

# Population Estimate and Foraging Niche of Dugong (*Dugong dugon*) in Davao Gulf

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## ABSTRACT

This study focused on the seagrass habitat quality assessment and population estimate of dugong in Davao Gulf. It was carried out through interview/survey and a three-month dugong daily monitoring from an elevated facility set along the shoreline. Line transect quadrant method (LTQM) and SCUBA diving were employed to assess the seagrass beds in the study sites.

Not less than 14 dugongs were counted in New Argao (12) and Talicud (2), mostly between 8AM-12NN and 1PM-4PM. Simultaneous occurrence of dugong in New Argao and Talicud was observed between November- December 2008.

Of the 14 seagrass species found in Davao Gulf, the *Halophila* species was the most preferred food of dugong with a herbivory rate of 80%. Approximately, 1,705 sq. m were occupied by feeding trenches within the three-hectare seagrass bed having a potential biomass production (wet weight) of 164.32 grams/sq. m. A dugong consumes 18.68 kg (wet weight) of seagrass per day. Thus, the seagrass beds in New Argao can sufficiently sustain the food requirement of dugong in the area.

Protecting the foraging niche of dugong is significant to address the declining population of dugong and to increase the chances of seeing them in the wild.

**KEYWORDS:** *Dugong dugon*, foraging niche, dugong feeding ground, seagrass habitat quality, feeding trenches

## INTRODUCTION

*Dugong dugon* is a large marine mammal of the order *Sirenia* and the only survivor today of the family *Dugongidae*. Dugongs have been listed as vulnerable to extinction since 1982 by the World Conservation Union (IUCN, 2004). It selectively feeds on seagrasses. It is an animal which is so very difficult to rear in an aquarium that only few dugongs are reared in captivity in the world. Dugongs, whales and dolphins are gaining interest for many people and remarkably potential objects of ecotourism (Lucero, 2005). It is perceived that dugong watching can bring some kind of healing and therapeutic effects. An ecologically friendly and inexpensive way of watching dugong is to watch them in their natural habitat. Thus, protection of important and critical areas in Davao Gulf providing natural refuge and foraging niche for dugong may enhance success of watching dugong in the wild.

Generally, the study aimed to investigate the population and occurrence of dugong and assess the seagrass habitat quality. Specifically, it aimed to (1) come up with an estimate of dugong population and (2) assess the status of seagrass beds (which are utilized as a feeding ground of dugong), seagrass species composition, species eaten by dugong and trenches.

## MATERIALS AND METHODS

The study was conducted in three stations within the coast of Davao Gulf (Fig.1), namely New Argao located between N 06° 22' 59"; E 125° 37' 22" and N 06°21'52"; E125°38'16.8", Talicud Island located between N 06° 57' 26.8"; E 125° 40'35.4" and N 06°55'40.4"; E 125°43'24.4"; Governor Generoso located between N 06° 37' 09"; E 126° 04' 44.5" and N 06°27'45.7"; E 126° 07' 11.1". The stations were established based on reported dugong sighting and occurrence.



Fig. 1 Map of Davao Gulf showing the study sites.

Legend:

- \*New Argao, Malita, Davao del Sur
- Talicud, Island Garden City of Samal
- ☐ Governor Generoso, Davao Oriental

Survey and interview were conducted with fisherfolks to obtain a historical record of dugong sighting and occurrence in the gulf.

To come up with an estimate of dugong population, daily visual observation and monitoring of dugong occurrence was made between 8 AM – 5 PM from an elevated facility located on the shoreline. An observer was assigned per station. Observation was made simultaneously from the three stations.

To assess the seagrass quality habitat, Line Transect and Quadrant Method (LTQM) along with SCUBA and skin diving were employed. Manta tow was also done and GPS was used to locate seagrass beds.

Production potential was determined through seagrass biomass determination. Seagrass grazing by dugong was also assessed involving vegetative harvesting and determining the difference in the seagrass biomass (wet weight) inside and outside the feeding trench.

## RESULTS

Records of dugong occurrence in Davao Gulf can be traced back nine decades. They often appeared in groups compared to its rarity in recent times. Local taboos prevent people from harming dugong. However, destructive fishing methods and use of obnoxious chemicals prevail in the area.

An estimate of not less than 12 dugongs (Fig. 2) inhabit the shallow coastal waters of New Argao. In Talicud Island, at least a pair of dugong frequents the channel. The frequency of dugong occurrence is high in the morning between 9AM to 11AM for New Argao. In the afternoon, occurrence is high between 1PM – 3PM for both New Argao and Talicud. However, the difference is not significant.



