



Status of the dugong (*Dugong dugon*) and associated habitat in the Comoros

**A progress report submitted to the
Rufford Small Grants Foundation
14.4.06**



**Community Centred Conservation
C3-Comores
2008**

© C3-Comores 2008

C3-Comores is a collaborative initiative between Community Centred Conservation (C3), a non-profit company registered in England and Wales no. 5606924 and Comorian partner organizations.

The activities described in this report have been supported by a Rufford Small Grant for Nature Conservation, PADI Foundation grant and BP Conservation Programme Future Conservationist Award.

Suggested citation:

C3-Comores (2008) STATUS OF THE DUGONG (*DUGONG DUGON*) AND ASSOCIATED HABITAT IN THE COMOROS. A progress report submitted to The Rufford Small Grants Foundation. 22pp



Dugong and diver

FOR MORE INFORMATION

<p>Community Centred Conservation (C3)</p> <p>www.c-3.org.uk info@c-3.org.uk</p>	<p>Mohéli Marine Park (PMM)</p> <p>Nioumachoua, Mohéli pmm@comorestelecom.com</p>
<p>C3-Comores</p> <p>BP 8310, Iconi, Grande Comore tel. +269 73 75 04 GSM +269 36 75 06</p>	<p>Association of Intervention for Development and the Environment (AIDE)</p> <p>http://www.aide.africa-web.org/ aide@snpt.km</p>
<p>University of the Comoros</p> <p>Universite des Comores Route de la corniche BP 881 Moroni Union des Comores univ_com@snpt.km</p>	<p>Ministry for the Environment</p> <p>Ministère de l'Environnement Mdé - Ex-CEFADER Moroni Union des COMORES</p>



Status of the dugong (Dugong dugon) and associated habitat in the Comoros

**Edited by C.N.S. Poonian
Community Centred Conservation (C3)**

**Moroni
2008**



AIDE



PADI FOUNDATION



ACKNOWLEDGEMENTS

This report is the culmination of the advice, cooperation, hard work and expertise of many people. In particular, acknowledgements are due to the following for their contributions:

COMMUNITY CENTRED CONSERVATION (C3)

Director: *Patricia Davis*

International Programme Manager: *Chris Poonian*

C3-Comores Programme Manager: *Rozenn Le Scao*

C3-Comores Programme Coordinator: *Melissa Hauzer*

University of the Comoros Trainees: *Mouzidalifa Issouf and Miroirdine Karmardine*

Interns: *Bjorn Alfthan, Audrey Clark, Joanne Nice, Ariana Arcenas, Kileken Ole Moi-Yoi, Sarah Freed, Patience Mulu, Arabella Bramley, Helen Pagett, Niamh Kelly and Emily Walker*

MOHÉLI MARINE PARK

Curator : *Kamardine Boinali*

Ecoguards, *particularly Hamada Issoufi and Cheikh Moussa*

Management Committee, *particularly Abdou Malida and Nassur Ahamada*

THE JUNIOR ECOGUARDS

FADEVICHO / HUPPE, *particularly Ahmed Dahalane, Omar Nafdi and Bachiroudine Issa*

THE MINISTRY RESPONSIBLE FOR THE ENVIRONMENT, MOHÉLI, *particularly Abdou Tchake, Minister for the Environment and Toiouilou Madi Bam Dou, Director General for Tourism*

THE MINISTRY RESPONSIBLE FOR THE ENVIRONMENT, COMOROS, *particularly Sitti Kassim, Minister for the Environment; Said Mohammed Ali Said, Secretary General, Fatouma Abdallah, Adjoint Director, INRAPE and Farid Anasse, INRAPE*

THE UNIVERSITY OF THE COMOROS *particularly Dr Kamaldine Afratine*

AIDE, *particularly Zaharani Moindjie and Said Ahamada, Secretary General*

All other volunteers and students, *particularly Ben Said Omar and Mouzdaoui Baussawi*

EXECUTIVE SUMMARY

Dugong (*Dugong dugon*), or sea cows, are listed as vulnerable to extinction and are the only herbivorous mammals that are strictly marine and specialize in feeding on seagrass beds. Little is known about the status of the dugong population of the Comoros, and few research, monitoring or awareness-raising activities have ever been carried out. In June 2006, to address this paucity of information on dugong and seagrass in the Comoros, C3-Comores initiated an integrated dugong and seagrass research, monitoring, capacity-building and awareness-raising programme throughout the country with the specific objectives:

- To gain an indication of the current population status of the dugong in the Comoros through interviews of fishers and incidental sighting cards.
- To carry out surveys of the species composition and to map the extent of seagrass beds throughout the Comoros.
- To raise public awareness of conservation issues associated with the dugong and its habitat.
- To use the results of this study to compile an Action Plan for the Conservation of the Dugong in the Comoros.

Following interviews with over 2,500 artisanal fishers and seagrass surveys along the whole coastlines of Mohéli and Grande Comore as well as awareness-raising activities which have reached thousands of Comorians, preliminary recommendations and conclusions are:

- Deliberate hunting of dugong in the Comoros, although commonplace in the 1970-80s, is no longer viable due to the small population size. The primary contemporary threat to the population is accidental capture in gillnets which urgently needs to be addressed through introduction of alternative techniques and/or livelihoods.
- The methodology from this study has been shared with the neighbouring island of Mayotte (France), encouraging a trans-boundary approach to management of the species and will be extended to Madagascar in 2008.
- A regional database should be established to consolidate data on the species across the WIO region.
- Low-cost studies such as this can reveal important information for management planning in place of more expensive techniques such as aerial surveys and satellite tagging programmes, which may not be scientifically or logistically viable for the study of small populations in developing countries.
- Further awareness-raising amongst fishers, particularly on Mohéli, is required to explain exactly why dugong are protected by law.

OUTPUTS FROM THIS WORK

Note: The completion of this project has been delayed as a result of serious political unrest on the island of Anjouan following a disputed election result in June 2007 (see Appendix 1).

MoU FOR INTERNATIONAL PROTECTION OF THE DUGONG

As a direct result of this project, Patricia Davis was invited to attend the Technical Workshop and meeting on the Memorandum of Understanding (MoU) for international protection of dugong in Abu Dhabi at the end of October 2007 and presented an update on the status of dugong in Comoros. This was an historic meeting, during which the Convention for Migratory Species (CMS) Conservation Management Plan for the western Indian Ocean region was finalized and government officials from Tanzania, Eritrea, France, Australia, Madagascar, United Arab Emirates and Pakistan ensured their nations were the first signatories to the MoU.

It is anticipated that all range states will shortly sign the agreement in order to catalyze and co-ordinate conservation initiatives for this endangered species throughout the world. Patricia had the opportunity to update delegates on the important dugong research being conducted in the Comoros as a result of strong collaborations between government, NGOs and local communities. Delegates from other countries were interested in applying C3's research methods to collect data on their own dugong populations so there will be close co-ordination in the future.

Unfortunately the Secretary General for the Ministry of the Environment in the Union of Comoros was unable to attend the meeting, but will be involved closely in the development and implementation of a National Conservation Action Plan in the coming months. Further information about this exciting step forward for dugong conservation can be found at <http://www.ead.ae/en/?T=4&ID=3391>

PUBLISHED PAPERS

Davis PZR, Poonian CNS (2007) INCIDENTAL CAPTURE OF THE DUGONG, DUGONG DUGON IN GILLNETS, MOHÉLI, UNION OF THE COMOROS. In Kiska J, Muir C (Eds) 1st Regional Workshop on Incidental Catches of Non-targeted Marine Species in the Western Indian Ocean, Workshop proceeding. 13-15th November 2006, Mayotte, France.

Alfthan B, Davis PZR (2006) DUGONG RESEARCH AND CONSERVATION ON MOHÉLI ISLAND, UNION OF THE COMOROS. Sirenews Newsletter of the IUCN Sirenian Specialist Group 46

CONFERENCE PRESENTATIONS

Davis PZR, Hauzer MD, Moussa C (2006) THE DEVELOPMENT OF SUCCESSFUL CONSERVATION PARTNERSHIPS FOR THE MANAGEMENT OF MOHELI MARINE PARK, COMOROS. Poster presentation, International Society for Reef Studies European Meeting September 19 – 22, 2006 Bremen, Germany (Appendix 2)

Davis PZR, Poonian C, Hauzer M, Kamardine Mabrouk Slim M (2007) DEVELOPMENT OF A NATIONAL CONSERVATION ACTION PLAN FOR THE DUGONG IN THE COMOROS - INTEGRATING ECOLOGICAL RESEARCH WITH LOCAL KNOWLEDGE. Oral presentation at the Fifth WIOMSA symposium, Durban, South Africa 22-26 October 2007.

Davis PZR, Poonian CNS, Hauzer M, Anasse F (2007) DEVELOPMENT OF A BLUEPRINT FOR A WESTERN INDIAN OCEAN REGIONAL DUGONG CONSERVATION STRATEGY. Poster presentation at the Conservation management of Sirenians in developing countries and indigenous communities workshop, 17th Biennial Conference on the Biology of Marine Mammals, Cape Town, South Africa. (Appendix 3)

AWARENESS MATERIALS

- 1000 dugong brochures printed (Appendix 4)
- 120 T shirts printed (Appendix 5)
- Mze Ngouva song and dance recorded (Appendix 6)
http://www.c-3.org.uk/English/Comoros/Projects/dugong_comoros.htm
- Radio show broadcast on Mohéli (Appendix 6)
- Dugong community awareness presentation compiled (Appendix 7)

EXPECTED OUTPUTS

- Technical report on the status of the dugong and seagrass in the Union of the Comoros
- National Conservation Action Plan for the Dugong in the Union of the Comoros
- Paper on the dugong population of Mohéli in Marine Mammal Science journal
- Online interactive maps of seagrass distribution in the Comoros

CONTENTS

1. INTRODUCTION	1
1.1 Dugong	1
1.2 Seagrass	1
1.3 The Union of the Comoros	2
2. OBJECTIVES	5
3. ACTIVITIES	6
3.1 Fisher Interviews	6
3.2 Incidental Sighting Cards	7
3.3 Seagrass Surveys	8
3.4 Awareness-raising events	9
3.5 Activities summary	10
4. PRELIMINARY FINDINGS	13
4.1 Dugong On Moheli	13
4.2 Historical Sightings	14
4.3 Awareness of Dugong	15
4.4 Distribution of Dugong	16
4.5 A National Conservation Action Plan	17
5. CONCLUSIONS AND RECOMMENDATIONS	18
6. REFERENCES	19
5. APPENDICES	21

I. INTRODUCTION

I.1 DUGONG

Dugong (*Dugong dugon*), or sea cows, are the only herbivorous mammals that are strictly marine and specialize in feeding on seagrass beds. They have a low reproductive rate with a maximum population increase rate of 5% per year, if there is low natural mortality and no human-induced mortality (Marsh 1986). The dugong is vulnerable to extinction throughout its range, which spans approximately 42 countries worldwide. Since 2002, calls have been made for a coordinated approach to the conservation of this species at both the regional and international levels. Since 2005, the Convention on Migratory Species (CMS) secretariat has been developing an international Memorandum of Understanding and Conservation and Management Plan (CMP) in collaboration with range states, which will facilitate the implementation of conservation efforts worldwide. In October 2007, the first 7 states signed the MoU and regional CMPs were finalized for the western Indian Ocean (WIO) and eastern Indian and Pacific Ocean (EIO) regions. Given that most states of the WIO lack the financial and technical resources to initiate dugong conservation plans, this study piloted a low cost research methodology, using local personnel, aimed at yielding data directly applicable for management planning. The technique has since been adapted for use in Mayotte (France) and could be applied elsewhere in the region.



