



Nigel Young

# Long Distance Walking Tracks: Impacts and Experiences

Biophysical Impacts and Psychosocial  
Experiences Associated With Use of Long  
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## FRONTISPIECE



The Mt Bartle Frere Track presented plenty of physical challenge during fieldwork.

*'Why do people hike and backpack? Why spend money on equipment and travel in order to get hungry, lost, bitten by bugs and risk getting sore feet?'  
(Kaplan and Kaplan, 1989. p. 117)*

## ACKNOWLEDGEMENTS

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alphabetical order as follows: Sally Bushnell, Marissa Cameron, Mike Grinke, Julian Howard, Tegan Koster, Mark Langford, Kath Larsen, Sonya Morrison, Dale Ockenden, Richard Ockenden Catherine Pohlman, Carl Rasmussen, Penella Rimon, Stuart Rob, Zorica Sarvas, Tereza Sklenar, and James Thorne-Stones.

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## ABSTRACT

This multidisciplinary doctoral research project investigated *visitor impacts* and *visitor experiences* associated with two long-distance walking tracks within the Wet Tropics region of North Queensland, Australia. A literature review demonstrated there has been minimal research conducted to date in relation to the *biophysical impacts* and *psychosocial experiences* of long-distance walkers in all locations, but particularly within the Wet Tropics region. Since encounters between visitors and a recreational site have the potential to generate either positive or negative biophysical and social impacts at the setting, in addition to positive or negative psychological impacts for the individual user (Bentrupperbäumer and Reser, 2000), this project represented a timely attempt to examine both research avenues from theoretical and applied perspectives.

Both long-distance walking tracks investigated in this research were located within World Heritage listed protected areas. World Heritage listing is an acknowledgement that locations possess international significance and places particular responsibilities upon management agencies to *conserve, present, rehabilitate, and transmit* their attributes to future generations (Wet Tropics Management Authority, 2000). The Mt Bartle Frere Track is situated within Wooroonooran National Park in the Wet Tropics of Queensland World Heritage Area, while the Thorsborne Trail is located on Hinchinbrook Island National Park within the Great Barrier Reef World Heritage Area.

This research utilised a range of methodologies derived from both the natural and social sciences, and a *human-environment transactional model* specifically developed for outdoor recreation settings (Bentrupperbäumer and Reser, 2000, 2002) was adopted as the overarching theoretical and analytical framework for the study. *Biophysical impacts* were assessed using rapid assessment methodology following the selection of a range of suitable environmental indicators. Impacts were recorded within one metre square quadrats and along 20 metre linear transects at 100 sampling points on each track. Spatial comparisons were made among sampling zones (tread, buffer, and control), and vegetation types on each track. Temporal comparisons were made between wet and dry season results. *Psychosocial experiences* were assessed using a self-report questionnaire administered to hikers via a range of distribution methods over a one year period using a convenience sampling strategy.

Spatial comparisons indicated that biophysical impacts were predominantly confined to the tread and buffer zones, and were more prevalent in proximity to locations where hikers congregated such as camping grounds, lookouts, and swimming holes. The biophysical impacts that were of most concern on the Mt Bartle Frere Track included track widening, exposed mineral soil, erosion, and the inadequate disposal of human body waste. Trampling impacts of most concern on the Thorsborne Trail included exposed mineral soil, human littering, human vegetation damage, and social trails.

Temporal comparisons of biophysical impacts between wet and dry season sampling suggested that some track widening occurred during the wet season on both tracks, presumably as a consequence of hikers attempting to avoid muddy or waterlogged track sections. Exposed mineral soil was most prevalent during the dry season on both tracks when visitation levels were highest. Mean organic litter depth was deepest during the wet season on both tracks, with significant seasonal reductions in litter being recorded on the Mt Bartle Frere Track. Incidences of human vegetation damage were also more widespread during the wet season on both tracks. Seasonal comparisons of biophysical impacts were discussed from a recreation ecology perspective using the concepts of *resistance* and *resilience*.

Psychosocial experience surveys (N = 623) provided a number of insights in relation to the profile of long-distance walkers using these two tracks. Respondents were typically young, well educated, highly experienced in the use of long-distance tracks, and primarily had experiential-based motivations for undertaking their walk. A substantial proportion of respondents were either repeat visitors or had learnt about the existence of their respective tracks via word of mouth, while only a minority of hikers had used formal information sources such as visitor information centres and the internet.

