Photo identification of Dugongs in Marsa Alam and Wadi El Gemal National Park, Egypt

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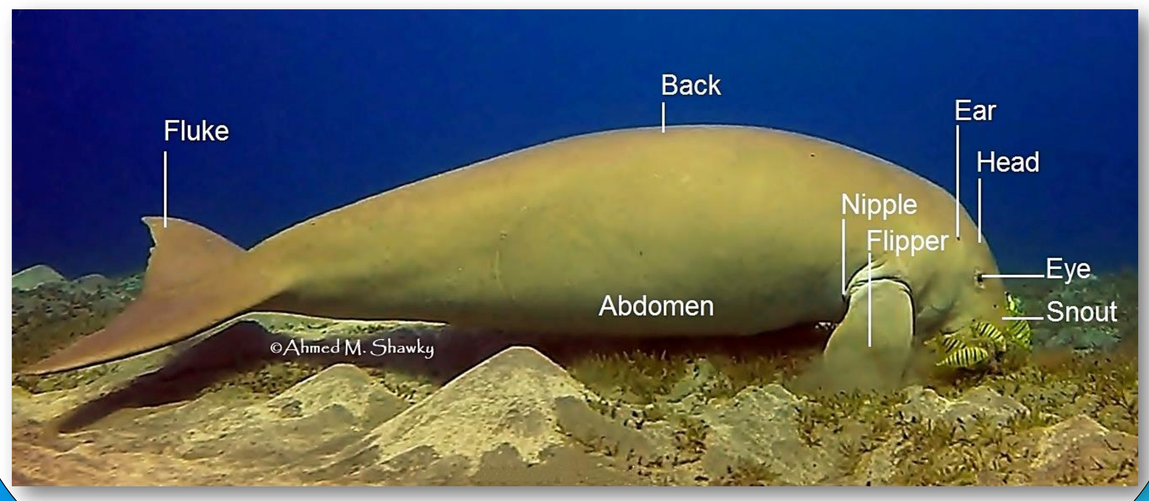
Introduction

The dugong (*Dugong dugon*) is the only marine mammal species that feeds mainly on seagrass and is the only existing species in the order Sirenia, family Dugongidae [1]. Photo identification based on body markings has been used to examine numerous free-ranging marine mammal species [2]. Information on calving intervals/reproductive rates and age at sexual maturity as determined from re-sightings of individuals is a useful measure for evaluating recovery of the species [3]. In this study, photo-ID was used for the first time to identify dugongs inhabiting the Wadi El Gemal National Park (WGNP) and Marsa Alam; information regarding their occurrence, distribution and abundance were documented, and an identification catalogue was created.

Objectives

1. Information on the persistence of scars, flipper and tail notches and their use for obtaining longitudinal data on individual dugongs.
2. An estimate of the minimum number of dugongs known alive in the coastal waters of the Marsa Alam and WGNP regions of the Egyptian Red Sea.
3. Insights into the population composition and movements of habituated, marked animals.



Method of Analysis

The study was undertaken between December 2015 and October 2017. The data was collected from 22 different sites located in two regions; Marsa Alam (14 sites) and WGNP (8 sites) (Figure 1). The observation was carried out by snorkeling and SCUBA diving and the underwater photographs were taken using an HD camera Go Pro Hero 4 with a red filter. Individual's size, sex, notches, scars on the different body parts were noted and photo-documented. All dugongs were assigned a five-digit identification number based on the location of initial sighting [3]. The first letters of the site name were followed by the number of the individual.

