

# SC/69A/CMP/04/Rev1

**Sub-committees/working group name:**

**Progress report from the Arabian Sea Whale Network**

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# Progress report from the Arabian Sea Whale Network

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## Abstract:

The Arabian Sea Whale Network (ASWN) is an informal collaboration of researchers and conservation bodies interested in the conservation of whale populations throughout the Northern Indian Ocean. Formed in 2015, the Arabian Sea humpback whale (ASHW) acts as a flagship species, but members collaborate on multiple aspects of cetacean research and conservation. This progress report includes updates on regional-level collaborative activities undertaken between May 2022 and April 2023, as well as updates on project-by project or national level activities undertaken by partners in the region. Regional level activities have been extremely limited due to the lack of funding for coordination. However, there has been significant progress at some national levels, and ASWN members are in regular communication and provide continued technical support to each other. Once again, the project updates from partners demonstrate a clear trend toward increased capacity and dedicated capacity building activities for local scientists. Many countries are actively expanding their local and national sighting and stranding reporting networks through the use of social media and dedicated outreach materials, and an increasing number of coastal surveys are being conducted in Arabian/Persian Gulf countries. Despite this increased observation and reporting effort, no humpback whale sightings were reported from the Gulf in the past year, and only one sighting record of three individuals was obtained from India. It is hoped that increased awareness and capacity building in ASHW range countries will help to progress the long-hoped for joint IWC-CMS regional Conservation Management Plan. In particular, it is hoped that a workshop held in Oman in November 2022 helped government and industry stakeholders there to better understand the conservation needs of ASHW and the potential benefits of both a national conservation action plan and a regional Conservation Management Plan.

## 1. Introduction and Background

The Arabian Sea Whale Network (ASWN) is an informal collaboration of researchers and conservation bodies interested in the conservation of whale populations throughout the Northern Indian Ocean. The Arabian Sea humpback whale (ASHW) is the flagship species, but all large whale species are of interest. Formed at the conclusion of a January 2015 workshop in Dubai, the ASWN does not have formal legal status or governmental recognition. A [website](#) and a logo create a sense of unified purpose and facilitate communication, fund-raising, collaborative research and data management and analysis. [Members](#) include independent researchers and consultants, researchers linked with academic institutions, and representatives of local, national and international NGOs, IGOs and government bodies. More information and background on the network are available through the website, [2015 inaugural workshop report](#), and other documents submitted to this and [past meetings](#) (see below). While on-the-ground research and conservation work in the Arabian Sea region is conducted by members at a project or national level, the network helps to promote the exchange of information and place local experience into a regional framework. It also helps to ‘champion’ the work conducted by individual members.

## 2. Contributions to the IWC SC from Arabian Sea Range States

In 2022 the ASWN submitted a brief progress report to the IWC Scientific Committee meeting (SC/68D/CMP04\_Rev1), and ASWN members submitted additional papers to the CMP and other subcommittees. This report represents an update on activities conducted since May 2022. Papers that are relevant to whale conservation in the Arabian Sea are:

- SC/69A/CMP/07: Cetacean surveys in Oman November 2019-November 2022
- SC/69A /CMP/05: Sightings of whales in the Northern Arabian Sea along the coast of Pakistan in 2022 and 2023
- SC/69A/CMP/10: Variation in songs of Arabian Sea humpback whales indicates continued isolation, stability of singing behaviour, and connectivity between Oman and India
- SC/69A/CMP/12: Acoustic monitoring for baleen whale vocalizations off southern Oman, 2020 to 2022
- SC/69A/HIM/07: Geospatial analysis of ASHW habitat preference and ship strike risk assessment
- SC/69A/ForInfo/34: Complementing Development with Conservation: A Workshop for the Management Planning for Arabian Sea Humpback Whales in Oman
- SC/69A/ForInfo/33: A note on humpback whales (*Megaptera novaeangliae*) in the central Indian Ocean
- SC/69A/ForInfo/52: Arabian Sea Humpback Whale (*Megaptera novaeangliae*) Singing Activity off Netrani Island, India
- SC/69A/ForInfo/68: Remote and non-invasive quantification of ‘Tattoo Skin Disease-Like’ dermatopathy in endangered Arabian Sea humpback whales using drone photography

### 3. Regional-level activities and developments

The ASWN coordinator role has not been funded since April 2019. As such, less time has been dedicated to some of the core functions of the network. However, a dedicated group has worked to maintain momentum on a number of initiatives described below.

#### 3.1 Network communication and collaboration

The [ASWN website](#) is updated occasionally (roughly once every few months) with [news items](#), ranging from new publications, to results of workshops, and newsworthy developments in ASHW range states. ASWN members remain in regular contact through a group email list (Google Group), which has been used throughout 2022 and early 2023 to share news between members about whale sightings and strandings in the region, as well as announcements of important meetings, funding opportunities, new publications and resources, etc.

