



Rainforest Tourism: Establishment of a visitor monitoring structure

Bruce Prideaux and Fay Falco-Mammone

School of Business
James Cook University, Cairns



Australian Government

**Department of the Environment
and Water Resources**

Funded through the Australian Government's
Marine and Tropical Sciences Research Facility
Project 4.9.2 Sustainable Nature-based Tourism: Planning and Management

© James Cook University

This report should be cited as:

Prideaux, B. and Falco-Mammone, F. (2007) *Rainforest Tourism: Establishment of a Visitor Monitoring Structure*. Unpublished report to the Marine and Tropical Sciences Research Facility. Reef and Rainforest Research Centre Limited, Cairns (17pp.)

Made available online by the Reef and Rainforest Research Centre Limited for the Australian Government's Marine and Tropical Sciences Research Facility.

The Marine and Tropical Sciences Research Facility (MTSRF) is part of the Australian Government's Commonwealth Environment Research Facilities programme. The MTSRF is represented in North Queensland by the Reef and Rainforest Research Centre Limited (RRRC). The aim of the MTSRF is to ensure the health of North Queensland's public environmental assets – particularly the Great Barrier Reef and its catchments, tropical rainforests including the Wet Tropics World Heritage Area, and the Torres Strait – through the generation and transfer of world class research and knowledge sharing.

This publication is copyright. The Copyright Act 1968 permits fair dealing for study, research, information or educational purposes subject to inclusion of a sufficient acknowledgement of the source.

The views and opinions expressed in this publication are those of the authors and do not necessarily reflect those of the Australian Government or the Minister for the Environment and Water Resources.

While reasonable effort has been made to ensure that the contents of this publication are factually correct, the Commonwealth does not accept responsibility for the accuracy or completeness of the contents, and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this publication.

This report is available for download from the Reef and Rainforest Research Centre Limited website:
Visit http://www.rrrc.org.au/mtsr/theme_4/project_4_9_2.html

April 2007

Contents

List of Tables	ii
List of Figures.....	ii
Acronyms Used In This Report	ii
Acknowledgements	iii
1.0 Introduction.....	4
2.0 Research Objectives	5
3.0 Survey Development.....	6
3.1 Preparatory Stage.....	6
3.1.1 Literature Review.....	6
3.1.2 Consultative Phase.....	8
3.2 Survey Design	9
3.3 Pilot Study.....	9
3.4 Survey Distribution.....	10
3.5 Data Entry and Analysis	11
4.0 Difficulties and Limitations.....	12
5.0 Research Reporting and Dissemination	13
Bibliography.....	14

List of Tables

Table 1: Key outcomes from Prideaux and Falco-Mammone (2007)	7
Table 2: Rainforest and Airport Exit Survey sections	9
Table 3: MTSRF Rainforest regions in relation to WTWHA Precincts.....	10

List of Figures

Figure 1: Interpretive tour at Skyrail Rainforest Cableway; and swimming at Mossman Gorge	4
Figure 2: Example of tour bus operator	11
Figure 3: Flooding in Barron Gorge National Park.....	12

Acronyms Used In This Report

AST	Alliance for Sustainable Tourism
CRC	Cooperative Research Centre
DEW	Commonwealth Department of the Environment and Water Resources
EPA	Queensland Environmental Protection Agency
FNQTOA	Far North Queensland Tour Operators Association
JCU	James Cook University
MTSRF	Marine and Tropical Sciences Research Facility
QPWS	Queensland Parks and Wildlife Service
Rainforest CRC	Cooperative Research Centre for Tropical Rainforest Ecology and Management
RRRC	Reef and Rainforest Research Centre Limited
TNQ	Tropical North Queensland
TTNQ	Tourism Tropical North Queensland
VIC	Visitor Information Centre
WTWHA	Wet Tropics World Heritage Area
WTMA	Wet Tropics Management Authority

Acknowledgements

A number of individuals and organisations assisted in the development of this project and are acknowledged below.