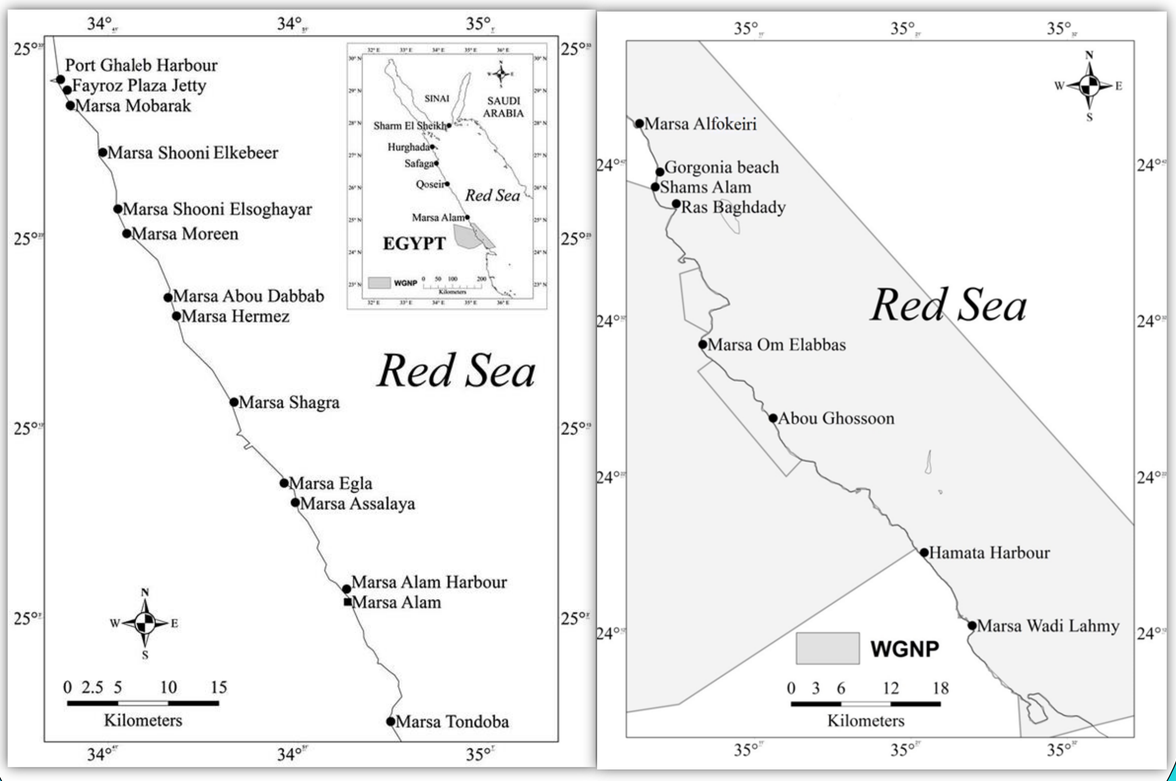


Figure (1): Map shows Maras Alam (A) and WGNP (B) study sites, Red Sea, Egypt.

Results

A total of 30 individuals were sighted in a catalogue (Table 1, 2 & 3). None of the dugongs was observed moving to or from WGNP and Marsa Alam. Particular dugong's specific sites and movements for eight different dugongs within the sites were recorded (16.6±14.0 km).

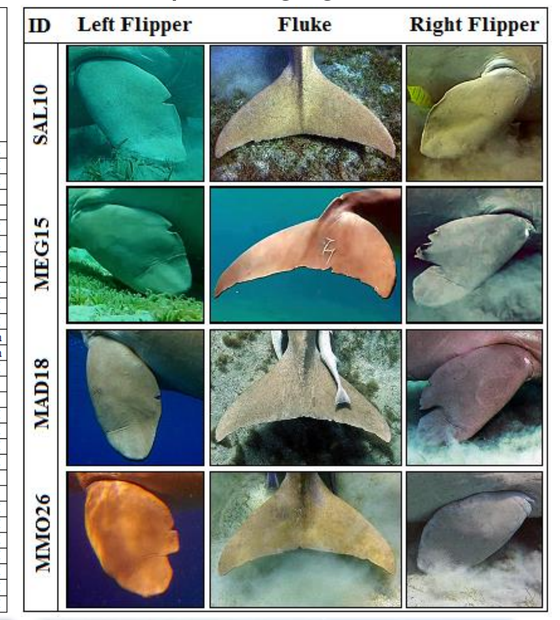
Table 1: Numbers of identified dugongs in the study regions.