Seagrass survey

I.2 SEAGRASS

Seagrass is an important component of coastal and near shore environments and its ecological value has become increasingly recognized over the past 40 years. Seagrass provides food for numerous fish species, waterfowl, marine turtles, and dugong (Short and Coles 2001). Seagrass habitats support

complex food webs by virtue of their physical structure and primary production and are well known for their role as breeding grounds and nurseries for crustaceans, finfish and shellfish. Seagrass beds rank with coral reefs and mangroves as one of the world's most productive coastal habitats. The loss of seagrass habitats is a significant aspect of the degradation of the world's oceans (Short and Coles 2001). The primary threat to the health of seagrass stems from land-based human activities. Increases in dredge and fill, coastal development, recreational boating and raised sediment and nutrient loading from run-off have dramatically reduced seagrass distribution (Short and Wyllie-Echeverria 1996).

1.3 THE UNION OF THE COMOROS

The Union of the Comoros is situated at the northern end of the Mozambique Channel, equidistant (approximately 300km) from continental Africa and Madagascar (Figure 1). It comprises three volcanic islands: Grande Comore, Anjouan and Mohéli. Since independence from France in 1975, the Comoros have not achieved firm political stability. The current governmental system, established in 2002, consists of an autonomous government for each island (dealing with internal island affairs), and a Union Government for the country as a whole (dealing with national and international affairs). The Comoros are currently facing extreme demographic pressures, 53% of the population is under 20 years old and the population is predicted to double within the next 33 years (Union des Comores 2005). As an island state, with limited natural resources, these rates of growth are likely to result in serious environmental degradation unless mitigation measures and proactive management of natural resources are initiated immediately. These impacts are most likely to be experienced first in coastal areas, since the majority of the population lives on the coast.

In contrast to its demographic circumstances, the Union of the Comoros has been identified as one of the 'hottest hotspots' in terms of global conservation priorities (Myers et al. 2000). Thus, this small island developing state is one of the world's critical sites for natural resource-based development and has tremendous potential, not only for ecotourism, but for conservation investment and action. These combined attributes of high marine diversity and intensive anthropogenic pressure underscore the importance of assessing, understanding and monitoring socioeconomic elements to strengthen current and implement further appropriate management and conservation strategies which include local stakeholders and communities.

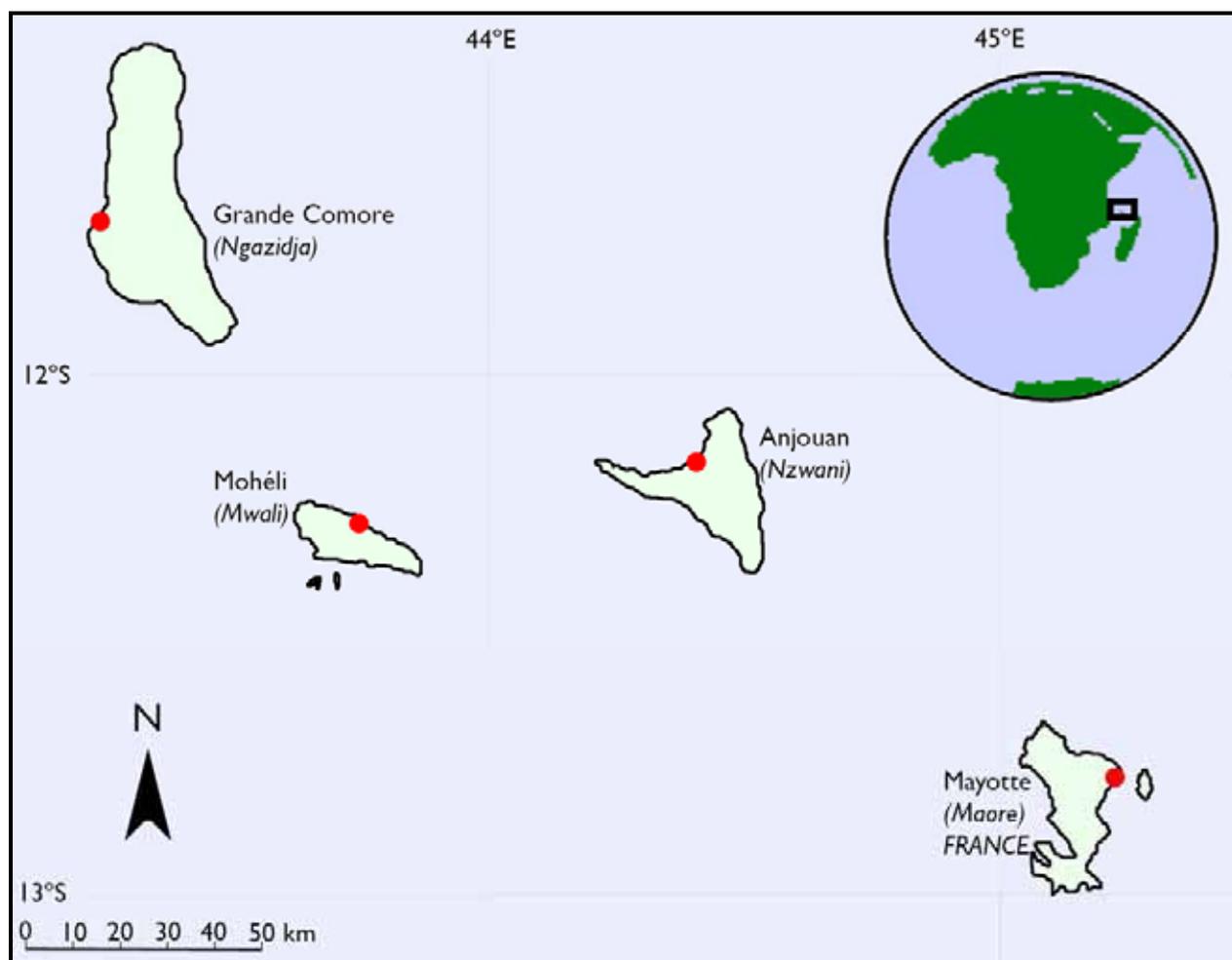


Figure 1: The Union of the Comoros and Mayotte

The three main obstacles to the country in the implementation of effective biodiversity conservation strategies have been identified as: lack of technical and financial resources; demographic pressure and an absence of fair distribution of the benefits arising from natural resources (Union des Comores 2003). In 1998, IUCN and the Comorian government, funded by GEF/UNDP, initiated a 5-year project entitled 'Conservation of Biodiversity and Sustainable Development in the Federal Islamic Republic of the Comoros' (Project Biodiversity). Although successful to some extent, this project was overambitious for the available levels of training, project timeframe and existing infrastructure (Wells 2005) and the final evaluation of the project concluded that the prognosis for its sustainability was poor (IUCN 2004). Although some components of Project Biodiversity were extended for two years as 'The Project for Rehabilitation Activities for the Conservation of Biodiversity', all funded activities concluded in 2005.

One of the most notable achievements of Project Biodiversity was the establishment of the first Marine Protected Area (MPA) in the Comoros, Mohéli Marine Park (Parc Marin de Mohéli PMM), on 19th April 2001. The MPA covers 404km² off the southern coast of the island (Figure 2). The

establishment of PMM was based on its rich biological diversity and the presence of key coastal habitats and endangered marine species including coral reefs, mangroves, humpback whales, dugong, and the third most important nesting site for green sea turtles in the world.



Figure 2: Mohéli showing boundary of Marine Park

Little is known about the status of the dugong population of the Comoros, and few research, monitoring or awareness-raising activities have ever been carried out. A rapid assessment questionnaire survey of 41 people identified Mohéli as the only remaining island where dugong occur, and suggested that although deliberate hunting was a problem in the past, the key contemporary threat was accidental capture in gillnets (Fatouma 2004). Gillnetting is completely banned within Mohéli Marine Park; to date, this ban has been enforced with varying levels of success, with fishers expressing dissatisfaction at the lack of provision of alternative fishing gears and training in alternative techniques (C3-Comores 2007). It has been predicted that the seagrass meadows of the Comoros should show similarities with those of Mozambique (Bandeira and Gell 2003) and seagrass is a significant habitat in the shallow waters of both the north and south regions of Grande Comore (Anasse et al 2003). In June 2006, to address this paucity of information on and action for dugong and seagrass on the Comoros, C3-Comores initiated an integrated dugong and seagrass research, monitoring, capacity-building and awareness-raising programme on Mohéli (Alfthan and Davis 2006) which was later extended to the other islands of the archipelago.

2. OBJECTIVES

- To gain an indication of the current population status of the dugong in the Comoros through interviews of fishers and incidental sighting cards.
- To carry out surveys of the species composition and to map the extent of seagrass beds throughout the Comoros.
- To raise public awareness of conservation issues associated with the dugong and its habitat.
- To use the results of this study to compile an Action Plan for the Conservation of the Dugong in the Comoros.



Three-legged race, Day of the Dugong



Sand art competition, Day of the Dugong

3. ACTIVITIES

3.1 FISHER INTERVIEWS

Fishers comprised a significant proportion of all 23 village communities of Mohéli and interviews were therefore carried out in every village, 10 within the Marine Park boundaries and 13 outside (Fig. 1). Fishers were interviewed at all coastal villages on both Grande Comore and Anjouan. Only fishers who had seen dugong were interviewed. The semi-structured interview (based on Beudard *unpublished* – see Appendix 8) was designed to ascertain details of dugong sightings (both live and dead); causes of death; and awareness of the status of the species. A team of interviewers, which included Marine Park rangers, visited each village. On locating groups of fishers, the team introduced the research programme, and determined which fishers had seen dugong. Correct identification of the species was confirmed by showing the fisher a photograph or drawing of a dugong. Fishers were assured that their answers to the questionnaires would remain confidential. The questionnaire has now been shared with researchers from Mayotte, Madagascar and Mozambique. Low-cost studies such as this can reveal important information for management planning in place of more expensive techniques such as aerial surveys and satellite tagging programmes, which may not be scientifically or logistically viable for the study of small populations in developing countries.



Fisher interviews, Mohéli



Fisher interviews, Grande Comore



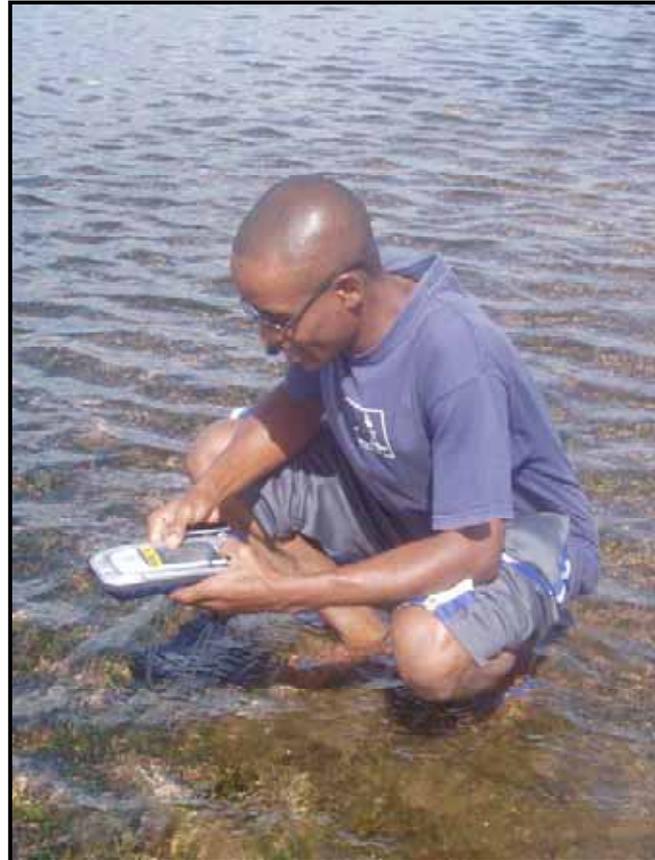
Fisher interviews, Anjouan

3.2 INCIDENTAL SIGHTING CARDS

Incidental sighting cards, (based on Community Centered Conservation (C3) 2003 – see Appendix 9), were distributed to all the villages of Mohéli. The cards were deposited with the village ecoguard, a reputable fisher or the village chief. These cards were intended to provide a means to record sightings of dugong as and when they occurred. Cards were then sent directly to Mohéli Marine Park allowing data entry into a centralized database and the opportunity to gather further information from the site (e.g. tissue samples in the case of a dead animal). Although no sightings were recorded during the course of the study, a number of fishers who had not been approached during the interviews used the cards to report historical sightings.

