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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: During the May 2020-April 2021 period, the Arabian Sea Whale Network (ASWN) has been somewhat restricted in its progress and activities due to COVID related restrictions. Progress on the establishment of a regional CMP for Arabian Sea Humpback whales has been particularly slow as governments in the region have understandably been focused on other issues. Fieldwork has also been limited, but many ASWN members have used the time to conduct other valuable work, some of which is reported here. The website has been maintained and email communications have been frequent, particularly in response to strandings reported by members in Iran and Kuwait. Two virtual meetings were held in January and February 2021, and two working groups have been established to focus on compilation and provision of stranding response materials and collaboration for acoustic studies in the Arabian Sea.

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 2020 the ASWN submitted a brief progress report to the IWC Scientific Committee meeting (SC_68B_CMP_11_Rev1), and ASWN members submitted a range of papers to the CMP and other subcommittees. This report represents an update on activities conducted since May 2020. Due to COVID-related restrictions on fieldwork, fewer papers are being submitted to this year’s meeting by ASWN members than in past year. Two papers that are relevant to whale conservation in the Arabian Sea are:

- SC_68B_CMP_XXX: Oman Research Update: Preliminary survey results and update on deep water acoustic deployments; and
- SC_68B_CMP_XXX: Sightings of Whales in the Northern Arabian Sea along the Coast of Pakistan in 2020

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

ASWN members remain in regular contact through a group email list, which is used to share news between members, as well as announcements of important meetings, funding opportunities, new publications and resources, etc.

The [ASWN website](#) is updated regularly (roughly once every 2-3 months) with [news items](#), ranging from new publications, to results of workshops, and newsworthy developments in ASHW range states. The ASWN Google Group has been used throughout 2020 to keep members in touch. Members have used it to share news or videos of unusual sightings, strandings or entanglements, providing the opportunity for an exchange of feedback, advice and support. It has also been used to share news of new publications, resources and funding opportunities. In August 2020 the ASWN website was moved to a different hosting platform that was less expensive and allowed the use of various plugins that would have required annual fees on the old WordPress server. The IWC Secretariat provided IT support for the creation of a searchable/filterable literature list. An ASWN member in India is now providing technical support for the maintenance of the website and updating of the online [searchable literature list](#) featured on the site.

The network also held two virtual meetings in January and February 2021. The January meeting focused on allowing members to reconnect and share updates on their recent work, much of which is reflected in the country-by country updates below. The February meeting focused on three main topics: 1) an encouragement to members to conduct surveys that would allow comparable estimates of relative abundance in a number of Arabian Sea regions to be compared with relative abundance of cetaceans documented in previous surveys (e.g. Ponnampalam, 2009, Minton et al. 2010; Ballance et al. 2001; Ballance & Pitman

1998); 2) a discussion of how to provide more effective entanglement and stranding response resources to ASWN members and other partners working in the Arabian Sea; and 3) a discussion of how to foster collaboration on acoustic research in the Arabian Sea.

The meeting led to the formation of two working groups focusing on entanglement and stranding response and acoustic research. These groups plan to meet virtually in the coming months. Minutes of this meeting are available [here](#).

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 ASWN coordinator continues to collaborate with the Indian Ocean Network for Cetacean Research ([Indocet](#)), that has had a series of contracts with Flukebook to refine the process for using Flukebook to conduct regional online humpback matching between research projects in the region.

While the Platform is expanding in its functionality and many of the initial bugs are being ironed out, it has not yet been used to conduct within-region or between-region matching. In the case of the ASWN, this is due mainly to the fact that there are not yet humpback whale photo-ID datasets available from anywhere other than Oman.

The research team in Oman is testing and refining a data collection App that would facilitate the processing of data collected during surveys and conversion into the Flukebook bulk upload format, both for data with associated photos for ID, and sightings data without associated photos.

