



Conservation status of the globally Vulnerable Dugong *Dugong dugon* (Müller, 1776) (Sirenia: Dugongidae) in the coastal waters of Kalpitiya area in Sri Lanka

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The Dugong *Dugong dugon* is the only extant species belonging to the family Dugongidae, order Sirenia (Phillips 1984; Weerakoon & Goonatilake 2006; Ilangakoon 2006; Ilangakoon & Tun 2007). It is distributed in coastal and marine environments ranging from northwest to northeast Australia, southeast to northeast Africa and the south and southeast Asia region (Smith & Marsh 1990; Adulyanukosol 2000; Marsh et al. 2002; D' Souza & Patankar 2009). It

is listed as a globally Vulnerable species (Marsh 2008) and also listed in CITES appendix I. The Dugong is one of a suite of large, long-lived marine vertebrates, including turtles and inshore cetaceans, which are under pressure from human activities (Phillips 1984; Preen 1998), and its maximum longevity observed is 73 years (Marsh et al. 1984). The gestation period is estimated to be about 12-14 months, with females birthing single young (Marsh 1986). The Dugong is a grazer which feeds on sea-grasses in near shore areas (Marsh et al. 2002; Chansue et al. 2006).

Dugongs look rather like a rotund dolphin without a dorsal fin. The head is distinctive with the mouth opening ventrally below a broad flat muzzle (Phillips 1984) covered sparsely with short stout hairs that are most developed around the mouth (Marsh 1989). The Dugong has been given the highest level of legal protection in South Asia, being listed under Schedule (I) of the Indian Wildlife Protection Act (Marsh et al. 2002; D' Souza & Patankar 2009), and also in the Wildlife and Nature Protection Ordinance in Sri Lanka “Act No. 1. of 1970” (Phillips 1984). The species is a relatively large and rare marine mammal in Sri Lanka (Santiapillai 1981; Phillips 1984; Ilangakoon 2006). The occurrence of the Dugong in Sri Lanka's waters appears in the literature in the late 19th century, at which time it seems to have been rare (Haley 1884; Nevill 1885). This article intends to document the conservation status of the Dugong in the coastal waters of the Kalpitiya and Puttalama areas in northwestern Sri Lanka, based on recent field observations and information gathered from local communities (Image 1).

The habitat of Dugong in Kalpitiya and Putalama areas: The Kalpitiya and Puttalama Lagoon area has several plant species: *Aegiceras corniculatum*, *Avicenia marina*, *Acrostichum aureum*, *Acanthus illicifolius*, *Bruguiera cylindrical*, *B. gymnorrhiza*, *Ceriops tagal*, *Exoecariya agallocha*, *Hibiscus tiliaceus*, *Rhizophora mucronata*, *R. apiculata*, *Scyphiphora hydrophyllaceae*, *Sonneratia alba* and *Xylocarpus granatum* dominant mangrove forests. The lagoon also harbours patches of sea-grass beds, which consists of species such as *Halophila beccarii*, *H. decipiens*, *H. ovalis*, *H. ovata*, *Thalassia hemprichii*,

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Image 1. Map of the Puttalam Lagoon of Dugong habitat. (Yellow circle is catch point and red circle is landing sites).

Cymodocea rotunda, *C. serrulata*, *Halodule uninervis*, *H. dinifolia*, and *Syringodium isoetifolium* as dominant aquatic vegetation. The Dugong - preferred sea grass, *Halodule* and *Halophila*, are also present in Puttalam

Lagoon (Marsh et al. 2002; pers.obs.).

The Dugong visits the sea grass beds in the near-shore areas of Kalpitiya, while fishermen have also observed this species in the Kalpitiya Lagoon area. The average depth of the near-shore area is about 2m, while the Kalpitiya Lagoon area is approximately 1.5m in depth. The sea area and brackish water temperature varies from 27-28 °C. The average annual rainfall in this area is 1,100mm, with most of the rainfall occurring from December to March, with occasional rains in the other months. The weather gradually becomes very dry from August to December with the highest temperatures recorded in August. The mean annual temperature in the Puttalam District is 28°C with a maximum of 32°C and a minimum of 24°C.

