

A Summary of the 2000-2001 Hawksbill Turtle Nesting Season on Aride Island.

Hannah Dugdale

Introduction

The Hawksbill Turtle *Eretmochelys imbricata* is classified as Category 1 'Critically Endangered' (Baillie & Groombridge, 1996). It's nesting on Aride has been monitored since 1976. Although the nesting population on Aride is small in comparison to other sites in Seychelles, the natural beach habitat and protection from poachers makes Aride an important breeding ground and it is vital that monitoring is continued. This paper presents the findings of the 2000-2001 nesting season.

Methods

Aride's south beach was patrolled from September 4th, 2000 until July 16th, 2001, as described in Crowley (2000) and Hannah (2001). The turtle nesting season in Seychelles runs from the 16th July in one year to the 15th July in the next (Mortimer, *pers. comm.*). Patrols initially occurred three times a day at 07:30, 12:00 and 18:00. After December 17th, 2000 the 12:00 watch was discarded, and on March 18th, 2001 the monitoring was reduced to once daily.

Results

The first emergence occurred on October 11th, 2000 and the last on June 16th, 2001. In total there were 54 emergences, of which: 20 resulted in definite nesting, nine probable nesting (laying unobserved and no nest was found upon excavation), 16 U-turns, eight abandoned nesting attempts and one unclassified non-nesting emergence.

Timing of Emergences

There were significantly more emergences observed during the 18:00 patrol than the 07:30 and 12:00 patrols ($\chi^2 = 7.68$, d.f. = 2, $p < 0.05$: Table 1).

Time	No. Emergences
07:30 patrol	3
Later morning	9
12:00	4
Later afternoon	10
18:00 patrol	12
18:00 – 07:30	16

Table 1 – The number of emergences observed during each patrol and those that occurred between patrols.

The number of emergences and definite nests were not evenly distributed throughout the season ($\chi^2 = 86.0$, d.f. = 17, $p < 0.05$; $\chi^2 = 41.2$, d.f. = 17, $p < 0.05$ respectively), but peaked during November (Figure 1).

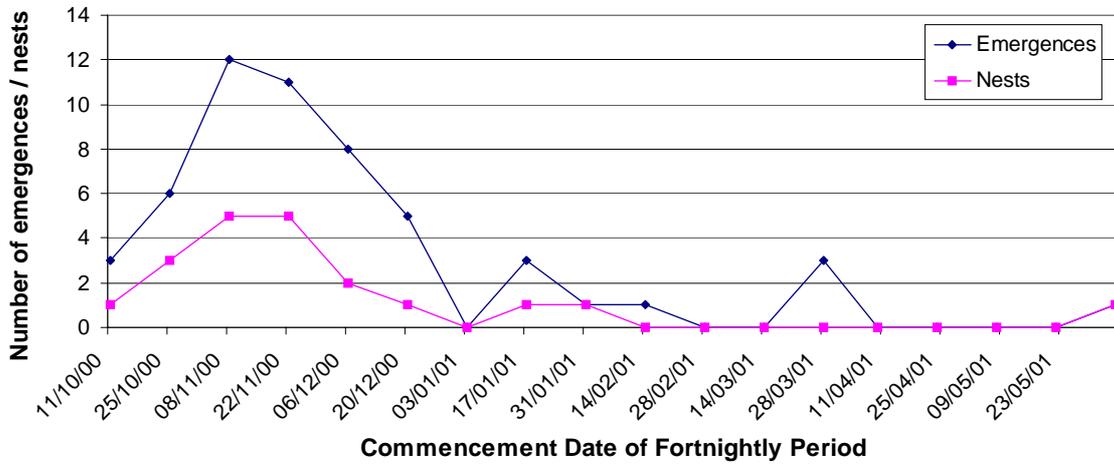


Figure 1 – The number of emergences and definite nests of Hawksbill Turtles over fortnightly periods, commencing at the first emergence, in the 2000-01 nesting season. The interval was broken into fortnights, as the re-nesting interval of the Hawksbill Turtle on Aride is 14.7 days (Dugdale, 2002).

Re-nesting Interval

Five females were identified during the nesting season, three of which were already tagged. The greatest number of observed emergences for an individual was four and three for observed, definite nests (Table 2).

Left tag no.	Right tag no.	Date of Emergence and Classification of Event
E1948	E1902	11/10/00 (a) 30/10/00 (u) 31/10/00 (n) 15/12/00 (u)
E1936	E1935	02/11/00 (n) 18/11/00 (a) 19/11/00 (n) 02/12/00 (n)
E1963*	E1964*	13/11/00 (n)
E1967*	E1965*	23/11/00 (n)
X	E056	06/11/00 (n)

Table 2 – Dates of observed emergences of identified turtles in the 2000-2001 season. n = definite nest, u = U-turn, a = abandoned nesting attempt, X = data not recorded, * = tagged in 2000-01 season.

