Journal of the Department of Wildlife Conservation 2006-1: 169-174

MARINE TURTLE CONCERVATION PROJECT AT BUNDALA NATIONAL PARK

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ABSTRACT

Five of the world's seven species of marine turtle come ashore to nest in the beaches of Sri Lanka. All five species are listed as endangered by the world conservation union (IUCN), and protected under national law.

All five species of marine turtles visit Sri Lanka nest at Bundala beach, which is about 16 Km in length every year during the turtle nesing period. Bundala cost line host nesting endangered Olive Ridley (*Lepidochelys olivaceae*), Green turtle (*Chelonia mydas*), Loggerhead turtle (*Caretta caretta*), Hawksbill turtle (*Dermochelys imbricata*) and Leatherback turtle (*Dermochelys Coriaceae*) Leatherback turtle is critically endangered species in the world.

Green turtles and Olive Readly turtles both visited Bundala beach for nesting during last four years Olive Readly nested three hundred and nine times (309) for the last four years. Year 2004 and year 2005 was not recorded any nesting sites of Logger head and Leatherback turtle on the Bundala beach, While Hawks bill turtle did not come last three years to Bundala beach except only single nesting site was recorded year 2004.

There are one hundred nineteen (119) uncertain arrivals of individuals were recorded. Uncertain means no direct evidence for which species made the nests, but nesting sites could be found on the beach. However compare to year 2002 and 2003 number of uncertain records comparatively reduce year 2004 and 2005.

Two conservation methods i:e in-situ conservation and ex-situ conservation method were applied for hatch of turtle eggs. Irrespective of the method used the success rate of hatchling of Green turtle and Olive readly were more than 85%. Lowest rate was recorded for Olive readly as 15.2%. Highest success rate were recorded in 2005 (83.4%) (Table 2) Wild boar and feral dogs are the main predators of turtle eggs on Bundala beach. To protect from predators, used concrete cylinders (dia - 30", height - 1 1/2', thickness 2") and labeled it to easy to identification, and determine the date of hatchlings come out.

INTRODUCTION

Bundala National Park is located in the Hambanthota District ($6^0$08' - $6^0$14N, $81^0$08' - $81^0$18'E) covering an area 3698 ha. The park falls within the Southeastern Arid Zone of Sri Lanka, with a general climate that can be classified as hot and dry. The average annual rain fall for the area is about 1,074 mm, with the highest monthly rainfall occurring in November. The mean annual temperature is about 27.1C^0. Topographically, the park is generally flat with sand dunes bordering the coastline.

Three shallow brakish water lagoons located within the park namely Malala (650 ha), Embilikala (430 ha) and Bundala (520 ha), from a complex Wetland system that harbors a rich bird life, including several species of migratory waterfowl. Recognizing the importance of Bundala as an important habitat for wildlife, it was declared as sanctuary under the fauna and flora protection ordinance in 1969, and later upgraded to a National Park in 1992 (Wet land site report and conservation management plan, Bundala National Park-1993).

Beside the bird life, the lagoons support a large number of fish and Shrimps. The reptile fauna of Bundala National Park includes many IUCN Red list species such as estuarine crocodile, endemic frog (*Bufo atukoralei*) also has been recorded from the Park (Bambaradenya *et al.*,2001).

Every year during the turtles breeding period Bundala cost line host nesting endangered Olive Ridley (*Lepidochelys olivaceae*), Green turtle (*Chelonia mydas*), Loggerhead turtle (*Caretta caretta*), Hawksbill turtle (*Eretmochelys imbricata*) and Leatherback turtle (*Dermochelys coriaceae*)

All five marine turtle species that nests in Sri Lanka are listed on the convention on International Trade in Endangered species (CITES) Appendix 1, of which Sri Lanka is a signatory.

Sri Lanka is also a signatory to an Mou (Memorandum of Understanding) on the conservation and Management of Marine Turtles and their habitats of the Indian Ocean and South - East Asia (IOSEA)

The Bundala National Park (BNP) initiated a monitoring program of nesting turtles at Bundala beach in year 2002. At present BNP get the service of volunteers from local villages to patrol the beach, to collect information about nesting and protect turtle nests. Concrete cylinders are used to proteet nest by wild boars and feral dogs.

The project has two main objectives. The main objective is to record the number of each turtle species nesting on the Bundala beach.

The second objective is to establish suitable methods of insitu and exsitu conservation methods for turtle nests at Bundala beach.

MATERIALS AND METHODS

Study Area

Sri Lanka has four climatic zones which include the wet zone, dry zone, intermediate zone and Arid zone. The study Area is located in the arid zone in Hambanthota district in Southern Province.

The study Area is located at $6^0$08' - $6^0$14'N, $81^0$08' - $81^0$18'E. The length of the Bundala beach is approximately 16 Km length. The beach contains number of sand dunes.