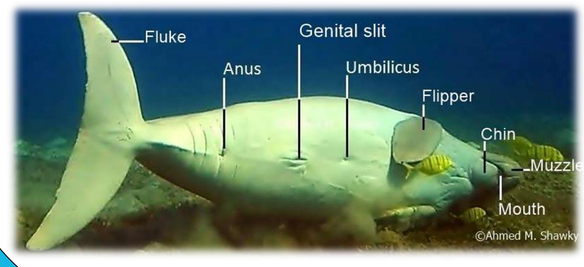
Region	Male	Female	Calf	Un-identified	Total number
WGNP	10	1	1	3	14
Marsa Alam	12	2	2	-	16

Table 2: Photo ID catalogue of 30 identified dugongs.

Dugong Identification Code	Sites	No. of Re-sighting	Sex
MFU01	Mana Alfokeiri	5	M
AGH02	Abou Ghossoon	4	M
HHA03	Hamata Harbour	2	M
HHA04	Mana Om Elabbas	5	F
HHA05	Ras Baghdady	5	C
MOA06	Shams Alam	2	M
RBA07	Gorgonia beach	1	M
RBA08	Mana Wadi Lahmy	1	M
SAL09	Mana Tondoba	1	M
SAL10	Mana Alam Harbour	84	M
SAL11	Mana Egla	3	M
SAL12	Mana Assalaya	1	M
MWL13	Mana Gabal Elrosman	1	Un
MWL14	Mana Hermez	1	Un
MEG15	Mana Abou Dabbab	73	M
MEG16	Mana Moreen	4	F
MEG17	Mana Shagra	4	C
MAD18	Mana Shooni Elsoghayar	66	M
MHE19	Mana Shooni Elkebeer	29	M
MAD20	Mana Mobarak	2	M
MAD21	Port Ghalab Harbour	2	M
MHE22	Fayroz Plaza Resort	1	F
MHE23		1	C
MHE24		1	M
MMO25		93	M
MMU26		6	M
MMU27		6	M
MMU28		1	M
MTO29		2	M
MEG30		1	M

Table 3: Examples of dugong ID\s with notches.





Conclusions

Identification of dugong using notches allowed re-sighting of the same individuals many times and in different sites [4]. Males outnumbered females in this study by a ratio of 7:1 in both areas. Calves were also recorded for the first time. We suggest that females are inclined to visit those areas to feed at a much quieter time in the day for example early morning or late at night thus avoiding disturbances caused by human activities. Nocturnal foraging has been reported in dugongs by several researchers and explained as a means to avoid human activities, fishermen and hunters [5].

More data is unknown about the dugongs in the offshore habitats. Understanding the movement capabilities of dugongs is essential for their conservation [6]. Future conservation plans in Egypt to notify decisions concerning to dugong conservation and management locally and regionally. Currently, a new study funded by Rufford Foundation (26053-B) is conducting to analysis the width of feeding trails related to dugong's muzzle width using laser photogrammetry to estimate the dugong population visiting the area.

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References

[1] Cullen-Unsworth L.C., Jones B.L., Seary R., Newman R., Unsworth R.K., 2018. Reasons for seagrass optimism: Local ecological knowledge confirms presence of dugongs. Mar pollut bull, (134): 118-122.
[2] Hammond, P. S., Mizroch, S. A. & Donovan, G. P., Individual recognition of cetaceans: use of photo-identification and other techniques to estimate population parameters 1990. Report of the International Whaling Commission. Cambridge. Special Issue 12, 440.
[3] Koelsc, J. K. 1998. Photographic identification and behavioral studies of Florida manatees (Trichechus manatus latirostris) in southwest Florid. Mote Marine Laboratory Technical Report #59.
[4] Souza, E. D. & Patankar, V., First underwater sighting and preliminary behavioural observations of Dugongs (Dugong dugon) in the wild from Indian waters, Andaman Islands, 2009. Journal of Threatened Taxa, 1, 49-53.
[5] Hodgson, A. J., Dugong behaviour and responses to human influences, 2004. Ph.D. Thesis, James Cook University, Townsville, Australia.
[6] Hobbs, A. J. P., Frisch, J., Hender, J., Justin, J. & Gilligan, Long-Distance Oceanic Movement of a Solitary Dugong (Dugong dugon) to the Cocos (Keeling) Islands, 2007. Aquat Mamm, 33 (2): 175-178.