Nest Site Selection

Emergences were unevenly distributed along the beach ($\chi^2 = 20.7$, d.f. = 4, $p < 0.05$), however definite nests were evenly spread ($\chi^2 = 6.5$, d.f. = 4, $p > 0.05$; Table 3).

Beach Area	No. Emergences	Expected No. Emergences	No. Nests	Expected No. Nests
1	14 (26%)	5 (10%)	4 (20%)	2 (10%)
2	11 (20%)	13 (24%)	4 (20%)	5 (24%)
3	12 (22%)	21 (39%)	4 (20%)	8 (39%)
4	10 (19%)	8 (14%)	3 (15%)	3 (14%)
5	7 (13%)	7 (13%)	5 (25%)	3 (13%)
Total	54	54	20	20

Table 3 – The beach area where emergences and definite nests of Hawksbill Turtle were recorded during the 2000-01 season. Expected values were calculated from the length of each beach section, assuming that emergences are equally likely along the whole length.

Hatching and Emergence Success

Out of 20 definite nests, excavation recordings were taken at 15. The mean clutch size was 166 ± 54 , mean hatching success was $86.5\% \pm 25.1$ and mean emergence success $86.3\% \pm 25.1$. Of the 20 definite nests there was evidence of crab activity at five. Upon excavation three of these nests were not located, and the other two had 98% and 84% hatching success.

Discussion

The mean number of emergences in any Hawksbill season on Aride is 27 with a mean of 11 definite nests (Dugdale, 2002). This indicates that overall the 2000-01 season was successful, however there has been a general trend of an increase in emergences and nests over the years. Comparison with the previous season when there were 52 emergences of which 20 resulted in definite nests (Hannah, 2001), reveals only a slight increase in emergences in the 2000-01 season. The last emergence of the 2000-01 season was in June, compared to February and March in the previous two seasons. This may be as monitoring, in the 1998-00 seasons, ceased at the end of March, whereas in the 2000-01 season the beach was always patrolled once a day after March. There may therefore have been a few emergences that were missed in the previous two seasons.

The mean minimum number of turtles nesting in a season on Aride is 5.6 (Dugdale, 2002). The minimum number that could have been responsible for the nests in the 2000-01 season, given the interval between definite nests and the number of tagged turtles observed, was five. This is slightly lower than the mean, however this is an overly conservative measure and the nesting population may have been greater than this as many emergences were unobserved.

Timing of Emergences

Significantly more emergences were observed during the 18:00 patrol than the 07:30 and 12:00, yet between 1981-2000 there were an equal number of emergences in the morning and afternoon (Dugdale, 2002). 16 emergences in the 2000-01 season occurred between 18:00 and 07:30. As Hawksbills are diurnal nesters presumably these occurred before the 07:30 patrol and it is recommended that this be altered to 07:00.

There was a peak in emergences and definite nests in November, which corresponds with the November peak in the 1998-99 season (Crowley, 2000). This peak is probably due to the change in the south-east to north-west monsoon, bringing rain which will aid nesting (Diamond, 1976).

Re-nesting Interval

Of the five tagged turtles only one emerged multiple times to nest. The re-nesting intervals displayed by this individual were 17 and 13 days. 17 days is an unusually high interval, with the mean on Aride being 14.7 days (Dugdale, 2002). The turtle did re-emerge after 16 days, but this was an abortive emergence and it is possible that this and other turtles made unobserved emergences.

Nest Site Selection

There were more emergences than expected in area one of the beach, but fewer than expected in area three. Beach access from offshore differs between areas. At low tide the approach to area 3 is hampered by the exposed reef, although the same is true for area 2. There was no significant difference in the number of definite nests that were laid in each beach area. It may be that although area three received less than its expected share of emergences, that the number of nests did not suffer as it was the most desirable nesting area. Beach characteristics during the season were unavailable to elaborate further.

Hatching and Emergence Success

The 2000-01 nesting season was very healthy, with 87% hatching success and 86% emergence success. Predation was suspected in five of the 21 nests. Only a small proportion of the eggs could have been lost in two of these nests, as they displayed high hatching and emergence success. However, the remaining two nests were not found upon excavation. The main predator of nests on Aride is the ghost crab *Ocypode* sp. Eggshells were noted at one of these nests and it may be that the whole of these two nests were lost to predation.

Conclusion

Overall the 2000-01 Hawksbill nesting season was very successful. This is due to the protection afforded by the nature reserve, and the general trend in an increase in emergences and nests is encouraging. Unfortunately there were no Green Turtle *Chelonia mydas* emergences in the 2000-01 season. This is probably due to the low number of individuals nesting on Aride (Dugdale, 2002) and with turtles nesting every two to three years, there will be years without Green emergences.

Acknowledgements

Dedicated Aride volunteers, rangers and wardens made this work possible through the turtle data they collected. In particular I would like to thank Jeanne Mortimer for reams of helpful advice on turtle nesting behaviour and beach protocols, and Andy Bamford for proof-reading the turtle reports and putting up with constant turtle talk.

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