- Many individual tour operators, tourist attractions and visitor information centres that have assisted with suggestions in the design of the survey instrument and provided staff to collect the survey forms;
- Dr Noel Scott of The University of Queensland, who peer reviewed the survey instrument;
- Tourism Tropical North Queensland;
- Alliance for Sustainable Tourism;
- Far North Queensland Tour Operators Association;
- Wet Tropics Management Authority; and
- Queensland Environmental Protection Agency

Photographs:

Fay Falco-Mammone (2006/2007)

Cover photograph – Malanda Falls, Swimming at Mossman Gorge,
Example of Tour Bus Operator, Flooding in Barron Gorge National
Park

Lance Milne (2006)

Interpretive tour at Skyrail.

1.0 Introduction

This research falls under the Australian Government's Marine and Tropical Sciences Research Facility (MTRSF) Program 4.9.2 *Sustainable Nature-based Tourism: Planning and Management*. The key tasks allocated to this program are:

- a. To report on the sustainable use of rainforest resources by the tourism industry; and
- b. To monitor visitors at the site level as well as community perceptions.

The region identified for this research is the Wet Tropics World Heritage Area situated in North Queensland.

The Wet Tropics World Heritage Area (WTWHA) has 180 visitor sites, 94 of which have infrastructure (Bentrupperbaumer, O'Farrell and Reser, 2004), and a number of commercial tourist attractions situated in close proximity to the WTWHA (e.g. Skyrail Rainforest Cableway).

The most recent estimates of visitation in the WTWHA indicate that over 4.65 million visits were made to the area in 2001/2002, with seventy-five percent of visits occurring at fifteen locations, particularly Daintree, Mossman Gorge, Kuranda and the Barron Gorge National Park, the Atherton Tablelands, Palmerston, and Mission Beach areas (Bentrupperbaumer, O'Farrell and Reser, 2004).

A vast range of nature-based attractions and activities are available within the WTWHA. These include interpretive tours, walking tracks, swimming, bird watching, camping, as well as day and overnight tours offered by various tour operators (for examples see Figure 1).



Figure 1: (Left) Interpretive tour at Skyrail Rainforest Cableway; and (right) swimming at Mossman Gorge.

2.0 Research Objectives

The MTSRF Project 4.9.2 tasks are defined by four key objectives:

1. Establish a visitor monitoring program for the WTWHA;
2. Identify key trends and drivers of Wet Tropics visitor patterns including economic contribution;
3. Produce tour operator user guide(s)/manual as part of the establishment of a best practice strategy for ecotourism in the WTHWA; and
4. Identify community attitudes, knowledge and perceptions of use and management of the Wet Tropics.

In this context, we apply the following definitions:

Trends: In the context of this research trends are defined as changes in the supply and demand patterns that govern the flow of visitors to the WTWHA. Trends that are of interest include reported increase of visitation to particular locations and regions in the WTWHA (namely Mossman Gorge and Daintree); potential new opportunities for increased visitation (such as the Misty Mountains area) and alternative activities (such as mountain bike trails); seasonality, and new visitor sectors.

Drivers: In this research context drivers are defined as external factors and internal motivators. External factors are those that encourage visitors to select the WTWHA as a destination ahead of other destinations. External drivers include destination image, competition from other destinations, economic climate and the health of the rainforest. Internal motivations (sometimes called push factors) are at a more personal level and include time and financial constraints, experience, expectations and satisfaction.

The focus of this report is to document the development of the main research tool used in this project – the rainforest visitor survey. Within this process, several key stages are identified as follows: the preparatory stage, the survey design, the pilot study, the development of a distribution methodology, data entry and analysis, and finally, reporting and dissemination.

3.0 Survey Development

3.1 Preparatory Stage

This research was designed to meet MTSRF's objective of:

- "Understanding the current and potential industry and community uses of biodiversity and natural resources with respect to ecological, social and economic sustainability; and providing information and options to assist North Queensland managers, industries and communities to optimise the use of biodiversity resources and minimise adverse impacts of use where they occur", and
- DEW's Priority Research Area 4 "Social and economic impacts of our environment", in particular "describing and predicting usage patterns" (DEW, 2007).

The first undertaking of this research was to identify existing research and gaps in knowledge of rainforest tourism in the WTWHA. This stage was carried out in two phases. The first phase was a literature review while in the following phase consultation was undertaken with key stakeholders.

