, 2011). Poaching has been confirmed in northern Madagascar, with over 40 per cent of the Green and Hawksbill Turtles caught being consumed or sold (Poonian and Whitty, unpublished). In January 2012, an important traffic of plastron (bottom of the turtle shell) was identified leading to the arrest of five people (Hamitra, 2012). It was estimated that up to 40kg/week was being shipped to Toliara. A new smuggling network was also uncovered in north-west Madagascar in 2012, supplying traders in Mahajanga, but the final destination has not been identified (IOSEA NR, 2014).

41. While unquantified, there is concern over the extent of turtle poaching occurring in Mozambique based on observations of discarded turtle carapaces found along the beach (Louro *et.al.,* 2012; Williams 2012). Turtle meat used to be freely shared among villagers (Pascal, 2008), but it was reported in 2013 that the fishery had become commercial (Stein-Rostaing, 2013). In the United Republic of Tanzania, a survey found that turtle products were being sold openly and in secret at main landing sites in the Dar es Salaam (West, 2008). There are also concerns about cross-border poaching in South Africa re-emerging as a problem (IOSEA, 2014).

42. Hunting for local illegal trade is a threat for Saltwater Crocodiles (*Crocodylus porosus*) and crocodiles in the Indo-Myanmar biodiversity-hotspot complex are particularly vulnerable (Meganathan *et.al.,* 2010; Meganathan *et.al.,* 2013; Velho *et.al.,* 2012).

South-east Asia and the Timor Sea

43. There is a long history of the use of aquatic mammals for food and non-food purposes in Asia (CMS 2015). More recently bycatch has evolved into directed and commercial hunting of cetaceans and sirenians (Leatherwood and Reeves, 1989; Leatherwood, 1994; Guissamulo and Cockcroft, 1997; Reeves, *et.al.,* 2003; Tun, 2006; Clapham and Van Waerebeek, 2007). Researchers have documented an escalating use of aquatic mammals and the emergence of commercialization of trade in marine mammals. The factors that may drive marine mammal use include population reductions in species that have been traditionally targeted; diminishing returns from traditional fisheries; and an increase in market demand for marine mammal products (Porter and Lai, 2017).

44. In Taiwan, Province of China, evidence suggests that there may still be substantial illegal harpooning of cetaceans.

45. In Indonesia, directed catches of several species are known to occur in the whaling villages of Lamalera on Lembata and to a lesser extent Lamakera on Solor. Limited interviews at sea indicate that artisanal fishers and small-scale long-line vessels (i.e., <400 hooks/set) in eastern Indonesia regularly use harpoons to catch small cetaceans (Kahn, 2002c).

46. Both historically and currently, at least 29 fishing villages in the Philippines have been reported to hunt cetaceans. In the southern parts of the Philippines a group of indigenous people known as badjaos are known to consume dolphins as part of their traditional diet. A diminishing number of small-scale directed hunts still occur in a few fishing villages. The meat of cetaceans (mainly dolphins) was formerly used chiefly as bait to catch sharks and Chambered Nautilus (*Nautilus pompilius*) (Dolar, *et.al.,* 1994; 1997). A taste for dolphin

meat eventually developed among the local people and the fishermen now catch dolphins for human consumption (Dolar, 1999c).

47. Some catch data from non-discriminant fisheries, such as 'experimental nets' in southern Asia, indicate that single net sets may take thousands of cetaceans, including baleen whales, which are subsequently used for human consumption and the pet food industry (CMS, 2015). Some countries have well-publicised hunts for small cetaceans and catch data is available although the impact on local populations is unknown.

48. Substantial numbers of dolphins and dugongs have been and probably continue to be caught for human consumption in Sabah (Malaysia/Borneo) waters.

49. Declines in Dugong numbers have been linked to hunting (Marsh *et.al.,* 1997; 2004 Heinsohn *et.al.,* 2004; Perrin, *et.al.,* 2005; Mustika, 2006).

50. Hunting Dugongs have been documented throughout its range in the Philippines. Dugong meat is considered desirable as a high source of cheap protein, especially in remote areas. Dugong meat was previously sold openly in public markets. However, because of the current protected status of Dugongs, the meat is now sold secretly (Kataoka, *et.al.,* 1995; Marsh, 2002).

51. In Thailand, there was local hunting of Dugongs in the past. Now Dugongs are only consumed that have been bycaught in nets (Sae Aueng *et.al.,* 1993). In Cambodia, Dugongs are considered to bring good luck if caught, and people pay high prices for the meat, and parts (Beasley *et.al.,* 2001). The meat is either consumed locally or sold to local restaurants. Dugong meat is also eaten in various regions of Indonesia and Papua New Guinea. Dugong parts are used for traditional medicine and making religious artefacts (Sanders, 1979; Hudson, 1986; Marsh, 2002).