While a majority of respondents positively appraised the natural, built, and social environments they encountered, many also identified a number of specific factors that had detracted from their experiences. Respondents from the Mt Bartle Frere Track were most concerned about the prevalence of soil erosion, feral animals, and the lack of track marking to assist wayfinding. Thorsborne Trail respondents were most concerned about the number of other people they encountered in camp grounds, encounters with large

groups, human litter, and feral animals. Although a majority of respondents from both locations approved of current track management, many indicated their support for a range of possible management interventions. Most respondents from each track were generally satisfied with their overall experience and the vast majority would be willing to undertake their respective hikes again, although satisfaction levels were higher among Thorsborne Trail respondents.

This research has enhanced theoretical understandings of human-environment transactions within a long-distance walking track context. These were explored in some detail using a conceptual mapping progression that compared the relative contributions that different domains within the human-environment transactional model make to experiences within different outdoor recreation settings. The research also made a number of scientific contributions to the human-environment transactional model through reaffirming and extending the model's core aspects of multidisciplinary, simultaneous assessment, multidimensionality, reciprocity and interconnectedness. Use of the human-environment transactional model has also provided a number of applied insights that may assist managers to better understand the linkages that exist between *impact upon environment* and *impact upon people* and the interconnectedness of human behaviour/experience/biophysical impact.

The research has enabled the formulation of a number of general principles that will hopefully assist management of other long-distance walking tracks within the Wet Tropics region and also generated a number of specific *site* and *visitor management* recommendations for each track, some of which have already been implemented. The results obtained from these tracks can be cautiously extrapolated to other long-distance walking tracks within tropical rainforest environments provided that site-specific factors are taken into consideration.

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## **CHAPTER 1 - INTRODUCTION**

### **1.1 BACKGROUND TO THIS STUDY**

This research has been undertaken at a time when interest in long-distance walking within the Wet Tropics region of North Queensland was arguably at an all time high. Increasing demand for long-distance walking tracks within the region has recently resulted in the development of the Misty Mountains Trails, a network of over 130 kilometres of hiking trails situated in predominantly high altitude tropical rainforest (Arts Queensland, 2004). The Misty Mountains Trails were funded by the Queensland Heritage Trails Network, a joint initiative between the Queensland State Government and the Australian Federal Government and officially opened on 29 August 2003 (Arts Queensland, 2004). The completion of the Misty Mountains Trails was closely followed by the construction of one of the Great Walks of Queensland in 2005, which is a 110 kilometre walking track that links Wallaman Falls and Blencoe Falls between Ingham and Cardwell (Environmental Protection Agency, 2005). Both walking track networks are located within the protected area estate managed by the Wet Tropics Management Authority and the Queensland Parks and Wildlife Service. When considered in conjunction with existing long-distance walking track infrastructure, long-distance hikers within the region have never had such an abundance of choice.

Although the Wet Tropics Walking Strategy defines long-distance walks as 'walks which involve overnight camping or accommodation, being of more than one day's duration' (Wet Tropics Management Authority, 2001. p. 17), it was believed that this definition was somewhat restrictive since some individuals choose to spend more time and stay overnight on a relatively short walking track, while others elect to complete a longer walk more quickly and therefore do not require an overnight stay. Consequently, a revised definition was adopted which defined long-distance walking tracks as any track that required a minimum of eight hours walking for the majority of hikers and provided them with the opportunity to stay overnight along the route. The revised definition did not require that all walkers stayed overnight during the course of their hike, but rather indicated that they must have the opportunity to do so. Similarly, the

revised definition of a long-distance walk did not require that all hikers spent eight hours completing their walk, but rather that the majority of hikers required at least this amount of time.

There has been limited research conducted to date in relation to biophysical impacts associated with use along the entire course of long-distance walking tracks within Australia, although some studies have addressed track erosion and impacts upon campsites and vegetation (Parks and Wildlife Service, 1998). There has also been a similar lack of research undertaken in relation to visitors' psychosocial experiences whilst using long-distance walking tracks within tropical rainforests, although some research has been conducted in association with short-distance walking tracks within the Wet Tropics region, typically those requiring less than one hour to complete (Turton, 2005). As a consequence of the recent expansion of long-distance walking track infrastructure within this region, this project provides a timely investigation of the impacts and experiences associated with this recreational activity.

