TOWARDS SUSTAINABLE WILDLIFE TOURISM EXPERIENCES FOR CERTIFIED SCUBA DIVERS ON CORAL REEFS

Thesis submitted by

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James Cook University

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DECLARATION OF ETHICS

The research presented and reported in this thesis was conducted within the guidelines for research ethics outlined in the *National Statement on Ethics Conduct in Research Involving Human* (1999), the joint *NHMRC/AVCC Statement and Guidelines on Research Practice* (1997), the *James Cook University policy on Experimental Ethics. Standard Practices and Guidelines* (2001), and the *James Cook University Statement and Guidelines on Research Practice* (2001). The proposed research methodology received clearance from the James Cook University Experimentation Ethics Review Committee (approval number H1495).

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Dean Kevin Miller Date

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Next I would like to thank my supervisors, Dr Alastair Birtles and Assoc. Prof. Peter Valentine. The initiation of this project, and therefore my collaboration with both Alastair and Peter, was the need to establish some level of protection for high quality dive sites and particular species that were thought to be significant to divers' experiences and thus the diving industry. At the onset of this project, many of the dive sites that were frequented by diving operators had very little protection from extractive activities. This meant that some of the more interesting features at several dive sites were either removed by commercial fishers, or collected as ornamental species for the aquarium trade. This was a matter of considerable concern to us and the industry, and was one of the driving forces for the need to undertake this research. This project forms part of ongoing research on the ecologically sustainable management of marine wildlife tourism by Alastair and Peter, and has been based on their successful work with the Minke Whale Project. Their knowledge and experience ensured that the course I set remained true. Their wisdom, ideas, and contributions were invaluable, not only to the research undertaken, but to my personal development as a scientist. I can only hope to achieve as much, and gain as much respect among my peers, as either of these two men.

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ABSTRACT

The economic opportunities created by SCUBA diving tourism are significant to reef-based communities, as are the potentials for positive outcomes for coral reef environments such as preservation and conservation. These potentials are largely dependent on the quality of the reefs and the marine life that occur there. However, this is rapidly being compromised worldwide by natural (e.g. cyclones, crown-of-thorns), anthropogenic (e.g. extractive fishing and collecting activities, tourism, deteriorating water quality), and global (e.g. coral bleaching) impacts. These impacts have the potential to damage and/or remove the biophysical attributes of coral reef sites most significant to divers' experiences, and are therefore likely to have a negative affect on the demand and visitation for dive sites and locations.

The purpose of this study was to investigate how the biophysical attributes that occur at coral reef dive sites influence certified SCUBA divers' experiences, and whether variations, measured using experience-based theoretical approaches, can be explained by participants' level of Diving and Coral Reef History (DACRH) using the recreational specialization construct. To address the research objectives, a multidisciplinary methodology was developed that described the certified SCUBA diving opportunity in a Recreational Opportunity Spectrum (ROS) and Limits of Acceptable Change (LAC) experience-based framework. This required natural science methodologies to measure, describe, and understand the biophysical attributes that occur at tourism sites, and social science techniques to describe and understand the divers, and the experiences they were having. To achieve this, a four-study research program was designed.

Study One assessed certified SCUBA divers participating in live-aboard diving trips visiting selected Great Barrier Reef (GBR) and Coral Sea dive sites. Based on divers' levels of participation, training and associated skills, and coral reef setting history, they were separated into four recreational specialization groups: 'beginner' (n=46), 'intermediate' (n=236), 'enthusiast' (n=246), and 'specialist' (n=52). Each group was found to be distinct from the others in terms of previous diving and coral reef history measurements, ownership of SCUBA related equipment, and the levels of coral reef interest and knowledge.

Study Two was an assessment of the biophysical attributes that occur on selected coral reef dive sites from the GBR and Coral Sea, and aimed to determine what visiting certified SCUBA divers were most likely to encounter while diving on the specific sites. This study found that differences in the biophysical attribute measurements at each site characterised the main differences between the sites, and thus the diving opportunities.

Study Three analysed the coral reef SCUBA diving experiences for divers on these trips and showed that divers had very high quality experiences on the dive sites, with some sites providing more enjoyable experiences than others. Divers were also having a wide range of experiences, and these were closely linked to the biophysical attributes identified in Study Two. However, some attributes, such as reef sharks and coral quality, were much more important to experiences than other attributes such as small fish life.

Finally, Study Four examined divers' experiences in the context of their degree of recreational specialization. This study found that diving experiences are modified by specialization, with higher specialization resulting in a wider diversity and richness of best experiences, but lower reported levels of enjoyment and evaluations of quality. More specialized divers also perceived a greater number and diversity of environmental impacts than less specialized divers, and these negatively influenced their experiences.

The research presented in this thesis has demonstrated that taking an experience-based approach to understanding the biophysical attributes that occur at tourism sites, as well as understanding the visitors and the experiences they are having, can play a critical role in managing natural areas for their ecologically sustainable use by tourism. This is achieved by identifying those biophysical attributes most significant to a wide range of divers' experiences. This level of understanding will be essential to the maintenance and protection of quality experiences for visitors. This is because many of the attributes significant to divers' experiences identified in this research are also at high risk of being impacted by the activities of extractive users, tourism operators and tourists, and also the affects of natural events and global scale processes. Finally, recommendations are made concerning the management of those biophysical attributes most at risk from damage and/or removal.

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