52. Limited hunting also occurs in Australia. Australia's indigenous peoples consider Dugong hunting to be an important expression of their identity. In the Western Islands of Torres Strait, the Dugong harvest in the 1990s has been estimated to be in the order of 1,000 individuals per year (Marsh *et.al.,* 1997; Marsh, 2002).

53. Marine turtle poaching in the Coral Triangle (South-east Asia) is thought to be on the increase (Lam, *et.al.,* 2011) for trade in China and Viet Nam. Also, to the deliberate harvest of turtles, there are an estimated 4,000 turtles being caught annually along the coast of Viet Nam as incidental bycatch (Hamann, *et.al.,* 2006). Approximately 1,115 green turtles are said to be poached annually in south-east Sulawesi (IOSEA, 2008) which was thought to have been the main location for hawksbill turtle exploitation in 2001 (Profauna Indonesia, 2003). Although it has been warned that some local populations could become extinct due to unsustainable harvest (Dethmers and Baxter, 2011), the level of poaching occurring in Sumatran waters for local consumption has not decreased (IOSEA, 2011; 2010). Warrior Reef in the Gulf of Papua New Guinea is an aggregation point for green turtles to forage and there are reports of local boats coming in at night to poach turtles (IOSEA, 2011b). Local fisherman in the Philippines are known to retain bycaught turtles (Lam, *et.al.,* 2011) but also target them while migrating (ASEAN-WEN, 2008).

54. Sea turtle egg collection appears to be pronounced in Indonesia (West Kalimantan), and Malaysia (Borneo) (WWF, 2005a), and large-scale egg collection probably also occurs elsewhere in Indonesia (IOSEA, 2013). In Malaysia, there is evidence of high egg take in Sabah (IOSEA, 2013; 2013b; ASEAN-WEN, 2008), Terengganu (Chan, 2006), and Rantau Abang (Troeng and Drews, 2004). The collection of Leatherback (*Dermochelys coriacea*) eggs at Rantu Abang is estimated to have resulted in a decrease in nests from 10,000 per year to just 3 in 2002 (Troeng and Drews, 2004).

55. In the Philippines, up to 70 per cent of eggs laid in the Tawi-Tawi Islands were subject to harvest in the past (Chan and Shepherd, 2002), and the harvests continue to recent times

(IOSEA, 2010). In Papua New Guinea, Leatherback egg collection was still widely practised along the Huon Coast until recently (Kinch, 2006). Anecdotal reports indicate that illegal egg collection still occurs along the coast of Myanmar (Win and Lwin, 2012) despite a decrease in nesting.

56. Turtle poachers from China (mainly from Hainan province) are reported to have turned to Malaysian waters for their supply of entire animals (Lam *et.al.,* 2011). Green Turtles caught by fishers in Philippine waters also appear to be traded directly with Chinese buyers in South China and the Sulu Sea, to evade enforcement controls (Lam *et.al.,* 2011). Following the contraction of a large-scale wholesale export market in Viet Nam – as a result of a domestic ban enacted in 2002 – much of the Vietnamese turtle catch was subsequently reported to be traded directly at sea in exchange for commodities brought on vessels from Hainan (Chan *et.al.,* 2009). Numerous seizures in Viet Nam, including Hawksbill Turtles, suggest that Indonesia and Malaysia could still be a source of raw scutes to use in bekko (tortoise shell) manufacture (IOSEA Mtg SS.7/Doc. 10.1).

57. Historically, Bali has been one of the world's largest markets for Green Turtles (*Chelonia mydas),* mostly supplied by people from other parts of Indonesia (notably South-east Sulawesi and Java) for national markets, but also to satisfy international demand (Troeng and Drews, 2004). Though annual volumes of turtle trade, formerly estimated in the tens of thousands (Animal Conservation for Life, 2001) appear to have significantly declined in recent years, domestic trade to supply restaurants in Bali continued to thrive in 2012 (Jakarta Globe, 2012). As of 2013, the trade of live Green Turtles shifted to processed meat, which is disguised to try to avoid detection by law enforcement authorities (Jakarta Post, 2013).