3.3 SEAGRASS SURVEYS

A rapid reconnaissance survey was conducted around the coastline of each island to identify the presence of seagrass beds. Fine-scale mapping was then carried out to determine the extent, species composition and density of seagrass areas using the internationally-standardized 'Seagrass Watch' protocol (McKenzie 2003, McKenzie and Campbell 2002, McKenzie et al 2003).



Mapping seagrass

Maps generated in Arc GIS are being overlaid with sighting data to create a series of critical 'hotspots', where public awareness campaigns and management efforts can be focussed in the future. Seagrass surveys have been completed on Mohéli and Grande Comore, and will be conducted on Anjouan as soon as the necessary government clearance has been obtained (see Appendix I).



Identifying seagrass specimens

3.4 AWARENESS-RAISING EVENTS

Day of the Dugong

On 26th August 2006, C3 and Mohéli Marine Park (PMM) held a day to celebrate the dugong in the village of Nioumachoua. C3, PMM, ADSN (Nioumachoua village association), Nioumachoua officials and residents organized the celebration, which began on Friday and lasted until Sunday. Speeches were given by PMM Director Kamardine Boinali, C3 Director Patricia Davis, The Minister of the Environment and Park Ranger Hamada Issouf. The celebration included radio broadcasts, a dance competition, a women's traditional tam tam, football, volleyball, a dugong quiz, and children's activities such as a treasure hunt. The celebration was well attended by Nioumachoua residents, Park Rangers and officials from throughout Mohéli. A local songwriter was commissioned to write a song about the dugong 'Mze Ngouva', which may be heard (with accompanying dance) online at http://www.c-3.org.uk/English/Comoros/Projects/dugong_comoros.htm.



Official ceremony, Day of the Dugong, Nioumachoua



A huge crowd gathers for the Day of the Dugong festivities



Junior dance competition – Day of the Dugong



Dance competition contestant - Day of the Dugong

Village presentations

Village presentations were given at Hoani and Hamba on Mohéli (2006) and at Iconi, Bouni, Ndroute, Mitsamiouli, and Chindini on Grande Comore (2007) to raise awareness about the dugong. Presentations were given by University of the Comoros students Mouzidalifa Yssouf and Miroirdine Karmardine who discussed the conservation and biology of the dugong and sea turtles (another endangered species of the Comoros also reliant on seagrass beds).



Mouzidalifa Yssouf gives a presentation

Each presentation attracted hundreds of local people, who enjoyed the <Powerpoint> presentation (see Appendix 7) and Mze Ngouva song. Communities were highly receptive and an intense discussion followed each presentation. Brochures (Appendix 4) and T shirts (Appendix 5) were produced to raise awareness of dugong conservation and were distributed on all three islands (fishers who had been interviewed were given priority for T shirts).



Miroirdine Kamardine gives a presentation

3.5 ACTIVITIES SUMMARY

ISLAND	FISHER INTERVIEWS	SEAGRASS SURVEYS	INCIDENTAL SIGHTING CARDS	AWARENESS RAISING
GRANDE COMORE	68 interviewed from 36 villages (approx 1200 approached)	Completed July 2007	Not applicable (very low frequency of sightings)	Village presentations in 5 villages
MOHÉLI	156 interviewed from 23 villages (approx 400 approached)	Completed November 2006	Distributed July 2006	Day of the Dugong, village presentations in 2 villages
ANJOUAN	38 interviewed from 30 villages (approx 1000 approached)	Awaiting official clearance (see Appendix)	Not applicable (very low frequency of sightings)	Awaiting official clearance (see Appendix)



The Minister for the Environment, Mohéli, gives a speech at Day of the Dugong

4. PRELIMINARY FINDINGS

4.1 DUGONG ON MOHÉLI

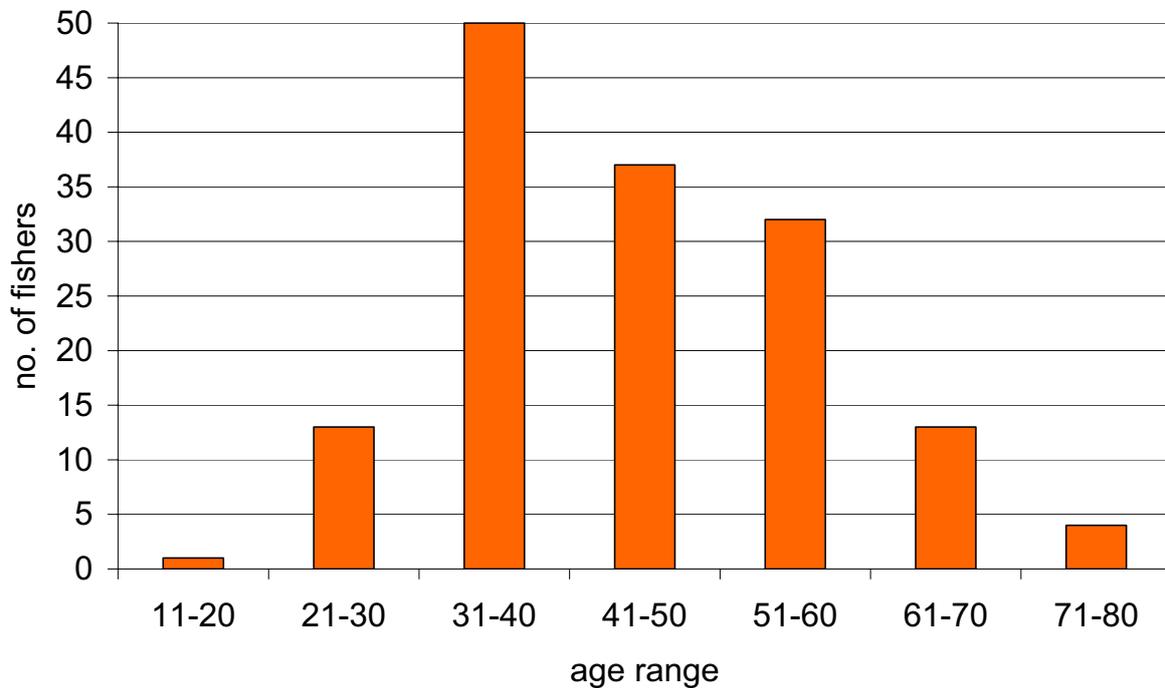


Figure 3: Ages of fishers interviewed on Mohéli

A total of 156 fishers who had observed dugong were interviewed, resulting in a total of 392 dugong sightings, 65% of which were live, and 35% dead. The fishers who reported sightings ranged from 19 to 80 years old, the modal age group was 31-40 years old (35%) (Figure 3). A significant majority of interviewees (86%) believed that the dugong population of Mohéli had declined in recent years (Figure 4). The fishers who perceived the population to have increased (11%) came from the villages of Nioumachoua and Itsamia, within the Marine Park. Far fewer dugong were reported from Grande Comore (68 fishers reported sightings out of approx. 1,200 approached) and Anjouan (38 fishers reported sightings out of approx. 1,000 approached), thus it is likely that dugong utilize habitat on Mohéli in preference to the other islands, although seagrass beds in the vicinity of Mitsamiouli in the northwest of Grande Comore may still be sustaining a significant number of dugong.

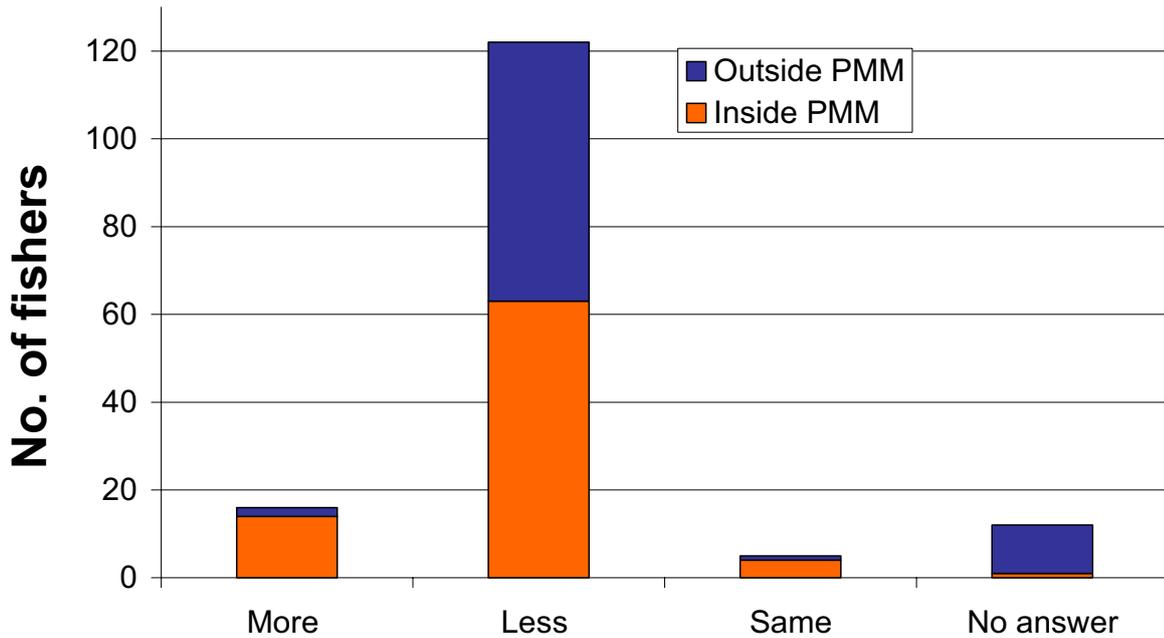


Figure 4: Reported change in dugong population of Mohéli

4.2 HISTORICAL SIGHTINGS

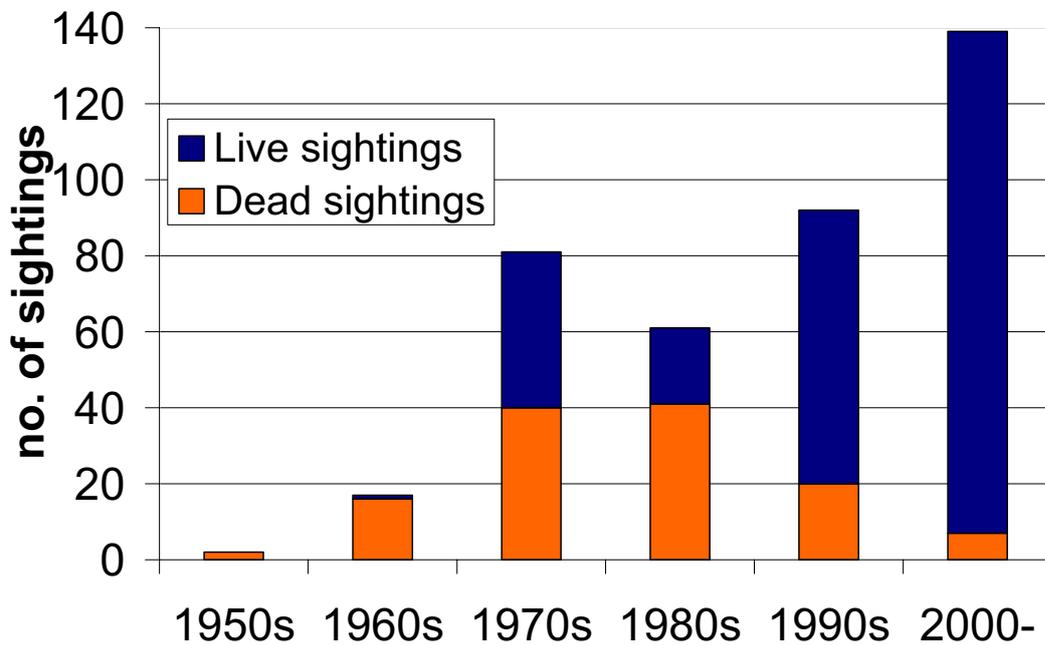


Figure 5: Fishers' recounted sightings of dugong on Mohéli

Sightings were reported from 1950 to 2006 (Figure 5), with more sightings reported in recent years, 35% since 2000 (probably because these were more easily remembered). The majority of sightings of dead animals were reported from the 1970s to 1980s (59%) whereas the highest number of live