Field survey

Although the nesting beach at Bundala is 19 Km in length currently only 4 Km of this is included in the conservation area. The major threat to nesting females, the eggs in the nest and the hatchlings in this area includes natural predators such as wild boar, and feral dogs, which damage nests and prey on hatchlings as they emerge.

This is combated by a team of 15 volunteers who come from the vicinity of the park to beach patrol 24 hours per day. The 4 Km stretch of beach at Bundala is monitored 24 hours a day, seven days a week so all members of staff work on and shift rotation system. There are different sets of overlapping shifts from 2.00 a.m. - 6.00 a.m., (5 staff), from 10 p.m. - 2 a.m. (5 staff), from 2 p.m. - 10 p.m. (3 staff) and 6 a.m. - 2 p.m. (2 staff) Nesting females that are observed at night are allowed to dig their nest and then recorded the number of eggs in the nest, their location and their biometric data (length of carapace, width, number of scales etc.). Once the nesting process is complete, the nests are covered by large concrete cylinders (height - 1 1/2 feet, diameter 30 inch, thickness 2 inch) specifically to protect the nest from the wild boar and feral dogs that are so plentiful in the park, throughout the incubation period (Figure 1). In addition hatchling number of emerging from the nest of each species is recorded. Identification was done using a colored atlas of same

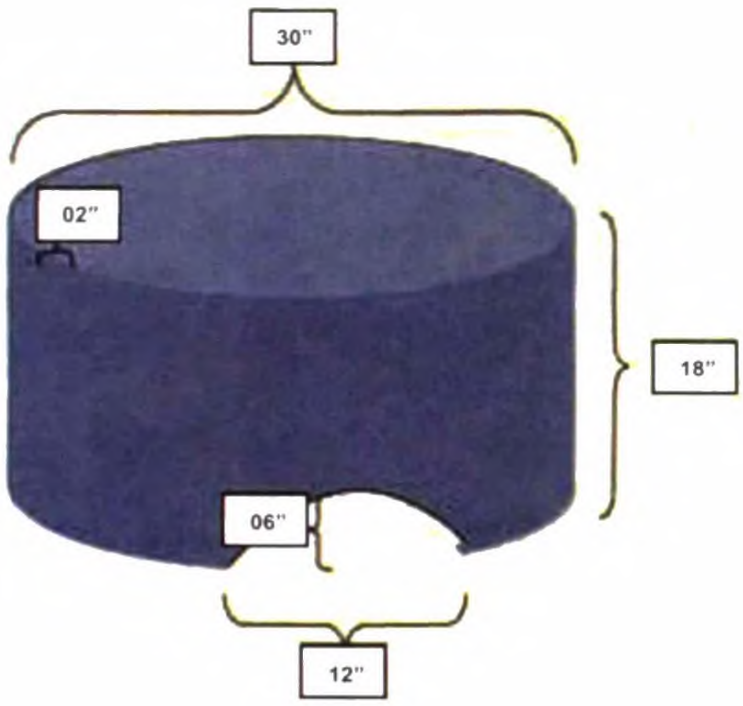

Figure 1. Turtle nest protecting cylinder

RESULTS

Five species of turtle which are logger head, Hawk bill, Leatherback, Green turtle and Oilve redly nests Bundala beach. But Loggerhead and Leatherback turtle did not nest during last two years. In addition Hawks bill did not nest in year 2003 and year 2005. Olive redly and Green turtles nest at Bundala beach regularly during last four years (Table 1).

Table 1. Nesting records of five species of turtles at Bundala beach from 2002 – 2005.

Name of species	Year				Grand Total
	2002	2003	2004	2005	
Green Turtle	26	06	06	03	41
Olive Redly	92	152	10	55	309
Loggerhead	35	09	-	-	44
Hawkbill	18	-	01	-	19
Leatherback	10	05	-	-	15
Uncertain	44	33	18	24	119