3.1.1 Literature Review

An extensive literature review was undertaken in order to identify existing research.

This focused primarily on the comprehensive research carried out by the Rainforest CRC and Wet Tropics Management Authority (WTMA). The literature review also included more broad tourism-related topics of rainforest and World Heritage Area research (see Bibliography).

Rainforest CRC Site-based Research

In 2001/2002, the Rainforest CRC conducted extensive studies of visitation patterns in the WTWHA. The studies included the collection of 2,780 visitor surveys at ten major visitor sites, behaviour observations, an inventory of site layout, design, infrastructure and signage, vehicle/visitor monitoring and a twelve-month traffic count (Bentrupperbaumer and Reser, 2002; Bentrupperbaumer, 2002 a, b, c). The results indicated that an estimated 4.65 million visits were made to the WTWHA, with seventy-five percent of visits occurring at fifteen locations (Bentrupperbaumer, O'Farrell and Reser, 2004).

Economic Values of Tourism in the WTHWA (Rainforest CRC)

More recently, Prideaux and Falco-Mammone (2007), in collaboration with the Rainforest CRC, conducted a rainforest tourism economic evaluation of visitation in the WTWHA. This study provided an update of the financial values of tourism within the WTWHA, discussed methods and/or models by which financial values of tourism within the WTWHA may be estimated on an ongoing basis, and provided an overview of the profile of visitors in the WTWHA. This report's outcomes were considered fundamental to the current project's structure.

Some of the key outcomes from the report are listed in Table 1.

Table 1: Key outcomes from Prideaux and Falco-Mammone (2007).

Variable	Results
Average time in WTWHA rainforest	3.17 days
Average total holiday time in TNQ region	7.36 nights
Rainforest locations visited – most popular	<ol style="list-style-type: none"> 1. Kuranda 2. Mossman Gorge 3. Daintree 4. Atherton Tablelands rainforest areas 5. Cape Tribulation
Importance of visiting National Parks during holidays	69.8% = Important or Very Important
Would you still visit rainforest in TNQ if not WTWHA?	82.9% would still visit
Recommendations for future research	<ul style="list-style-type: none"> • Accurate estimates of total visitor numbers to WTWHA locations based on locals and others (i.e. non-resident domestic and international visitors); • Estimates of protected area expenditure by local residents; and • Examine the question of substitutability of both the WTWHA rainforest and of the GBR.

Wet Tropics Management Authority Report

Each year, WTMA publishes their annual report that includes a comprehensive account of the state of the WTWHA. The most recent report, namely, the State of the Wet Tropics 2005-2006 (WTMA, 2006), discusses a number of issues and developments that are relevant to the current project. In particular, with reference to tourism, the report states:

“The Wet Tropics region has experienced substantial increases in both domestic and international visitor cover the past two decades... There is concern about the impact that high concentrations of visitors may be having on certain parts of the Area, particularly along the coast between Cairns and Cape Tribulation” (WTMA, 2006, p. 86-87).

These statements, combined with the outcomes of previous research and reviewed literature, point to several areas of significance regarding research on tourism in the WTWHA. These are:

- Visitor numbers;
- Visitor profiles – particularly motivations, activities, satisfaction;
- WTWHA location visitation patterns;
- Potential rainforest activities and locations; and
- Economic contribution of tourism.

Consequently, these research points were integrated into the consultative phase of the current project's structure.

3.1.2 Consultative Phase

Following the completion of the literature review and identification of research and knowledge gaps, the next phase involved consulting with key stakeholders to determine the scope, depth and focus of the research to be carried out.

To this end, meetings were organised with representatives from the following agencies:

- Wet Tropics Management Authority;
- Queensland Environmental Protection Agency / Queensland Parks and Wildlife Service;
- Tourism Tropical North Queensland;
- Far North Queensland Tour Operators Association; and
- Alliance for Sustainable Tourism.

