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ECS WARD

**CROCODILE NEST SURVEY
LAKE ST LUCIA**

DECEMBER 1985 - JANUARY 1986

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Summary

- A total of 101 crocodile nests was recorded during the 1985-1986 survey.
- The survey did not cover the whole Lake, only those areas known to have crocodile nests.

Introduction

The objectives of the survey were:

- i) To obtain an estimate of number of nests, and hence the number of breeding crocs.
- ii) To investigate nest site selection factors.

The people involved in the nest surveys were : D. Blake, D Burden, M. Coetzee, D.Densham, S. McLean, A. Myesa, H. Dosthuysen, I Porter, R.Taylor, and M. Ward .

Nests were located by walking along the shoreline and searching for the characteristic signs of a nest. These signs are:

- 1) The crocodile guarding the nest is disturbed and is flushed into the water.
- 2) Often there are pathways between the nest and the water.
- 3) The nest itself is usually a patch of bare sand, where the vegetation has been removed by digging and has not recovered as the female crocodile often lies on top of the nest. Often the body impression of the crocodile is still visible in the sand.
- 4) As crocodiles use the same nesting areas in successive seasons, nest holes and shell fragments from previous years are clues to the location of current nests.

Although the indications of a nest are usually fairly obvious this is not

always the case, and it is likely that a number of nests were not detected in the areas searched.

For each nest a data sheet was filled in (see sample data sheet in appendix 1)

The surveys were carried out between 18 December 1985 and 7 March 1986

Results

Not the whole of the Lake area was searched, but only selected portions of the shoreline, shown in figure 1, were selected as these were known to have the largest concentrations of nests. Incidental nests found in other areas (Eastern Shores, Mkuze Mouth) were also recorded.

The locations of the nests found are mapped in figure 1. From these it can be seen that a total of 101 nests was detected. Generally the height of the nest above water level and its distance from the edge of the water depends on the topography of the area. For this reason these parameters have been analysed separately for each region of the lake and the trends are shown in figure 2.

Of the 101 nests found only three showed signs of predation. One at Ndlozi Pan by a leguaan or a water mongoose, and two in the Back Channels by humans. This figure is considerably lower than expected.

Additional data

Sand samples were collected from most of the nest sites. These samples were sent to Dr I van Heerden at the National Research Institute of Oceanology in Stellenbosch for grain size analysis. The analysis of these will show whether the crocodiles select for specific sand grain characteristics when choosing a nest site.

The original data sheets contain data which have not been analysed. These data are housed in the St Lucia research centre with a duplicate set being filed at the Crocodile Centre.

Discussion

Few records of nest counts from previous years are available. Some old records are given by Pooley (1982). Interpretation of these data are difficult as the intensity of the surveys was not recorded,

More recently, the nests in the 1983-84 season were virtually all flooded by the floods associated with cyclone Domoina. Very few hatchlings would have survived. The 1984-85 surveys were only conducted in the Ndlozi Pan and Otoneni-Ngema areas. The results were 5 nests at Ndlozi which had all

been robbed by predators, and 16 nests in the Otoneni-Ngema area. Of these 16 nests, 8 had not yet hatched, 2 had been flooded, 4 had been robbed by predators and 2 had hatched successfully.

The most obvious feature of the 1985-86 survey is that the bulk of the nests were not found in the Ngema - Otoneni area which has always been regarded as being the major nesting site. This survey showed that the Mamba Stream, Nkazama Stream and Back Channels areas are all very important.

Little information was obtained from the data collected to characterise nest sites. To do this effectively comparative data would have to be collected for areas not used by the crocodiles. Nest sites can subjectively be described as having the following features:

1) Substratum can be very variable, ranging from sand (coarse or fine grained) in most sites to clay in some of the Back Channel sites and to a highly organic peat-like soil in the Mkuze Mouth. Soil colour can be light or dark.

2) The distance to fresh water may be a factor. Most of the nest sites have fresh water pans nearby.

3) Aspect is not critical as long as the nest is in full sunshine for much of the day.

4) Height above the water varies from 40cm to seven meters. Obviously the eggs must be above the water-table. Soil moisture is likely to be a critical feature as the eggs cannot withstand dessication.

5) Distance from water is not critical. The mother, however, would prefer nest sites close to the water's edge.

6) Almost all the nests were close to the base of shrubs or the edge of forest. This is possibly a feature selected by the mother for her own protection as she is often to be found lying-up in the shade near the nest.