#### 3.2 Regional database

The Arabian Sea Whale Network continues to test and refine its **regional online database** developed using the [Flukebook](#) platform and funded in part by the IWC SC. This is accessible through a [dedicated page](#) on the ASWN website, which includes instructions for obtaining an account, as well as links to videos demonstrating how to conduct data searches and matching on the platform. The volunteer coordinator has worked with the Indian Ocean Network for Cetacean Research ([Indocet](#)), and the Flukebook developers to continue to refine the work flow and tools within Flukebook intended to support long term photo-identification data management and collaboration between research groups. These tools are described in a recent peer-reviewed publication titled “Flukebook: an open-source AI platform for cetacean photo identification” (Blount et al., 2022). Frustratingly, the platform is not yet being used to its full potential – partly due to a lack of dedicated whale photo-identification efforts in ASWN countries other than Oman, and partly due to continued user-interface challenges.

#### 3.3 Genetic analysis of ASHW samples and the *Megaptera indica* type specimen

Funding was approved by the IWC SC in 2016 to conduct genetic analysis of ASWH samples and the type specimen for *Megaptera indica*. The type specimen was sampled at the Paris Museum of Natural History in November 2019. However, issues related to COVID-19 and securing export/import permits have prevented its shipment from France to New York, and thus prevented analysis. This is also a factor in the delay of analysis of additional samples from Oman to better understand taxonomy of ASHW. A new approach is underway directly between the American Museum of Natural History and the Paris Museum to complete the shipment.

#### 3.4 Progress toward a joint IWC-CMS Conservation Management Plan (CMP)

In October 2017, the Convention on Migratory Species approved a [Concerted Action for Arabian Sea humpback whales](#) (CMS, 2017). Since that time, discussions have been underway between relevant stakeholders in order to promote the implementation of a joint IWC-CMS regional Conservation Management Plan. An IWC CMP would require endorsement by the only two ASHW range countries that are IWC members, India and Oman.

In 2022 the Environment Society of Oman (ESO) secured funding to embark on a national Conservation Action Plan process involving relevant government and industry stakeholders. A workshop held in November 2022 involved representatives of both the IWC and the CMS, and a wide range of presentations intended to provide government and industry stakeholders in Oman with background on the urgent conservation needs of ASHW, as well as the benefits for governments and industries who participate in proactive conservation management. The meeting concluded with commitments from participants to engage in the development of a national conservation action plan, and to consider the steps necessary to contribute to a regional CMP. The report of this workshop has been submitted to this meeting as SC/69A/ForInfo/34.

As part of the process toward developing an inclusive joint- CMS-IWC regional CMP for ASWH, it will be necessary to extend the CMS Concerted Action (CA) for the species. The end goal of the CMS CA is the development of a regional CMP with full buy in from as many ASHW range country governments as possible. This CA was extended at the last CMS COP in India in February 2020, and will need to be extended again at the next COP in Uzbekistan in October 2023 to allow range countries to work toward this goal. A formal progress report and extension request will need to be submitted to the CMS by May 26<sup>th</sup>, 2023. Annex 1 contains a table reporting on progress against the CMS Concerted Action objectives as of April, 2023, which will also form the basis of the report to the CMS Scientific Advisory Council and the COP.

#### **4. Project-based and national level progress**

As COVID 19 restrictions were gradually or intermittently lifted over the past year, ASWN members have continued to conduct important research and conservation activities throughout the ASHW range, making contributions to progress on the CMS Concerted Action and the hoped-for progression to a joint IWC-CMS CMP. The updates below demonstrate a trend toward increased capacity for systematic cetacean research in most ASWN member countries, with a number of peer-reviewed publications emerging from the region over the past year. The updates also demonstrate how many ASWN partners are applying knowledge gained from cetacean research to capacity building for local scientists, outreach, awareness raising, threat-mitigation and engagement with the relevant stakeholders responsible for conservation policy and management. Finally, the reports below indicate that while dedicated cetacean surveys are being conducted in an increasing number of locations in the Arabian/Persian Gulf, and social media campaigns and outreach activities are expanding reporting networks in many Gulf countries, there have been no confirmed humpback whale sightings in any of these locations in the past year.

Note that ASHW range country updates are presented in alphabetical order this year, and contributors are all listed as co-authors to this general update.

##### **4.1 India**

###### *Passive Acoustics*

Karnataka: In 2022, the vocalizations of a humpback whale recorded on a 300STD SoundTrap deployed off Netrani island in late 2019 were analysed. The paper is now published (D'Souza et al 2023) and has been submitted as SC/69A/ForInfo/52. A Sound Trap 500STD funded by the Karnataka State Forest Department, was deployed at the same location on 30th January 2021 and stopped functioning in early March 2021. The Karnataka State Forest Department deployed another 500STD, between November 24th,

2021 and March 28th, 2022. The files from both these devices are yet to be retrieved. There is no device in the water since March 2022.