sightings were made since 2000 (52%). The high percentage of dead dugong sightings during the 1970s and 1980s indicates that dugong were deliberately hunted during these decades. Fishers almost unanimously reported a decline in dugong numbers on Mohéli; thus it may be inferred that the lower percentage of dead sightings in recent years indicate that dugong are no longer deliberately hunted owing to their rarity. When questioned about the cause of death, the majority of fishers did not answer, although 21% were confirmed as being caught in a gillnet and 29% of these catches were reported as being accidental. No data were available regarding the incidence of illegal gillnetting within the Park, however in the absence of an efficient surveillance programme, illegal fishing activities certainly continue (C3-Comores 2007). It is impossible to estimate the size of the population from this study, although it would certainly appear that there are extremely few individuals surviving in the waters of Mohéli.

4.3 AWARENESS OF DUGONG

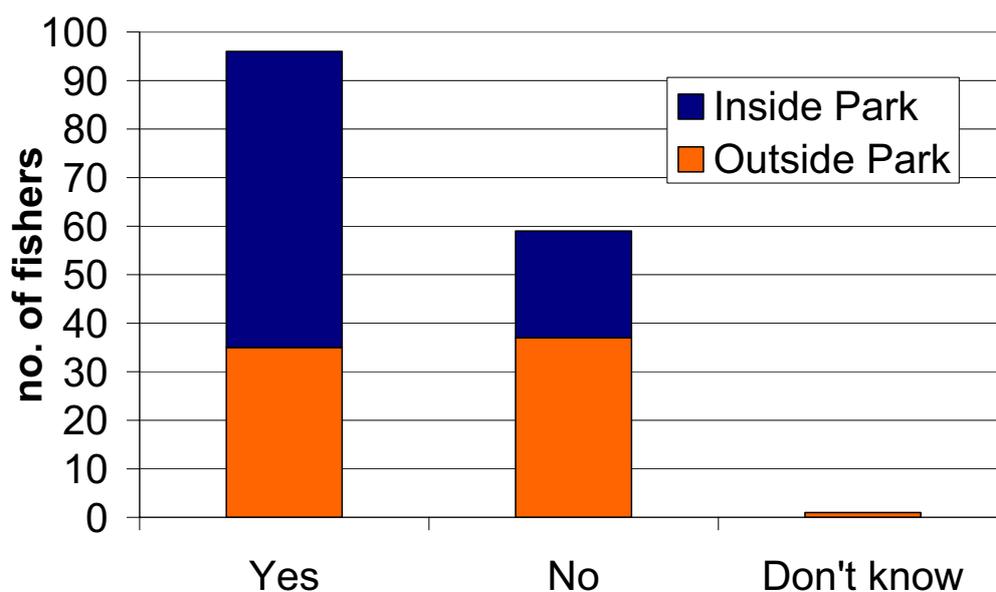
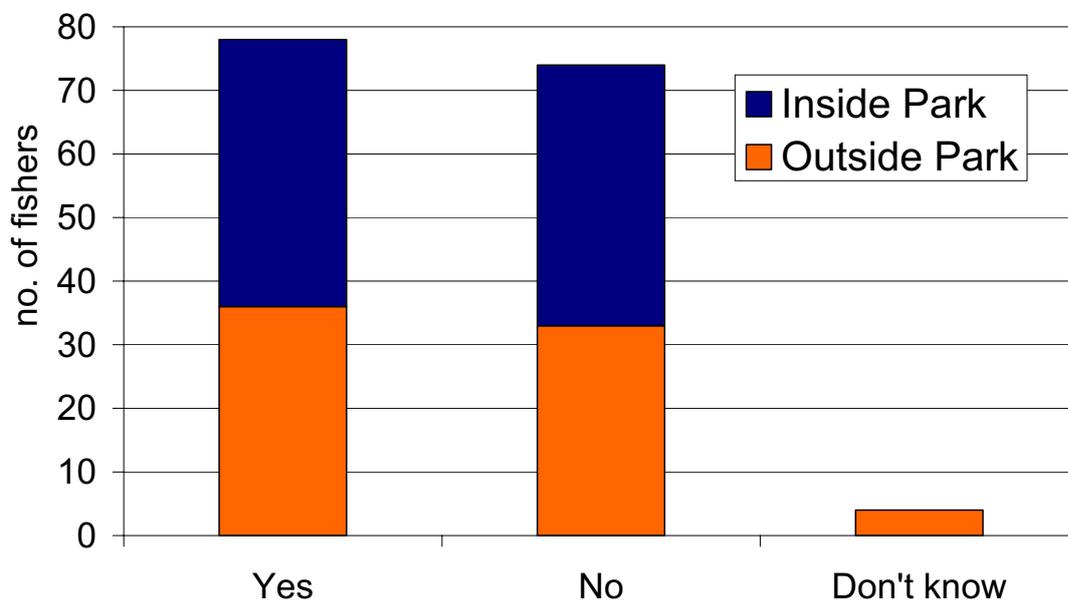


Figure 6: Mohélian fishers knowledge that dugong is protected

The majority of fishers living within PMM were aware that the dugong was protected by law (72%), however, fewer knew that the dugong was endangered (51%) (Figure 6 and 7). Fishers outside the Marine Park showed lower levels of awareness regarding the law (49% knew that dugong were protected) although their level of knowledge regarding its endangered status was the same as fishers from within the Park (52%). Clearly, awareness-raising campaigns need to focus on the reasons for

dugong protection, including the international context of conservation efforts in order to increase understanding of its endangered status and voluntary compliance with regulations.

On all three islands, fishers recounted a local custom that required a fisher who had caught a dugong to go to the mosque to testify that he had not had sexual intercourse with the animal before he was allowed to eat it or distribute its meat to others. Many fishers believed a female dugong resembled a woman; these perceived similarities between humans and dugong could facilitate public awareness campaigns, promoting the animal as a charismatic flagship species for wider marine conservation initiatives.



Figure

7: Mohélian fishers' knowledge that dugong is endangered

4.4 DISTRIBUTION OF DUGONG

The relative frequency of sightings provided information on dugong 'hotspots' (Figure 8) for each of the islands. On Mohéli, the most important areas for dugong appeared to be: (1) The south-east region of Itsamia; (2) The islands off the south coast; (3) The area known as Sambia off the south coast. All these areas are currently within the boundary of Mohéli Marine Park, and so it is essential that the Park is more effectively managed in order to ensure a future for dugong in the Comoros. Although management efforts need to be applied at the national level, (given that dugong can travel hundreds of kilometres in a few days) these priority areas on each island should be included in Protected Area planning and be the focus of future awareness campaigns.

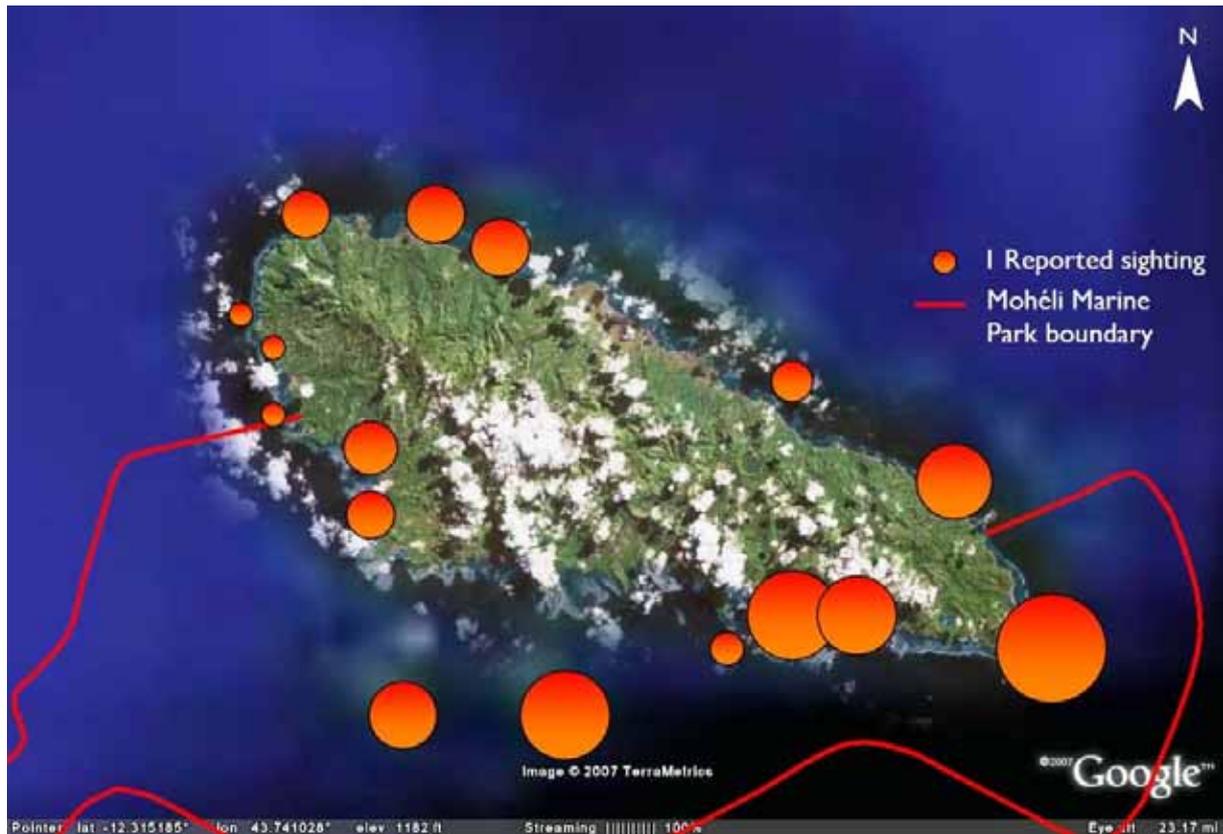


Figure 8: Relative frequency of sightings on Mohéli since 2000

4.5 A NATIONAL CONSERVATION ACTION PLAN

Following the objectives of the regional Conservation Management Plan, a National Conservation Action Plan is being developed by C3 and the national and island governments. It is anticipated that this plan will be finalized in 2008 through stakeholder consultations and completion of fieldwork on Anjouan to provide the framework for long-term conservation efforts for the species and its habitat.