3.3. Progress toward a joint IWC-CMS Conservation Management Plan (CMP)

- In February 2020, the CMS COP13 approved the extension of the ASHW Concerted Action into the next triennium (2020-2023). This proposal includes several activities similar to those normally incorporated in an IWC CMP (Addressing knowledge gaps, information and sharing and awareness raising, capacity building and development of implementation strategies).
- In May 2020, the IWC Scientific Committee recommended that IWC members in ASHW range states (India and Oman) support all the elements of the CMS Concerted Action, including the research recommended to update information on the population's Key Ecological Attributes, and that the IWC and CMS continue to collaborate to work toward a joint regional conservation management plan.
- In September 2020, the IWC Conservation Committee also recommended continued support for a joint CMP, but recognised that governments in ASHW range states have other pressing priorities during the COVID pandemic, and that we may need to wait until this is under control before pressing for more concrete action and support.
- In April 2020 the IWC and CMS wrote a joint letter to the CMS and IWC focal points/commissioners in India. However, changes in key government posts in both India and Oman have required that the IWC, CMS and ASWN partners on the ground take time to build new relationships and support. A meeting is planned to take place in Oman to help raise awareness and garner support among new government (and potentially industry) stakeholders, with in-kind support from the Environment Society of Oman (ESO). However, the timing of these meetings remains uncertain in relation to the

pandemic. ESO is seeking funding to host a local CMP meeting in Oman, which might be followed by a meeting for regional government stakeholders. The IWC and the CMS have limited funding set aside for an ASHW CMP, which could be used to support these meetings.

4. Project-based or national level progress

Despite the restrictions on fieldwork and travel imposed by COVID 19, ASWN members continue 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.

4.1 Oman:

Awareness raising and Outreach: Environment Society of Oman

The ESO has also faced challenges related to the pandemic which has limited fieldwork and face-to-face meetings with key stakeholders for marine/cetacean conservation. However, the ESO team has been able to forge contact with new individuals following a government reshuffle and maintain advocating for a CMP on ASHW as a priority, and they have also worked with Five Oceans Environmental Services LLC (5OES) to produce a new Oman Marine Mammal Atlas, an E-book, which, at the time of writing was due for launch in the coming weeks, and will be featured on the ASWN website.

Field Research

5OES undertook a field survey in Dhofar in March 2020 with a focus on ASHWs and used this opportunity to deploy acoustic equipment, which was followed by fieldwork conducted in March 2021 to recover those units. The results of the March 2020 fieldwork are presented in SC_68B_CMP_XXX.

Entanglement response

An entangled humpback whale was successfully released in Duqm Port, Oman in January 2021. The whale was reported entangled in fishing gear to the Oman Stranding Network and led to a wide collaborative effort for its release between the Environment Authority, Five Oceans Environmental Services LLC and Future Seas Global SPC, supported by the Environment Society (ESO) and the Port of Duqm. Assistance was also sought from Oman's Coast Guard, Royal Air Force of Oman, as well as real members of the IWC entanglement expert panel. The incident highlighted the value of IWC-supported entanglement response training that took place in Oman in 2015, as well as the effectiveness of collaboration between multiple government and non-governmental stakeholders in the response. A detailed account of the release can be found [here](#).

Publications

A paper was published in the journal *Endangered Species Research* in December 2020, describing what an international team of researchers believes to be a new population of blue whales in the Western Indian Ocean, including the Arabian Sea and the Coast of Oman. The paper is the result of research effort initially focused on ASHW, with ongoing collaboration between the Environment Society of Oman, New England Aquarium, African Aquatic Conservation Fund, Five Oceans Environmental Services LLC, Oman's Environment Authority and Oman's Ministry of Agriculture, Fisheries and Water Resources. The work was

funded by Shell Development Oman LLC (SDO), with support from the International Whaling Commission, Renaissance Services S.A.O.G., and NOAA Fisheries. The paper can be accessed in this [link](#).

