



Progressing Dugong & Seagrass Conservation in the Western Indian Ocean
Special Session at the WIOMSA 12th Scientific Symposium
South Africa, 14th October 2022

Background

Historical information suggests that dugongs (*Dugong dugon*) were once widely distributed and relatively abundant throughout most of the Western Indian Ocean (WIO), ranging from southern Somalia to southern Mozambique as well as many of the Indian Ocean islands. Today, dugongs are listed by the IUCN as Vulnerable to extinction globally, and a recent assessment identifying the East African coastal subpopulation as Critically Endangered has recently been submitted to the IUCN Red List.

The largest remaining viable subpopulation of dugongs in the WIO region is currently found in the Bazaruto Archipelago region of Mozambique. With other subpopulations in the region close to extirpation, Bazaruto's dugongs (estimated at 250-350 individuals in 2021 by Trotzuk et al, 2022) represent the species' last known stronghold in the WIO.

Range states in the WIO subregion have initiated several activities aimed at improving conservation outcomes for dugongs, in collaboration with the United Nations Environment Programme / Convention on the Conservation of Migratory Species of Wild Animals (UNEP/CMS) Dugong Memorandum of Understanding (MOU). The CMS Dugong MOU, hosted by the Environment Agency Abu Dhabi since 2009, is the only international agreement on dugong protection and seeks to prioritize dugong conservation efforts in the region by strengthening regional collaboration and supporting strategic programmes of work.

This special session was organized by the CMS Dugong MOU in partnership with African Parks and the Marine Megafauna Foundation, and brought together experts and government representatives from the region to identify research and management priorities as an important step to ensuring the survival of this critically endangered, iconic and charismatic marine mammal.

Session Overview

The session started with an opening remark and welcome note by Gabriel Grimsditch, CMS Dugong MOU Coordinator, followed by talks and presentations by a number of experts. A total of 49 participants attended the special session (see participants list in Annex II) and a copy of the full session agenda can be found in Annex I.

Mr Grimsditch introduced and chaired the special session. He provided an overview of the CMS and of the Dugong MOU, including the projects, activities and tools related to dugong conservation that are being supported by the Secretariat. These include the Dugong & Seagrass Hub (<https://www.dugongseagrass.org/>), the Dugong & Seagrass Research Toolkit (<http://www.conservation.tools/>), and an overview of the Seagrass Ecosystem Services Project funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) under the International Climate Initiative (IKI) in five countries in Southeast Asia.

Evan Trotzuk, Research and Monitoring Coordinator for African Parks at Bazaruto National Park, presented on the current situation of dugongs in Bazaruto National Park, as well as an assessment of the extinction risk to dugong populations in the region, led by African Parks, which has been submitted to the IUCN and which classifies the East African dugong subpopulation as Critically Endangered. With this assessment, it is possible to make a proposal to the CMS Conference of Parties (COP) to move this regional dugong population from CMS Appendix II to Appendix I.

Abdul Mugabe, of the Marine Megafauna Foundation, presented on the importance of protecting dugongs in the marine areas adjacent to Bazaruto National Park as they are considered critical to the survival of dugongs in the WIO region. He also provided an overview of an ongoing dugong conservation project (2021-2024), in Inhassoro, Mozambique. The project is funded by Fondation Segré and receives technical support from the CMS Dugong MOU.

Status reports on dugong research, awareness-raising and research were presented by experts and researchers from the majority of WIO countries and territories that have known dugong populations, including Tanzania (Lindsey West), Mayotte (Leá Bernagou), Seychelles (Marie-May Jeremie), Comoros (Philippe Robert), Kenya (Asma Awadh), Somalia (Mohamud Ali), and Madagascar (Norbert Andrianarivelo).

Apart from the Seychelles and potentially Somalia, all of these countries report very low populations of dugongs with estimates of less than ten individuals in each country. Drone surveys to quantify the dugong population present in Aldabra Atoll, Seychelles, are currently being planned and designed. In January 2022, a research mission by the University of St Andrews (UK) and the Wildlife Conservation Society (Kenya), found anecdotal evidence of a potentially significant dugong population in Somaliland, bordering Djibouti, and this warrants further investigation.

