Fachbereich 09: Chemie, Pharmazie und Geowissenschaften
Geographisches Institut
Johannes Gutenberg-Universität Mainz

TOURISM RESEARCH ‚ON THE ROCKS': A QUALITATIVE AND QUANTITATIVE STUDY ON RANGITOTO ISLAND (AUCKLAND, NEW ZEALAND) AND ITS INTERPRETIVE MEDIA

CHRISTIAN WITTLICH

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LOCAL SUPERVISOR: PROFESSOR DR. RICHARD LE HERON (UNIVERSITY OF AUCKLAND)

ERSTGUTACHTER & BETREUER: UNIV.- PROFESSOR DR. DR. H.C. MANFRED DOMRÖS

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PREFACE

Since my early years I have been excited about travelling to far-off destinations for the purpose of studying and admiring natural and cultural features. This applies as much to journeys with my parents or on my own, as to the more educating and sophisticated field trips I have experienced throughout my geography studies. Inspired by a traditional Aboriginal musical instrument – the didgeridoo – I had the desire to travel ‘down under’ to meet the indigenous people of Australia and to experience the unique natural habitats and the wildlife that lives within them.

In fact, my geography studies and my ongoing interest in sustainability, environmental education, and geological features as well as my passion for travelling to remote places did see one seize the chance to study and to research down under. However, it was not in Australia - but a little further east across the Tasman Sea: New Zealand.

New Zealand was the country which enabled me to merge all my interests into one thesis topic. Instead of participating in nature tourism as a visitor I changed perspectives and took the position of a researcher who investigated tourism and interpretive media on a marine volcano. An intense interdisciplinary literature review in combination with field work in a unique coastal-volcanic environment has led to this work as one main outcome of my academic year in New Zealand.

ACKNOWLEDGEMENTS

Within this section I kindly wish to acknowledge and thank the number of people who inspired and supported me throughout all the different stages of this thesis. I would especially like to thank the **German Academic Exchange Service (DAAD)**, which made it possible to spend an academic year in New Zealand on a scholarship for research and studies.

Due to strict data protection regulations, personal data had to be removed from the acknowledgements section.

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ABSTRACT

Rangitoto Island, an island of volcanic origin, is a unique (eco) tourism attraction and landmark of the one million strong city of Auckland (New Zealand) that has experienced national and international tourist attention since 1890. The present study aimed to fill a gap in the academic literature dealing with Rangitoto tourism and related issues, particularly in the field of environmental education. This involved the recording of demographic data of Rangitoto's visitors and a thorough investigation of four different interpretive on-site media such as information signs or guided tours. A methodological implementation of the relevant research questions required a questionnaire, face to face interviews and tourist observations. A subsequent quantitative analysis of the data obtained revealed a clear gain in knowledge for the group of visitors which made use of the on-site media. Thereby, particularly the information signs proved to be an effective medium for environmental education. The qualitative analysis of the interviews, however, brought further interesting results for each medium. In addition, about one hundred recorded visitor comments with regards to improvements of the site provide a good base to discuss issues of infrastructure, transport, and the interpretive media. These comments express valuable visitor impressions and can thus be seen as a first response to the decade-long work of the Department of Conservation. Whether Rangitoto can finally be classified as an ecotourism destination will remain a question for future research. This is partially due to incomplete data, but mainly because of the complexity of the phenomenon of ecotourism.

Keywords: Ecotourism, Guides, Information signs, Interpretation, Rangitoto

ZUSAMMENFASSUNG

Rangitoto Island, eine Insel vulkanischen Ursprungs, ist eine einzigartige (Öko-) Tourismusattraktion und gleichzeitig ein Wahrzeichen der Millionenstadt Auckland (Neuseeland), das seit dem Jahre 1890 nationale- und auch zunehmend internationale touristische Aufmerksamkeit erfährt. Die vorliegende Studie hat sich zum Ziel gesetzt, eine bestehende Lücke in der akademischen Literatur über den dort stattfindenden Tourismus und die dazu in Bezug stehenden Themen, vor allem das Thema der Umweltbildung, zu schließen. Dies erfolgte durch die Aufnahme demographischer Daten der Inselbesucher und der eingehenden Untersuchung vier verschiedener ‚interpretativer Medien' vor Ort, wie zum Beispiel Informationsschildern oder geführten Touren. Eine methodische Umsetzung der themenbezogenen Forschungsfragen gelang durch eine Fragebogen-Erhebung sowie persönlichen Interviews und der Beobachtung von Touristen.