4.2 Pakistan

Shoaib Kiani of the University of Karachi has been maintaining a database of cetacean strandings in Pakistan, which now exceeds 150 records of both small and large cetaceans. He is working on a manuscript to describe a Cuvier's beaked whale skeleton from the west coast of Pakistan. Shoaib also continues to support the WWF Pakistan fisheries crew-based observer programme for bycatch monitoring, with assistance on species identification, media coverage, and seminars. Shoaib's university is also in possession of the following cetacean tissue samples that may be of interest for regional genetic analysis: Blue Whale [01], Bryde's Whale [01], Arabian Sea Humpback whale [01], Indo-pacific humpback dolphin [02].

Shoaib Kiani is working with Koen Van Waerebeek to revise and analyse graphic evidence of several beaked whales bycaught in offshore tuna gillnets in deep EEZ waters of Pakistan, some of which have been reported as Longman's beaked whale *Indopacetus pacificus*. A primary report is expected in the next few weeks.

The WWF Pakistan fisheries crew-based observer programme that has yielded valuable ASHW sightings in recent years formally ended in September 2019. Since that time a handful of tuna gillnet vessel captains have continued to provide reports of whale sightings on a voluntary basis. These are summarised in SC_68B_CMP_XXX.

4.3. India

The number of ASWN members in India continues to grow, as the team of researchers focusing on cetaceans on the west coast of India and associated Arabian Sea island chains expands. In 2021, the team started to analyse the vocalisations from a SoundTrap funded by IWC, installed off Netrani island from 2019 to Feb 2020. This SoundTrap stopped working in March 2020. A new SoundTrap 500std funded by the Karnataka State Forest Department, was deployed at the same location on 30th January 2021. Another SoundTrap 300std with a battery pack was deployed at 37m depth off Poovar, Kerala (border of Kerala&Kanyakumari) on March 10th 2021. Isha Bopardikar will be working on the analysis of acoustic data from the SoundTraps.'

4.4. Sri Lanka

Oceanswell has not been in a position to conduct fieldwork in Sri Lanka over the past year, and the whale watching companies with whom they collaborate have also had very few trips due to the pandemic. However, Asha de Vos and collaborators are working on a publication related whale watching from previous years.

Ranil Nanayakkara has been documenting humpback whale sightings and conducting photo-identification and acoustic research with sperm whales.

4.5 Maldives

Humpback whales are rare in the Maldives, but sightings are becoming increasingly common during the southwest monsoon season. This is the southern summer, and it is likely that these whales are from the

southwest Indian Ocean population (IWC breeding stock C). These records have been compiled and submitted for publication as part of a wider study of humpback whales in the central Indian Ocean. In addition to that study, a review of cetacean strandings is nearing completion and should be submitted for publication shortly. And a line-transect survey is planned for April 2022, in order to estimate cetacean abundance around the northern atolls. This will repeat previous surveys from April 1998 and April 2013, providing a time series for the estimation of population trends.

4.6 Iran

Plan for the Land Society

Plan4land has been faced with serious challenges related to COVID and economic sanctions. Nonetheless, the team is working on a paper on the humpback dolphins of “Dayer-Nakhiloo Marine National park” with support from Bruno Diaz and Gill Braulik (hopefully this will be published soon). The team plans to extend its study areas to “Deltas of Rud-e-Shur, Rud-e- Shirin and Rud-e- Minab” (International wetland, Iran Ramsar Sites, IBA) and “Khuran straits” (International wetland, Iran Ramsar Sites, IBA). They also plan to survey the Musa Bayin collaboration with other countries in the region. The team has published a new book called Dolphins of Iran, which can be shared in PDF version with anyone from the network who would like a copy. Finally, with support from Gill Braulik, they are working a paper focusing on the results of the 10 years of the Iran national stranding network, that Plan4land has helped to create and support.