Kerala: A SoundTrap 300STD with a battery pack deployed at 37m depth in Poovar, Kerala (at the border between Kerala and Kanyakumari) stopped functioning in February 2022. This SoundTrap has been sent for repair in order to hopefully retrieve the data recorded. A Soundtrap 600ST was deployed at the location between 18<sup>th</sup> October 2022 and 29<sup>th</sup> January 2023 and the data is yet to be explored.

#### *Participatory Informant Network and reported ASHW sightings*

In 2022-2023 workshops were held with dive centers and fishing villages along the coast of south and central Kerala and central Karnataka (Bhatkal, Karwar and Murudeshwar). A continued effort took place to increase voluntary participation in the informant network primarily in waters off Gujarat, Karnataka, Kerala, and Tamil Nadu of southwest and southeast India. The Wildlife Institute of India is compiling a report on the Status of the ASHW in India to submit to the MoEF-CC, Government of India.

A live sighting of three humpback whales were reported on December 14<sup>th</sup> 2022, off the coast of Karnataka, off Bhatkal. This sighting was captured in video recorded by fishers and shared with local participatory network member Ram-Vithal at Murudeshwar; and entered on the database <http://www.marinemammals.in/database/sightings-and-strandings/>.

## **4.2. Iran**

### *Plan for the Land Society*

Despite difficult conditions, the Plan for the Land Society (P4L) team is still trying to improve boat surveys, research, and conservation of marine mammals (especially Indian Ocean Humpback dolphins, *Sousa plumbea*) in Iranian waters. In 2022, boat surveys including individual photo-identification efforts were conducted in the Khur-e-Khuran International Wetlands. Finless porpoises (*Neophocaena phocaenoides*) and humpback dolphins were recorded during the boat surveys, but no humpback whales or other cetacean species were observed.

P4L has been engaged in a social media campaign to raise awareness of endangered species, by preparing an animated educational video about what to do and not to do when people encounter either live or dead cetaceans. The video encourages members of the public to support science and conservation by recording and reporting data, sharing photos, etc.

P4L translated both the UNEP/CMS & WWF on 2020 guidelines for the safe and humane handling and release of bycaught small cetaceans and the FAO Indian Ocean cetacean species identification cards into Persian. These were distributed to fishermen and other stakeholders and accompanied by training and workshops to engage their help in reporting and releasing cetaceans. Despite this increased reporting network, no reports of humpback whale sightings or strandings were received in the past year.

### 4.3 Kuwait

#### *Boat-based surveys*

Boat-based surveys utilizing distance sampling and photo-ID techniques were conducted on a semi-monthly basis, when weather was suitable. Indian ocean humpback dolphins (*Sousa plumbea*) were the most frequently observed species over the past five years, particularly in the area around the northern Failaka and Boubyan islands. Surveys strive towards describing and quantifying the humpback dolphin population and observations show peak social interaction in early winter and spring months like November and March respectively (Figures 1 and 2). No humpback whales were observed during these surveys, or reported to the team through its established stranding and sightings reporting network.

#### *Capacity building*

A training program on “Marine mammal survey techniques” was conducted on November 13-16th 2022, hosted by the Kuwait Institute for Scientific Research (KISR) in collaboration with Kuwait University. The training program involved eight participants from KISR. The objective of the training program was to train local researchers in boat-based and interview methodology to study marine mammals in Kuwait waters and provide them with experience in using QGIS open-source software for plotting survey data and interpreting results. The course had three instructors: Mr. M. Nithyanandan (Associate Research Scientist, KISR), Mr. Yusuf Bohadi (Researcher, Kuwait University) and Mr. Walid Zekri (KISR, for boat logistics). Classroom training was complemented with field-based practical sessions which included boat based data collection, stranding response, and handling and data collection with stranded cetaceans (using an inflatable real size dolphin model).

#### *Publications*

A paper titled “Confirmed sightings of Bryde’s Whale, *Balaenoptera edeni* Anderson, 1878 (Cetacea: Balaenopteridae) from Kuwait” has just been published in *Zoology in the Middle East* (Al-Kandari et al. 2023). The manuscript reviews 18 Bryde’s whale sightings documented from various sources such as researchers, social media platforms (Facebook, Instagram and Tik tok) and citizen science resources collected during the years 2009-2022. This paper also documented “tread water feeding behaviour” of Bryde’s whale from the Arabian/Persian Gulf waters.

### 4.4 Maldives

#### *Humpback Whales:*

Anderson et al. (2022) compiled all available humpback whale records from the Central Indian Ocean (n=68), with the majority of records from the Maldives (n=44) but also from southern India, Sri Lanka and the Chagos Archipelago. These data show a bimodal pattern of seasonal occurrence of humpback whales in the region. Those occurring during the northern winter (December to March) are known from other studies to belong to the Arabian Sea humpback whale population. There have been no humpback whales recorded in Maldives during the boreal winter since 2002. The authors interpret this as a possible indication of range contraction for the Arabian Sea humpback whale population. Humpback whales occurring during the austral

winter (June to October) are assumed to belong to the southwest Indian Ocean population (IWC breeding stock C). Numbers of opportunistic sightings in the austral winter are increasing, which the authors interpret as an indication that the population appears to be spreading northwards as it recovers from commercial whaling, with several recent southern winter records from as far north as 5°N in northern Maldives and southern Sri Lanka. During the austral winter, calves are first seen in August, with numbers of calves increasing in September and October. For both populations, interactions with regional fisheries, particularly pelagic gillnetting, may be a major cause of mortality.

