

ENVIRONMENTAL ENRICHMENT FOR SEA TURTLES IN REHABILITATION: PRELIMINARY STUDY

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Introduction

Since 2009, the Queensland coast has experienced high rainfall with the associated runoff causing high turbidity levels that block the sunlight needed for seagrass growth. This has resulted in a several fold increase in stranded sea turtles due to starvation as seagrasses are the preferred diet for these species. This increase in standings exceeded the capacity of the existing turtle rehabilitation facilities in Townsville (Reef HQ), and in light of this an adjunct emergency centre was established at the School of Veterinary and Biomedical Sciences at James Cook University (JCU) in mid-2011.

In the wild, sea turtles would have rocks to rub against, caves to hide in and vegetation to swim through. The turtles housed at JCU are in relatively small tanks and are usually housed alone while recuperating. Therefore, it was decided to enrich the environment of the tanks to enable the turtles to express more natural behaviours to enhance their health and hopefully speed recovery.

The psychological and physiological benefits gained from enriching captive animal environments are well known (Young, 2003; Lloyd, 2008). However, few enrichment studies have been conducted on reptiles. Only one study could be found in the literature that enriched the environment of sea turtles (Therrien, Gaster, Cunningham-Smith & Manire, 2007). Therrien et al.'s (2007) study was conducted to instigate an environmental enrichment programme for four display turtles to offset the effects of a sterile, single species environment. The results suggested that environmental enrichment is as effective with marine reptiles as has been found with other animals and should be encouraged for all captive sea turtles.

Method

Ethical approval was granted by JCU's Animal Ethics Committee for this study (Animal Ethics Approval N^o A1501). Four green sea turtles (*Chelonia mydas*) housed at JCU for rehabilitation prior to being released back into the wild were used for this experiment. It was not known what sex or age the turtles were, but all were presented as floating.

Starving turtles often present as "floaters" and have special needs regarding their environment. Hence, we added a range of enrichment devices, both sunken and floating, to the each of the turtles' tanks for a period of 20 minutes. These devices included: balls, pipes, waterfall, boxes, brooms and food dispensing devices.

Six behavioural categories, based on Therrien et al.'s (2007) observations, were identified with and without (control) enrichment devices present. These behaviours were: resting, pattern (repetitive) swimming, random swimming, focussed behaviour,

orientation and non-categorised – the latter being anytime the turtle was not involved in a defined behaviour.

It was hypothesised that when enrichment was present, a decrease in stereotypic pattern swimming and resting behaviour would be seen.

Results

Preliminary results show that there were significant ($p < 0.05$) differences between the time spent in all six behaviours for all four turtles, and that the behaviour of individual turtles was significantly different from each other depending on what enrichment device was present.

Trends in the dataset suggest that pattern swimming and resting behaviour were reduced when enrichment devices were present.

Discussion

Introducing simple enrichment devices offer a cheap, practical way of adding complexity to the environment, which is likely to benefit the welfare of turtles in rehabilitation. The turtles in the present study appeared to have preferences as they did not behave the same way with all enrichment devices, therefore a variety of devices should be added to the environment. It is possible that turtles, like dogs, will habituate to the same device and should not have *ad lib* access to the devices but should have their 'toys' rotated regularly. Further research will be conducted to look at the effects of specific enrichment devices on behaviour; it would be interesting to look at colour and size of objects that were not controlled for in this preliminary study.

Acknowledgments

Many thanks are extended to Kathy La Fauce and all the volunteers for their marvellous work in looking after the turtles, and to Cathy Gonner for time spent on behavioural observations.

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