Further thematic presentations were made on a) techniques for drone surveys (Christopher Cleguer), b) a project on studying the genetics of dugongs in the region (Shelley Edwards), and c) reducing mortality and bycatch of megafauna due to gill net usage (Evelyn Ndiritu). These presentations triggered discussions on the importance of regional collaboration.

Discussion

Overall situation of dugongs in the Western Indian Ocean

As per the information presented during the special session, the overall situation for dugongs in the WIO is dire, with the only remaining viable population that has been well documented currently existing in the Bazaruto Archipelago in Mozambique (approximately 250-350 individuals). Protecting this population, especially from threats when the dugongs migrate outside the marine protected area, is critical for the survival of the species in the region. Recently documented dugong sightings suggest there may be a potentially significant dugong population in the Seychelles. An extensive drone survey of the dugong population is planned in Aldabra Atoll in the coming months, as part of a collaboration between the Seychelles Islands Foundation and the James Cook University of Australia. Recent research suggests that there may also be a notably important population of dugongs in Somaliland, bordering Djibouti, but this has not yet been well documented, and is considered a priority area for further research. In all other countries in the region, dugongs exist only in very small numbers, with most countries estimating populations of less than 10 individuals.

The importance of understanding genetic connectivity in the region

An important discussion was facilitated regarding genetics and connectivity between dugong populations in the region. Dugong genetic variability in the region is currently recorded as low, but it is not known whether this is because the WIO represents the extremity of the dugong evolutionary range or due to the low number of samples analyzed so far. Rhodes University is currently developing a research project to address this knowledge gap. Genetic samples from countries in the region are

needed for analysis, and the session stimulated interest in providing samples for this study from Mayotte and Mozambique. Rhodes University will contact other countries in the region to request relevant samples, and the CMS Dugong MOU can potentially play a role in facilitating international collaboration.

It was noted that there has been an ongoing request to retrieve dugong samples from Kenya which has proved challenging. The issue of CITES permits was raised, as these are important documents needed to export dugong samples, however it is important to note that samples needed for genetic analysis are small and can also be taken from skin or bone fragments. It was also suggested that countries could carry out genetic extractions in their own national labs, and then share the results with Rhodes University for a regional connectivity analysis. This would build capacity locally and also encourage the inclusion of scientists from all nations in the region in the study. Sharing of samples for genetic analysis is considered critical for the success of the research.

Technologies for monitoring dugong populations

New technologies for dugong monitoring were discussed. There were discussions regarding optimal aerial survey designs using drones and light aircraft, and experiences were shared between different countries.

Researchers from Mayotte shared that they are developing genetic markers to identify dugongs using eDNA technology, potentially providing a useful and cost-effective tool for establishing dugong distribution in geographical areas where there is a lack of empirical evidence.

Conservation strategies for dugongs in the region

Finally, conservation strategies to protect dugong populations were discussed. The importance of protecting terrestrial forests for water quality was highlighted in the Comoros. Researchers from Kenya presented the impacts of gill net mesh sizes on marine megafauna bycatch and mortality and also presented on their work on introducing fishing communities to gill net mesh sizes that have lower impact on megafauna such as turtles and sharks. It was highlighted, however, that these gill nets would not reduce bycatch and mortality of dugongs or other marine mammals, as marine mammals roll when they encounter a net and thus become entangled and drown. This reinforces the critical need to work with local fishing communities to reduce or eliminate the use of all harmful gill nets. Researchers from Mozambique, Comoros, and Tanzania also shared their experiences of working with local communities to raise awareness on dugongs and enforcing no gill net zones.