This paper has been submitted to the meeting as SC/69A/ForInfo/33: A note on humpback whales (*Megaptera novaeangliae*) in the central Indian Ocean

#### *Abundance Surveys:*

A 17-day line-transect survey was carried out in Maldivian waters April 2022, with the aim of estimating cetacean relative abundance around the northern Maldivian atolls. That survey repeated previous surveys that were conducted in April 1998 and April 2013. A further survey is planned for April 2024. The time series of data collected may allow the estimation of population trends for some species. No humpback whales were observed during this survey. Although cetaceans are protected within Maldivian waters, where most kinds of net fishing are banned, they are subject to high levels of bycatch elsewhere in the northern Indian Ocean, particularly by pelagic gillnet fisheries. The need for fishery-independent surveys to estimate cetacean abundance and population trends has been specifically emphasized by the Indian Ocean Tuna Commission (IOTC, 2020: para 143) and the IWC SC (IWC, 2021: pages 62 & 173).

#### **4.5 Oman:**

##### *Field Research and data analysis*

In November 2022, an international team conducted a three-week long survey in the Gulf of Masirah to document distribution, conduct photo-identification, and use UAV photogrammetry to assess the body condition of Arabian Sea humpback whales. In contrast to the November 2021 fieldwork during over 20 individual ASHW were encountered and photographed over 17 days of fieldwork, the 2022 field survey in the same area and at the same time of year yielded only 4 humpback whale sightings comprising 3 individual whales. As in 2021, alongside documentation of distribution, photo-identification, biopsy sampling, and aerial-photogrammetry were used to assess individual life history, health, genetic, and body condition parameters. More details are provided in SC/69A/CMP/07: Oman Cetacean Research Activities Status Update 2023

Fieldwork also included mapping of fisheries effort, which is contributing to a wider project focused on mapping and assessing co-occurrence of whales and fisheries. The preliminary results of this work will likely be presented as a working paper to the IWC SC in 2023.

Funding was approved by the IWC SC in 2018 to conduct an analysis of the available long-term sample of humpback whale songs from Oman, and compare to a small existing sample from India. The final results of this analysis are presented in SC/69A/CMP/10 Variation in songs of Arabian Sea humpback whales indicates continued isolation, stability of singing behavior, and connectivity between Oman and India.



Finally, fieldwork in Oman has included retrievals and redeployments of SoundTrap recorders. The preliminary results of the analysis of data collected is presented in SC/69A/CMP/12: Acoustic monitoring for baleen whale vocalizations off southern Oman, 2020 to 2022.

Two papers on ASHW health and anthropogenic threats resulting from (partially) IWC funded fieldwork and analysis were published in peer reviewed journals 2022 and 2023. These are based on reports presented to the IWC SC in previous years:

- Leslie M.S., Kant L., Perkins-Taylor C., Van Bresseem M.-F., Minton G., MacDonald D., Christiansen F., Willson M.S., Collins T., Baldwin R., Al Harthi S. & Willson A. (2023) Remote and non-invasive quantification of ‘Tattoo Skin Disease-Like’ dermatopathy in endangered Arabian Sea humpback whales using drone photography. *Mammalian Biology*. (also available as SC/69A/ForInfo/68).
- Minton G., Van Bresseem M.F., Willson A., Collins T., Al Harthi S., Sarrouf Willson M., Baldwin R., Leslie M. & Van Waerebeek K. (2022) Visual Health Assessment and evaluation of Anthropogenic threats to Arabian Sea Humpback Whales in Oman. *Journal of Cetacean Research and Management* 23, 59-79.

#### *Capacity building and Outreach*

In 2022 the Environment Society of Oman (ESO) received [funding to conduct a cetacean research and conservation capacity building programme over a period of one year for graduate Omani scientists and trainees](#). Six candidates were selected for the programme which included both classroom- and field-based training. Five classroom-based modules were delivered through hybrid presentations, and covered topics ranging from general cetacean biology and ecology to specific boat-based survey methodology. These were followed by monthly field-based training sessions, providing opportunities to consolidate data collection skills in the Muscat area. This capacity building was also supported by IWC SC funds to host and train the graduate team on dedicated humpback whale surveys. Three trainees participated in the November 2022 humpback whale survey conducted in the Gulf of Masirah. Participants will be completing their final projects – assignments ranging from awareness campaigns to data analysis, depending on their particular skills and interests – by June 2023.