The aim of these meetings was to understand some of the issues facing rainforest tourism management authorities and tour operators in the region. As a result of the literature review and meetings, the scope of the research was refined. The core areas to be addressed in the research include:

- Socio-demographic visitor characteristics;
- Visitors' motivations;
- Travel patterns in each WTWHA region and immediate surrounding locations;
- Activity patterns in the WTWHA rainforest;
- Alternative destinations considered;
- The economic value of tourism in the WTWHA;
- Opportunities for tourism in low visitation regions of the WTWHA; and
- Satisfaction levels with the rainforest experience.

The research areas correspond to the MSTRF's goal of "understanding the current and potential industry and community uses of biodiversity and natural resources with respect to ecological, social and economic sustainability; and providing information and options to assist North Queensland managers, industries and communities to optimise the use of biodiversity resources and minimise adverse impacts of use where they occur". In addition, they enhance existing knowledge in the following ways:

1. Refining existing segmentation system and identify patterns of visitation based on socio-demographics, motivations and activities;
2. Identifying and analysing alternative destinations considered by respondents;
3. Measuring satisfaction with rainforest experiences by increasing our understanding of visitor travel patterns, and comparisons with previous research on the WTWHA, other Australian rainforests, and international rainforest-based tourism destinations; and
4. Internal and external factors driving trends in visitation patterns.

The methodology employed in this research is a visitor survey distributed through participating operators and by on-site survey steam.

3.2 Survey Design

The next stage of this research involved designing the survey. The first requirement was that the issues raised above be answered. There were several other constraints upon the survey design to be considered:

1. The operators requested a short survey of no more than three to four pages.
2. Some stakeholders had requested specific questions in order to collect data of particular interest to them. In particular, the WTMA and EPA/QPWS indicated a desire for information on potential rainforest activities.
3. Given the scope and duration of the survey and the amount of data collected, data needed to be easy to collate and analyse. It was decided that questions would be mainly close-ended, Likert-scale or multiple-choice questions.
4. It became apparent that a comparative study of reef and rainforest visitors could be usefully undertaken in future by comparing results of this project with results of companion MTSRF Project 4.8.6 *Analysis of recreational and tourism use and impact on the Great Barrier Reef for managing sustainable tourism*.

Accordingly, the present surveys (Rainforest and Airport Exit Survey – visit http://www.rrrc.org.au/mtsrf/theme_4/project_4_9_2.html to download survey results) have four distinct sections as listed in Table 2 below.

Table 2: Rainforest and Airport Exit Survey sections.

Survey Sections	Rainforest	Airport
A	Socio-demographics – directly comparable between reef and rainforest data.	Socio-demographics – directly comparable against reef and rainforest data.
B	Motivational questions – directly comparable between reef and rainforest data.	Socio-demographics – directly comparable against reef and rainforest data.
C	Specific to the rainforest and remains consistent throughout the course of the research.	Reef and rainforest travel patterns.
D	Provides a rapid response to emerging issues, region-specific questions and topics of interest to stakeholders.	Provides a rapid response to emerging issues, region-specific questions and topics of interest to stakeholders.

3.3 Pilot Study

The questionnaire was piloted in the Cairns region with the assistance of two rainforest tour operators, one rainforest attraction and the Cairns Domestic Airport. A total of fifty surveys were distributed, with forty-six completed surveys returned. Responses were analysed for validity and reliability. In cases where respondents had clearly misunderstood the question or had not responded, the questions were reviewed and altered.

The pilot survey was then sent to a group of independent stakeholders in order to gain both academic and industry feedback. Stakeholders included selected representatives from the University of Queensland, the Wet Tropics Management Authority, Tourism Tropical North Queensland and the Alliance for Sustainable Tourism. The resulting comments were taken into consideration in the design of the final Rainforest Survey and Airport Survey.

In addition, field trips were undertaken to meet with tour operators and attractions that would be distributing the survey. Discussions included the objectives of the study, the method of distribution, and identification of any potential distribution issues. A project fact sheet was designed for the study, and left with distribution agents.

3.4 Survey Distribution

Next, a systematic, representative and manageable distribution system needed to be established. As listed in Table 3 below, the WTWHA is divided into twelve distinct precincts. For ease of distribution and analysis, these precincts were condensed into five MTSRF Rainforest regions, representing Daintree, Cairns-Kuranda, Innisfail / Mission Beach / Tully, Ingham and Paluma. Consideration was given to area-based responsibilities of Regional Tourism Organisations and Local Tourism Organisations.