Recommendations

A number of recommendations are proposed following the Special Session:

1. Sharing samples and information for genetic analysis is considered critical to understanding the genetic variability and connectivity of dugong populations in the region. Partners in WIO countries are recommended to collaborate with Rhodes University to explore the most effective way of sharing samples. It is also recommended to explore the feasibility of performing DNA extractions in-country with national laboratories and sharing results with Rhodes University for analysis and inclusion in a regional connectivity study. The CMS Dugong MOU can potentially assist in facilitating collaboration between researchers in the region. It is recommended to include national researchers from all partner WIO countries in this research project.
2. CMS and partners to provide support to dugong conservation efforts in areas surrounding Bazaruto National Park in order to protect the last known viable population of dugongs in the region, particularly to the north of the park where there are significant anthropogenic threats and use of gill nets.

3. CMS to collaborate on research into establishing size of dugong population in Somaliland. It is recommended that the CMS dugong research toolkit be utilized and implemented as part of the study to determine the most efficient methodologies for monitoring dugongs.
4. African Parks to provide technical support to relevant signatory states in making a proposal to the CMS COP to include the regional East African dugong population in CMS Appendix I, building on the regional assessment that has been submitted to IUCN and classifies this population as Critically Endangered.
5. Prepare a report of findings from the WIOMSA special session for the CMS Dugong MOU Meeting of Signatories, currently planned for first quarter of 2024
6. WIO countries to prepare national reports for the CMS Dugong MOU Meeting of Signatories

For more information, contact:

Gabriel Grimsditch, Programme Coordinator - gabriel.grimsditch@un.org

Memorandum of Understanding on the Conservation and Management of Dugongs and their Habitats throughout their Range (Dugong MOU)

Convention on Migratory Species Office - Abu Dhabi • United Nations Environment Programme
c/o Environment Agency - Abu Dhabi • PO Box 45553 • Abu Dhabi • United Arab Emirates

• T: +971 2 403 3604 • www.dugongseagrass.org • www.cms.int/dugong

Annex I – Agenda

Time	Activity	
8:30 – 9am	Registration	
9 – 9.15am	Welcome and outline of the schedule	Gabriel Grimsditch, CMS Dugong MOU, Abu Dhabi
9.15 – 9.30am	Overview of the CMS Dugong MOU	Gabriel Grimsditch, CMS Dugong MOU, Abu Dhabi
9:30 – 10am	IUCN Regional Assessment & Bazaruto Dugong Survey	Evan Trotzuk, African Parks, Mozambique
10 – 10.15am	Inhassoro Dugong Project	Abdul Mugabe, Marine Megafauna Foundation, Mozambique
10.15 – 10.30am	Drone surveys for marine megafauna Recorded presentation	Christopher Cleguer, James Cook University, Australia
10.30 – 11am	Coffee break	
11am – 12pm	Global Dugong Genetics Project	Shelley Edwards, Rhodes University, South Africa
12 – 12.15pm	Tanzania	Lindsey West, Seasense , Tanzania
12.15 – 12.30pm	Somalia Online presentation	Mohamud Ali, Ministry of Fisheries and Marine Resources, Somalia
12.30 – 12.45pm	Kenya Online presentation	Asma Awadh, WWF-Kenya, Kenya
12.45 – 2pm	Lunch break	
2 – 2.15pm	Mayotte	Leá Bernagou, Association des Naturalistes Environnement et Patrimoine de Mayotte, Mayotte
2.15 - 2.30pm	Seychelles	Marie May Jeremie, Seychelles Island Foundation, Seychelles
2.30 – 2.45pm	Comoros	Philippe Robert, Moheli National Park, Comoros
2.45 – 3pm	Gear modification to reduce megafauna mortality	Evelyn Ndiritu, CORDIO East Africa, Kenya
3 – 3.15pm	Madagascar	Norbert Andrianarivelo, Institut Halieutique et des Sciences Marines de l'Université de Toliara, Madagascar
3.15 – 4pm	Research priorities Management/Community priorities Policy priorities	Group work led by CMS Dugong MOU
4pm	Summary and recommendations	Gabriel Grimsditch, CMS Dugong MOU

Annex II – Participants sign in sheet

WIOMSA 12th Scientific Symposium
 October 14th 2022, Nelson Mandela University.
 Special Session: Progressing dugong & seagrass conservation in the WIO

