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# Dugong stranding and suggestions for conservation: a tool to support endangered marine resource conservation

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## ABSTRACT

The study aimed to (a) provide record of dugong stranding and mortality, (b) conduct necropsy of dugong, (c) characterize the circumstantial causes of mortality and stranding and (d) determine the threats that impede dugong conservation. Secondary data available on strandings and mortality of dugong were utilized to confirm validity of data obtained from interview of fishfarmers. Record of logged and reported incidents of dugong strandings and mortality were also retrieved. Necropsy was done every time dugong mortality occurred. Information and data were kept in dugong data sheets. Preliminary results showed that from 2001 – 2008, six strandings of dugongs have been documented in Malita, Davao del Sur. All the six strandings occurred within an approximate 10 km stretch of coastline (from Brgy. Lacaron to Brgy. Tingolo) of Malita, Davao del Sur. One out of the six strandings was a female baby dugong. The other four were male adult dugong with a length of not less than 2m. The probable causes of death were mostly anthropogenic: victim of spear fishing, blasting, entangled in net and intentionally caught for food. Parasitism was also observed in one of the dugongs that was examined where the gut, stomach, intestine were heavily infested with round worms.

**KEYWORDS:** dugong, Dugong dugon, necropsy, dugong necropsy, dugong stranding

## INTRODUCTION

Dugongs (*Dugong dugon*) are the only surviving member of the family Dugongidae (Marsh *et al.*, 1999) that are strictly marine and forage over seagrass meadows (Lucero, 2009). They are now endangered and are the only extant species of herbivorous marine mammal of the order Sirenia. They are now vulnerable to extinction (IUCN, 2004). The increasing number of endangered aquatic species (SEAFDEC Report, 2008) has become a global concern knowing that the indiscriminate exploitation by man of these species for commercial gains has led to species' decreasing populations. There is a felt need to provide and compile information essential to establishing mechanism for regional collaboration in the research and conservation activities. In the same context, records and information obtained from dugong necropsy would provide future perspective and scientific usage and understanding of possible threats, morphological and phylogenetic variations.

This inquiry aimed to (a) provide a record of dugong stranding and mortality, (b) conduct necropsy of dugong, (c) characterize the circumstantial causes of mortality and stranding and (d) determine the threats that impede dugong conservation.

The information and data derived from necropsy can be applied to analyze morphological and phylogenetic variations; ascertain and affirm habitat disturbances and possibly provide links to future conservation perspectives.

## MATERIALS AND METHODS

1. Interview: Persons who reported/caught the dugong were interviewed and data obtained were recorded in the Dugong Data Sheet. The information obtained includes, the identity of the person who caught/reported or who have seen the stranding, identity of other persons who were present at the time of stranding, location of stranding, and an account of how it was found. It should be a standard operating procedure to first determine whether the dugong is still alive so that the immediate rescue and rehabilitation management can be employed.

2. Necropsy: The process includes diagnosis and physical examination of the dead dugong where information as to weight, length, condition of the dugong, location of the stranding and the possible cause/causes of death were determined. Presence of external lesions, bruises, cuts were noted. Examination of the dead dugong was made and significant findings were recorded. A report on the findings of the examination was submitted to partner LGU-OMAF.

3. Gut analysis was also done to check for ingested objects or partially chewed seagrass species.
4. Samples of the blubber, muscle, skin, hair for possible DNA analysis were kept in ethanol solution.
5. Study site. Strandings considered in this study were those that occurred from 2001-2008 at Malita, Davao del Sur, Philippines (Figure 1)

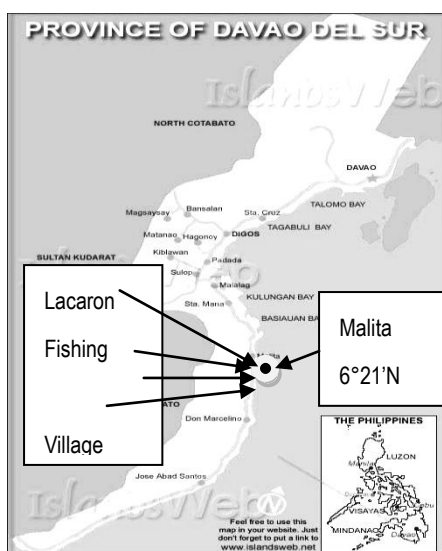


Fig. 1 Map showing the study site

## RESULTS

Results showed that from 2001 – 2008, six strandings of dugongs have been documented in Malita, Davao del Sur (Table 1). All the six strandings occurred just within an approximate 10 km stretch of coastline (from Brgy. Lacaron to Brgy. Tingolo) of Malita, Davao del Sur (Figure 1).

Out of the six strandings, one was a 70kg female baby dugong 120cm long. The other four were male with a length of not less than 2m, and a weight ranging from 370-450 kg. The gender of the dugongs stranded on August 17 and 18 of 2008 cannot be determined since only the head and the tail fluke were turned over to the authorities.

The first recorded and documented dugong stranding happened on November 18, 2001 (Figures 2 and 3). A stab wound at the dorso-caudal part of the body was observed on the 450 kg male dugong. The stab wound may imply that there was the intention to kill the dugong for food. On August 16, 2003, a baby dugong about 120 cm and weighing approximately 70 kg was examined (Figure 4). There were no lacerations on its body and is presumed to have been separated from its mother. Another dugong stranding happened on November 2005 where net marks on its body were found (Figure 5). On October 1,

2007, a dead 210 cm long and 370 kg male dugong was found floating along the coastal waters of Lacaron, Malita, Davao del Sur. Its body was slightly bloated without external lacerations but found heavily infested with nematodes from the mouth to the gut, stomach and intestines and the other organs as well. Parasitism was the suspected cause of mortality. Samples of nematodes were preserved in ethanol solution. Massive information and education campaigns by the local government unit in collaboration with all levels of the academic partner agencies and stakeholders were conducted regarding conservation of marine resources. Corresponding ordinances in support to the conservation effort were passed.