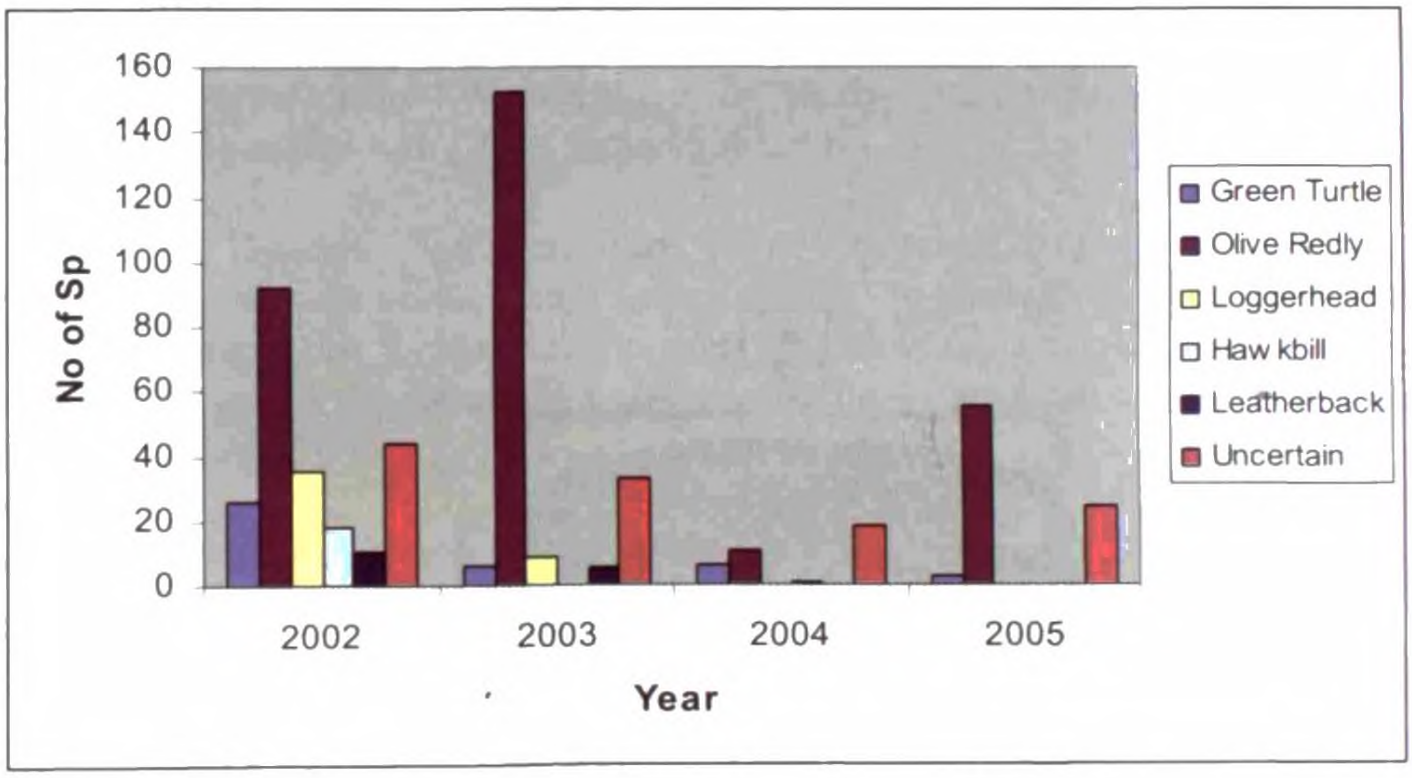

Figure 2. Nesting records of five species of turtles at Bundala beach from 2002 – 2005.

Figure 2. Green Turtle

Figure 3. Hawkbill

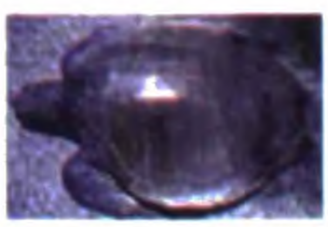

Figure 4. Olive Redly

Figure 5. Loggerhead

Figure 6. Leatherback

Olive readly arrived three hundred and nine times (309) for last four years to Bundala beach which was recorded highest nesting. Lowest attendance was recorded for Leatherback for last four years (15 times), while Hawks bill, Green turtle and logger head were recorded 19 times, 41 times and 44 time attendance respectively (Table 1).

Second highest attendance (119 times) was recorded uncertain species which were not identified particular species but could be fond nests (Table 1).

Success rate of hatchling is very high irrespective of two conservation methods. Highest success rate of hatchlings of Green turtle could be fond year 2002 (96.01%) while year 2005 it was 88.31%. Year 2003 and 2004 the rate was 85.7% and 85% respectively. Highest success rate of hatchlings of Olive Readly was recorded during the year 2005 (85.09%) (Table 2).

Success rate of hatchling of uncertain species, year 2005 was recorded (83.4%). Lowest rate was recorded year 2003 (67.42%) (Table 2).

Table 2. Success rate of hatchlings of in-situ and ex-situ conservation method for five species of turles at Bundala beach.