Recent field observations: We interviewed 78 fishermen (32 fisheries societies in 21 fisheries villages) engaged in near-shore fishing activities in the Kalpitiya and Puttalam areas. Their frequency of Dugong observations averaged once in every 100 fishing trips, indicating a low chance of encountering Dugongs in this area. Two specimens were observed in fisheries bycatch during the study period; on 05 December 2007 (Image 2) in the Soththupitiya Village (8°07'03.41"N & 79°44'21.44"E) in Kalpitiya Peninsula, and on 21 October 2008 in Puttalam. The Soththupitiya specimen was an adult male with a snout to tail end length of approximately 1.5m that was accidentally caught in a fishing net in the Kalpitiya Lagoon area. The body was taken away by junior officers of Kalpitiya navy camp. Some fishermen had observed Dugongs in Puttalam Lagoon in Uchchamunei and Kalpitiya. They did not provide the exact dates of these observations. There is an



Image 2. The Dugong from fisheries bycatch in Soththupitiya Village, Puttalam, Sri Lanka. Photographed with a mobile phone.

accepted fact that the Muslim community in the area does not like to catch and eat Dugongs for religious reasons, which is useful information for education and awareness programmes.

Trends in population status: According to Santiapillai (1981), prior to the mid 1980s, Dugongs were both abundant and widely distributed along the northwestern coast of Sri Lanka, although no numbers are available regarding the abundance. At this time they were actively hunted in the Puttalam area using gillnets. Over the past 30 years however, Dugong numbers have declined dramatically and sightings are now very rare. Interviews fishermen yielded just 12 reported sightings since the beginning of year 2000 (9 incidental captures and 3 live animals), which is a small number even for the 1% observation frequency mentioned above. According to fishermen in this area, a small resident population is known to exist in just two remaining areas, Kalpitiya (Images 3 a, b, c) and Uchchamunei area. In some areas Dugongs are

referred to as ‘Caddadt pandri’ (sea pigs) in Tamil (Phillips 1984). An island near Kalpitiya is called ‘Pandipitiya’ (pig island) most probably referring to Dugong island.

Threats to Dugong in Kalpitiya and Putalama areas: The main threat to Dugongs in the past was deliberate hunting for meat (Ilankoon 2006). Anthropogenic threats to Dugong in the Kalpitiya area can be divided into direct and indirect impacts. According to information gathered from local communities, Dugongs were killed there at the rate of one animal every four months. Direct impacts include hunting, habitat loss, habitat degradation, water pollution and accidental entanglement as a result of commercial fishing practices. Indirect impacts include agricultural practices such as land clearing and the application of fertilizers with subsequent run-off impacting sea grass beds, which serve as the feeding habitats of the Dugong. Other indirect impacts include disturbance and alteration of habitat from mining, use of harmful



Image 3. A - Undisturbed mangrove forest patch in Soththupitiya; B - Lagoon view of Kalpitiya area; C - Boat ride to different islands in Kalpitiya area; D - Interviews with fishermen of Wavata Villuwa area in Puttalam.

fishing practices such as drag nets / push nets, dredging and trawling activities. The sea grass beds are also adversely affected by sedimentation related to aquaculture ponds in the area. However, according to the historical notes from 1957 and 1959, some 100 to 150 dugongs were taken each year in the Mannar District of Sri Lanka (Phillips 1984).

Recommendations for conservation of Dugong: The following suggestions are made to conserve the dwindling populations of Dugong in the northwestern coastal waters of Sri Lanka:

(i) Scientific research and monitoring: A systematic research on this threatened marine mammal should be initiated, to document its current distribution in the area, habitat status, breeding and migration patterns. The local fishermen should be involved in a community based monitoring programme to document observations related to Dugong, including records on bycatch. Priority attention should be placed to document the small resident population of Dugong in this area, as informed by the fishermen. The National Aquatic Resources Research and Development Agency (NARA) Station in Kalpitiya could play a lead role in monitoring programs, also Department of Wildlife Conservation (DWC).

(ii) Environmental education and awareness: A well-planned and targeted program has to be carried out among local communities on the need to conserve the Dugong, and other marine mammals, reptiles (i.e., turtles, sea snakes) and coral reef fish in the area. Such a good programme should be targeted at discouraging local communities from consuming Dugong meat. The Central Environmental Authority (CEA), Ministry of Education, Educational Publication Department, and environmental related NGO's may perhaps play the most important role in environmental education and awareness programmes, also the Department of Wildlife Conservation (DWC).

(iii) Declaration of a protected area: There is tremendous potential to declare a marine and coastal Ramsar site (an internationally important wetland) in this area, which would enable to conserve the habitats of not only the Dugong, but several other marine animals inhabiting this region. The naval base in Kalpitiya could play a vital role in the conservation of Dugongs in this area. We believe that the lagoon areas are very important but they need to be planned and managed in such a way that they balance the needs

to protect the marine environment whilst promoting poverty alleviation, integrated livelihoods and a human rights approach to development along the Puttalama Lagoon.

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