7) Areas with emergent shoreline vegetation nearby are possibly favoured as these are suitable for use as nursery sites by the hatchlings.

8) Nest sites are in areas which have high concentrations of crocodiles throughout the year.

As the survey was not comprehensive, we cannot make population extrapolations from the data. All we do know is that there are at least 101 breeding females in the population and as Pooley (1982) estimates that there is an average of 45 eggs per nest, it can be extrapolated that the nests found contained some 4500 eggs. We have little information about the extent of nest predation and none of the survival rates for hatchlings.

Our knowledge about the crocodile population is very low, especially when one considers that the crocodiles are possibly the most important predator

in the St Lucia system, that crocodiles are a red data book species, and that the St Lucia population is probably the largest in the country.

Recommendations for future surveys.

A third objective should be added for future surveys. This should be to estimate the hatching success of the nests by quantifying losses due to predation, flooding, infertility, etc. This would entail marking a sample of the nests at the beginning of the season, and then revisiting the nests after they should have hatched to see what proportion have been successful.

To obtain a better estimate of the size of the breeding population it will be necessary to conduct a more intensive survey covering the whole of the St Lucia area.

Reference:

Pooley, A.C. (1982). The ecology of the Nile Crocodile *Crocodylus niloticus* in Zululand. Unpublished M.Sc thesis. University of Natal.