5. CONCLUSIONS AND RECOMMENDATIONS

- Deliberate hunting of dugong in the Comoros, although commonplace in the 1970-80s, is no longer viable due to the small population size. The primary contemporary threat to the population is accidental capture in gillnets which urgently needs to be addressed through introduction of alternative techniques and/or livelihoods.
- The methodology from this study has been shared with the neighbouring island of Mayotte (France), encouraging a trans-boundary approach to management of the species and will be extended to Madagascar in 2008.
- A regional database should be established to consolidate data on the species across the WIO region.
- Low-cost studies such as this can reveal important information for management planning in place of more expensive techniques such as aerial surveys and satellite tagging programmes, which may not be scientifically or logistically viable for the study of small populations in developing countries.
- Further awareness-raising amongst fishers, particularly on Mohéli, is required to explain exactly why dugong are protected by law.

6. REFERENCES

- Alfthan B, Davis PZR (2006)** DUGONG RESEARCH AND CONSERVATION ON MOHÉLI ISLAND, UNION OF THE COMOROS. Sirenews, Newsletter of the IUCN Sirenian Specialist Group 46
- Anasse, F., Ahamada, S., Jantzen, J., Bigot, L., Quod, J.P., Tyack, O., Hamadi, Y., Hamidou, M., Ahamed, S. (2003)** ATLAS DE VULNERABILITE DES ZONES CORALLIENNES PEU PROFONDES SUD ET NORD DE LA GRANDE COMORE. Projet Régional Environnement – Commission de l’Océan Indien 7.ACP.RPR.68. 51pp
- Bandeira SO, Gell F (2003)** THE SEAGRASSES OF MOZAMBIQUE AND SOUTHEASTERN AFRICA. In: World Atlas of Seagrasses. Green EP, Short FT. UNEP World Conservation Monitoring Centre. University of California Press, Berkeley, USA.
- C3-Comores (2007)** STAKEHOLDERS’ PERCEPTIONS OF MOHÉLI MARINE PARK, COMOROS: LESSONS LEARNED FROM FIVE YEARS OF CO-MANAGEMENT. C3 Technical Report Series No. 4. ISSN 1754-5188. Community Centred Conservation (C3), London, UK. 34pp
- Community Centered Conservation (C3) (2003)** DUGONG AND SEAGRASS IN MALAKAL HARBOR, KOROR, REPUBLIC OF PALAU: CURRENT STATUS AND MANAGEMENT RECOMMENDATIONS. C3 Technical Report Series No. 3. ISSN 1754-5188. Community Centred Conservation (C3), London, UK. 24pp
- Fatouma, A A (2004)** UNION OF THE COMOROS Pp. 48-49. In Towards a Western Indian Ocean Dugong Conservation strategy: The status of Dugongs in the Western Indian Ocean region and Priority Conservation actions. WWF East African Marine Ecoregion 2004. Dar es Salaam, Tanzania: WWF. 68pp.
- IUCN (2004)** Projet CONSERVATION DE LA BIODIVERSITE ET DEVELOPPEMENT DURABLE AUX COMORES PNUD/GEF COI/97/G32/A/IG/99. Rapport final du Projet. 42pp
- Marsh H (1986)** THE STATUS OF THE DUGONG IN TORRES STRAIT. Torres Strait Fisheries Seminar. Port Moresby. 11-14 February 1985. Torres Strait Fisheries, Port Moresby
- McKenzie LJ (2003)** DRAFT GUIDELINES FOR THE RAPID ASSESSMENT OF SEAGRASS HABITATS IN THE WESTERN PACIFIC. QFS NFC Cairns, Australia. 43pp
- McKenzie LJ, Campbell SJ (2002)** SEAGRASS-WATCH: MANUAL FOR COMMUNITY (CITIZEN) MONITORING OF SEAGRASS HABITAT. WESTERN PACIFIC EDITION. QFS, NFC, Cairns. 43pp2nd

- McKenzie LJ, Campbell SJ, Roder CA (2003)** SEAGRASS-WATCH: MANUAL FOR COMMUNITY (CITIZEN) MONITORING OF SEAGRASS HABITAT. Edition. QFS, NFC, Cairns. 100pp
- Short FT, Coles R (eds.) (2001)** GLOBAL SEAGRASS RESEARCH METHODS. Elsevier Science B.V., Amsterdam
- Short FT, Wyllie-Echeverria S (1996)** NATURAL AND HUMAN-INDUCED DISTURBANCE OF SEAGRASSES. *Env. Cons.* 23 :17-27
- Union des Comores (2005)** DOCUMENT DE STRATÉGIE DE CROISSANCE ET DE RÉDUCTION DE LA PAUVRETÉ. Document Intérimaire Actualise. 138pp
- Wells S (2005)** ASSESSMENT, SYNTHESIS, AND GAP ANALYSIS OF EXISTING AND PLANNED ACTIVITIES IN THE COASTAL ZONE COUNTRIES OF THE AGULHAS AND SOMALI CURRENT LARGE MARINE ECOSYSTEMS (ASLME). Report to the Wildlife Conservation Society. 92pp

7. APPENDICES

7.1 COMOROS: Government considers military option to resolve electoral crisis

<http://www.irinnews.org/report.aspx?ReportId=72715>

JOHANNESBURG, 13 June 2007 (IRIN) - A military solution to end the burgeoning electoral crisis on the Indian Ocean island of Anjouan, one of three islands comprising the Union of Comoros, is being considered by the government, IRIN has reliably learned. Grand Comore and Mohéli islands held scheduled elections on Sunday 10 June, but Anjouan's poll was initially postponed by a week after deadly clashes between Union government forces and the island's para-military police. The archipelago's complex electoral system was brokered in 2001 by the Organisation of African Unity (OAU), in the wake of Mohéli and Anjouan seceding from Grand Comore in 1997. The electoral system provides for a semi-autonomous government and president for each island - Anjouan, Grand Comore and Mohéli - with a rotating presidency for the over-arching Union government. The Comoros constitutional court approved 31 candidates to contest the individual island elections: 18 for Grande Comore, eight for Anjouan and five for Mohéli. Mohamed Bacar, 45, elected president of Anjouan in 2002, was asked to step down by the court on grounds that he had served his five-year term, and nominated an interim president to head the island's government until the elections were held.

Illegal election

Bacar refused to step down, printed his own ballot papers and went ahead with the election, despite a declaration by the African Union (AU) - the OAU's predecessor - and the Union government that the Anjouan poll would be deemed invalid.

We don't have the forces to remove him, but, believe me, the day we have the forces, whether from the African Union - when we have the mandate - or our own forces, when we will be strong enough to do so, we will remove him[Bacar] by all means. The AU withdrew a 40-strong contingent of South African policemen sent to monitor Anjouan's election, and the Union government prevented the dispatch of electoral material to hinder the holding of any ballot on the island.

Events leading up to Anjouan's poll included the inability of candidates to campaign freely and the sacking of the national radio offices, during which four of its journalists were detained and allegedly tortured. The airport was also blocked to prevent the Union's president, Ahmed Abdallah Sambi, and the AU troop commander from visiting the island.

Bacar has claimed a landslide victory of 90 percent and is planning to hold his presidential inauguration on Thursday.

Military loyalties

Francisco Madeira, AU special envoy, and representatives of the Arab League, held negotiations with Bacar on Monday and Tuesday this week to try and defuse the political crisis. Bacar, Anjouan's former chief of police and a participant in the island's 2001 military coup before being elected as the island president the following year, is said to command "100 percent loyalty" from the gendarmerie. Apart from a few hundred gendarmes, who possess heavy weapons in their armoury, the island also has an armed militia thought to be about 500-strong. His investment in military power has skewed the balance of military forces between the island and Union forces, and his younger brother, Abdou, commands Anjouan's security forces.

Idi Nidhom, the vice-president of the Comoros, reportedly said this week: "We don't have the forces to remove him but, believe me, the day we have the forces, whether from the African Union - when we have the mandate - or our own forces, when we will be strong enough to do so, we will remove him [Bacar] by all means." The UN Resident Coordinator in the Comoros, Opia Mensah Kumah, told IRIN the Union government had indicated that even if Bacar agreed to new elections on Anjouan in the next few days, it was unlikely a free and transparent election could be held on 17 June and a more realistic date of 24 June had been suggested. "The crisis is very serious and not just for Anjouan, which some have

characterised as police state, but for the entire union," Kumah said. "The UN has a development mission here in the Comoros, and a protracted political dispute impacts negatively on our work and effectiveness."

Unity versus separation

Political analyst Ahmed Thabit told IRIN it was "evident" that the Comoran forces were not strong enough to combat Bacar, "but once he knows the AU is serious about force, he will seek a compromise ... Bacar has become a rebel and he cannot be allowed to take the whole country hostage." Ahmed said the Comorian political system, with its three presidents and governments, plus a national union government, was not only unaffordable in a country ranked 132 out of 177 in the UN's Human Development Index, but also fomented the very divisions it sought to allay. "Every island believes in a wide autonomy, but not to the extent that every island has its own government," he said. The prevailing political system, especially when it came to paying for services such as electricity and water, created a "tug-of-war" between the different governments, which worked against unity. Everybody boycotted the [illegal Anjouan] election and only very few people cast their votes, as they knew voting would be tantamount to agreeing to separation. Ahmed said there was a groundswell among the Comorans for greater unity between the islands and a return to elected governors, as was the case under the 1978 constitution, instead of island presidents. "Everybody is fed up with Bacar, even on Anjouan they are fed up."

"Everybody boycotted the [illegal Anjouan] election and only a very few people cast their votes, as they knew voting would be tantamount to agreeing to separation," Ahmed said.

The geographical position of the Comoros at the northern entrance of the Mozambican Channel made it a haven for pirates before it was colonised by France in 1841. After 130 years of colonial rule, during which its strategic importance waned with the opening of the Suez Canal, the islands gained independence in 1975 but has experienced three decades of instability with 19 successful and attempted coups.

7.2: POSTER PRESENTATION, INTERNATIONAL SOCIETY FOR REEF STUDIES EUROPEAN MEETING SEPTEMBER 19 – 22, 2006 BREMEN, GERMANY

7.3: POSTER PRESENTATION 17TH BIENNIAL CONFERENCE ON THE BIOLOGY OF MARINE MAMMALS, CAPE TOWN, SOUTH AFRICA.

7.4 AWARENESS-RAISING BROCHURE

7.5 T-SHIRT DESIGN

7.6 MZE NGOUVA SONG LYRICS AND RADIO SHOW SCRIPT

7.7 AWARENESS-RAISING PRESENTATION

7.8 INCIDENTAL SIGHTING CARDS

7.9 FISHER QUESTIONNAIRE

7.10 DAY OF THE DUGONG POSTER

7.11 DAY OF THE DUGONG PROGRAMME

THE DEVELOPMENT OF SUCCESSFUL CONSERVATION PARTNERSHIPS FOR THE MANAGEMENT OF MOHELÍ MARINE PARK, COMOROS

Patricia Z. R. Davis, Melissa Hauzer* and Cheikh Moussa Ibouira

*delegate



ABSTRACT

The Union of the Comoros is situated at the northern end of the Mozambique Channel, equidistant (approximately 300km) from continental Africa and Madagascar. It comprises three volcanic islands; Grande Comore, Anjouan and Mohéli. The Comoros are classed as a Least Developed Country with 88% of the population living on the coast and fisheries being of considerable economic importance (8% of GDP). Effective management of marine resources thus assumes a particular importance in the development of sustainable livelihoods and the reduction of poverty. In addition, the rich biodiversity of the Comoros provides immense potential for the development of marine eco-tourism.

