

NELSON MANDELA
UNIVERSITY

**SEA TURTLES AS OCEAN AMBASSADORS:
OPPORTUNITIES AND CHALLENGES**

INAUGURAL LECTURE

By

Professor Ronel Nel (PhD)

delivered at Nelson Mandela University on

16 May 2022

Faculty of Science: ZOOLOGY

2022

Abstract

Sea turtles are ocean migrants that nest on the same beaches where they were born but forage on reefs and oceanic waters great distances away. Movement between these locations is sometimes years or even decades apart. Because of these broad-ranging movements and the many countries, they visit throughout their lives, effective conservation can only be achieved through international cooperation. However, wherever and whenever sea turtles come ashore, they fascinate people. Watching a sea turtle nest is like looking back through a window into deep time. This appearance and disappearing act of sea turtles create an enigma that elicits a multitude of disciplinary, inter-, and intradisciplinary teaching, research and engagement opportunities ranging from archaeology to social sciences, including tourism, biology and ecology, conservation and policy. In these different spheres, I operated over the last two decades to understand sea turtles, their biology and behaviour to affect their conservation.

The biggest question I have pursued in my research career is to understand why the leatherback sea turtle population (*Dermochelys coriacea*) nesting in the iSimangaliso Wetland Park, South Africa, has not increased despite decades of protection. Another sea turtle species, namely loggerheads (*Caretta caretta*) nesting in the same area, experiencing similar conditions, has responded positively to conservation.

Through two decades of research evaluating the intrinsic and extrinsic population drivers, such as reproductive output, age to maturity, natality and mortality, it seems evident that the population dynamics of sea turtles is much more complicated than what a simple population model would predict. From the literature, it is clear that other species, like the Mediterranean monk seal, red knot (a sandpiper) and other coastal species, are suffering a similar fate, i.e., lack of recovery despite conservation. These trends suggest that these species have become refugees in their own habitat. Marine habitats are transformed through human activities and may now be unsuitable to support larger populations under the current climate for these complex species.

Current research is aimed to disentangle past and present distributions to assess if these species have responded by using alternative habitats over time or if there are body condition parameters (such as individual size, offspring size or survivorship, or metabolomics) that will point us in the direction to grow these endangered populations. Our research suggests that sea turtles, with their very complex life history facing multiple threats, live at the edge of success and extinction. Understanding and managing their path to success is a delicate balance with many aspects that need consideration.