#### *Conservation management measures*

The ESO also received funding to support ASHW conservation management measures in Oman. To this end, a [the Oman Environment Authority and ESO hosted a workshop in November 2022](#) that involved representatives from a wide range of government agencies responsible for the environment, biodiversity, coastal development, marine policing and enforcement, tourism, energy and transport, among others. The two-day workshop included presentations focusing on the current status and threats to ASHW, the benefits of regional conservation management plans, and ways in which oil and gas, fisheries, tourism, and shipping can contribute to, and benefit from proactive whale conservation measures. The second day of the workshop, which also involved representatives of the CMS, the IWC, and the World Shipping Council (WSC) focused on collaborative exercises to define the specific mitigation measures, resources, and responsible stakeholders that could form part of a national conservation action plan for ASHW as well as the steps required for Oman to contribute to a regional CMP. The Oman Environment Authority and the ESO are collaborating to act on the workshop’s first recommendation, which was to form a cross-

stakeholder working group to draft an implement a national conservation plan, using the workshop report as a road map. The ESO and other stakeholders are also collaborating with Oman’s Ministry of Transport, the World Shipping Council and the IWC to act on another workshop recommendation to investigate the options for routing measures that would reduce the risk of ship strikes to ASHW off the coast of Oman. More details on the workshop are available in SC/69A/ForInfo/34 and more detail on the ship-strike risk assessment for ASHW off the coast of Oman is available in SC/69A/HIM/07.

## 4.6 Pakistan

### *Data collection and reporting on the sighting and stranding of cetaceans*

Data collection and reporting on cetaceans from coastal fisheries, continues through the WWF Pakistan led crew-based observer programme that has submitted multiple previous reports to the IWC SC (e.g. Moazzam and Nawaz 2017; Moazzam et al. 2019; Moazzam et al. 2020). The reporting network now includes 20 fishers as crew-based observers. From June 2022 to the present, the fishers have reported many instances of whale sightings during their fishing trips. These include sightings of Arabian Sea humpback whales, which are reported in more detail in SC/69A/CMP/05. In addition, a number Bryde’s whale (*Balaenoptera edeni*) sightings were documented as well as strandings of small cetaceans (including 5 finless porpoises, *Neophocaena phocaenoides*, and 7 Indian Ocean humpback dolphins, *Sousa plumbea*) were reported during 2022-23.

### *Conservation management and stakeholder engagement*

In February 2023, The IUCN Marine Mammal Protected Areas Task Force, represented by its Co-Chairs, and Deputy Chair visited Karachi in order to discuss ways in which the Important Marine Mammal Areas (IMMAs) that have been identified in Pakistan’s waters could be used to stimulate and implement concrete conservation management measures. Pakistan hosts three IMMAs, two of which are located in estuaries and creeks, and one of which, the North East Arabian Sea IMMA, was designed specifically to encompass habitat where Soviet whaling data and recent crew-based observer sightings indicate a regular presence of ASHW (see <https://www.marinemammalhabitat.org/imma-atlas/>)

The visit was organized and hosted by WWF-Pakistan, and encompassed two days of meetings with relevant government, NGO and industry representatives and a national stakeholder workshop, which helped to raise awareness of IMMAs in Pakistan and the species that would benefit from specific protection measures within these IMMAs. The visit concluded with a field visit to Indus Estuary and Creeks IMMA, which provides important habitat of the Indian Ocean humpback dolphin (*Sousa plumbea*) on the east coast of Pakistan.

The meeting also provided an opportunity to discuss issues related to the Critically Endangered Indus River Dolphin (*Platanista minor*). The conference and stakeholder discussions culminated in the consensus that the implementation of IMMAs would serve as a crucial instrument to establish science-based evidence for cetacean conservation and lead to the declaration of effective marine protected areas.

### *Capacity building and publications*

An M.Phil. thesis “Analyses of Updated Records of Some Large Marine Vertebrates and Their National Conservation Legislation” has been submitted to the University of Karachi. This thesis discusses stranding,

and bycatch records of cetaceans including those of large whales from 1872 to 2022 along with a chapter each on “record of Longman’s beaked whale and *Mesoplodon* sp.” and skull morphometry of a stranded Cuvier’s beaked whale. The thesis analysed national legislation pertinent to cetacean conservation and protection in Pakistan and proposed a way forward for systematically responding to large marine vertebrate beaching/strandings through the establishment of a formal “national cetacean strandings network” and national stranding database. The proposed network and database would improve knowledge and understanding of the distribution and threats to ASHW and other large whales.

#### **4.7. Sri Lanka**

##### *Field based research and cetacean sightings database*

In February-March 2023, the Oceanswell team in Sri Lanka, conducted an annual cetacean survey off southern Sri Lanka. During 16 days of boat-based surveys, the team documented blue whales (*Balaenoptera musculus*), Bryde’s whales (*Balaenoptera edeni*), Omura’s whales (*Balaenoptera omuri*), Orca, Dwarf sperm whales (*Kogia Sima*), Pilot whales (*Globicephala macrorhynchus*), Risso’s dolphins (*Grampus griseus*), bottlenose dolphins (*Tursiops sp.*) and spinner dolphins (*Stenella longirostris*). No humpback whales were observed on this survey.