Über eine anschließende quantitative Auswertung der dadurch erhaltenen Daten konnte ein evidenter Lernerfolg für die Gruppe von Besuchern die sich mit den Medien beschäftigt hatten festgestellt werden. Dabei erwiesen sich vor allem die Informationsschilder als ein effektives Medium für Umweltbildung.

Die qualitative Auswertung der Interviews brachte weitere interessante Ergebnisse zu den einzelnen Medien hervor. Zusätzlich bilden etwa einhundert erfaßte Besucherkommentare im Hinblick auf Verbesserungsvorschläge eine gute Basis um sich mit den Themen Infrastruktur, Transport und den untersuchten Medien neu auseinander zu setzen. Diese Kommentare geben wertvolle Besuchereindrücke wieder und können daher als eine erste Antwort auf die jahrzehntelange Arbeit des Amts für Umweltschutz verstanden werden. Ob Rangitoto schlußendlich als eine ‚Ökotourismus-Destination' klassifiziert werden kann, bleibt weiterhin eine Frage für die zukünftige Forschung. Dies liegt zum einen an fehlenden Daten, zum anderen aber vor allem an der Komplexität des Phänomens Ökotourismus.

1. Introduction

Within this chapter the author wishes to outline the scientific reasons, goals and the research questions which form the foundations of this study. This section also aims to introduce the research location (Figure 1) and the design of this study.

1.1 Research Location

New Zealand's largest city is situated in the upper part of the North Island. With a population of about 1.3 million people the Auckland region accommodates 32.4% of New Zealand's population (Statistics New Zealand 2008). Although the Auckland region is quite densely populated there is still enough room available for nature tourism. Some popular places with tourists are just a thirty minutes car ride away from downtown Auckland (e.g. Muriwai and Piha beaches or the Waitakere Ranges), while the relevant research location – *Rangitoto Island* – lies

Figure 1. Rangitoto Island - a picture taken from Mission Bay.

only eight kilometres away within Auckland Harbour and is accessible by ferry which takes about ten minutes to bring visitors from central Auckland to Rangitoto. The shield volcano is almost an isolated island except for its small land bridge to neighbouring Motutapu Island (Figure 2).

With a surface of 2321 ha[1] (Taylor 1989, in: Wilcox 2007: 10), Rangitoto Island is an iconic landmark for Aucklanders and with 80,000 visitors a year (Wilcox 2007: 18) a popular urban recreation area for domestic and international visitors. Chapter Two and Four of this work will introduce Rangitoto in more detail.

