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## DUGONG EMERGENCY PROTECTION PROJECT

**Project Summary**  
**2010 - 2015**



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## INTRODUCTION TO THE ISSUE

Recent population estimates indicate that the area in and around Mozambique's Bazaruto Archipelago retain a Dugong (*Dugong dugon*) population of no more than 200 individuals. This population represents the Western Indian Ocean's (WIO) single remaining viable population, which is under threat from a combination of factors including:

- Their incidental, and sometimes intentional capture in fishing nets (Gill nets);
- Uncontrolled coastal and inland development leading to habitat loss;
- Fishing practices (seine netting) that mechanically damage seagrasses (Dugong forage);
- Climate change<sup>1</sup>.

The Convention on Migratory Species reports (October 2010) that Dugongs face the risk of extinction within the next 40 years. With reference to Mozambique's coastline, Marsh *et al.* (2002) state: **"It is highly unlikely that the Dugong population in the Bazaruto region can endure (let alone recover) unless immediate and effective actions are taken towards their conservation, and these actions are adopted by local authorities and communities"**.

Professor Marsh's (Chair of IUCN *Sirenian* Specialist Group) concern was repeated at the 2009 Maputo International Dugong Conference, where her presentation of population statistics indicate that even low mortality rates "will devastate the population". Unless the Bazaruto Dugongs are afforded critical attention through a strategic and integrated protection programme they have no chance of survival. The Dugong Emergency Protection Project was designed through the Endangered Wildlife Trust's Marine and Coastal Conservation Programme in response to the most imminent threats identified by the International Dugong Conference stakeholders.

## DUGONGS AND THEIR HABITAT

Dugongs occur in shallow tropical and subtropical coastal and island waters of the Indo-pacific. These *sirenians* are seagrass specialists and frequent shallow coastal bays, mangrove channels, and the lee of large inshore islands. The Dugong's fecundity is highly sensitive to the availability of adequate seagrass forage. When Dugongs lack the required amount and quality of food, they are known to delay breeding and limit lactation.

Seagrass ecosystems are highly responsive to human-induced disturbances which cause sediment loading, eutrophication, mechanical damage, and turbidity. These effects often act synergistically, and result in reduced photosynthetic ability of grasses, a reduction in productivity, and often- a change in species composition. Together with coral reefs and mangroves, seagrass ecosystems rank as one of the world's most productive coastal habitats. To date, 60% of this habitat has been lost from the Indian Ocean. It has been estimated that these flowering marine plants store 15% of atmospheric carbon in their extensive network of below-ground structures. The carbon sink service that seagrasses provide can only be sustained by preserving the health and extent of the world's meadows. Evidence put forward by the IUCN (The Management of Natural Coastal Carbon Sinks Report, 2009) shows that it is difficult to reverse seagrass loss at meadow scale, but conservation and restoration of less extensively affected meadows is possible. Thus, management of seagrasses should be directed towards general

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<sup>1</sup> at this stage one can only speculate on how this linkage might operate; however, a likely event under increased rainfall would be greater turbidity, and hence lowered seagrass productivity.

environmental and anthropogenic conditions that favor seagrass growth. The Bazaruto Archipelago's seagrass environment constitutes an area of Globally Outstanding status ([www.wiomsa.org](http://www.wiomsa.org)).

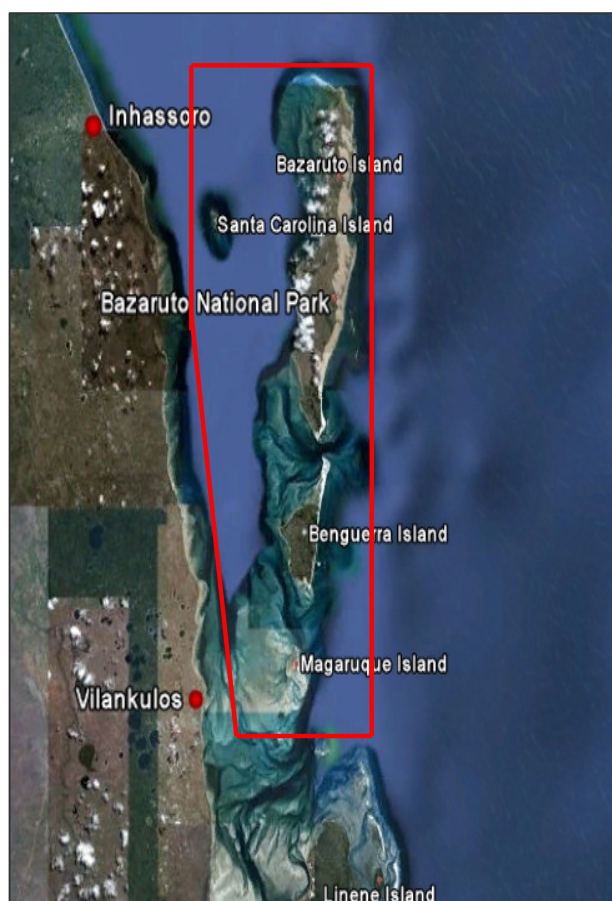
## PROJECT AREA

The Bazaruto Archipelago National Park was proclaimed in 1971, and is now comprised of 4 islands aligned in a north/south direction: Bazaruto, Benguera, Margaruque, Bangué, while Santa Carolina lies between Bazaruto and the mainland. The Sao Sebastiao Peninsula extends from the mainland, forming the southernmost portion of the Archipelago, but is not included within the Park.