Oceanswell continues to collect sightings and strandings data from the general public and to host a ‘marine mammal stranding database’ where citizen scientists can upload their observations. All sightings from both the dedicated cetacean survey images collected by citizen scientists and whale watching operators are currently being uploaded into the Sri Lankan Marine Mammal photo-ID database. These third party reports included one sighting of a pair humpback whales breaching off the coast of Ahangama in January 2023.

Additionally, from January -April 2023, Biodiversity Education And Research (BEAR) has been carrying out field surveys on the East and Northwest coasts of Sri Lanka. During their surveys they recorded blue whales, Bryde’s whales, Humpback whales, Sperm whales (*Physeter macrocephalus*), Dwarf sperm whales, Pilot whales, pygmy killer whales (*Feresa attenuata*), melon-headed whales (*Peponocephala electra*), killer whales (*Orcinus orca*), Risso’s dolphins, spinner dolphins, common bottlenose dolphins (*Tursiops truncatus*), striped dolphins (*Stenella coeruleoalba*) and unidentified beaked whales (*Mesoplodon sp.*). The sighting frequency of Bryde’s whales has increased substantially around the Island (East, South and Northwest), when compared to previous years. Three humpback whale sightings were documented, one sighting in each month in January, February and March. The January sighting was of a mother-calf pair.

BEAR continue to maintain an acoustic catalogue of sperm whale codas and clicks as well as other cetaceans found in Sri Lankan waters. BEAR has photo identified several new individual killer whales in Sri Lankan waters.

##### *Capacity building and outreach*

Oceanswell is organising and fully funding a ‘quantitative skills for ecologists course’ for 21 Sri Lankan students, one Indian student, one Seychelles student and two Maldivian students through a grant from the Bertarelli Foundation. The 7-day residential course will cover an introduction to R, skills in habitat modelling and bioacoustics. It will be taught by Dr. Clare Embling (University of Plymouth), Dr. Danielle Harris (University of St. Andrews) and Dr. Asha de Vos (Oceanswell).

Oceanswell established the first graduate programme and fully funded a student at Ocean University, Sri Lanka to pursue a PhD in cetacean bioacoustics. Udayanga Sampath was provided initial training on survey techniques with Dr. Charles Anderson in the Maldives and subsequently participated in the recently concluded Sri Lankan field season conducted by Oceanswell. While Udayanga's preliminary research will focus on cetaceans of Chagos, he will also work on cetaceans in Sri Lankan waters.

Furthermore, four interns participated Oceanswell cetacean field research and engaged in work related to photo-identification databases as well as trilingual outreach and education programmes. Outreach materials included graphic 'zines', and 'live from the field' sessions to provide the public with insight into the daily routines of cetacean field researchers.

### *Publications*

Peer reviewed publications from the past year that involve data and authors from Sri Lanka and are relevant to the Arabian Sea humpback whale CMP include:

- Letessier, T. B., Mannocci, L., Goodwin, B., Embling, C., de Vos, A., Anderson, R. C., Ingram, S. N., Rogan, A., & Turvey, S. T. (2023). Contrasting ecological information-content in whaling archives with modern cetacean surveys for conservation planning and identification of historical distribution changes. *Conservation Biology*.
- Anderson, R.C., Isha, D.N. Sutaria and A. De Vos (2022) A note on humpback whales (*Megaptera novaeangliae*) in the central Indian Ocean. *Journal of Cetacean Research and Management*, 23: 49-57.

## **4.8. United Arab Emirates**

### *UAE Dolphin Project & Zayed University*

The Dubai dolphin survey team has successfully completed a second year of continuing surveys of Dubai coastal waters, thanks to the continuous support of Atlantis the Palm, Zayed University and F3 Marine and under the permit from Dubai Municipality. Two new transects were added to the previous area, the first expanding north and the second covering offshore waters beyond 50km from the coast, including the protected area of Moon Island. In total 40 additional surveys were conducted, representing 180 hours of navigation and 3,316 km on transects. The survey recorded 11 marine mammal sightings, including 2 sightings of Indian Ocean humpback dolphins (*Sousa plumbea*), 8 sightings of Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) and 1 sighting of dugongs (*Dugong dugong*).

Two F-Pods were deployed - one in an inshore area and one approximately 5km offshore. Dolphins were recorded at both locations whereas finless proposes only at the offshore location.

A Zayed University Research Incentive Grant was secured in the second half of 2022 to support the development of an effective stranding network in Dubai and Abu Dhabi Emirate and to conduct a dedicated year-long survey to investigate the occurrence and frequency of small cetaceans in Abu Dhabi City waters. The Abu Dhabi City dolphin surveys started in November 2022 in collaboration with and with the research permit of Abu Dhabi Environment Agency. A total of 6 surveys have been conducted so far and 8 sightings have been recorded (5 humpback dolphins, 2 dugongs of which one was mixed with finless porpoises, and 1 of Indo-Pacific bottlenose dolphin).