4.7 United Arab Emirates

Fujairah Whale and Dolphin Project

After a break in fieldwork due to COVID-19 travel restrictions, surveys off Fujairah started again in February 2021, including 5 days of aerial (helicopter) and vessel transect surveys in offshore waters starting approximately 20kms from shore in water depths of 80-120m and with end points reaching as far as 80kms from shore in water depths of well over 1,000m. The surveys were repeated again the following month (late March) and will be repeated again in both August and November. The work has a multi-species focus and is run in partnership with the Port of Fujairah with the intention of assisting the latter in the development of vessel-traffic mitigation top reduce potential impacts on marine mammals in the area.

The Fujairah Whale and Dolphin Research Project is also collaborating with the UAE (Dubai-based) Dolphin Project (see below for more details) on genetic study of *Tursiops truncatus*. Over 30 biopsy samples have been collected to date and analysis is planned for the coming year.

(see www.fujairahwhales.com and follow the social media links).

UAE Dolphin Project & Zayed University

Despite the pandemic the UAE Dolphin Project, which is now conducted through Zayed University, has progressed on several fronts. Current projects include a) stomach content analysis of Indo-Pacific bottlenose

dolphins; b) progress in organising a national stranding network by involving local authorities, providing necropsy training to dedicated personnel (Dubai Municipality, Sharjah Municipality); c) secured private funding (Atlantis, Dubai, F3 Marine) and started a one-year survey of Dubai coastal waters under Dubai Municipality research permit. Since February 2021, surveys are conducted twice a week, covering 1000 km² of Dubai's coastal waters. The survey follows predetermined transects and aims to provide data to document marine mammal species. Results will be used to map the distribution of and generate population estimates of the most regularly observed species. To date, 10 surveys have been conducted and eight sightings have been recorded (3 finless porpoises, 5 Indo-Pacific bottlenose dolphins). Preliminary analysis of bottlenose dolphin Photo-ID data confirmed the presence of individuals previously identified in 2013-2014. The project is working towards developing a genetic study with national (Fujairah Whale Project) and international collaboration utilising both biopsy and stranding samples, and defining a roadmap to develop a national stranding network.

4.8 Kuwait

A series of sightings and strandings reported from Kuwait led to three new members from Kuwait joining the ASWN. These new members have actively participated in discussions about sightings and strandings of Bryde's whales in the country, also providing a review of strandings in recent years.

Recently, collaborative efforts to investigate the cause of these strandings have been taken by the Environmental Public Authority (EPA) and the Public Authority of Agriculture Affairs and Fish Resources (PAAF). As a more streamlined sampling protocol has been established with each stranding, improving capacity to document and collect biological data. Archival organic remains/samples have been retained at the fisheries lab for future collaboration. The PAAF is particularly interested in collaborations to conduct DNA sequencing to establish the origin and lineages of marine mammals in Kuwait, so as to be included in future fisheries management plans for threatened and protected species.

Along with the documentation of strandings and Bryde's whale sightings, individual efforts have been taken by researchers of similar interests to establish a local platform to educate the public and monitor cetaceans in Kuwait waters: www.cetaceansq8.net. The website provides a platform to share sightings, volunteer opportunities, as well as published records of whales and dolphins observed in Kuwait. The website is complemented by an Instagram account (@cetaceansq8) that further enhances awareness-raising efforts.

A project focusing on Indian Ocean humpback dolphins (*Sousa plumbea*) continues from a PhD study that commenced in 2018. The project aims to assess the status of a population regularly observed in the northern waters of Kuwait (Around Boubyan island and Failaka island). In recent months the study has collaborated with a wider endeavour undertaken by the EPA in collaboration with the IUCN to list and document the wildlife in Kuwait, resulting in photo-ID protocols being integrated into fieldwork conducted by the EPA. This is supported by targeted training in photo-ID methodology. The collaboration also includes plans to expand the photo-ID survey to Kuwait's southern coastal and offshore waters.