58. Information available on trade in turtle eggs in South-east Asia suggests that it may be limited to the Coral Triangle countries, especially Indonesia (East and West Kalimantan) and Malaysia (Sabah, Sarawak and Terengganu), between which exchanges appear intense. In recent years large numbers of eggs have been reported for sale in cities of Kalimantan, supplied by various Indonesian islands and elsewhere (ProFauna Indonesia, 2010). Individual confiscation of eggs numbering the thousands have also been reported recently (IOSEA Mtg SS.7/Doc. 10.1).

59. In Malaysian Borneo, eggs were reportedly sold openly without controls in Sabah and Sarawak, even though both states prohibit egg collection. Additionally, some confiscations in recent years provide insight into smuggling patterns. In Peninsular Malaysia, Terengganu is reported to have historically been a major centre for egg trade, supplied in part by eggs imported from neighbouring countries and from other Malaysian states where egg collection is illegal – attracting buyers from as far away as Indonesia (The Star, 2015; TRAFFIC Southeast Asia, 2009).

Pacific Islands Region

60. A new species or subspecies of beaked whale (*Mesoplodon sp)*, Dense-beaked Whale (*Mesoplodon densirostris*), Cuvier's Beaked Whale (*Ziphius cavirostris*) and the Pygmy Sperm Whale (*Kogia breviceps*) are used for human consumption in the islands of Kiribati. (Baker, *et.al.,* 2013) 'Drive hunting' of dolphins, including Pantropical Spotted Dolphins, Spinner Dolphins and 'Bottlenose' Dolphins (probably *Tursiops truncatus)* has a long history in the Solomon Islands, specifically on the island of Malaita (Oremus, *et.al.,* 2015).

61. Dugongs have high cultural value, and traditional legal hunting is widespread in Pacific Island Range States. Hunting is probably the main source of Dugong mortality in this region. In some areas, there has been a technology switch from harpoons to gill nets. (Kinch, 2008) The Dugong harvest of the Papua New Guinea villagers along the northern coast of Torres Strait is significant; many animals are now caught using nets (H Marsh unpublished information from a 2009 workshop in Daru, Papua New Guinea).

62. Dugong hunting in Palau is a deliberate rather than opportunistic activity and is often timed to obtain meat for special occasions. Dugong meat is also highly prized in the Solomon Islands, New Caledonia and Vanuatu (Chambers, *et.al.,* 1989; Kile, *et.al.,* 2000; Marsh, 2002).

63. Consumption of turtles across the Pacific Islands Region is widespread with deep historical roots. Legal hunting of turtles in the Oceania (Pacific Islands and Australia) accounts for 26,675 turtles per year, across 17 countries. (Humber, *et.al.,* 2014) Traditional accounts of turtle butchery and cooking indicate that nearly all fleshy parts were consumed. While universally valued, there is significant regional variability to the rules and social practices concerning turtle consumption. In many Polynesian islands, turtle consumption has been restricted to high-ranking individuals. In some, meat was consumed by males. Turtle shell has also been used widely and has been less culturally regulated. In part of Melanesia, turtle shell trade has formed an important part of society (Balazs, 1983; Broderick, 1997; Allen, 2007; Rudrud, 2010).

Caribbean

64. There are documented captures of Pilot Whales but including Pygmy and False Killer Whales (*Feresa attenuate* and *Pseudorca crassidens*), Bottlenose, Atlantic Spotted (*Stenella frontalis*), Fraser's (*Lagenodelphis hosei*) and Common Dolphins in St Vincent and the Grenadines, Trinidad and Tobago, St Lucia, and Dominica. (Bolaños-Jiménez, 2014) Intentional cetacean hunts have been documented in Haiti involving Dwarf Sperm Whales (*Kogia sima*) and Humpback Whales (*Megaptera novaeangliae*). Species being hunted in Barrouallie: Short-finned Pilot Whale, Orca (*Orcinus orca*), False Killer Whale, Rough-toothed Dolphin, Spotted Dolphin (*Stenella frontalis*), Spinner Dolphin (*Stenella longirostris*), Clymene Dolphin and Risso's Dolphin (*Grampus griseus*). (*Pers. Comm*., the Haiti Ocean Project).

65. West Indian Manatees (*Trichechus manatus*) are also hunted throughout the Caribbean both opportunistically (for instance, accidental entanglement in fishing nets) and directed captures. (Vail and Griffin, 2005).

66. Turtles are also intentionally hunted and consumed in various locations throughout the Wider Caribbean Region (*Pers. Comm* the Haiti Ocean Project).