The project continues to collect marine mammal sighting and stranding records reported by the general public. Between April 2022 and March 2023, 50 sightings were recorded from the public including one baleen whale sighting, identified as a possible Bryde's whale (*Balaenoptera edeni*). More details about the citizen science data results are provided in Natoli et al., 2022, also available as SC/69A/ForInfo24.

A total of 5 baleen whales, 5 bottlenose dolphins and 1 unidentified dolphin species were also reported stranded along the UAE shores. With the exception of one stranding for which only the vertebrae were available, all the other stranded baleen whale carcasses were confirmed not to be humpback whales. In collaboration with the Environment Protected Areas Authority (EPAA) Sharjah, two full necropsies were conducted. Furthermore toxicological analysis of samples collected from whales stranded along the UAE coastline in the past years were conducted in collaboration with American University of Sharjah and EPAA Sharjah.

In this past year, the team has expanded to include two Research Assistants employed through Zayed University, and the project is also actively involving a number of Zayed University students in boat surveys, increasing local capacity for cetacean research and conservation.

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**Annex 1** Progress on the activities identified in the CMS Concerted Action for Arabian Sea humpback whales as of April 2023

<b>Arabian Sea Humpback Whale Concerted Action: Priority Activities and Outcomes</b>		
<b>Activity</b>	<b>Expected Outcome</b>	<b>Progress as of April 2021</b>
<i>Addressing knowledge gaps</i>		
The development of a marine mammal reporting <b>smartphone App</b> and citizen science tools, to allow the crews of fishing, coast guard and whale-watch vessels and ferries to record and report whale and dolphin observations.	Improved data and models of current humpback whale distribution throughout the Arabian Sea	ASWN members have briefly tested Apps that can be used by tourism companies and members of the public, as well as for research (e.g. <a href="#">Spotter Pro</a> , <a href="#">Whale Alert</a> , <a href="#">Seafari</a> ). However, due to COVID and lack of funding to date, none are yet in regular use, or translated into the languages used by range states. Many ASWN partners have created WhatsApp reporting networks to collect reports of cetacean sightings and strandings, resulting in increased reports of cetaceans.
Collaborative <b>boat-based research</b> to continue photo-identification studies, collect genetic samples, and identify critical habitat. The involvement of local scientists in this research will build capacity for future conservation in the region.	Improved data on whale distribution, habitat use, population identity and connectivity between regions, and increased number of qualified cetacean researchers in the region.	Boat-based research has continued annually in Oman and coastal surveys for cetaceans are occurring regularly in Iran, Kuwait and the UAE. A survey was planned in Pakistan in January 2020, but cancelled due to permitting and security issues, and not rescheduled due to COVID. Funding has not yet been obtained for large-scale collaborative research efforts. However, a systematic cetacean survey took place in the Maldives in April 2022. Furthermore, researchers working in India, Sri Lanka, the Maldives and Chagos have published a review of all available information on humpback whales in the Central Indian Ocean to assess seasonal trends and possible population affiliations. See <a href="https://journal.iwc.int/index.php/jcrm/article/view/341">https://journal.iwc.int/index.php/jcrm/article/view/341</a>
Use of <b>passive acoustic recorders</b> to detect the presence of whales and monitor human introduced noise in areas that are logistically difficult or dangerous to survey.	Improved understanding of whale distribution in Eastern Arabian Sea (e.g. Gujarat and Rann of Kutch)	Recordings made in Oman in 2012-13 have been analysed and the results have presented at the IWC (Cerchio et al., 2016; Cerchio et al., 2018, Cerchio et al 2023). A manuscript on blue whale song recorded offshore from Oman was published with great media attention, and a new PAM effort to record in deep water off Oman commenced in March 2020. Opportunistic recordings have also been analysed from India (Mahanty et al., 2015; Madhusudhana et al., 2018). SoundTraps procured with funding from the IWC and the Karnataka State Forest Department have been collecting data which has been analysed and accepted for peer-reviewed publication (D'Souza et al. in press). Funding and logistics have not yet been in place to conduct larger scale passive acoustic surveys off of Pakistan.
<b>Genetic analysis</b> of samples collected from strandings and during dedicated whale surveys to determine whether Arabian Sea humpback whales comprise a new sub-species.	Likely designation of ASHW as new species or sub-species, understanding of kinship and relatedness of sampled whales	The type specimen for <i>Megaptera indica</i> was sampled at the Paris Museum of Natural History in November 2019. However, issues related to COVID-19 and bureaucracy prevented its shipment from France to New York, and thus prevented analysis. This is also a factor in the delay of analysis of additional samples from Oman to better understand taxonomy of ASHW. A new approach is under discussion and implementation.
		Although not listed as one of the targeted activities in the Concerted Action, the rationale refers to the need to monitor humpback whale health and threats through . An IWC grant facilitated a visual health assessment of all humpback whale images collected off the coast of Oman from 2000 onward. This assessment was published with the Journal of Cetacean Research and Management (Minton et al. 2022), with another follow-up paper describing a new technique for using aerial based images to assess tattoo skin disease-like lesions (Leslie et al. 2023). IWC support also facilitated modelling of abundance and trends for the ASHW population based on photo-identification and genetics data from Oman. Modelling is complete and is awaiting review.
		Regional ASHW ecological niche modelling work previously presented to the IWC (Willson et al. 2017) has been updated with results of more recent satellite telemetry work and a refined method. A ship strike risk assessment based on co-occurrence between identified whale habitat and AIS derived shipping traffic density mapping contributed to a WWF report on <a href="#">‘blue corridors’</a> , and will be submitted for peer-reviewed