Table 3: MTSRF Rainforest regions in relation to WTWHA Precincts.

WTWHA Precincts		MTSRF Regions
1	Bloomfield / Windsor	Daintree
2	Daintree / Cape Tribulation	
3	Douglas / Wangetti	
4	Julatten / Mareeba	
5	Kuranda / Cairns	Cairns-Kuranda
6	Russell / Mulgrave	Atherton Tablelands
7	Tablelands	
8	Wooroonooran	
9	Koombooloomba / Kirrama	
10	Cassowary Coast	Innisfail / Mission Beach / Tully
11	Wallaman	Ingham
12	Paluma	Paluma

To obtain a representative sample over the course of the project, a proportional number of surveys were distributed in each region. Distribution numbers were based upon tourist numbers and profiles visiting key WTWHA locations as identified by Bentrupperbaumer and Reser (2002) and Bentrupperbaumer (2002 a, b, c). The previous studies identified different visitor profiles and numbers at each of the WTWHA locations. Tourists visited WTWHA locations either on tour buses / coaches or as independent travellers (using either private or rented vehicles). As such, distribution channels for the surveys reflected these factors and included tour operators, attractions, visitor information centres as well as on-site interviewing.

Tour Operators and Attractions

Operator support was sought through a number of trips and meetings with operational managers and business directors / owners. Initially, a total of three large and one small tour operators, three tourism attractions and three visitor information centres offered their support. Tour operators (see Figure 2) distributed the survey through tour guides taking visitors on selected tours to either the Atherton Tablelands or Daintree National Park.



Figure 2: Example of tour bus operator.

Tourist attraction and visitor information centre staff, under the guidance of operational managers, were responsible for distributing surveys to tourists visiting their attractions. This limited randomisation of the data, but was felt to be a necessary and acceptable compromise in order to ensure survey returns.

On-site Interviewing

The two most significant WTWHA rainforest locations attracting the highest visitor numbers were located in the Daintree National Park (see Bentrupperbaumer, 2002 b, c). In particular, Mossman Gorge and Marddja Boardwalk were identified as significant locations where both a large number and diversified group of tourists visited. These were the locations targeted for interviewing by MTSRF team members. The interviewing days were varied between weekdays and weekends.

3.5 Data Entry and Analysis

The results from the surveys are being scanned, manually entered and coded into SPSS. The first Barometers are attached as Appendices D and E. In subsequent barometers, tables allowing comparison between quarters will be included.

4.0 Difficulties and Limitations

There were several difficulties encountered whilst developing the project in 2006 and early 2007. Briefly, these were:

MTSRF Project Timing

The time taken for MTSRF funding and contract arrangements to be finalised resulted in the project officially commencing in November rather than in July when the project was initialised.

Seasonality

The first quarter of visitor surveys – November to February – is known as the “low-tourist season”. During this period, many rainforest tour operators either close for the season or maintain smaller numbers of tours to WTWHA locations. Consequently, it was difficult to establish the survey distribution with these operators during this quarter.

Severe Weather Conditions

The first quarter also represents the “wet season” in the region. Heavy rain and localised flooding deterred tourists from visiting rainforest locations, and limited access to either the region itself (that is, for drive tourists) or to particular rainforest locations (such as Paluma, Daintree and Mossman Gorge).



Figure 3: Flooding in Barron Gorge National Park.

Japanese Tourist Market

This quarter’s research did not include the Japanese Market. Visitor patterns of the members of Japanese tour groups are considered to be significant to the WTWHA. While Japanese visitors generally spend less time in TNQ (4.5 nights versus 7 nights for other international visitors sampled in this research) (see Tourism Queensland, 2005), however, they account for thirty percent of total international visitors to the region (Tourism Queensland, 2005). The surveys will be translated into the Japanese language in subsequent quarters.