Name of species	Year			
	2002	2003	2004	2005
Green Turtle	96.01%	85.71%	85%	88.31%
Olive Redly	15.2%	80.59%	-	85.09%
Loggerhead	92.07%	71.27%	-	-
Hawkbill	92.17%	-	-	-
Leatherback	83.33%	72.34%	-	-
Uncertain	81.06%	67.92%	80.07%	83.41%

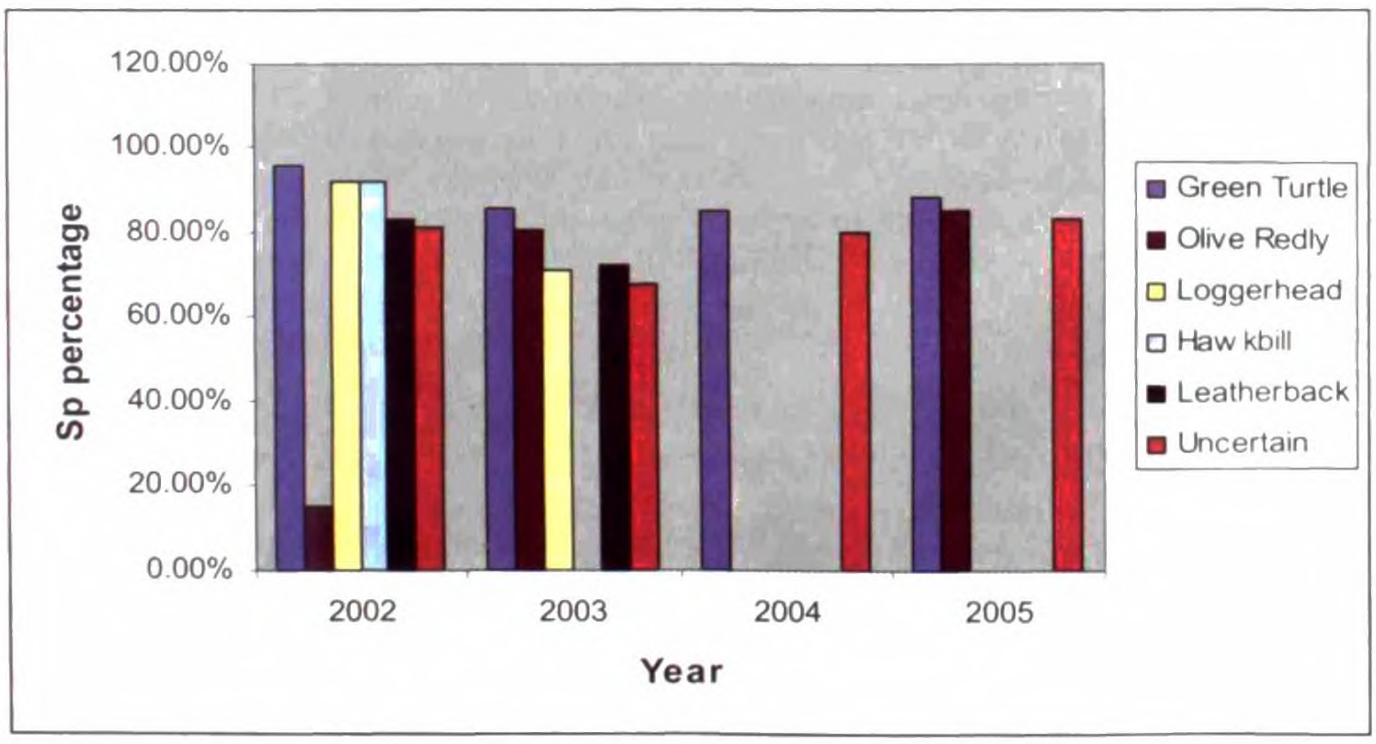

Figure 2. Success rate of hatchlings of in-situ and ex-situ conservation method for five species of turles at Bundala beach.

DISCUSSION

Green turtle and Olive Redly turtle came to Bundala beach for nesting throughout last four years (2002-2005). Therefore nesting of two species can be seen throughout the year in Bundala beach. Leatherback and Loggerhead did not come during last two years. Hawks bill turtle did not come during last three years except one attendance of year 2004. According to IUCN Leatherback, Logger head and Hawk bill species are critieally endangered species in the world. In addition it may be the reason, which these species may nest beyond the conservation area. Turtle conservation project confined about 4 Km length of the beach.

Success rate of hatchling of all five species are very high irrespective of in-situ and ex-situ conservation method. Species which are not seen at the time of nesting were recorded as uncertain species. Success rate of uncertain species is high in last four years (Table 2). Number of volunteers need to minimize the record of uncertain species. Furthermore volunteers should be given appropriate technology and knowledge to identify species using their tracks.

CONCLUSION

Beach of Bundala National Park provides good nesting habitats for five species of turtles in the world. Green turtle and Olive readly came to nest throughout the last four years to Bundala beach. Therefore Bundala National Park harbors a rich reptile diversity. No special reason could be found for the absence of critically endangered three species of turtles Leatherback, Hawk bill and Logger head turtle, for the last three years.

In situ and ex-situ conservation methods are very successful in the Bundala beach. The area of the project must be expanded for 16 Km and it will help to get more number of attendance and nesting sites. In addition the number of volunteers should be increased, so that more data could be gathered during peak nesting season.

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