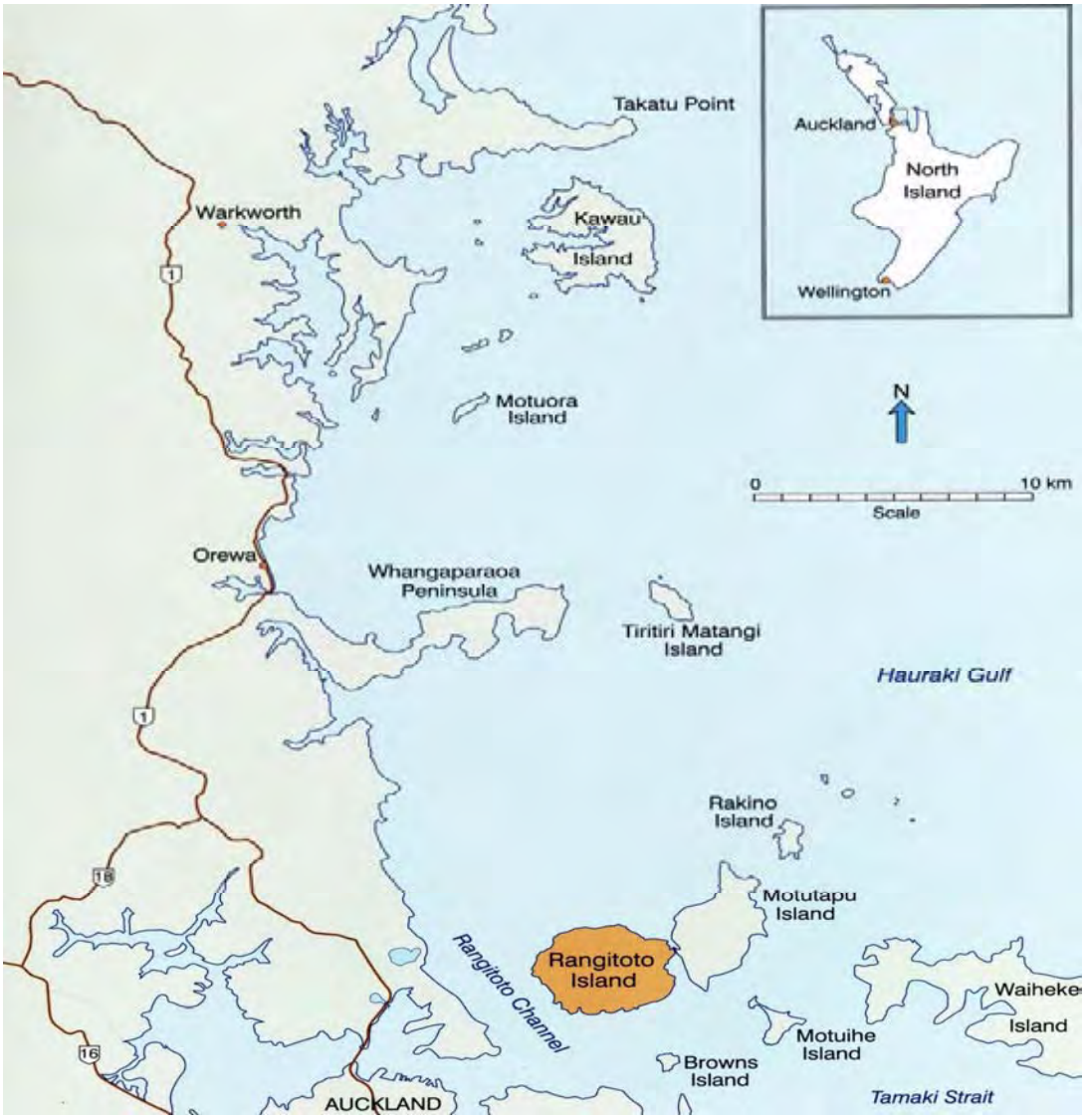

Figure 2: Location of Rangitoto Island. Source: Wilcox 2007: 7.

1.2 Scientific reasons for this study

In recent decades several studies on Rangitoto have been written from different points of view: To name a few, Murdoch (1991) focused on the Maori[2] historical associations with Rangitoto Island, as did the publications 'Myths and legends of Auckland landmarks' (Phillips-Gibson 2006) and 'Maori legends of the

[1] For comparison, this area equates to about 812 times the size of the Bruchwegstadium in Mainz.
[2] The Maori are the indigenous people of New Zealand.

land' (Graham 2005). In contrast, other studies (Kearns & Collins 2006; Yoffe 2000) focused on Rangitoto's holiday communities and their traditional style of construction which is unique for New Zealand.

The most recent and complete publication on Rangitoto (Wilcox 2007) is a two hundred page long book on the island's natural history. This is by far the widest-reaching publication on Rangitoto to date.