5.0 Research Reporting and Dissemination

Research reporting will take place at two levels. First, regular reporting to the Reef and Rainforest Research Centre will address the DEW's MTSRF project milestones. Second, quarterly reporting to key stakeholders will be undertaken in the form of industry workshops and reports. Quarterly reports are available for download from the Reef and Rainforest Research Centre website (visit http://www.rrrc.org.au/mtsr/theme_4/project_4_9_2.html). It is planned that a quarterly meeting will be held in the regions in which the data has been collected.

The data presented will represent an aggregate across the WTWHA region. The reports will be made publicly available to interested parties. In addition, each partner involved in the distribution of the surveys will receive a copy of their business-specific results at the end of the year.

Further dissemination of results will occur through conference presentations such as the TTNQ-JCU Research Forum (April 2007) and the FNQTOA Annual General Meeting (anticipated for May 2007).

Bibliography

Bentrupperbaumer, J. M., O'Farrell, S. E. and Reser, J. P. (2004). *Visitor Monitoring System for the Wet Tropics World Heritage Area. Volume 2 Visitor Monitoring Process from Pre-Destination to Post-Destination*. Cooperative Research Centre for Tropical Rainforest Ecology and Management. Rainforest CRC, Cairns.

Bentrupperbaumer, J.M. (2002a). *Lake Barrine: Site level Data Report 2001/2002*. Rainforest CRC, Cairns.

Bentrupperbaumer, J.M. (2002b). *Marrdja Boardwalk: Site level Data Report 2001/2002*. Rainforest CRC, Cairns.

Bentrupperbaumer, J.M. (2002c). *Mossman Gorge: Site level Data Report 2001/2002*. Rainforest CRC, Cairns.

Bentrupperbaumer, J. and Reser, J. (2002). *Measuring and Monitoring Impacts of Visitation and Use in the Wet Tropics World Heritage Area: A Site-Based Bioregional Perspective*. Rainforest CRC, Cairns.

Driml, S. (2002). Travel Cost Analysis of Recreation Value in the Wet Tropics World Heritage Area. *Economic Analysis and Policy*, 32 (2): 11-26.

Driml, S. (1998). *The Value of Protected Areas to Queensland*. Report prepared for the Queensland Department of Environment and Heritage, Brisbane: Kinhill Economics.

Driml, S. (1997). *Towards Sustainable Tourism in the Wet Tropics World Heritage Area*. Report to the Wet Tropics Management Authority, Cairns.

Driml, S. (1997). Bringing Ecological Economics out of the Wilderness. *Ecological Economics* 23: 145-153.

Driml, S. (1994). *Protection for Profit*. Report prepared for the Great Barrier Reef Marine Park Authority, Townsville.

Driml, S. and Common, M. (1995). Economic and financial benefits of tourism in major protected areas. *Australian Journal of Environmental Management*, 2: 19-29.

Hornback, K. E. and Eagles, P. F. J. (1999). *Guidelines for Public Use Measurement and Reporting at Parks and Protected Areas*, IUCN, Gland, Switzerland and Cambridge, United Kingdom.

Prideaux, B. and Falco-Mammone, F. (2007). *Economic Values of the Wet Tropics World Heritage Area*. Cooperative Research Centre for Tropical Rainforest Ecology and Management. Rainforest CRC, Cairns.

Task Force on Economic Benefits of Protected Areas of the World Commission on Protected Areas (WCPA) of IUCN, in collaboration with the Economics Service Unit of IUCN (1998). *Economic Values of Protected Areas: Guidelines for Protected Area Managers*. IUCN, Gland, Switzerland and Cambridge, United Kingdom.

Wet Tropics Management Authority (2006). *Managing a World Heritage Area*. Retrieved 10 October 2006 from http://www.wettropics.gov.au/mwha/mwha_laws.html

Wet Tropics Management Authority (2006). *State of the Wet Tropics 2005-2006*. Cairns.

Wet Tropics Management Authority (2000). *Wet Tropics Nature Based Tourism Strategy*. Cairns.

Wilson, R. F., Turton, S. M., Bentrupperbaumer, J. M. and Reser, J. P. (2004). *Visitor Monitoring System for the Wet Tropics World Heritage Area. Volume 3 Case Studies – Biophysical Assessment*. Rainforest CRC, Cairns.