This research is fundamentally about *visitor impacts* and *visitor experiences*. It investigates the biophysical impacts and psychosocial experiences of visitors using two established long-distance walking tracks within the Wet Tropics region, namely the Mt Bartle Frere Track in Wooroonooran National Park and the Thorsborne Trail on Hinchinbrook Island National Park. Both of these walking tracks are well patronised and are considered to be representative of the diversity of long-distance walking experiences available in the region, as they encompass a mix of lowland and upland tropical rainforest, coastal and montane environments, and offer hikers varying degrees of difficulty and availability of facilities. While there is limited management control over access and visitor numbers using the Mt Bartle Frere Track, access and visitation levels are highly regulated for the Thorsborne Trail. Established long-distance walking tracks have been preferred to the more recently developed walking networks described above due to the fact that the former have a reasonably consistent level of visitor use and a pre-existing level of impacts that are commensurate with the timeframe permitted for this study. Furthermore, since the vast majority of visitors to Hinchinbrook Island arrive via commercial ferries, this presented an opportunity to make contact with large numbers of hikers which was not readily available at mainland walks.

The dual focus upon *visitor impacts* and *visitor experiences* is consistent with the research priorities identified in the Wet Tropics Walking Strategy which is the policy blueprint for future walking track management within the Wet Tropics region. The following two quotations are 'research issues' that have been taken directly from the Wet Tropics Walking Strategy and highlight the need for additional walking track research within the Wet Tropics region.

*'There is little relevant information or research into walkers' experiences, use of tracks, behaviour, demand and satisfaction levels in the Wet Tropics region. This will be useful when assessing priorities for managing current walks or creating new ones'* (Wet Tropics Management Authority, 2001. p. 51).

*'There is a need to identify potential adverse impacts on walks'* (Wet Tropics Management Authority, 2001. p. 52).

The Wet Tropics Walking Strategy also articulates four priority research areas.

1. Coordinate available research funds, particularly those from the Wet Tropics Management Authority and land managers, to ensure research specifically addresses the needs of walk managers.
  2. Undertake research on walker demand and satisfaction.
  3. Undertake research to measure and monitor walker impacts and their relationship to walker behaviour.
  4. Undertake research into the economic and social benefits of walking.
- (Source: Wet Tropics Management Authority, 2001. p. 52).

## **1.2 RESEARCH GOALS**

This thesis goes some way towards addressing the research deficiencies that surround use of long-distance walking tracks within the Wet Tropics region. The theoretical dimension aims to explore the human-environment interactions associated with visitor use of long-distance walking tracks, while the applied dimension will have direct relevance to both protected area managers and the tourism industry. Although the

research draws heavily upon the philosophy and methodology of previous studies conducted in largely temperate zones, particularly North America, it has been tailored to suit the particular ecological and social parameters that exist within tropical North Queensland.

Five key goals were established.

1. To assess biophysical impacts associated with visitor use of selected long-distance walking tracks within the Wet Tropics region.
2. To enhance knowledge about the psychosocial experiences of visitors undertaking selected long-distance walking tracks within the Wet Tropics region.
3. To assess the appropriateness of using human-environment transactional models as a theoretical framework within which to assess the experiences of visitors using extensive long-distance walking tracks.
4. To utilise biophysical impact and psychosocial experience findings to enhance current understanding of human-environment interactions.
5. To develop site specific management recommendations for each of the two walking tracks under consideration, and to develop general management principles for long-distance walking tracks within the Wet Tropics region.

### **1.3 RESEARCH METHODOLOGIES**

Two principal methodological approaches were used to achieve these goals.

1. Collection and analysis of biophysical impact data associated with visitor use of selected long-distance walking tracks within the Wet Tropics region using *rapid assessment methodology*.
2. Collection and analysis of psychosocial experience data obtained from visitors undertaking selected long-distance walking tracks within the Wet Tropics region using a *survey instrument*.

#### 1.4 RESEARCH QUESTIONS

1. What are the biophysical impacts associated with visitor use of long-distance walking tracks within the Wet Tropics region and how do these impacts vary over space and among vegetation types along tracks?
2. How do biophysical impacts associated with visitor use of long-distance walking tracks within the Wet Tropics region vary in response to changing seasonality (wet and dry seasons)?
3. What is the profile of visitors (with respect to demographics, logistic arrangements, motivations) using selected long-distance walking tracks within the Wet Tropics region?
4. How do visitors perceive the natural, social and built environments associated with the two long-distance walking tracks being examined, and the management of these environments?
5. How satisfied are visitors with their experience of hiking the two long-distance walking tracks under investigation and what specific factors enhance or detract from the quality of their experience?