To conclude in this matter, while there are a number of publications about Rangitoto none of them has investigated tourism on the island and this study can thus be seen as a general contribution to knowledge. In addition, the island and its interpretive media[3] have never undergone a visitor evaluation. Moreover, there is no record indicating what visitors come to Rangitoto, where they come from, what age and occupational group they belong to, how satisfied they are with their Rangitoto experience, and how 'green' (i.e. environmentally conscious) their attitude is. It is important to know who visits the destination and what attitude towards sustainability these visitors have.

This aspect leads to another significant reason for carrying out this study. The demographic knowledge generated about Rangitoto's visitors will support the work of the Department of Conservation (hereafter DOC) which manages the site, the Auckland Regional Council (hereafter ARC), and the Fullers ferry operator which provides transport to and on the island. On a regional level, DOC, the ARC (both governmental institutions) and Fullers share a mutual stewardship to ensure sustainability on Rangitoto.

According to the government's 'New Zealand Tourism Strategy' (2007) sustainable tourism is by far the most favoured kind of tourism for New Zealand which "[…] must protect and enhance the environment on which it depends, so that it can be enjoyed by future generations – and future visitors" (Ministry of Tourism et al. 2007: 20).

By focusing on how important sustainability, conservation of nature and education for Rangitoto's visitors is, data was generated which should be of use for DOC, the ARC and Fullers and support their work to ensure a sustainable kind of tourism on Rangitoto. With 310 respondents to the questionnaire and more than ten in-depth face to face interviews, there is now a substantial amount of data which in

[3] The term 'interpretive media' refers to all facilities (e.g. informative interpretation signs, information shelters, guided tours) in place aiming to facilitate environmental and cultural education.

some respect can be seen as a 'first response' to the work DOC and Fullers have already completed on Rangitoto.

An additional reason for carrying out this study is that this investigation will extend our knowledge of the interpretive media examined. The study evaluated three different media: information signs installed along a track (teaching trail), a fully commented guided tractor tour (one of three guided tours available) and an information shelter. Furthermore, the investigation asked all visitors for their suggestions for upgrading the site which in turn could be used for later improvement. Therefore, this thesis also serves as a conceptual extension of Rangitoto's specific teaching trail and the entire site in general. This conceptual extension could also be useful for anyone who is involved in tourism, in teaching trail planning processes or in outdoor education using interpretive media.

To summarise, this study…

- …adds to the existing literature on Rangitoto Island from a tourism perspective
- …offers new demographic knowledge about Rangitoto's visitors
- …focuses on visitor issues related to sustainability which are important for DOC and Fullers to consider in order to fulfil the goals of the 'New Zealand Tourism Strategy 2015'
- …offers the first opportunity for visitors to express criticism and thus to give constructive feedback from their Rangitoto experience
- …presents the first visitor evaluation on the island and its interpretive media.

1.3 Study aims and research questions

The overall aim of this thesis is:

To evaluate Rangitoto Island as one of Auckland's top tourism attractions and to assess the on-site interpretive media in their task to transfer environmental and cultural knowledge to visitors.

Further corresponding aims are…

- To contribute to the existing literature on Rangitoto Island from a tourism perspective.
- To extend the general understanding on interpretive media.
- To classify tourism on Rangitoto.

- To see what kind of people come to Rangitoto and how environmentally friendly they are.
- To give recommendations for improvement of the site.
- To examine whether interpretive signs and guided tours are able to increase environmental and cultural knowledge (knowledge gain).
- To find out whether visitors are pleased with the interpretive signs in place.
- To compare the efficiency of interpretive signs with a guided tour in terms of the knowledge gain.

The following research questions were devised in order to achieve these aims:

Tourism specific questions:

- What audience (i.e. nationality, level of knowledge, ecological awareness) comes to Rangitoto and what is their main purpose?
- Does domestic tourism play a role on Rangitoto?
- How many tourists come to Rangitoto and how many of them are returning visitors?
- Is Rangitoto Island an ecotourism destination?
- How environmentally conscious are the tourists visiting Rangitoto?
- Are they ecotourists at all?