67. In Mexico, the exploitation of sea turtles has been a traditional activity for centuries among coastal communities in regions like Baja California (BC) (Caldwell, 1963; Nabhan, 2003). In the Caribbean, sea turtles have similarly been exploited for over 200 years, in areas such as the Cayman Islands (Aiken *et.al.,* 2001; Bell *et.al.,* 2006), Turks and Caicos (Richardson *et.al.,* 2009), the British Virgin Islands, and Anguilla and Montserrat (Richardson *et.al.,* 2006). An outstanding case is Nicaragua, where over 8,000 turtles were taken annually (Lagueux *et.al.,* 2014). Nowadays by-catch and direct harvest of sea turtles still exists in several places in Latin America, including Mexico, Brazil, and the Caribbean, among others (Mancini and Koch, 2009; Senko, *et.al.,* 2014; Geubert, *et.al.,* 2013; Ankersen, *et.al.,* 2015; Richardson, *et.al.,* 2006; Lagueux, *et.al.,* 2014).

Latin America

68. At least 12 countries in Latin America record the use of cetaceans for food and non-food purposes both from targeted hunts and opportunistic catch or strandings (Van Waerebeek and Reyes, 1994; Crespo, 2009; Dawson, 2009; Flores and Da Silva, 2009; Goodall, 2009; Cosentino and Fisher, 2016). Species of concern include Botos (*Inia geoffrensis*), Dusky Dolphins (*Lagenorhynchus obscurus*), Long-beaked Common Dolphins (*Delphinus capensis*), Burmeister's Porpoises (*Phocoena spinipinnis*) and Common Bottlenose Dolphins.

69. Boto are illegally harvested for use as bait in fisheries for Catfish (*Calophysus macropterus*) (Mintzer, *et.al.,* 2012). The use of Dusky Dolphins as bait in long-line and gill-net shark fisheries in the Pacific appears prolific and is increasing (Van Waerebeek and Würsig, 2009; Mangel, *et.al.,* 2010). Peale's Dolphins (*Lagenorhynchus australis*) are hunted as aquatic wild meat for use as crab bait, although changes in the dynamic of this fishery may have lessened this pressure (Lescrauwaet and Gibbons, 1994; Goodall, 2009).

70. At least eight countries note the directed take of sirenians, both the West Indian Manatee (*Trichechus manatus*) and the Amazon Manatee (*Trichechus inunguis*), for food and non-food purposes (Braga Ferreira, *et.al.,* 2011; Luna, *et.al., 2*008).

71. There has historically been sea turtle consumption in the Pisco-San Andres area south of Lima, where a sophisticated turtle trafficking network thrived in the Pisco area during 1970s and 1980s. Turtle harvesting was operated by seven to ten boats exclusively dedicated to catching sea turtles, using specially designed nets with a well-established trafficking structure. The average catch was between 10 to 30 turtles per vessel per day, and the captures were mainly composed by Green Turtles and, to a lesser extent, Leatherbacks (Frazier, 1979; Hays-Brown and Brown, 1982). In 1987 up to 110 boats were recorded landing turtles in Pisco, standing as the largest sea turtle harvest ever recorded in Peru. In just 10 months, over 20,000 turtles were landed. Sea turtle extraction was a legal activity until 1995 when a total ban on the use of all the sea turtle species was established by Peruvian legislation (Morales and Vargas, 1996). However, the hunting still continues in Pisco using incidental and directed illegal captures (Quiñones, *et.al.,* 2010).

Implications for Human Health

72. For generations, terrestrial and aquatic wild meat consumption has been sustainable, but modern pressures and growing human population has changed the balance. (Milner-Gulland and Bennett, 2003; Brashares, *et.al.,* 2011; Cawthorn and Hoffman, 2015, 2016) A changing climate, scarcity of other meat sources and community displacement by industrial mining, commercial forestry, palm oil plantations and distant water industrialized fisheries has forced many communities into marginal areas, and their reliance and harvest of new forms of wild meat have grown. This has forced communities to depend on meat sources that could carry human health risks.

73. Although the majority of emerging infectious diseases can be linked to wildlife sources, most pathogen spill-over events to people could likely be avoided if the transmission was better understood and practices adjusted to mitigate risk. Harvesting and handling of high-risk taxa, poor biosafety and potential for disease spread through the movement of regional or international market visitors are all risk factors for the occurrence of a disease emergence event similar to the public health catastrophes of Severe Acute Respiratory Syndrome and Ebola virus disease. (Greatorex, *et.al.,* 2016) While most research has concentrated on terrestrial bushmeat, there is sufficient information to warrant caution and concern relating to aquatic species as well.