Mohéli Marine Park was the first MPA to be established in the Comoros in 2001, based on its rich biological diversity and the presence of humpback whales, endangered dugong and the third most important nesting site for green sea turtles in the world. Partnerships between village associations, national government and NGOs are so far proving to be successful on Mohéli. Ten villages are involved in the management of the Park through village associations with 12 local 'ecoguards' in charge of day-to-day management and monitoring activities. Capacity-building is provided by a formal collaboration between an international NGO, Community Centred Conservation (C3) and the Park and income-generating projects are currently being initiated throughout the island.



LOCAL KNOWLEDGE

Local knowledge is a vital component of this programme and has proved particularly useful for studies of the dugong on Mohéli. Interviews with fishers and an incidental sighting programme have revealed that the dugongs may be more widespread than previously thought. C3-Comores hopes to follow this work up with aerial surveys in 2007.



Village consultation

SCIENTIFIC RESEARCH

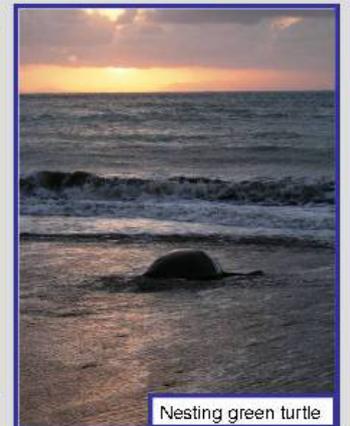


Seagrass survey

The programme is currently studying the dugong and sea turtle populations of Mohéli and the seagrass habitat on which they depend. This work has included: mapping of populations and habitat, tagging nesting turtles, seagrass survey; dugong carcass recovery and basic necropsy and storage and dispatch of tissue and stomach contents (for DNA and diet analysis). Local participants and ecoguards are trained and participate fully in all aspects of the work programme.

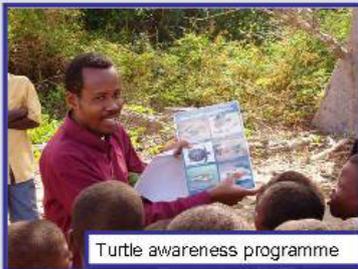
THE FUTURE

In the future, C3-Comores hopes to further increase the research capacity of Mohéli and replicate the success of the programme on the other islands of the Comoros. The greatest obstacle to date has been the lack of available infrastructure and sustainable funding, and this has to be carefully considered when planning conservation management programmes. In the past, many initiatives on the island have been overambitious for the available infrastructure and levels of training. However, community-centred co-management using simple, low-cost techniques is now creating long-lasting results for the Comoros.



Nesting green turtle

AWARENESS-RAISING



Turtle awareness programme

C3-Comores initiated 'Operation Mohéli' in June 2006, funded by the BP Conservation Programme, this project focuses on the dugong and sea turtles. By promoting these flagship species and their habitats, local communities have been encouraged to take responsibility for the conservation of their own marine resources. Much of C3-Comores fieldwork is carried out by local volunteers, ensuring that the skills and knowledge that they gain remain within the Comoros.

CAPACITY-BUILDING

The Comoros lack a marine research institution and there is a fundamental need to strengthen organizational capacity. The C3-Comores programme aims to enhance the marine management capacity of the islands through training of governmental, NGO and Marine Park staff. Inter-island exchanges have proved beneficial, and have enabled experiences to be shared. It is hoped that international exchanges will also be possible in the near future.



SCUBA training

ALTERNATIVE LIVELIHOODS



Turtle-watching at Itsamia

The Comoros, and in particular Mohéli, show great potential for the development of ecotourism. C3-Comores has carried out surveys of tourists and also investigated villagers perceptions and needs to promote ecotourism on Mohéli. The programme is also researching and providing start-up funds for other income-generating schemes.

ACKNOWLEDGEMENTS

This study is being carried out as part of a programme undertaken on Mohéli by C3-Comores – a collaboration between Community Centred Conservation (C3) and Mohéli Marine Park. We are extremely grateful to the following donors for supporting our work:



PADI FOUNDATION

FOR FURTHER INFORMATION

Community Centred Conservation (C3), 17, Northcliffe Drive, London, N20 8JX
C3-Comores, BP34, Fomboni, Mohéli, Comoros
Tel. +269 34 25 57/9
Email: info@c-3.org.uk
Web: www.c-3.org.uk



Community Centred Conservation - C3-Comores



DEVELOPMENT OF A BLUEPRINT FOR A WESTERN INDIAN OCEAN REGIONAL DUGONG CONSERVATION STRATEGY

Patricia Z R Davis¹, Chris Poonian², Melissa Hauzer³ and Farid Anasse⁴

^{1,2} Community Centred Conservation (C3), London, UK; ³C3-Comores, Ioni, Grande Comore; ⁴Ministry for the Environment, Union of the Comoros; ³Presenting author

INTRODUCTION

The dugong, *Dugong dugon*, is vulnerable to extinction throughout its range, which spans approximately 42 countries worldwide. Since 2002, calls have been made for a coordinated approach to the conservation of this species at both the regional and international levels. Since 2005, the Convention on Migratory Species (CMS) secretariat has been developing an international Memorandum of Understanding and Conservation and Management Plan (CMP) in collaboration with range states, which will facilitate the implementation of conservation efforts worldwide. In October 2007, the first 7 states signed the MoU and finalized regional CMPs for the western Indian Ocean (WIO) and eastern Indian and Pacific Ocean (EIO) regions. Given that most states of the WIO lack the financial and technical resources to initiate dugong conservation plans, this study piloted a low cost research methodology, using local personnel, aimed at yielding data directly applicable for management planning. The technique has since been adapted for use in Mayotte (France) and could be applied elsewhere in the region.



Figure 1: The Union of Comoros and Mayotte

THE STUDY SITE

The study was carried out in the Union of Comoros (Figure 1), situated between Mozambique and Madagascar, between June 2006 and January 2007. The country is comprised of three islands; Mohéli, Anjouan and Grande Comore. A population of dugong was known to exist but little data were available on the species or its habitat.

LOCAL KNOWLEDGE

Semi-structured questionnaire surveys were carried out on all three islands with fishers who had reported seeing dugong in the past. Data were collected on frequency of sightings, locations and times of sightings, mortalities, levels of awareness and local myths surrounding the species.



A dugong caught by fishers



A dugong feeding on seagrass

SEAGRASS MAPPING

A rapid reconnaissance survey was conducted around the coastline of each island to identify the presence of seagrass beds. Fine-scale mapping was then carried out to determine the extent, species composition and density of seagrass areas using an internationally-standardized protocol (Seagrass Watch). Maps generated in Arc GIS are being overlaid with sighting data to create a series of critical 'hotspots', where public awareness campaigns and management efforts can be focussed in the future.



Mapping a seagrass bed

THE DUGONG AS A FLAGSHIP SPECIES

On all three islands, fishers recounted a local custom that required a fisher who had caught a dugong to go to the mosque to testify that he had not had sexual intercourse with the animal before he was allowed to eat it. Many fishers believed a female dugong resembled a woman; the similarities between humans and dugong could facilitate public awareness campaigns, promoting the animal as a charismatic flagship species for wider marine conservation initiatives.

FOR FURTHER INFORMATION

Details of dugong questionnaire available from: Community Centred Conservation (C3); Tel. +269 73 75 04; +230 911 26 26; Email: info@c-3.org.uk; Web: www.c-3.org.uk

Seagrass survey methods available from: www.seagrasswatch.org



Figure 2: Live dugong sightings 2000 - 2006 on Mohéli

KEY FINDINGS

- The relative frequency of sightings provided information on dugong 'hotspots' (Figure 2) for each of the islands. Although management efforts need to be applied at the national level, (given that dugong can travel hundreds of kilometers in a few days) these priority areas should be included in Protected Area planning and be the focus of future awareness campaigns.
- Deliberate hunting, although commonplace in the 1970-80s, is no longer viable due to the small population size. The primary contemporary threat to the population is accidental capture in gill nets which urgently needs to be addressed through introduction of alternative techniques and/or livelihoods.
- Levels of awareness about the conservation status of dugong and relevant legislative protection is low and should be included in future sensitization.
- Seagrass areas have been mapped and need to be included in the planned national Protected Areas Network.

A NATIONAL CONSERVATION ACTION PLAN

Following the objectives of the regional CMP, a National Conservation Action Plan is being developed by C3 and the national and island governments. This plan will be finalized in 2008 through stakeholder consultations and will provide the framework for long-term conservation efforts for the species and its habitat.

RECOMMENDATIONS

- The methodology from this study has been shared with the neighbouring island of Mayotte, encouraging a trans-boundary approach to management of the species and will be extended to Madagascar in 2008.
- A regional database should be established to consolidate data on the species across the WIO region.
- Low-cost studies such as this can reveal important information for management planning in place of more expensive techniques such as aerial surveys and satellite tagging programmes, which may not be scientifically or logistically viable for the study of small populations in developing countries.

ACKNOWLEDGEMENTS

This work was carried out by C3 in collaboration with the Ministry for the Environment, Union of the Comoros; Mohéli Marine Park, AIDE and the University of the Comoros and was funded by the BP Conservation Leadership Programme, Rufford Small Grants and PADI Foundation. Melissa Hauzer is grateful to Project GloBAL for providing her travel and accommodation costs for the 17th Biennial Conference on the Biology of Marine Mammals.



Si le dugong disparaissait de la surface de la Terre, celle-ci ne s'arrêterait pas de tourner. Peut-être bien... Mais de même que la perte de toute chose qui nous est chère, ne le regretterions-nous pas?

Pour que ce mammifère ne devienne pas un animal imaginaire nageant seul au travers des pages de contes des générations futures :

Aidez-nous à préserver les plages et les lagons, et ne jetons plus nos déchets n'importe où!

Préservez les forêts, car l'impact du défrichement forestier aux conséquences dramatiques sur les littoraux nuit aux espèces en voie de disparition comme le dugong.

Préservez les herbiers source de nourriture indispensable à la survie du dugong et à l'équilibre des lagons.

Tous ces gestes sont aujourd'hui indispensables pour sauver les derniers dugongs aux Comores!

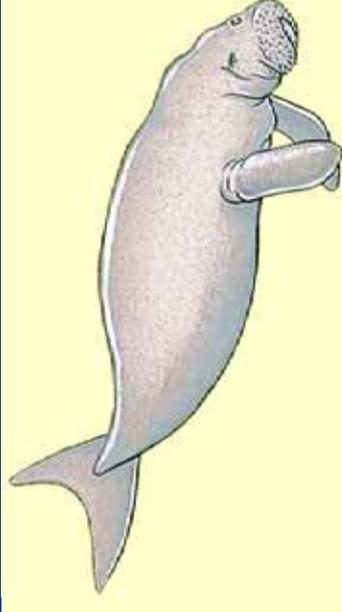


AIDE



***Soyons responsables
ensemble!***

LE DUGONG



Le dugong (Dugong dugon) est un mammifère marin de la famille des Siréniens, famille comprenant l'espèce plus connue des lamantins. L'aspect anthropomorphique du dugong fut traditionnellement comparé à la physionomie des sirènes par les pêcheurs des Comores, et a donné lieu à quelques légendes.

Le dugong peut vivre jusqu'à 70 ans, mesure jusqu'à 3.5 m, et pèse jusqu'à 400kg. La robe du dugong est recouverte d'un poil court et s'assombrit avec le temps. Une femelle dugong atteint l'âge de reproduction entre 10 et 17 ans, et à une durée de gestation de 14 mois.