These research leading questions guided the author to the following hypothesis:

Because of its visitors (demand-side) and their pro-environmental attitude, Rangitoto Island can be classified as an ecotourism destination.

In order to address the interpretive media specific aims the following questions were raised:

Interpretive media specific questions:

- What do visitors learn from Auckland's marine volcano?
- What learning is associated with trail-side interpretive signs?
- How much time/attention do visitors spend in front of a sign?
- What learning is associated with the guided tractor tour?
- Guided tours versus interpretive signs: from which source do people learn more?
- Do people enjoy learning about Rangitoto?
- How deeply are they engaged with the knowledge gain? Are they actually willing to learn while undertaking a day trip?

- What suggestions do visitors have for improvement of the site?

These interpretive media specific questions lead to the following hypotheses:

1. The provision of interpretive signs on Rangitoto Island is helpful because visitors who make use of them gain knowledge of the site.
2. Visitors who participate in a guided tour have a higher level of satisfaction and a higher knowledge gain compared to visitors who make use of information signs.

In order to operationalise the outlined hypotheses a methodological framework was established which will be introduced in detail in Chapter Five.

1.4 Thesis design

This work is subdivided into eight major chapters: Following the introduction, Chapters Two and Three build the theoretical framework of this study and link the most sustainable form of tourism, ecotourism (Weaver 2001), with important aspects of environmental learning and outdoor education.

Chapter Two begins with the wider notion of sustainability in a tourism context and thereafter introduces a historical consideration of different ecotourism definitions and its relationship to other kinds of tourism, before applying a more New Zealand-specific focus.

Chapter Three fosters and emphasises the relation between ecotourism and education. Environmental and cultural education is seen as a core principle of many renowned ecotourism definitions (see Donohoe & Needham 2006) and thus important enough for this study to be introduced in a separate chapter. However, after introducing the principles and special features of environmental education an entire range of interpretive media will be introduced which together all have the common aim of transferring knowledge to visitors. This chapter also introduces Rangitoto's media more precisely. The section concludes with a variety of linear educational theories claiming that an increase in factual knowledge automatically leads to pro-environmental behaviour. In contrast, the presentation of more recent non-linear models will reflect the ongoing academic debate and demonstrate that the linear educational models are highly contested.

The following Chapter Four is completely devoted to Rangitoto and subdivided into two sections: the first section will deal with the natural, the second with the cultural history of the island.

Chapter Five presents the methodological approach applied for this thesis and will also reveal the limitations intrinsic to this study.

Following the methodology chapter, the results section forms the core of this investigation. Within the results chapter, primary data generated in the field over a period of three months will be analysed and interpreted in a quantitative and qualitative manner. This most substantive section will give scope for identifying significant correlations and for making an essential step towards achieving the aims of this study.

Throughout the subsequent discussion chapter, the author will reconsider the research questions and the theoretical key-concepts underpinning this study in order to link them to the results before ending with the conclusion which will give further suggestions for future research.

2. Ecotourism: Investigating a complex tourism phenomenon

In a narrow sense, tourism can be seen as a "sector of national and regional economies" (PCE 1997: A11) and thus as a branch of industry which offers many different scientific approaches. Research in this diverse subject is often undertaken by economists, sociologists, geographers and marine scientists and therefore also offers an interdisciplinary approach.

The term tourism can be defined at a variety of levels: Jafari (1977) defined tourism as "[t]he study of man away from his usual habitat, of the industry that responds to his needs and of the impacts that both he and the industry have on the host's socio-cultural, economic and physical environments" (Jafari 1977, in: PCE 1997: A11). Jafari's definition gives an emphasis on the impact tourism has. The World Tourism Organization states that tourism "comprises the activities of persons travelling to and staying in places outside their usual environment [space] for not more than one consecutive year [time] for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited [purpose]" (WTO 2008: 1).