In the near future, it is also hoped that passive acoustic monitoring devices will be planted in key areas, to further expand the survey effort into the acoustic realm.

A manuscript on recent (2010-2020) stranding events of Indo-Pacific Finless Porpoise (*Neophocaena phocaenoides*) from Kuwaiti waters was submitted for peer review in a regional journal.

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Annex 1 Progress on the activities identified in the CMS Concerted Action for Arabian Sea humpback whales as of April 2021

Arabian Sea Humpback Whale Concerted Action: Priority Activities and Outcomes		
Activity	Expected Outcome	Progress as of April 2021
<i>Addressing knowledge gaps</i>		
The development of a marine mammal reporting smartphone App 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. Spotter Pro , Whale Alert , Seafari). 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.
Collaborative boat-based research 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 in Oman. A survey was planned in Pakistan in January 2020, but cancelled due to permitting and security issues, and not rescheduled due to COVID. Funding was also secured to conduct boat surveys in the Karnataka province of India. Equipment was procured, and surveys were due to commence in March-April 2020, but were postponed due to COVID-19. Funding has not yet been obtained for large-scale collaborative research efforts. However, researchers working in India, Sri Lanka, the Maldives and Chagos have collaborated to conduct a review of all available information on humpback whales in the Central Indian Ocean to assess seasonal trends and possible population affiliations. A publication is expected later this year.
Use of passive acoustic recorders 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 analyzed and the valuable results have presented at the IWC (Cerchio et al., 2016; Cerchio et al., 2018). 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 analyzed from India (Mahanty et al., 2015; Madhusudhana et al., 2018). Two Soundtraps procured by IWC funding by Sutaria were placed off Netrani island, Karnataka, India from November 17th 2019 to March 3rd 2020. Analysis of data collected from that unit is underway, and a new unit was placed at Netrani Island in January 2021. A second unit was placed along the coast of Kanyakumari, India. Funding and logistics. Funding and logistics have not yet been in place to conduct larger scale passive acoustic surveys off of Pakistan.
Genetic analysis 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 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. In recent weeks all the relevant permissions (e.g., CITES, ESA, MMPA) were finally secured by WCS, AMNH, and Paris Museum to complete the shipment; the sample may even be received by the time this paper is presented at the IWC SC.
		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. These provide updated indications of health and anthropogenic scarring, and contribute to the updating of key indicators for the population's status. IWC support also facilitated modelling of abundance and trends for the ASHW population based on photo-identification and genetics data from Oman.
		Regional ASHW ecological niche modeling 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. The habitat suitability layers are currently being prepared for a ship strike risk assessment by looking at co-occurrence between identified whale habitat together with shipping traffic density mapping (derived from

		satellite based AIS data). This work, completed as part of a PhD study, will be submitted for peer-reviewed publication in the coming months.
Information sharing and awareness raising		
The development of a regional shared online data platform 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, Flukebook , and Indocet , have resulted in the completion of an ASWN online database that uses the Flukebook Platform. This new 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.
An improved website 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 outreach tools 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 Arabian Sea Whale Network website has undergone some improvements, and is maintained with updates and news items , as well as a page dedicated to the new data platform . The ASWN has produced an infographic to use in reaching out to stakeholders, as well as three issues of a newsletter . The Environment Society of Oman created a very effective video on ASHW and on ghost nets . However, more could be done to create a wider variety of outreach tools, including power-point presentations, videos, or other tools in multiple languages.
Capacity building and development and implementation of mitigation strategies		
Organization of targeted regional workshops, meetings and training 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 here . Many of the researchers working with Arabian Sea humpback whales were also involved in the IUCN Important Marine Mammal Areas workshop for the Western Indian Ocean and Arabian Seas . 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.
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 IWC hosted workshop focusing on bycatch in the Indian Ocean , 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 Appointed Councilor for Aquatic Mammals, the regional representative of CMS Office - Abu Dhabi, 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.