Fig. 2 A photo of a pair of dugong taken on December 21, 2008 at New Argao, Malita, Davao del Sur

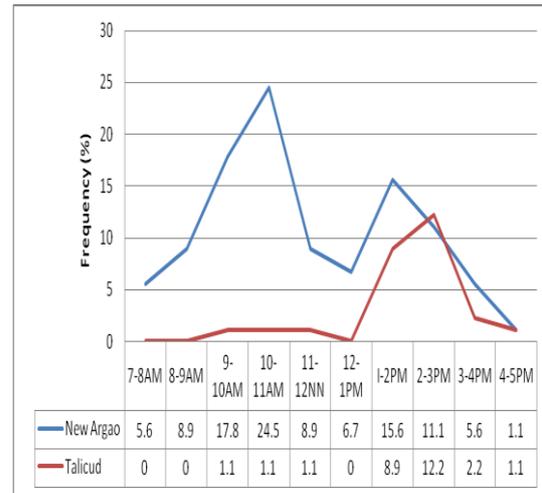


Fig. 3 Comparative data of the frequency of dugong occurrence in New Argao and Talicud

Feeding trenches (Fig. 4) are concentrated in New Argao where *Halophila* species dominate. The size of the trenches range from .13 m - .2 m wide and 13 m – 15.9 m long. The average size of a trench is 2.53 sq. m. Shape of feeding trenches vary from oval, short to long narrow stretch, branching and curved.



Fig. 4 One of the feeding trenches found in the *Halophila* dominated seagrass bed

On average some 674 trenches occurred in one hectare (equivalent to 1,705 sq. meters). The approximate area required to support a dugong is estimated at 142 sq. m. of seagrass bed per day. Each dugong is estimated to consume 18.68 kg of seagrass a day.

Fourteen species of seagrasses were accounted namely: *Halodule pinifolia*, *Halodule uninervis*, *Cymodocea rotundata*, *Cymodocea serrulata*, *Syringodium filiforme*, *Syringodium isoetifolium*, *Enhalus acoroides*, *Thalassia hemprichii*, *Thalassia testudinum*, *Halophila*

*decipiens*, *Halophila engelmannii*, *Halophila minor*, *Halophila ovalis* and *Halophila spinulosa*.

New Argao has the highest species richness of 12 dominated by *Halophila* species followed closely by Talicud with 11 species dominated by *Thalassia* and *Halophila*. Eight species are found in Governor Generoso dominated by *Cymodocea* species.

The seagrass biomass production is highest in Talicud Island which is estimated at 2.4 tons/ha. Biomass production in New Argao is approximately 1.6 tons/ha. while that in Governor Generoso is approximately 1 ton/ha.

Physico-chemical parameters like salinity, temperature, pH, tide and climate are comparable among the three areas in New Argao, Talicud Island and Governor Generoso and do not vary significantly.

## DISCUSSION

Historical records derived from fisherfolks on the rarity and low occurrence of dugong in recent times coincide with the observed occurrence of dugong in New Argao and Talicud. The frequency of occurrence decreases as dugong count increases, an indication that dugong seen in herds is a thing of the past. In recent times dugongs are often seen singly or in pairs. The prevalence of destructive fishing activities within the gulf implies that man and man-induced activities contribute and are highly considered a threat that endangers the remaining number of dugongs in the Gulf.

A viable population of dugongs are still found in Davao Gulf with an estimate of not less than 12 in New Argao and 2 in Talicud. Dugongs found in these areas at a time are not the same dugong but may belong to same population of dugong that inhabit the shallow coastal waters of Davao Gulf.

It is also worth noting that the *Halophila* species dominate in New Argao. Results of this study shows that feeding trenches were concentrated in New Argao where *Halophila* species dominate. This finding implies that the seagrass beds may be used as foraging area and may explain the higher occurrence of dugong in this site. This finding also confirms the observation of Nakanishi, *et al.* (2006) where among the seagrass meadows, concentration of feeding trails were found at *H. ovalis* communities in tidelands implying that dugongs selectively feed on *H. ovalis*. It also supports the clarification that seagrass meadows are important feeding grounds of dugong (Preen and Marsh, 1995).

The seagrass biomass production of 1.6 tons/ha/day in New Argao is slightly lower than that in Talicud, but it can sufficiently sustains the 18.68 kg feeding requirement of each dugong per

day. This finding closely resembles the consumption data of a dugong in captivity which is 25 kg of seagrass per day (wet weight) or 8% of its body weight (Toba Aquarium and PCP Report, 1995).

Provision of healthy and quality seagrass habitat for dugong may significantly contribute to sustain the remaining population of dugong in the area.

## CONCLUSION

Based on the findings of the study, the following conclusions are drawn:

1. A viable population of dugong still exist in Davao Gulf.
2. An estimated population of not less than 12 dugongs are distributed in New Argao and at least a pair of dugong is found in Talicud Island.
3. Fourteen species of seagrasses are found in Davao Gulf dominated by *Halophila* species, the most preferred food of dugong.
4. The seagrass beds in New Argao are the foraging niche of dugong.
5. Current seagrass biomass production in New Argao can sustain the feeding requirements of the dugong population in Davao Gulf.

## ACKNOWLEDGEMENTS

This study is partly supported by NAGAO-Natural Environment Foundation-Japan, SPAMAST, LGU-Malita, Davao del Sur, LGU- Gov. Generoso, Davao Oriental and CGU-Island Garden City of Samal (IGaCoS).

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