Ecotourism, as a very specific kind of tourism, is not so easy to define. Besides space, time, purpose and impact there are more criteria describing this complex tourism phenomenon. Hundreds of ecotourism definitions exist from various sources, all including different aspects. As a result, there is no universal definition (Björk 2000; Dowling & Fennell 2003; Wight 1993) but a set of common principles which will be introduced in this chapter and used as an appropriate ecotourism working definition for this thesis.

This chapter will introduce ecotourism in the broader context of sustainability before an emphasis on important ecotourism definitions is given. Furthermore, this section will look at ecotourism in the context of other tourism types, introduce the characteristics of an ecotourist, and highlight inconsistencies within the eco-concept, before taking a more New Zealand-centred focus.

2.1 Towards a sustainable future: the notion of ecotourism

Tourism in general is a growing business. As Figure 3 shows, "[t]he world Tourism Organization projects that international tourism arrivals will grow from 593

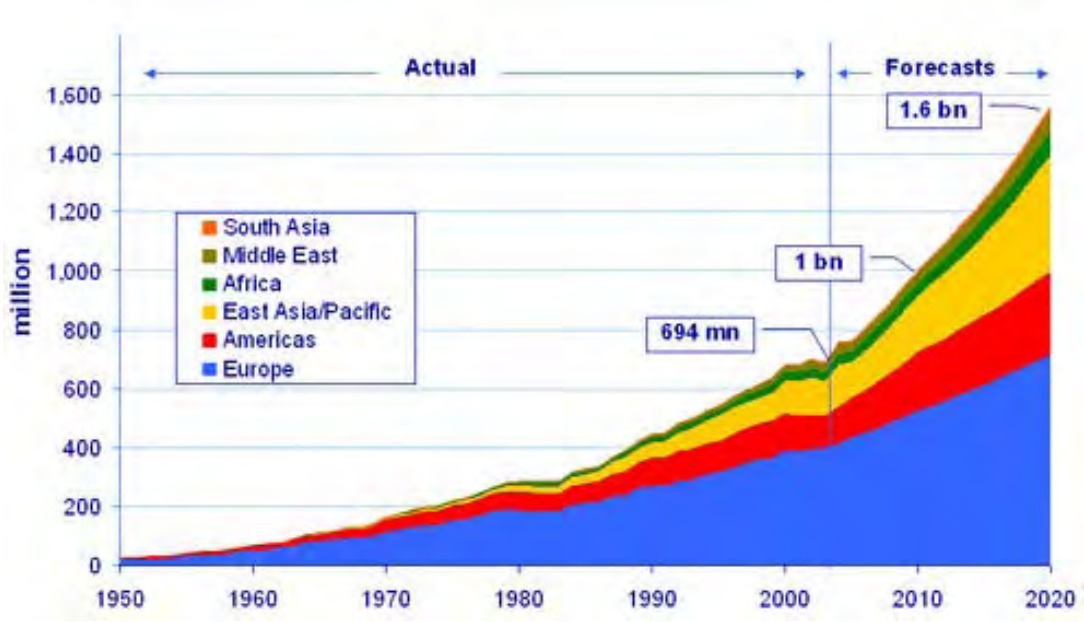

Figure 3: International tourist arrival growth. Source: WTO: 2007

million in 1996 […] to over 1 billion by 2010. At the same time earnings from international tourism are expected to climb from US$ 423 billion in 1996 to US$1.5 trillion in 2010" (Luhrmann 1997, in: Fennell 1999: 162).

However, it has been widely recognised that tourism can lead to serious consequences for the environment such as trail erosion, vegetation trampling, denuded campsites, wildlife disturbance, soil compression or dispersal of invasive species due to visitor crowding which can lead to unintentional long-lasting effects (Curtin 2003; Marion & Reid 2007; Lusseau 2005; Richter *et al*. 2006; Stensland & Berggren 2007). Judging from Figure 3, Europe, the Americas and the East Asian and Pacific regions have as receiving countries to face tourism growth the most.