74. While the association between infectious diseases and the bushmeat/wild meat trade is well established in the research community, risk perception among bushmeat/wild meat hunters and traders has not been well characterized. A study conducted in Sierra Leone found that individuals that engaged exclusively in preparation and trading of bushmeat/wild meat were more likely to accidentally cut and expose themselves to potential zoonotic pathogens compared to those that primarily engaged in bushmeat/wild meat hunting; and women involved in bushmeat/wild meat trade are at greater risk of exposing themselves to potential zoonotic pathogens through accidental self-cutting compared to men (Subramanian, 2012).

75. There are many hazards associated with the consumption of sea turtle products (e.g., meat, adipose tissue, organs, blood, eggs) due to the presence of bacteria, parasites, biotoxins, and environmental contaminants. Reported ill health effects of consuming sea

turtles infected with zoonotic pathogens include diarrhoea, vomiting, and extreme dehydration, which occasionally have resulted in hospitalization and death. Persistent organic pollutants (POPs) – such as organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), and polybrominated diphenyl ethers (PBDEs) – and heavy metals have been reported in sea turtles at various stages of their life cycle. (Aguirre, *et.al.,* 2006; Frías-Espericueta, *et.al.,* 2006; Senko, *et.al.,* 2009; Gardner, *et.al.,* 2006; van de Merwe, *et.al.,* 2009; Warwick, *et.al.,* 2013) These levels have been shown to exceed international food safety standards and could result in toxic effects including neurotoxicity, kidney disease, liver cancer, and developmental effects in foetuses and children.

76. Researchers have documented high concentrations of total mercury and methyl-mercury in cetacean meat in St. Vincent, West Indies, as compared to published data for other seafood products (Fielding and Evans, 2014). These mirror more extensive studies elsewhere in the world.

77. Long-term independent studies of children in the Faroe Islands have directly linked neurological delays, cardiovascular problems and other development problems to their mother's pre-natal consumption of whale meat. In addition, recent studies have shown a direct link between the occurrence of Parkinson's disease in Faroese adults and eating Pilot Whale meat (Weihe and Joensen, 2012) In response to these findings, on 8 August 2008 the Faroe Islands' Chief Medical Officer and Chief Physician wrote an open letter to the Government stating that "*pilot whales today contain contaminants to a degree that neither meat nor blubber would comply with current limits for acceptable concentrations of toxic contaminants….*". Prenatal exposure to MeHg has been associated with clear effects on the developing brain. Cohort studies in the Faroe Islands have demonstrated that children exposed to MeHg in utero exhibit decreased motor function, attention span, verbal abilities, memory, and other mental functions (Weihe, *et.al.,* 2016).

78. The interpretation of the spatial and temporal patterns of variation in organochlorine concentrations in marine mammal populations is complex because of the lack of wide-scale, long-term surveys. Most research is concentrated in western Europe, northern America and areas of Asia, while it is extremely limited or non-existent in Africa and most regions of the southern hemisphere. Marine mammals from the temperate fringe of the northern hemisphere, particularly fish-eating species which inhabit the mid-latitudes of Europe and North America, show the greatest organochlorine loads. Concentrations in the tropical and equatorial fringe of the northern hemisphere and throughout the southern hemisphere are low or extremely low. During recent decades, levels have increased in regions located far from the pollution source as a consequence of atmospheric transport and redistribution (Aguilar, *et.al.,* 2002).

79. Close contact with marine mammals also poses human health risks. Marine mammal zoonoses, if left untreated, induce life-threatening systemic diseases that could pose public health risks. It is probable that the number of known zoonoses from marine mammals will expand. The consumption of raw or undercooked pinniped or cetacean meat has resulted in bacterial (e.g. *salmonellosis* and *botulism*) and parasitic (*trichinellosis* and *toxoplasmosis)* diseases in humans (Bender, *et.al.,* 1972; Tryland, 2000; McLaughlin, *et.al.,* 2004; Van Bressem, *et.al.,* 2009; Tryland, *et.al.,* 2012).

80. Some zoonotic agents are of particular relevance as foodborne pathogens, such as *Trichinella spp., Toxoplasma gondii, Salmonella* and *Leptospira spp*. Also, *Mycoplasma spp. parapoxvirus* and *Mycobacterium spp.* constitute occupational risks during handling of marine mammals and marine mammal products. (Tryland, *et.al.,* 2012) The zoonotic hazard of marine mammal *brucellosis* and *toxoplasmosis* may have been underestimated, attributable to frequent misdiagnoses and underreporting, particularly in developing countries and remote areas where carcass handling without protective gear and human consumption of fresh cetacean products are commonplace. Environmental factors seem to play a role in the emergence and pathogenicity of various infectious diseases. Inshore and estuarine cetaceans incur higher risks than pelagic cetaceans due to habitats often

severely altered by anthropogenic factors such as chemical and biological contamination, direct and indirect fisheries interactions, traumatic injuries from vessel collisions and climate change (Van Bressem, *et.al.,* 2009).