The Park extends across the two administrative districts of Vilankulo and Inhassoro in Inhambane province. The combined total population of the two districts is estimated at 187,000. The Archipelago itself supports a resident population of about 3,500 people located in seven communities. More than 70% of the population is directly dependant on fishing and fishery related industries as a primary livelihood and base for economic and social development. Due to limited alternative income opportunities provided in the Archipelago, the resident population, and ensuing anthropogenic pressures have over the years exerted extreme pressure on the area's marine, coastal, and terrestrial resources.



**Figure 1:** Red block indicates the Western Indian Ocean Region.



**Figure 2:** Red block indicates Bazaruto Archipelago National Park.

## DUGONG LIFE HISTORY

Dugongs are long-lived with a low reproductive rate, and high investment in each offspring. Their life history parameters are:

- Lifespan: 70+ yrs
- Litter size: 1
- Gestation period: 13-15 months
- Age at first breeding: 10-17 yrs
- Calving interval:  $\geq 2.5$  yrs
- Lactation:  $\sim 1.5$  yrs

The implication of these attributes is that high survivorship in the adult sector of the population is critical to maintain stable population levels. In other words, any **incidental capture will be devastating to a population**. Consequently, project conservation efforts are aimed primarily at keeping adults alive.

## DUGONG MORTALITY

Gill netting has been identified as the most formidable threat to the Dugongs in Mozambique. Findings (WWF Mozambique) indicate that 32% of fishermen surveyed within the districts adjacent to the Bazaruto Archipelago National Park utilize Gill nets. Capture in these occurs either intentionally or as bycatch, and Dugongs drown in nets that are left unattended. Most incidents of mortality have been linked to the commercial netting for shark fins- more especially in the remoter areas of the Archipelago. This necessitates the need for enhanced law enforcement in areas of high risk, which will be addressed through the Dugong Emergency Protection Project.



**Figure 1.** Bantam Ultra-light aircraft used for aerial surveillance. ([www.microaviationsa.co.za](http://www.microaviationsa.co.za)).



**Figure 2.** Fitting tracking device to Dugong (James Sheppard).



**Figure 3.** Confiscated and butchered Dugong carcass.



**Figure 4.** Illegal netting/ hunting activity.

## PROJECT OBJECTIVES

The project's primary objective is to **secure core Dugong herds and habitat** in the Greater Bazaruto Archipelago by **mitigating major threats** and **strengthening existing structures** in collaboration with various institutions and Government authorities. The project's outcomes will enable identification of areas and levels of threat posed by human conflict, and mitigate these through a range of law enforcement strategies in collaboration with local authorities. In addition, creation of alternative livelihoods and monitoring (of Dugong movements, biology, and habitat-use) will inform long-term conservation approaches and interventions

This project will address the following secondary objectives over the duration of five years:

Project Objectives	Expected Outcomes
(1) Develop an understanding of historical, current, and future status of Dugongs, their habitat, threats hereto, and measures to overcome these to focus conservation action.	Specific priority areas are identified for intervention, including mitigation and proactive measures.
(2) Implement appropriate interventions to overcome threats to Dugongs and their habitat within relevant areas.	Enhanced law enforcement activities are implemented through strategic protection for Dugongs and seagrass meadows.
(3) Strengthen local structures to secure the sustainability of protection measures for Dugongs and their habitat.	Formally building capacity and coaching local authorities and community members to be able to carry out adequate protection in the long term (sustainability of the solution).

## PLANNED ACTIVITIES FOR 2011:

Activity	Target
Desktop analysis/ literature review of: All existing Dugong conservation activities, aerial survey data, seagrass abundance and distribution data, and best analytical methods of Dugong population estimation	April 2011
Conduct aerial surveys to collect current information on Dugong abundance, distribution, movement, and population dynamics	12 Months of data
Conduct Focal animal studies to establish movement patterns	12 Months of data
Collect and analyze ad-hoc Dugong sightings	12 Months of data
Source current satellite imagery of seagrass distribution and abundance throughout the GBA to establish a baseline in seagrass distribution and abundance.	April 2010
Ground-truth seagrass distribution and abundance	12 Months of data
Regular surveillance flights along set transects to identify the locality, extent, and distribution of fishing pressure within the GBA	12 months of data
Perform community survey relating to boat size, crew number, net length	July 2011

Registration of boats (and marking) and fishing equipment in collaboration with the Parks and Maritime Authorities	July 2011
Gauge community awareness regarding Dugong entanglement in Gill nets and the effects of seine netting on seagrasses	July 2011
Gauge community and operator awareness of the importance of conserving high risk/ no take/ no-go sites	July 2011
Asses current income from fishing, and amount of individuals reliant on fisheries	July 2011
Identify feasible alternative livelihood options (e.g. Tourism, crafts, Carbon trading)	July 2011
Establish a threat index and threat locations (based on the community survey results, surveillance flights, seagrass distribution, and Dugong distribution)	December 2011
Dugong reporting: Appropriate training for reporting procedure of Dugong sightings and entanglements (for operators and community fishers)	October 2011- ongoing
Join the Dugong Task Force (which ought to come into effect once Mozambique has become signatory to the CMS MOU for Dugong and seagrass protection)	October 2011
Create a Dugong Protection Forum (Tourism/ Operators, and relevant community members) including TOR's for all signatories, and meet 3 times/ year	October 2011 - ongoing

## CONCLUSION

There is broad scientific agreement that marine biodiversity is seriously threatened by human activities. Without a significant effort from government, business and particularly from ordinary citizens, these forces will continue to negatively impact on our valuable marine resources and will result in a loss of marine and coastal biodiversity, as well as the valuable direct and indirect benefits we gain from these ecosystems.



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