According to the call for a more sustainable use of our natural resources, which has officially been raised since the first Earth Summit in Rio de Janeiro (1992), it is a challenging but worthwhile task to manage increasing numbers of tourists in a more sustainable way. The first definition of 'sustainable development' was given and popularised by the Brundtland Commission report on the global environment and development in 1987 and defined it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission 1987, in: Redclift 2005: 213).

The Brundtland commission was created to address growing concerns "[…] about the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development" (United Nations 2007). In establishing the commission, the UN General Assembly recognized the global dimension of environmental problems in nature and determined that it was in the interest of all nations to establish policies for sustainable development.

Although "sustainable development" is contested and surrounded by many discourses (see Redclift 2005), it offers an answer to the growth forecasts in the tourism sector through the establishment of more sustainable kinds of tourism on the supply-side and through publicity on the demand-side. One sustainable kind of tourism is 'sustainable tourism' which is defined as "tourism that adheres to the principle of sustainable development and to associated criteria of environmental, socio-cultural and economic sustainability" (Weaver 2001: 352).

Given that sustainability is one core criterion 'Ecological Tourism' (Eco-Tourism) can be seen as a subset of sustainable tourism and as an alternative to mass tourism. To specify, ecotourism distinguishes itself from sustainable tourism by adding further core principles, making this kind of tourism a tourism type in its own right. The following chapter will give insights into what these core principles are.

2.2 Ecotourism: an ongoing definitional discourse

Many ecotourism definitions have been introduced since the late 1970s and have been debated by scientists from many different countries and disciplines. Through a retrospective point of view, the author would like to introduce how the term 'ecotourism' and its definitions have historically developed and what ecotourism actually seems to be for us today.

Blamey (2001) argues that the origins of the term 'ecotourism' are not totally clear but indicates that one of the first to use it appears to have been Hetzer in 1965, who identified four principles of what he called 'responsible tourism.' These principles are "minimizing environmental impacts, respecting host cultures, maximizing the benefits to local people, and maximizing tourist satisfaction" (Blamey 2001: 5).

Fennell subsequently argued that the first of these criteria is what today we consider to be the most distinguishing characteristic of ecological tourism (Fennell 1998, in Blamey 2001: 5).

It can thus be seen why the origins of the term are not entirely clear – because the originators of the concept used terms other than 'ecotourism'. More related to practice, other early contributors to the development of the concept are provided in "Miller´s [1978] work on national park planning for eco-development in Latin America, and in documentation produced by Environment Canada in relation to a set of road-based "ecotours" they developed from the mid-1970s through to the early 1980s. Each of these ecotours focused on a different ecological zone found along the corridor of the Trans-Canada highway, with an information pack available to aid interpretation" (Fennell 1998, in: Blamey 2001: 5). This example gives evidence to a shift from pure responsible tourism to tourism which incorporates aspects of interpretation and education within a tourism context.

Since the 1980s, the definitional debate has increased including further dimensions (Blamey 2001). While some scientists see ecotourism as an educational experience (Blamey 2001; Buckley 1994), others view it as an expression of sustainable development (Björk 2000; Fennell 2003).

2.2.1 The first formal ecotourism definition

In 1983, Ceballos-Lascuráin, a Mexican environmentalist, introduced one of the first formal and quite broad definitions of ecotourism stating that

> "[Ecotourism is] traveling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestations (both past and present) found in these areas"
> (Ceballos-Lascuráin, 1987: 14, in: Donohoe & Needham, 2006: 193).

This anthropocentric definition – although widely accepted – does not focus on visitors' behaviour during their travel and their responsibility towards nature and hence simply emphasises the aspect of tourist enjoyment and their recreation.

In the 1990s, Ceballos-Lascuráin modified his definition by reconsidering the Hetzerian principles and by broadening the definitional discourse to a more holistic approach. The following definition has since been adopted by the International Union for Conservation of Nature (IUCN) and sees ecotourism as

> "Environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features — both past and present) that promotes conservation, has low negative visitor impact, and provides for beneficially active socio-economic involvement of local peoples" (Ceballos-Lascuráin 1996: 20, in: IUCN 1999: 2).