Le dugong est inscrit sur la liste de la Convention du commerce international des espèces menacées d'extinction (CITES) et est strictement protégé par le gouvernement Comorien.



www.c-3.org.uk



Pour plus de renseignements sur le dugong contactez:

**CONSERVATION CENTREE
SUR LA COMMUNAUTE**

BP8310, Iconi, Grande Comore
tel. +269 73 75 04
GSM +269 36 75 06

info@c-3.org.uk

Son habitat

Le dugong est un herbivore qui broute les herbes marines tout comme une vache dans un pré (d'où son surnom en anglais de 'sea cow' vache marine). Les herbiers marins situés entre un et cinq mètres de profondeur sont les zones d'alimentation favorites du dugong, ces zones sont aussi le lieu où le dugong a le plus de chance d'être aperçu.

Certaines tortues de mers et poissons se servent également des herbiers comme source de nourritures. Les herbiers marins véritables pâturages productifs de la mer ont une fonction importante dans l'oxygénation des lagons, et sont des refuges pour beaucoup d'espèces marines.

Où le trouve-t-on?

On peut le voir dans les eaux chaudes de l'Est de l'Afrique jusqu'au Vanuatu. Dans le passé l'animal était présent dans les eaux territoriales de l'Union des Comores (Grand Comores, Anjouan et Mohéli) mais il semble que depuis les années 1970 on ne le trouve plus qu' autour de l'île Mohéli. Les pêcheurs Mohéliens observent régulièrement les traces de son passage, où le voient parfois aux alentours d'Itsamia, Miremani, Ouallah et les îlots à Nioumachoua.

Pourquoi les dugongs initialement présents sur tout l'archipel des Comores sont menacés et risquent de disparaître à Mohéli?

Jusqu'en 1980, le dugong était souvent chassé par les pêcheurs.

Bien que cet animal soit discret, cela ne fait aucun doute qu'un petit nombre d'entre eux subsistent aujourd'hui dans les environs des Comores.

En cause: la forte pression de chasse des années passées, nous l'avons dit, mais aussi les captures accidentelles dans les filets de pêche.

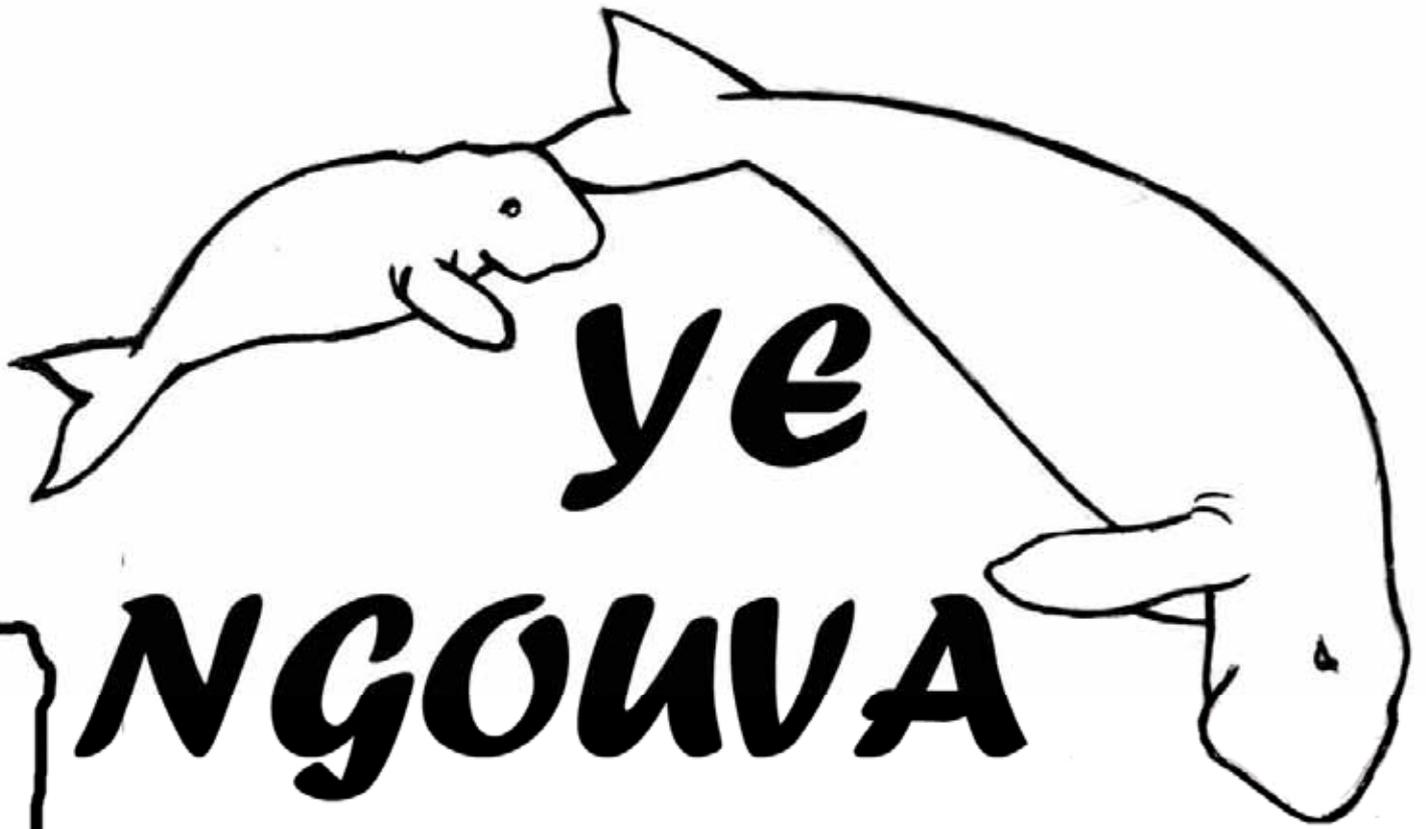
La disparition des herbiers, son garde-manger, est due en grande partie aux activités humaines (coulées de boues dans le lagon suite à la déforestation, vidanges de moteurs, produits chimiques des cultures, déchets, détergents rejetés dans la mer).

Cependant l'homme n'est pas seul responsable de la disparition des herbiers et des dugongs...

Les catastrophes naturelles comme les dépressions tropicales ou cyclones participent à la destruction et l'asphyxie des herbiers par les mouvements de sable et des débris coralliens qui viennent se déposer sur ces aires fragilisées.

©Roberto Bozzani - 2004





NGOUVA

**Wo wutadjiri
wahé Comori!**



PLAN D'ACTION POUR LA CONSERVATION DU DUGONG



Parc Marin
de Mohéli

AIDE

Union des Comores
Unité-Solidarité-Justice



The Rufford
Small Grants for
Nature Conservation
www.rufford.org/rg

PADI
FOUNDATION

Mze Ngouva: Le Notable Dugong

Notre Comores est un pays pauvre,
Une partie de sa richesse est base sur la tourisme:
Des touristes qui veulent voir les especes qui sont rares das les autres pays.
Beaucoup de gens qui viennent aux Comores pour voir le visage grand notable dugong.
Preservons le et tantons de le connaitre.
Ne faut pas le massacrer car ce nous qui allons perdre et finalement on va ce lamenter.

Protegons le dugong pour ameliorer le tourisme
Protegons le dugong pour preserver l'environnement.

Le monde entier nous aide pour sauver le dugong
Et il y a un bon moment qu'on le massacre sans se rendre compte.
Alors, maintenant revieillons nous ensemble pour le sauver pour qu'il nous quitte pas.

Protegons le dugong pour ameliorer le tourisme
Protegons le dugong pour preserver l'environnement.

La boue qui descend dans la mer rest tres dangereuse.
Les ordures qu'on jete a la mer sont aussi tres dangereux.
Ils sont la cause de la destruction des herbiers dans la mer.
Et monsieur dugong meurt de faim et il dispairait aux Comores.

Protegons le dugong pour ameliorer le tourisme
Protegons le dugong pour preserver l'environnement

Il ne faut pas le tuer.
Il faut plutot le sauver.
Limitons la boue qui descend a la mer.
Ne pas jetez n'importe quoi dans la mer
Et aussi ne pas utilisez les fillets
O Dieu, aidez nous pour sauver le dugong.

Protegons le dugong pour ameliorer le tourisme.
Protegons le dugong pour preserver l'environnement.

I: Sais-tu que les Comores sont un lieu très important dans le monde pour le dugong?

B : Mais attends, qu'est-ce c'est un dugong?

I: Le Dugong est un mammifère qui vit dans la mer et qui ne mange que les herbiers marins. Les adultes mesurent à peu près 3,5 mètres de long et les plus grands peuvent peser 400 kg. Le dugong peut vivre jusqu'à 70 ans.

B: 70 ans! Olala, c'est presque comme nous. Alors, pourquoi est-ce que les Comores sont très importantes pour les dugongs?

I: Les dugongs étaient chassés et tués dans la plupart du monde pour la viande. En plus, beaucoup de dugongs se noient dans les filets parce qu'ils ont besoin de respirer comme nous.

B: Mais, les gens des Comores attrapent et mangent le dugong aussi, non?

I: Oui, il y a des gens d'ici qui chassent le dugong encore. Ils ne réalisent pas que s'ils tuent les dugongs, tous vont mourir et l'espèce va disparaître.

B: Vraiment? Ils vont disparaître complètement des Comores ?

I: Oui, si on n'arrête pas de tuer les dugongs.

B: Les hommes, ils sont la seule menace pour le dugong?

I: Non, malheureusement, il y a beaucoup d'autres menaces. Les herbiers marins sont en train de disparaître, et sans les herbiers les dugongs ne peuvent pas manger.

B: Il parait que le dugong aurait beaucoup de problèmes avec les chasseurs et aussi avec la disparition des herbiers. Sais tu si je peux faire quelque chose pour les aider ?

I: La chose la plus importante est que tu parles avec les autres, et que tu leur dises que les dugongs sont très importants aux Comores. Dis aussi que c'est nous qui décidons du futur des dugongs. C'est très important de les protéger au lieu de les chasser.

B: Comment je pourrais apprendre plus à propos des dugongs?

I: Tu as de la chance ! Le 26 août, il y aura une Journée du Dugong à Nioumachoia. Tu pourras apprendre beaucoup de choses sur les dugongs, et si tu as des questions tu pourras demander à des ecoguards et des autres qui connaissent bien les dugongs. Pendant la Journée, il y aura beaucoup de concours et d'autres activités à propos du dugong !

B: Vraiment? Ca commencera à quelle heure?

I : A huit heures du matin.

B : Et vas tu a la journée du dugong ?

I : Bien sur !

B : D'accord ! Merci beaucoup !

I: Do you know that the Comoros is one of the most important places for dugongs in the world?

B: What is a dugong?

I: It is an animal that lives around here. It only eats sea grass, but can weigh up to 400kgs. They can live for a very long time, up to 70 years.

B: 70 years! Wow, that is as long as humans. So why is the Comoros so important for dugongs?

I: Dugongs were hunted in most of the world for their meat. Also, many drown in nets because even though they live in the ocean, they have to breathe air just like us.

B: But people here catch and eat dugongs as well, right?

I: Yes, there are some people who still do that. They do not realize that if they keep on killing Dugongs, there will soon be none left.

B: Really? They will disappear from the Comoros forever?

I: Yes, they will become extinct if we do not stop killing them.

B: Is that the only threat for dugongs?

I: No the other big problem is that sea grasses are disappearing and without sea grass, the dugongs will have nothing to eat.

B: Wow, it seems that the dugong is really in trouble here from both hunting and the disappearance of sea grass. What can I do to help?

I: Well, tell other people about the dugong and their importance to Mohéli. It is important that we try to protect rather than hunt them to extinction.

B: Is there some way that I can learn more about the dugong?