Name	Affiliation	Email address
BERNAGOU Lisa	Association des Naturalistes	Pea.bernagou@netnamy.org
Abdul Mujib	Association des Naturalistes	abdulmujib@netnamy.org
Karen Allen	Fundación Ekhuila	Karen@ekhuila.org
Linsey West	Sea Sense	linsey@seasense.org
Jenny Wiegro	University of Dar es Salaam	jennywiegro@gmail.com
Erasmus Dorence	Musée de la Faune	erasmus.dorence@musée-nature.org
Nick Hood	Uppsala University	nick.hood@zoology.uu.se
Lina Muna Haduku		lina.muna.haduku@gmail.com
Edmond Cisse	CUFA MAYOTTE	edmond.cisse@cufa-mayotte.org
EVAN PROZUK	AFRICAN PARKS	evan@afrikanparks.org
Benjamin Jones	Project Seagrass	ben@projectseagrass.org
Franz Luchini	NMV	franz.luchini@gmail.com
TERENCE RUGGASAMY	RMTA	terence.ruggasamy@gmail.com
Adeline Couet	OCEAN CONSULT	adeline.couet@ocean-consult.com
Suzana Kihia	KENYA MARINE (KMFRI)	suzana.kihia@gmail.com
Amy Mumu	KMFRI	mumu.amy@gmail.com
STACY RAEZ	FEW	sraez@fewtrusts.org
Shelley Edwards	Rhodes Univ.	s.edwards@ru.ac.za
Salmacia Bano	Rhodes University	salmacia.bano@gmail.com
Notosha Roussouw	University of Cape Town	nroussouw@gmail.com
Valera Lucena Dias	EDUARDO MENDANE UNIV	valerac@edumuniv.com
LIBERTY LINDA	Edinburgh University	liberty.linda@ed.ac.uk
CLARE THOMES	CORDIO SA	clare.thomes@cordio.com
GRACE WAGUCHU	WILDLIFE RESEARCH BOARD	grace.waguchu@wrb.go.ke
Alphine Moga	Wildlife Conservation Society	almoga78@gmail.com
DANIELA OLIVA	Edwards Mandara Univ	daniela.oliva@gmail.com
Jessica Juliana	BIOFUND MOZAMBIQUE	juliana@biofund.org.mz
Judith Manganyi	BIOFUND Moz	judithmanganyi@biofund.org.mz
EVYLINE NDUBITU	CORDIO East Africa	evyline.ndubitu@cordio.com
JANORUWINE UCU	KMFRI	janoruwine@gmail.com
GABRIEL NDOROGI W	KMFRI	wandorogi@gmail.com
Vic Cockcroft	DUGONGS.ORG	vic@cockcroftdugongs.org
VALARIE SILALI	KMFRI	valariesilali@gmail.com
Mario-Nay Ferrer	SEYCCAT/SIF	ce@seyccat.org

Katia BALLORAIN CEDTM KATIABALLORAIN@CEDTM-ASO-ORG
 Joshua Rantakariainen CORDIO jranth@cordio.org
 Anneke Faure SEYCCAT. afaure@seyccat.org
 10 gwtlym Rowlands Uni of Oxford gwtlym.rowlands@biology.ox.ac.uk
 Lucy Martin Ocean Ecology lucy.martin@ocean-ecology.com
 Ingvar Nässtrand WWF SE ingvar.nasstrand@wwf.se
 Norbert ANDRIANARIVELU IESA andnorb@yahoo.fr
 (University of Antananarivo)
 SÁBOCK B RUSELWA University of Dar es Salaam ruselwa_email@univ.ac.tz
 Zephania Arnold WWF - Tanzania zarnold@wwf.org
 JENNY WES - TANZANIA JENNY@WES-ORG
 Peter Manyara IUCN peter.manyara@iucn.org
 Mary Ontomwa KMFRI - Kenya maryontomwa2023@yahoo.com
 11 Gabriel Grimaldi CUS Dugong MBU gabriel.grimaldi@univ.ac.tz

Annex III – Session photos







