

IMPACTS OF THE RECENT TSUNAMI ON THE BUNDALA NATIONAL PARK – THE FIRST RAMSAR WETLAND IN SRI LANKA

by

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INTRODUCTION

The Bundala National Park (BNP), covering an area of 6216 ha, is located about 250 Km Southeast of Colombo, in the Hambantota District (6°08' – 6°14'N, 81°08'- 81°18'E) (Figure 1.1). The park falls within the Southeastern Arid Zone of Sri Lanka, with a general climate that can be classified as hot and dry. Topographically, the park is generally flat with sand dunes varying in width from about 50 –300m bordering the coastline. Three streams, Malala Oya, Embilikala Oya and Kirindi Oya discharge their waters into the park and adjacent areas. The park consists mainly of dry thorny scrubland and lagoons. The shallow brackish water lagoons located within the park includes Koholankala (390 ha), Malala (650 ha), Embilikala (430 ha) and Bundala (520 ha). The Malala and Embilikala lagoons are interconnected by a natural canal, and receive drainage water from the Badagiriya and Kirindi Oya irrigation systems, respectively. A part of the core area of the BNP is the 50 m width of beach extending along a 12 km. stretch.

In relation to biodiversity, the BNP consists of a total of 11 major habitats/vegetation types (Bambaradeniya *et al.*, 2003). These include 7 terrestrial vegetation types and 7 wetland types. The terrestrial habitats consist of dry thorny scrubland, arid zone forests, sand dune vegetation, gentle sea shore vegetation, arid zone maritime grasslands/pastures, riverine forests, and anomalous Mesquite (*Prosopis*) scrublands, while the wetland types include saltmarsh, mangrove, brackish water lagoons, sea shore (sandy and rocky), saltern, water holes/tanks and streams. A total of 383 plant species,

belonging to 90 families were documented from the above vegetation and habitat types in Bundala (Bambaradeniya et al., 2003). These include six endemics and seven species that are nationally threatened, while 15 are invasive alien species. Of the total plant species documented from Bundala, 121 are woody species. The animals documented from Bundala include a total of 324 species of vertebrates, of which 11 species are endemic, while 29 species are nationally threatened. The vertebrates include 32 species of fish, 15 species of amphibians, 48 species of reptiles, 197 species of birds, and 32 species of mammals. Among the invertebrates are 52 species of colourful butterflies.

TSUNAMI RELATED IMPACTS ON THE BNP

A rapid environmental assessment was conducted in the BNP two weeks subsequent to the Tsunami, to gather information on the damage caused to the park and its biodiversity. Qualitative observations were made on the structural damage caused to the habitats/vegetation types of BNP, and information was also gathered from park managers and the local communities living around BNP.

In general, the BNP and the adjoining Bundala village have been well protected by a broad, mature and stabilized sand dune running parallel to the coastline. The following observations were made in the BNP, subsequent to the recent Tsunami.

- The beach area in BNP has been subjected to erosion, resulting in the reduction of the cover of gentle sea-shore vegetation that consists of runners and creepers such as *Ipomoea pescapre* and *Spinifex littoreus*. In certain locations, the cover of this coastal vegetation type has been reduced up to 75%.
- The erosion of beach in turtle nesting areas has resulted in the destruction of at least 75 turtle nests (mainly belonging to Green Turtle and Olive Ridley Turtle) that were present in the Wellagangoda beach stretch.

- Cutting of an artificial canal across the mature sand dune bordering the Bundala lagoon (by the Bundala Salt Company to drain saline water from the Salt tern) has resulted in funneling of sea water into the lagoon, resulting in sea water incursion into the Bundala lagoon and the Salt tern, destroying the salt pans. The receding water has also resulted in the destruction of the only mangrove habitat (0.5 ha) that occurred at the natural tidal inlet area of the Bundala lagoon. Scattered debris consisting of dead plant material and non-biodegradable material was observed in the Bundala lagoon and the surrounding environment.
- The sand bar formed across the tidal inlet of the Malala lagoon had been penetrated by the sea water that had funneled into the lagoon. The tidal inlet (lagoon mouth) of Malala had been widened subsequent to the Tsunami, resulting in the drainage of water in the Malala and the connected Embilikala lagoon. Many species of freshwater fish inhabiting these two lagoons had been subjected to mass mortality due to increased saline conditions. Dead specimens of *Channa striata* were observed in the edge of the lagoon.
- Fishermen involved in fishing activities in the Malala lagoon informed of a considerable reduction in fish catches in the lagoon subsequent to the Tsunami.
- Deposition of mud and sand was observed in small patches of maritime grasslands and saltmarsh habitats bordering the Malala lagoon, resulting in the destruction of vegetation in these habitats.
- The invasive alien reed *Typha angustifolia* that covered a considerable area of the Embilikala lagoon and its canal that links it with the larger Malala lagoon was completely destroyed as a result of increase salinity. This has resulted in the exposure and destruction of nesting sites of some native aquatic avifauna.
- Clumps of the invasive alien Prickly-pear cactus (*Opuntia dillenni*) that were prevalent in the beach area of Bundala have been washed off inshore through the

Malala tidal inlet and the Bundala artificial canal, and these were observed to be regenerating in new areas where they have been deposited.

- Some trees of the narrow riverrine forest located on the border of the Kirindi-oya had been uprooted by the sea water that had been funneled in through the river mouth.

OBSERVATIONS AND REMARKS ON NATURAL RECOVERY OF AFFECTED HABITATS AND SPECIES

The eroded beach stretches bordering the BNP would be able to recover naturally over a short period of time (1-2 years), by the sand carried out to the ocean by the Kirindi-oya and the Bandagariya irrigation systems. The gentle sea-shore vegetation in the affected beach would also be able to recover naturally from the remaining vegetation, within 1-2 years. The DWC staff at BNP informed that Green Turtle and the Olive Ridley Turtle are returning to the beach areas for nesting in small numbers, which indicates a gradual recovery of turtles that visit Bundala for nesting.

