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**AN APPLICATION OF SATELLITE TRACKING TECHNOLOGIES TO
CONSERVE WILDLIFE: A CASE STUDY APPROACH**

A dissertation presented in partial fulfilment of the requirements for the degree of

Doctor of Philosophy

in

Natural Resource Management

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MASSEY UNIVERSITY

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‘The animals of the world exist for their own reasons. They were not made for humans any more than black people were made for white, or women created for men.’

Alice Walker (1944 -)

ABSTRACT

Wildlife management is an important area of conservation and has become a priority for many countries and organisations around the world. One of the fundamental components of a sound wildlife management plan is a good understanding of a species' behaviour and habitat. For animals within inaccessible environments, satellite tracking provides a powerful tool for revealing information on animal movements and their habitat requirements.

In this dissertation, the conservation benefits and technical effectiveness of satellite tracking are examined through four case studies representing a diverse range of threatened species studied for periods between six months and five years. The studies revealed important ecological insights on the *in situ* movement and behaviour of the African elephant (*Loxodonta africana*), Kruger National Park, South Africa; the New Zealand bush falcon (*Falco novaeseelandiae*), Central North Island, New Zealand; the estuarine crocodile (*Crocodylus porosus*), Darwin, Australia; and the northern royal albatross (*Diomedea sanfordi*), Taiaroa Head, New Zealand and Chile. For each of these studies, satellite telemetry provided location data enabling analyses of the animals' movements and home ranges, and these analyses inform specific management recommendations. For example, the long time series study on African elephants highlighted the importance of developing reciprocal animal management policies where cross-boundary movements of animals occurred between adjacent parks.

The strengths and weaknesses of different satellite tracking systems are compared and guidelines developed to assist wildlife managers in selecting the best technology to suit their research needs. An assessment of the trade-offs between the technical features built into transmitters and the associated cost is also presented.

The study shows how the use of satellite tracking systems provides conservation agencies with a better understanding of wildlife behaviour and strengthens their ability to improve wildlife management planning.

DEDICATION

To my best friends, Derek, Scotty and Roger, for being by my side throughout.

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This research journey was a challenging and thrilling experience. I spent many a day in a library or by the fire at home researching an area of passionate interest to me and tracking the movements of four diverse and interesting species throughout different parts of the world. My motivation has always been a desire to contribute to conservation in some way and to obtain skills that will enable me to assist with the issues facing us today.

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