		publication in the coming months. A new risk assessment is presented to the 2023 meeting of the IWC Scientific Committee (SC/69A/HIM/07).
<b>Information sharing and awareness raising</b>		
The development of a <b>regional shared online data platform</b> to promote standardization, comparability and timely analyses of data collected throughout the region. This will be used to facilitate the creation of sensitivity maps and assist stakeholders in the design of local, national and regional conservation strategies, including protected areas	Improved understanding of ASHW distribution and connectivity between study areas.	Three years of collaborative development between ASWN members, <a href="#">Flukebook</a> , and <a href="#">Indocet</a> , have resulted in the completion of an <a href="#">ASWN online database</a> that uses the Flukebook Platform. This data platform allows uploading, archiving, and analysis of cetacean sightings data, as well as use of 'computer vision' to conduct automated matching of humpback whale tail flukes within, and between research projects in the Arabian Sea and wider Western Indian Ocean. Unfortunately, due to user-interface issues and a lack of photo-identification data from countries other than Oman, the data platform is not used to its full potential.
An improved <b>website</b> that provides a portal to the shared database (see above), informs the general public of whale conservation needs, and provides members with a range of <b>outreach tools</b> to engage governments and other stakeholders in their region and involve them in Whale conservation efforts	Increased awareness of ASHW conservation needs among stakeholders	The <a href="#">Arabian Sea Whale Network website</a> has undergone some improvements, and is maintained with updates and <a href="#">news items</a> , as well as a <a href="#">page dedicated to the new data platform</a> . The ASWN has produced an <a href="#">infographic</a> to use in reaching out to stakeholders, as well as three issues of a <a href="#">newsletter</a> . The Environment Society of Oman created a very effective <a href="#">video on ASHW</a> and on <a href="#">ghost nets</a> . However, more could be done to create a wider variety of outreach tools, including power-point presentations, videos, or other tools in multiple languages.
<b>Capacity building and development and implementation of mitigation strategies</b>		
Organization of targeted <b>regional workshops, meetings and training</b> opportunities that will involve local and national government agencies as well as young scientists, build capacity and develop multi-stakeholder mitigation strategies and conservation measures in key range states.	More effective stranding/entanglement response leading to better survival of affected cetaceans, improved data on bycatch/entanglement rates throughout the region, increased government participation	A workshop was held in Oman, in January 2018, focusing on the final stages of development of the ASWN Flukebook data platform, as well as the issue of data collection from fisheries in the region. The full workshop report can be downloaded <a href="#">here</a> . Many of the researchers working with Arabian Sea humpback whales were also involved in the <a href="#">IUCN Important Marine Mammal Areas workshop for the Western Indian Ocean and Arabian Seas</a> . While organized with different aims, it also involved opportunities for regional capacity building and stakeholder engagement particularly with the Oman government representatives who were present. A workshop for Oman government and industry stakeholders was held in November 2022 to raise awareness of the conservation needs of ASHW and the potential benefits of participating in a regional CMP.
Replication of ship strike mitigation strategies from Oman, and by-catch mitigation from Pakistan to other parts of the Arabian Sea.	Reduced risk of ship strike throughout region, improved chance of survival of entanglement	It is hoped that ASWN participation in the <a href="#">IWC hosted workshop focusing on bycatch in the Indian Ocean</a> , and a possible IWC Pilot project in Pakistan will lead to more effective monitoring, reporting and mitigation of bycatch in the region. ASWN members are also working closely with the IOTC to report results from Pakistan.  Development of a region- wide approach to ship strike mitigation is expected to be partly informed by the ship strike risk assessment currently in progress (and discussed in the section on addressing knowledge gaps above).
Development of a range-state endorsed regional ASHW Conservation and Management Plan	Regional Conservation and Management Plan to promote long-term coordinated and collaborative conservation and management across the ASHW range participation	Discussions are still underway between the CMS and the various representatives of the International Whaling Commission and its member states focused on initiating development of an IWC ASHW Conservation Management Plan that if finalized would be jointly endorsed by IWC and CMS. Government-level endorsement from both India and Oman, the only two ASHW range states that are IWC members, remains to be confirmed and discussions are still ongoing.