On May 30, 2008, another male dugong with a body length of 240 cm, approximately 400 kg was subjected to necropsy (Figure 6). It was already in an advanced state of decomposition, smelling so badly and the body was highly bloated especially the genitalia. The skin in the ventral side of throat to the flipper was scraped off and both teats and axilla of the right and left flipper and the genital area as well burst with black fluid oozing. Part of the intestine and the entrails came out from the incisions in the genital area.

Table 1 Record of stranding

Date of stranding	Sex	Weight (Kg) & Length (cm)	Location	Diagnosis/ Other observations
11-18-2001	M	W=450kg L=244 cm	Tingolo New Argao	Stab wound at the dorso-caudal part of the body
08-16-2003	F	W=70 kg L=120 cm	Fishing Village	External body free from lesions and injuries
11-2005	M	W=400kg L=220cm	Fishing Village	With net marks on the body
10-01-2007	M	W=370kg L=210cm	Lacaron	Without external lacerations; visceral organs heavily infested with nematodes
05-30-2008	M	W=400kg L=240cm	Lacaron	Body extremely bloated; with numerous external lacerations due to sharp objects
08-17-2008	Un-kno wn	No data	Lacaron	Only the Head was turned over to the station
08-18-2008	Un-kno wn	No data	Lacaron	Only the tail fluke was turned over to the station

On August 17, 2008 a reported butchering of dugong was discovered but only the head was retrieved (Figure 7). The following day

August 18, 2008, a tail fluke was brought to the research station (Figure 8) which could be that of the head of the dugong retrieved the previous day. However, there was uncertainty because the fluke seemed small for the head. It could be a tail fluke of a baby dugong.



Fig. 2 A 244cm long dugong with stab wound at the dorso-caudal part of the body



Fig. 3 A reconstructed dugong skeleton found at SPAMAST, Malita, Davao del Sur



Fig. 4 A 1.2m long and 70 kg female baby dugong preserved whole in formalin solution



Fig. 5 A 220cm long male dugong found by fishermen entangled in net



Fig. 6 A decomposing carcass of a 240cm and 400 kg dugong



Fig. 7 The head of a butchered dugong

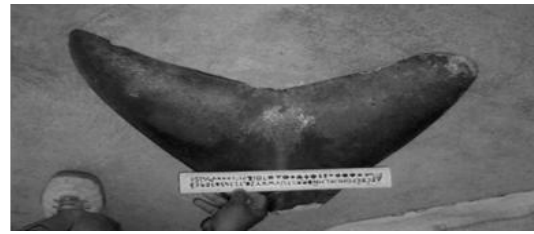


Fig. 8 The tail of a butchered dugong

## DISCUSSION

The probable causes of death were mostly anthropogenic: victim of spear fishing, blasting, entangled in net and intentionally caught for food. Parasitism was also observed in one of the dugongs that was examined where the gut, stomach, intestine including the heart and lungs were heavily infested with round worms.

Baby dugongs are nurtured and stay with the mother for milk until 18 months. Probably, the dead baby dugong that was found on August 16, 2003 might have been separated from the mother, weakened and then died.

From 2005-2007, there were seven reported cases of stranding and mortality in the nearby coasts within Davao Gulf (Dagondon, *et al.* 2007). From 2001-2008, six mortalities were recorded for Malita area totaling to 13 individuals dead within Davao Gulf in a matter of 7 years. The record of the strandings and mortality of dugong from 2001-2008 is alarming since it indicates that in a year not less than 1 individual dies due to anthropogenic causes. Dugongs give birth at an interval of 5 – 7 years. So, even in the absence of exploitation, reproductive and population growth of dugong is at a very slow phase.

Record of dugong stranding, necropsy report and voucher specimens are kept and used as archives. Since, there is difficulty of obtaining

specimens of these endangered marine resources, these collections in the SPAMAST Laboratory and Marine Station, are truly a source of valuable information that would link future events to that of the past.

### CONCLUSION

The following conclusions were derived based on the findings of the study:

1. The mortality data of dugong for 2001- 2008 is alarming (13 individuals die in just 7 years).
2. Humans and human activities remain the highest contributor to dugong mortality.
3. Necropsy provides data and information that that may be utilized to link marine resource conservation undertakings of the past and present to that of the future.

### RECOMMENDATIONS

Based on the study, the following are recommended, that:

1. Regional (Southeast Asian Region) collaboration be strengthened in the conservation of dugong and acting on a unified conservation program.
2. A Volunteer Task Force for Endangered Marine Resource Conservation be created to facilitate concerted effort on the conduct of Dugong Rescue and continued Awareness Campaign on conservation of marine resources particularly at the local level.
3. Necropsy must be done on stranded dead dugong. Tissue specimens be taken and preserved in 100% ethanol for possible DNA analysis.
4. Practitioners in veterinary medicine, licensed embalmers, chemists, biotechnicians, biologists are enjoined to pledge support whenever stranding occurs.
5. An Environmental Conservation and Protection Facility (expanded museum) be established in support to the Endangered Marine Resource Conservation Program that would serve as a learning facility providing services on databanking, safekeeping of preserved and specimen and showcasing the natural heritage of Davao Gulf and its environs.

6. The team conducting necropsy may from time to time participate in capability building and trainings on current updates on necropsy.

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