I: Yes actually, there is going to be a day of the dugong where you can learn all about the animal. There will also be many competitions, prizes, and other fun activities.

B: Really? Where and when?

LE DUGONG (NGOUVA)



Conservation Centrée sur la Communauté (C3) **AIDE**



Identification du Dugong

- Le Dugong est un mammifère de la mer.
- Le Dugong mange seulement des herbiers.
- La plus proche relatif vivant est l'éléphant.
- Le dugong est le mammifère marine le plus menacé en Afrique.




Description

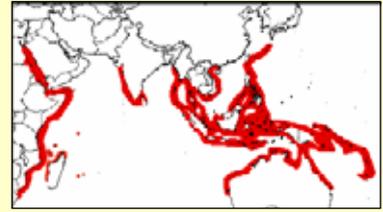


- **Adultes:** mesure a peu près 3.5 mètres de long, et pèse 400 kg.
- **Bouche large avec des hérisses sensible sur le lèvre de dessus pour chercher et déraciner les herbiers.**
- **Les dugongs viennent a la surface pour respirer comme les tortues.**



Répartition géographique Mondiale

- Il y avait 37 pays ou les dugong ont habité.
- Disparu: Maurice, les Maldives, Seychelles et la plupart des îles.




Répartition géographique aux Comores

- Recherche dans le passé a montré qu'il n'y a pas des dugongs en Grande Comore et en Anjouan.
- C3 fait le recherche pour déterminer le vrai répartition des dugongs aux Comores.
- En Grande Comore et Anjouan - rare
- A Mohéli on a observé plus, mais en régression.




Habitat

- **Eaux côtières**
- **Baies peu profondes et protégées.**
- **Zones coïncidentes avec les herbiers marins. Rôle écologique.**
- **Peut voyager en eaux profondes.**
- **Quand la marée est basse, c'est possible de voir les traces des dugongs.**




Vie

- Peut vivre plus de 70 ans
 - Mature entre 10 et 17 ans
 - Gestation est entre 13-15 mois.
 - Une femelle adulte peut mettre au monde un veau chaque 2.5 à 5 ans
- Veaux:
- Nées dans les baies peu profondes et protégées.
 - 1.2 mètres long et pèse 30 kg
 - L'Allaitement dure 14-18 mois.



La population récupère lentement parce qu'ils reproduisent lentement



Mouvements

- Peuvent nager jusqu'à 600 km en 5 mois
- Peuvent traverser des océans jusqu'à 4 km de profondeur.
- En Australie: tours de 15-40 km autour des herbiers, baies, et océan.
- Nécessité d'une gestion internationale.



Statut

- Déclin en vers 20% de la population dans 90 années
- Protégés par CITES et le gouvernement Comorien.
- Vulnérable parce qu'ils reproduisent lentement et besoins d'un habitat spécifique.



Ménaces

- L'accroissement de la population humaine accentue les autres problèmes et dégrade l'habitat
- Pêche à filet
- Braconnage 1960's-1980's
- L'augmentation de la vase cause de la déforestation peut tuer les herbiers



Ménaces

- Des dugongs qui sont attrapés par hasard dans les filets sont tués et mangés
- Dégradation d'habitat et pollution
- Moteurs de bateau et dynamite pour pêcher
- Déclin à Mohéli (86% pêcheurs)
- Développement sur la côte



Dans les circonstances optimales, une population des dugongs peut augmenter seulement 5% chaque année.



donc si on tue 1-2 dugong dans population de 100 chaque année, la population va toujours décliner.

Moyens de protection

- **Sensibilisation et formation.**
- **Arrêter le braconnage et l'attrapage par hasard.**
- **Identifier les zones importantes et les sauvegarder.**
- **Interdire strictement la chasse.**
- **Protéger les herbiers.**
- **Arrêter la déforestation et pollution.**
- **Promouvoir cet espèce pour écotourisme.**



Merci à

PADI FOUNDATION



...et nos volontaires



Des questions?



FICHE D'OBSERVATION POUR LE DUGONG

NUMERO DE FICHE	
NOM DE L'OBSERVATEUR Dzina lay moundrou ayunona	
DATE Wakiti	
LIEU Vahano yi liyo	
HEURE Lera ya wone hanwo	
ETAT DE LA MAREE Maji yapvo / maji ya jaya	
TEMPS Koussi kachikazi mgnombeni	
NOMBRE D'INDIVIDUS Nombre ya guva	
LONGEUR DU DUGONG Wdile wayi guva	
PROFONDEUR DE MER Uwengi way bahari	
HABITAT Mahala	
COMPORTEMENT Heliyayo	
AUTRE OBSERVATIONS Mtudiyo wagine	

S'il vous plait marquer l'endroit sur la carte de Mohéli avec un 'X' et son numéro de fiche.

Fiche #

ENQUETE SUR LA PRESENCE DU DUGONG (NGOUVA)

Date:	Village:	Enquêteur:
Age (estimation):	Activité:	Nom (facultatif):

Assurez que vous enquêtez un pêcheur qu'a vu le dugong et que vous lui avez montré l'image du dugong

1. Dans quelle(s) zone(s) avez-vous vu le Dugong? - Marquez chaque site d'observation sur la carte avec fiche #

Lieu(x)	Nombre d'individus	Milieu	Taille	Nombre de fois	Jour / Nuit	Année	Période	Morte / Vivant	Cause

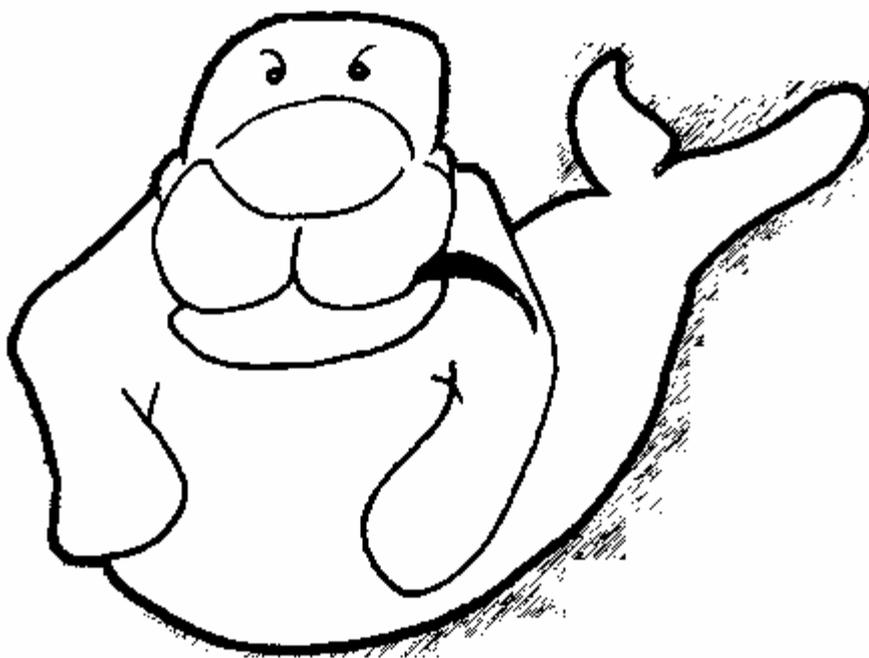
Type(s) de milieu(x): **Herbiers / Mangrove / Tombant / Au Large** Types de tailles: **Petite (<1m) / Moyenne (1<M<2m) / Grande (>2m)**; Période : **Kusi/Kashkasi/Maribu Cause : eg. filet/ne sais pas**

2. Quelle activité occupiez-vous lors de vos observations? Pêche (Ngawa) / Pêche (vedetti) / Vu depuis la côte / Autre.....
3. Avez-vous déjà pêché un Dugong? Oui / Non
Si Oui : Date.....Type de pêche.....Accident / Volontaire
4. Avez-vous déjà mangé de la viande de Dugong? Oui / Non Date.....
5. Avez-vous déjà observé une mère et son petit? Oui / Non Date.....Lieu.....
6. Savez-vous que le Dugong est une espèce en danger de disparition? Oui / Non
8. Savez-vous que le Dugong est une espèce protégée? Oui / Non
9. Les observations de Dugong sont-elles plus/autant/moins fréquentes aujourd'hui? Plus / Autant / Moins
10. Connaissez-vous des « histoires » se rapportant au Dugong?

Chani, vouyENCHIWO ngouva na mfi. Chani ni ngeshibaliliao mtsanga ousi tchikwe na yi maludja.

Journée de Ngouva

Mwali, modja mengoni ikawo vouyENCHIWO
ngouva harimoi yi douniya



Nari hifadhu chissiwa chatrou
Nari hifadhu yi chani chatrou
Nari hifadhu zingouva

26 . 8 . 2006
Nioumachoi

Mohéli, un des derniers habitats dans le monde pour le dugong
Les habitats de dugong sont les herbiers, qui sont aussi habitat pour les poissons, et qui protègent l'île de sable que est emmenée par les vagues
Protégeons notre île, protégeons nos herbiers, protégeons le dugong



PADI FOUNDATION





Conservation Center
sur la Communauté



Le Parc Marin de Mohéli



Conservation Center
sur la Communauté



Le Parc Marin de Mohéli

Programme pour la Journée du Dugong

Vendredi 25 Août

- 10:00 Nettoyage de la plage
- 18 :00 Concours de danse
- 21:00 Concert : Quazar (Tex)

Samedi 26 Août

- 9 :00 Lecture du Coran
- 9 :15 Introduction de la journée par M. Kamardine Boinali (Conservateur du PMM)
- 9 :30 Discours sur l'importance du dugong par Mme. Patricia Z.R.Davis (Directrice de C3)
- 9 :45 Discours par le Ministre de l'Environnement
- 10 :00 Présentation du dugong par les Ecogardes (nécessaire pour « Questions pour un champion »)

12 :00 Jeux pour les enfants et les ados

Chasse aux trésors pour les ados

Construction de sculptures du dugong de sable pour les enfants

Pinata avec les bonbons

15 :00 Questions pour un champion « spécial dugong »

16 :00 Match de volley-ball

19 :30 Distribution des cadeaux aux gagnants des activités de la journée
Projection publique de photos

20 :00 Discours par les hommes de Nioumachaioia
Remerciement par Le Maire de Nioumachaioia

20 : 30 Danse du dugong

21 :00 Tamtam des Femmes

Dimanche 27 Août

12 :00 Match de football pour les petits

15 :00 Match de football pour les grands

Programme pour la Journée du Dugong

Vendredi 25 Août

- 10:00 Nettoyage de la plage
- 18 :00 Concours de danse
- 21:00 Concert : Quazar (Tex)

Samedi 26 Août

- 9 :00 Lecture du Coran
- 9 :15 Introduction de la journée par M. Kamardine Boinali (Conservateur du PMM)
- 9 :30 Discours sur l'importance du dugong par Mme. Patricia Z.R.Davis (Directrice de C3)
- 9 :45 Discours par le Ministre de l'Environnement
- 10 :00 Présentation du dugong par les Ecogardes (nécessaire pour « Questions pour un champion »)

12 :00 Jeux pour les enfants et les ados

Chasse aux trésors pour les ados

Construction de sculptures du dugong de sable pour les enfants

Pinata avec les bonbons

15 :00 Questions pour un champion « spécial dugong »

16 :00 Match de volley-ball

19 :30 Distribution des cadeaux aux gagnants des activités de la journée
Projection publique de photos

20 :00 Discours par les hommes de Nioumachaioia
Remerciement par Le Maire de Nioumachaioia

20 : 30 Danse du dugong

21 :00 Tamtam des Femmes

Dimanche 27 Août

12 :00 Match de football pour les petits

15 :00 Match de football pour les grands