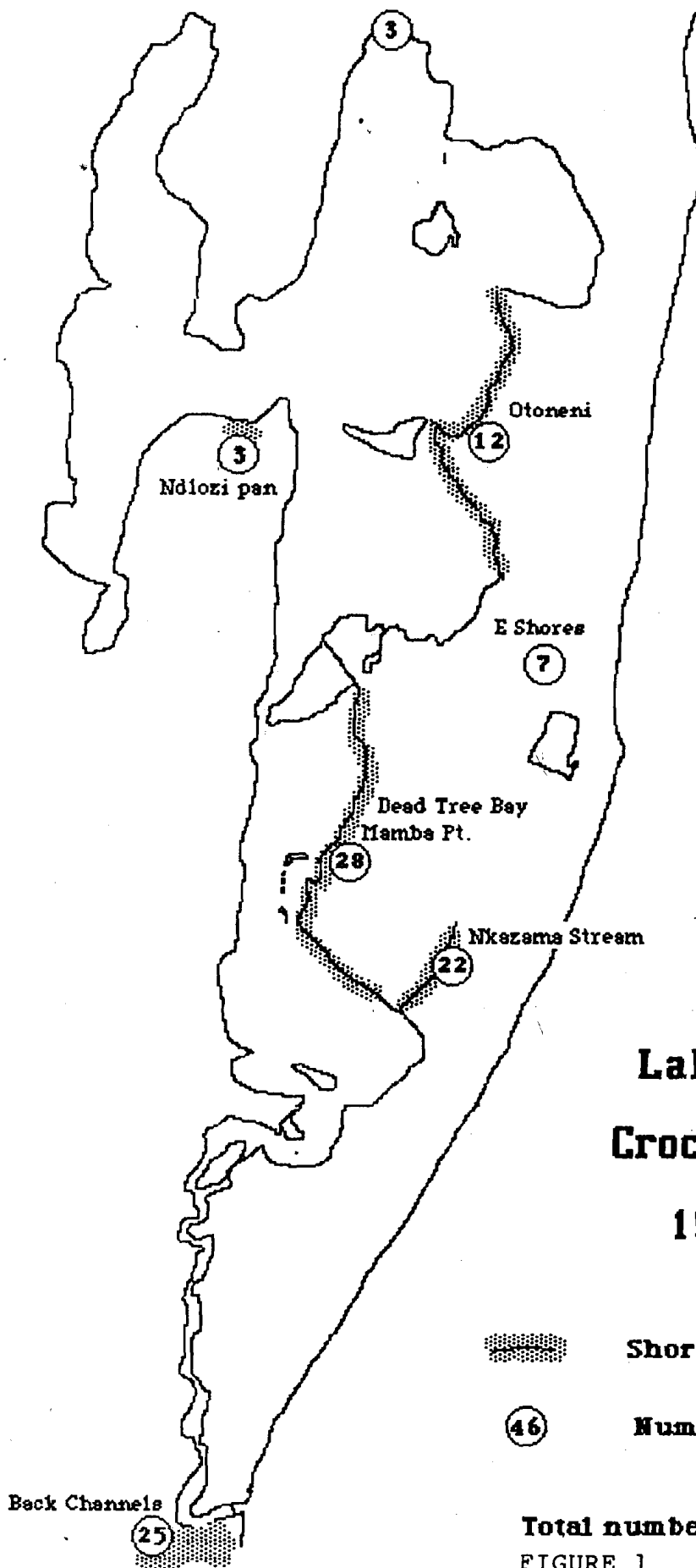


FIGURE 1

Distance of croc nests from water

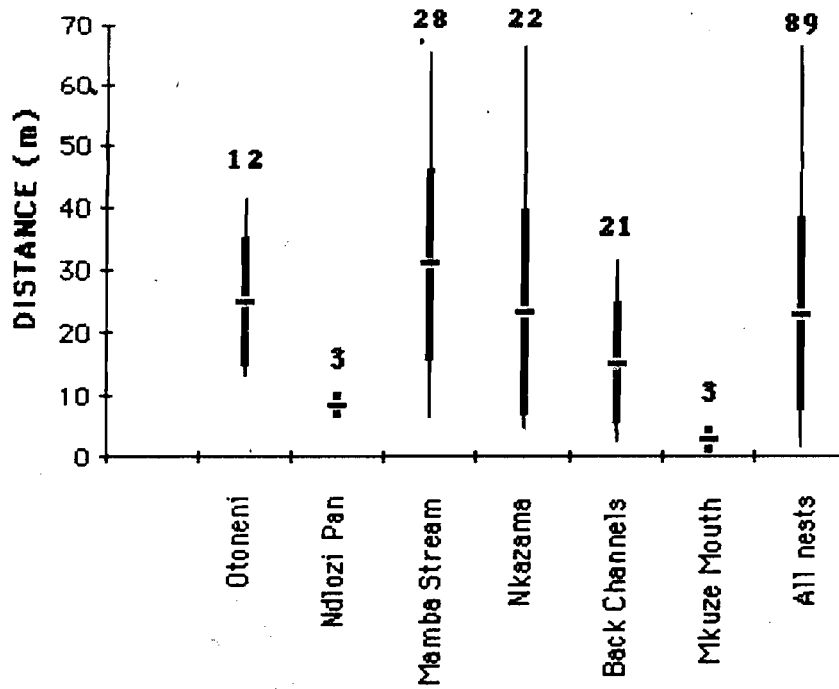


Figure 2a. The distances of nests from the water. For each bar the mean, standard deviation, minimum, maximum and number of measurements are shown.

Height of croc nests above water

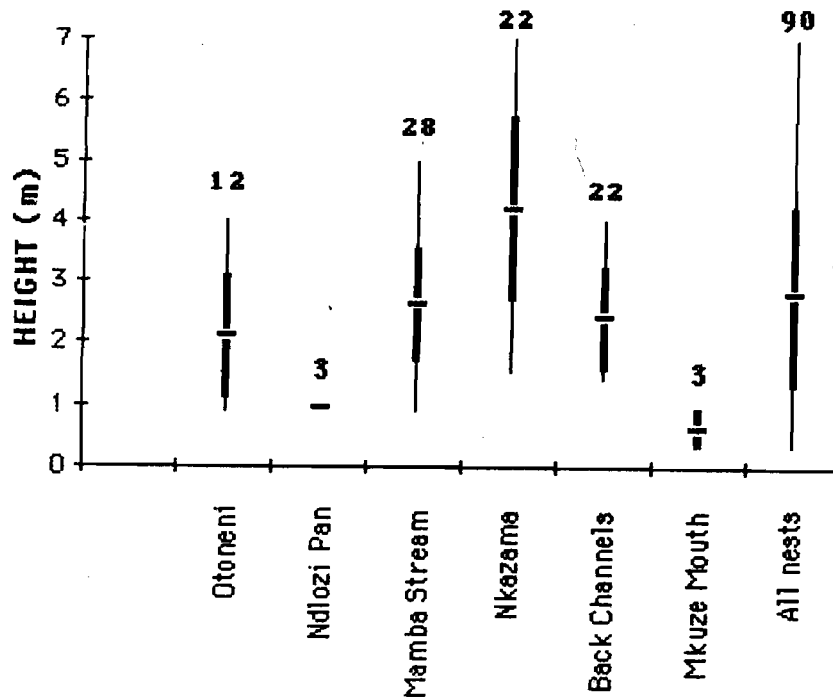


Figure 2b. The height of nests above the water. For each bar the mean, standard deviation, minimum, maximum and number of measurements are shown.