81. Biological risks associated with the consumption of products from both farmed and wild reptile meat and eggs include infections caused by bacteria (*Salmonella spp., Vibrio spp.*), parasites (*Spirometra, Trichinella, Gnathostoma, pentastomids*), as well as intoxications by biotoxins. For crocodiles, *Salmonella spp*. constitute a significant public health risk due to the high intestinal carrier rate which is reflected in an equally high contamination rate in their fresh and frozen meat (Magnino, *et.al.,* 2009).

Collaboration with Other Fora

82. The Convention on Biological Diversity (CBD) and the Collaborative Partnership on Sustainable Wildlife Management (CPW), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Scientific Committee of the International Whaling Commission (IWC) and Abidjan Convention (ABC) have made recent decisions that have direct relevance to CMS and aquatic wild meat.

Convention on Biological Diversity and the Collaborative Partnership on Sustainable Wildlife Management (CPW)

83. At the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP10, 2010) Parties took note of the recommendations of the Bushmeat Liaison Group, including the definition of bushmeat (or wild meat) hunting as the harvesting of wild animals in tropical and sub-tropical forests for food and for non-food purposes, including medicinal use.

84. In March 2013, the Collaborative Partnership on Sustainable Wildlife Management (CPW), coordinated by CBD and the Food and Agricultural Organisation (FAO) was formed, as a voluntary association of international organisations with substantive mandates and programmes to promote the sustainable use and conservation of wildlife resources. CMS and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) are founding partners. In March 2015, a CPW Bushmeat Sourcebook was launched and included information about the contribution of terrestrial bushmeat to food security and local livelihoods and how unsustainable harvesting can affect the ecological stability of ecosystems. Aquatic wild meat has not so far been considered in these CPW discussions.

85. CBD COP12 (2014) endorsed a draft Action Plan for Article 10c, which focuses on enhancing the role of customary laws, traditional knowledge and community protocols for sustainable use and management of wildlife. COP12 also agreed to progress an analysis of the impact of subsistence use of wildlife on the survival and regeneration of wild species.

86. At the thirteenth CBD COP 'Decision XIII/8. Sustainable Use of Biodiversity: Bushmeat and Sustainable Wildlife Management' furthered this work, and specifically asked the Executive Secretary to:

    a. further elaborate technical guidance for better governance towards a more sustainable bushmeat sector;
    b. organize a Wildlife Forum event, facilitating the involvement of Parties, other Governments and relevant stakeholders, including indigenous peoples and local communities, to consider and define the priorities for work on sustainable wildlife use and management; and
    c. enhance synergies with the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services about the re-scoping of the assessment on the sustainable use of biodiversity. (CBD, 2016).

Convention on International Trade in Endangered Species of Wild Fauna and Flora

87. CITES has also been progressing bushmeat work, especially as it pertains to international trade. In 2004 CITES recognized that the scale of, and trade in, terrestrial bushmeat harvest was impacting certain species, especially in sub-Saharan Africa, and may be one of some pressures impacting an even greater number of species. A Central Africa Bushmeat Working Group has been established, and an important handbook on CITES and livelihoods developed (CITES, 2016b).

Scientific Committee of the International Whaling Commission

88. In 2015, the Small Cetacean Sub-Committee of the International Whaling Commission (IWC) prioritized the issue of wild meat, due to concern that localized takes of small cetaceans were escalating and that some populations were being subject to unsustainable pressure. Three regional workshops were proposed, to take place between 2016 and 2018, each aiming to better understand the extent of the wild meat issue in Asia, South America and Africa. A 'toolbox' of investigative techniques was developed, which include; formats for semi-structured community interviews that are mobile app-based thus standardizing data collection and establishing a centralized database; the use of wildlife forensic tools to quickly identify cetacean products for sale in markets; 'big-data' review, including social media platforms, to collate information on fisheries, the socio-economic climate, consumer trends, etc., and thus build models to explore the relationship between these and the prevalence of wild meat consumption. The workshops will comprise of biologists, social scientists, manager authorities and NGOs. The first of these workshops was held in Thailand in 2016, and the second will be held in Brazil in 2017. The main outcome of the Thailand workshop was to formalize co-operation on this issue in Asia and to establish a common reporting database. A CMS representative provided advice and greatly contributed to the reporting initiative at this workshop (IWC, 2015; 2016; 2017).