It should be noted that no specific research hypotheses were utilised due to the investigative nature of the research.

## 1.5 SYNOPSIS OF THESIS CHAPTERS

The thesis is presented in eight chapters and is organised around the research questions outlined above. Each chapter contains both an introduction and summary. Extensive use has been made of colour coding to assist the reader to quickly distinguish among data from the **Mt Bartle Frere Track**, the **Thorsborne Trail**, and **Combined Data**. Colour has also been used to differentiate between **Site Management** and **Visitor Management**, and between the **Biophysical Setting** and the **Psychosocial Setting** in figures and tables where appropriate. These colours are applied consistently and repeatedly to aid navigation and comprehension.

The thesis commences with an extensive literature review, **Chapter 2**, which provides an overview of protected area management, and presents the theoretical framework used to conceptualise human-environment interactions. This chapter also reviews literature considered relevant to both biophysical impacts and psychosocial experiences associated with visitor use of long-distance walking tracks. The literature review demonstrates that there has been a lack of research effort applied to date in relation to long-distance walking tracks within tropical rainforest environments.

**Chapter 3** provides an overview of the study area, the Wet Tropics region of North Queensland, Australia. It also provides a summary of current long-distance walking activities and management arrangements for walking tracks within the region. The chapter describes the two study sites, namely the Mt Bartle Frere Track and the Thorsborne Trail.

**Chapter 4** details the research methods used. The first part of the chapter describes the biophysical impact assessment methods including a description of the environmental indicators used in the rapid assessment methodology, an overview of the sampling strategy and data collection phase, and a review of data analysis techniques. The second part of the chapter describes the methodology used to collect psychosocial experience data and the research design, sampling methodology, composition of the visitor survey instrument, survey distribution mechanisms and data analysis techniques.

**Chapter 5** presents the results from the biophysical impact assessment sampling. These are presented in the context of the research questions and include both spatial and seasonal comparisons of impacts. Spatial comparisons of impacts were made among different sampling zones (tread, buffer, control), among vegetation types, and where appropriate, between tracks, while temporal comparisons were made between wet and dry season sampling.

**Chapter 6** presents the results from the psychosocial experience sampling with results again structured around research questions. Particular emphasis is placed upon describing the profile of long-distance walking track users, including their demographic characteristics, motivations, and logistical arrangements. The chapter also reports respondents' appraisals of the natural, built, and social environments they encountered, in addition to their perceptions of the management of those environments. The chapter concludes with a discussion of the issues that influenced visitor satisfaction, including the factors that both enhanced and detracted from enjoyment.

In **Chapter 7** results are discussed within a human-environment transactional framework in order to extend theoretical understandings of human-environment interactions in a long-distance walking track context. The chapter also presents a number of specific management recommendations for each field site, in addition to general principles for future management of long-distance walking tracks within the Wet Tropics region.

The principal findings are succinctly summarised in **Chapter 8**. Additional related research questions are also identified.

The thesis concludes with an extensive **Reference List** and a collection of relevant **Appendices** that support the information presented.



## 1.6 TROPICAL CYCLONE LARRY

As the final write up stage was nearing completion a Category 5 cyclone, Cyclone Larry, crossed the North Queensland coast near Innisfail on the morning of 20 March 2006. This storm had a maximum measured wind gust of 294 km/hour and a lowest reported central pressure of 959.3 hPa (Bureau of Meteorology, 2006). Cyclone Larry created extensive damage to residences, public infrastructure, agricultural crops, and natural ecosystems in the region between Cardwell and Cairns (Bureau of Meteorology, 2006).

As a result of the very destructive nature of this cyclone both long-distance walking tracks under investigation in this research required closure. Whilst damage to vegetation and infrastructure on the Thorsborne Trail was only slight and the trail reopened within a few weeks, the Mt Bartle Frere Track was extensively damaged and requires extensive work before the track can reopen to the public. This event further highlights the critical importance of this research given it is the only substantial and systematically recorded *baseline* data set available for which damage and recovery over time can be credibly documented.