The aquatic birds (including natives and migrants) observed in the lagoons of BNP was healthy, in relation to population numbers and species composition.

The terrestrial habitats inundated by sea water may be subjected to a rapid invasion by the invasive alien Mesquite (*Prosopis juliflora*), as it spreads well in saline soils.

The breached sand bar across the Malala lagoon has now been re-established, and the drained Malala and Embilikala lagoons will be filled with water within a short period of time.

RECOMMENDATIONS FOR ACTION

- Propagules of the invasive alien Prickly-pear cactus transported to inland areas by the Tsunami waves should be collected and destroyed.
- The destroyed patch of mangrove located at the tidal inlet area of the Bundala lagoon should be restored with seedlings of *Lumnitzera racemosa*.
- Non-biodegradable material scattered in the lagoons and surrounding areas should be collected and destroyed.
- A scientific monitoring programme should be carried out to monitor the marine turtles that visit the beach area of the BNP for nesting
- Strengthen and re-activate the marine turtle in-situ conservation programme carried out by the DWC prior to the Tsunami in BNP.
- Monitor the spread of Mesquite (*Prosopis juliflora*) in areas inundated with sea water resulting from the Tsunami waves.

Tsunami affected areas in Bundala National Park

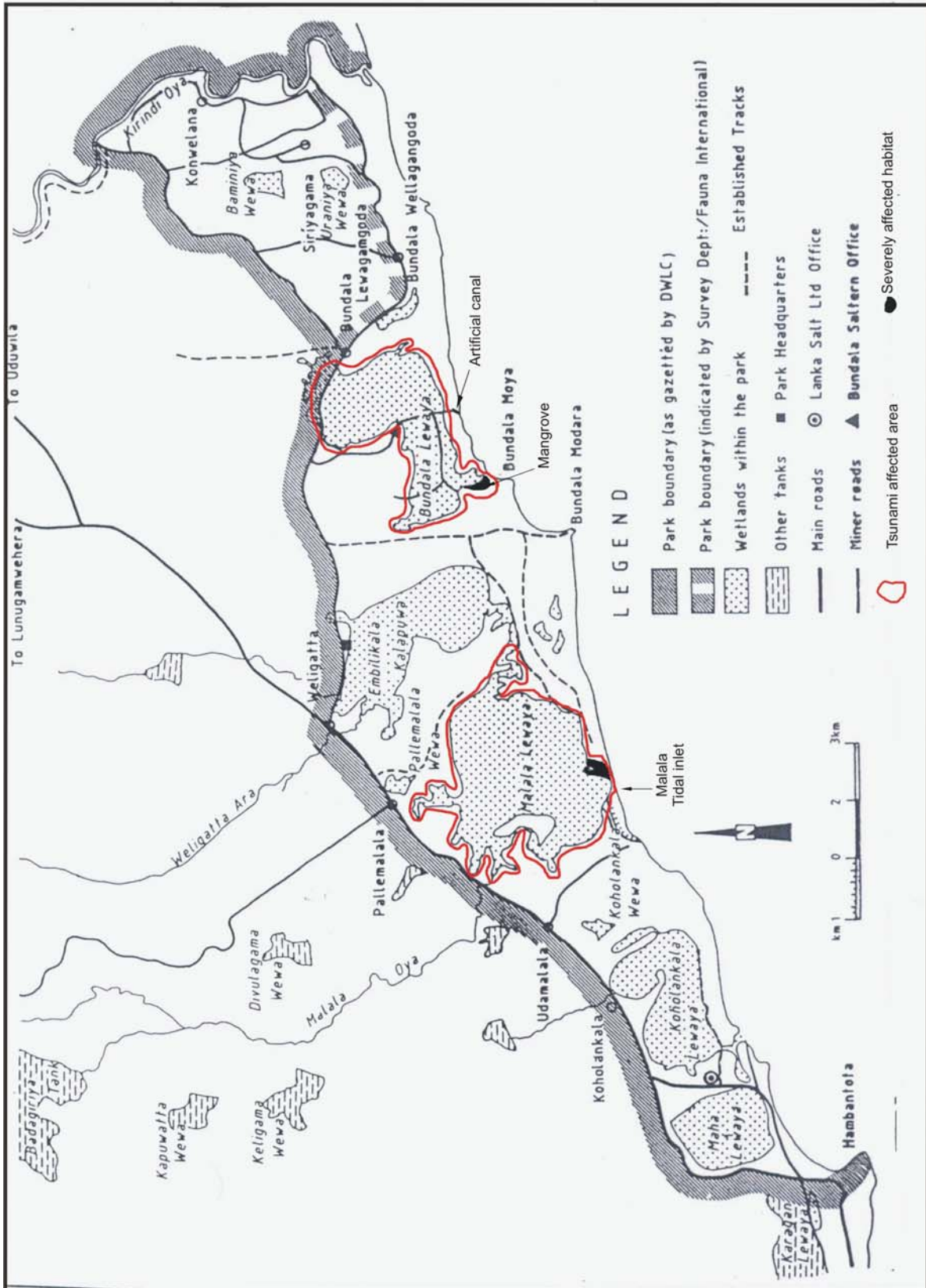


Figure 1

References

Bambaradeniya, C.N.B., S.P. Ekanayake, R.H.S.S. Fernando, W.P.N. Perera and R. Somaweera (2003). A biodiversity status profile of Bundala National Park – A Ramsar wetland in Sri Lanka. *Occ. Pap. IUCN Sri Lanka.*, 2:iii+ 37pp.