Abidjan Convention

89. At the twelfth Conference of the Parties to the Abidjan Convention (ABC COP12) in March 2017, Parties considered the direct consumption and other uses of endangered, threatened or protected coastal and marine species and the African Strategy to Combat Illegal and Unlawful Trade in Wild Fauna and Flora in Africa (ABC, 2017).

90. The development of a programme to assess wild meat harvest of aquatic mammal, reptile and amphibian species on sale in markets, the origins of the meat, and which species are traditionally caught and consumed was strongly supported (ABC, 2017).

91. ABC COP12 invited CMS, the CMS Memorandum of Understanding concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa, Western African Aquatic Mammals MOU, CBD, FAO, CPW, CITES, World Bank, International Union for Conservation of Nature (IUCN), West Africa Biodiversity and Climate Change (WA-BiCC), OceanCare and other NGO partners, led by the Abidjan Secretariat, to develop an *Abidjan Convention Action Plan to Combat Trade, Direct Consumption, Illegal Logging, and Other Uses of Endangered, Threatened or Protected Coastal and Marine Species*, to be presented for consideration and adoption at ABC COP13 (2020) (ABC, 2017) .

<u>Discussion and analysis</u>

92. Increased demand for aquatic wild meat is a significant and immediate threat to aquatic wildlife in many regions around the world. There are serious human health implications associated with the consumption of some species.

93. This harvest of cetaceans sirenians, turtles, and crocodiles listed on CMS Appendix I and II is an issue of direct and fundamental relevance for CMS Strategic Plan targets 2, 5, 6, 11, 12, 13 and 14.

94. International policy effort is currently focused on terrestrial bushmeat and international trade. Local aquatic wild meat harvests are pervasive and largely unregulated. The increased demand for aquatic wild meat is a significant and immediate threat to aquatic wildlife in many regions around the world (Alfaro and Van Waerebeek, 2001, 2013; Clapham and Van Waerebeek, 2007; Robards and Reeves, 2011).

95. CMS is unique in its ability to facilitate a wide group of technical experts, with taxonomic and regionally specific information, as is demonstrated by this cross-taxa and thematic document. CMS can also disseminate this information through the CMS Family, including Western African Aquatic Mammals MOU, Dugongs MOU, IOSEA Marine Turtles MOU, Atlantic Turtles MOU and Pacific Cetaceans MOU.

96. While this document has been facilitated by volunteer effort from within the Aquatic Mammals Working Group (AMWG), the issue is bigger than the AWMG group can sustain, and the current Scientific Council structure has limited focused capacity to take the issue forward in the coming triennium.

97. If established, the proposed Aquatic Wild Meat Working Groups could:

    a. establish an aquatic wild meat knowledge base to support CMS Parties to reach Targets 2, 5, 6, 11, 12, 13 and 14 of the Strategic Plan for Migratory Species 2015-2023;

    b. serve as an expert resource for CMS to contribute to the bushmeat/wild meat discussions within the CPW and CITES, and where international coordination and cooperation is required;

    c. collect and present information about seabird harvests, for consideration by Parties at CMS COP13;

    d. facilitate a discussion about the inclusion of CMS-listed sharks and rays as aquatic wild meat species, and form a recommendation for consideration by Parties at CMS COP13;

    e. investigate methods or opportunities for collaboration to quantify the extent of the aquatic wild meat trade;

    f. provide information on the extent of Central African turtle harvests;

    g. provide technical guidance about aquatic wild meat harvests, to inform the CBD process;

    h. provide information for, and participate in, the proposed CBD Wildlife Forum event to consider and define priorities for work on sustainable wildlife use and management;

    i. continue to share information with the IWC Small Cetacean Sub-committee and participate in future Small Cetacean Sub-committee meetings with a focus on aquatic wild meat; and

    j. contribute to the development of the *Abidjan Convention Action Plan to Combat Trade, Direct Consumption, Illegal Logging, and Other Uses of Endangered Threatened or Protected Coastal and Marine Species*;

Contributors

98. This document was developed through the Aquatic Mammals Working Group, with support from experts outside of the group. Margi Prideaux facilitated expert contribution from Scott Baker, Tim Collins, Mel Cosentino, Nicola Hodgins, Donna Kwan, Sigrid Lüber, Narelle

Montgomery, Jim Moore, Lindsay Porter, Javier Antonio Quiñones Davila, Meike Scheidat, Joanna Toole, Alison Wood and Koen Van Waerebeek. Comments were gratefully received from Vin Fleming, Heidrun Frisch-Nwakanma, Andrea Pauly, Melanie Virtue and James Williams.

CMS Species of Concern by CMS Appendices and Region

The following species represent an initial list of CMS-listed species by appendices and region. More detailed regional analysis is required.

	CMS Appendix I	CMS Appendix II
West and Central Africa	Atlantic Humpback Dolphin (*Sousa teuszii*) West African Manatee (*Trichechus senegalensis*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Kemp's Ridley Turtle (*Lepidochelys kempii*) Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*)	Atlantic Humpback Dolphin (*Sousa teuszii*) Clymene Dolphin (*Stenella clymene*) Common Bottlenose Dolphin (*Tursiops truncatus*) Pantropical Spotted Dolphin (*Stenella attenuata*) West African Manatee (*Trichechus senegalensis*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Kemp's Ridley Turtle (*Lepidochelys kempii*) Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*)
The Indian Ocean and rivers, Arabian Gulf and the Red Sea	Ganges River Dolphin (*Platanista gangetica*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Kemp's Ridley Turtle (*Lepidochelys kempii*) Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*)	Ganges River Dolphin (*Platanista gangetica*) Indo-Pacific Humpback Dolphin (*Sousa chinensis*) Common bottlenose Dolphin (*Tursiops truncatus*) Spinner Dolphin (*Stenella longirostris*) Dugong (*Dugong dugon*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Kemp's Ridley Turtle (*Lepidochelys kempii*) Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*) Salt-water Crocodile (*Crocodylus porosus*)
Southeast Asia and the Timor Sea	Ganges River Dolphin (*Platanista gangetica gangetica*)	Ganges River Dolphin (*Platanista gangetica gangetica*) Indo-Pacific Bottlenose Dolphin (*Tursiops aduncus*)

	CMS Appendix I	CMS Appendix II
	Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*) Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*) Gharial (*Gavialis gangeticus*)	Indo-Pacific Humpback Dolphin (*Sousa chinensis*) Spinner Dolphin (*Stenella longirostris*) Dugong (*Dugong dugon*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*) Olive Ridley Turtle (*Lepidochelys olivacea*) Flatback Turtle (*Natator depressus*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*) Salt-water Crocodile (*Crocodylus porosus*)
Pacific Islands Region	Cuvier's Beaked Whale (*Ziphius cavirostris*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*)	Common Bottlenose Dolphin (*Tursiops truncatus*) Pantropical Spotted Dolphin (*Stenella attenuata*) Spinner Dolphin (*Stenella longirostris*) Dugong (*Dugong dugon*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*)
Caribbean	Common Dolphin (*Delphinus delphis)* West Indian Manatee (*Trichechus manatus*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Kemp's Ridley Turtle (*Lepidochelys kempii*)	Clymene Dolphin (*Stenella clymene*) Common Bottlenose Dolphin (*Tursiops truncatus*) Common Dolphin (*Delphinus delphis)* Fraser's Dolphin (*Lagenodelphis hosei*) Orca (*Orcinus orca*) Risso's Dolphin (*Grampus griseus*) Spinner Dolphin (*Stenella longirostris*)

	CMS Appendix I	CMS Appendix II
	Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*)	West Indian Manatee (*Trichechus manatus*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Kemp's Ridley Turtle (*Lepidochelys kempii*) Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*)
Latin America	Franciscanas (*Pontoporia blainvillei*) West Indian Manatee (*Trichechus manatus*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*) South American River Turtle (*Podocnemis expansa*)	Boto (*Inia geoffrensis*) Burmeister's Porpoise (*Phocoena spinipinnis*) Commerson's Dolphin (*Cephalorhynchus commersonii*) Dusky Dolphin (*Lagenorhynchus obscurus*) Franciscanas (*Pontoporia blainvillei*) Guiana Dolphin (*Sotalia guianensis*) Spectacled Porpoise (*Phocoena dioptrica*) Tucuxis (*Sotalia fluviatilis*) Peale's Dolphin (*Lagenorhynchus australis*) Amazon Manatee (*Trichechus inunguis*) West Indian Manatee (*Trichechus manatus*) Green Turtle (*Chelonia mydas*) Hawksbill Turtle (*Eretmochelys imbricata*) Olive Ridley Turtle (*Lepidochelys olivacea*) Leatherback Turtle (*Dermochelys coriacea*) Loggerhead Turtle (*Caretta caretta*) South American River Turtle (*Podocnemis expansa*)

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