This definition focuses more on the visitors and their behaviour towards nature. The most important shift compared to his first definition is the inclusion of conservation issues and the local population, topics that are deeply rooted in the concept of ecotourism from that time on.

2.2.2 A paradigm-shift within the discourse

Based on the principles of Ceballos-Lascuráin, Butler (1992) introduced a very detailed definition entirely distinguishing ecotourism from other kinds of tourism such as mass-tourism, nature tourism or adventure tourism. The underlying philosophy is no longer anthropocentric but biocentric, focusing on the environment as the central actor "[…] in that an ecotourist accepts nature largely on its own terms, rather than significantly transforming the environment for personal convenience" (Butler 1992, in: Acott et al. 1998: 240). In addition, his definition strengthens educative potential by introducing cognitive (information) and affective (emotional) dimensions "[…] requiring a high level of preparation from both leaders and participants" (Butler 1992, in: Acott et al. 1998: 240). Only one year after Butler, Buckley (1994) introduced a four point model including environmental education, sustainability, conservation and nature-based activities. This created a more structured framework in which to consider ecotourism.

2.2.3 Presenting 'The Top Six'

In 2001, Fennell presented an analysis that reviewed 85 ecotourism definitions and is possibly the most comprehensive analysis to date. Fennell declares "variability" as a distinguishing feature of the definitional literature he reviewed. He identified a growing sensitivity to "sustainability" and "benefits to locals" and considers it a "new trend" within the definitional discourse (Donohoe & Needham 2006: 194-195).

Donohoe and Needham, who adopted the method of reviewing ecotourism definitions, introduced a new concept in 2006. They tried "to establish a strong working definition for ecotourism standards and its fundamental tenets" (Donohoe & Needham 2006: 196) by applying a thematic content analysis model for selected ecotourism definitions in order to extract common themes in ecotourism definitions. They analysed a theoretical study sample including 30 academic definitions of ecotourism ranging from 1987 to 2005 that allowed them to identify a serious thematic overlap concluding the top six themes in recent ecotourism definitions.

Representatively ecotourism…

- is **nature-based** tourism (rank 1)
- contributes to **preservation/conservation** (rank 2)
- offers an opportunity for outdoor **education** (rank 3)
- considers the aims of **sustainability** (rank 4)
- brings **benefits to locals** which should be equally distributed (rank 5)
- carries **ethics**, **responsibility** and can lead to **awareness** (rank 6).

Donohoe and Needham consider these six themes as the core of an up-to-date ecotourism definition.

To summarise, although many scientists have contributed qualitative and quantitative findings to the definitional discourse based on a paradigm-shift from a homocentric to a biocentric view, a universal ecotourism definition is lacking (Björk 2000; Dowling & Fennell 2003; Wight 1993). However, judging by all the different definitions reviewed so far, the author appreciates Donohoe and Needhams's analytical approach to a comprehensive definition and strongly agrees with their findings. Although there is no worldwide ecotourism definition in place, theirs can be used as a sound working definition for this thesis.

2.3 Ecotourism in the context of other tourism types

Understanding ecotourism is not fully possible without contemplating its relationship with other kinds of tourism. Ecotourism is a subset of 'nature-based tourism' (Fennell 1999). Nature-based tourism "is any type of tourism that relies on attractions

Figure 4: Ecotourism activities in the context of nature-based tourism. Source: Adapted from Weaver, Faulkner & Lawton 1999, in: Weaver 2001: 23.

directly related to the natural environment" (Weaver 2001: 16). Therefore, nature-based tourism is a superior category for sub-categories such as Adventure, 3S (sea, sand, sun), Captive, Extractive, Health and Ecotourism (Figure 4). Within Figure 4, a categorisation depending on different *activities* takes place and further describes the sub-categories. The Figure also shows how these sub-categories sometimes overlap with each other.

On a larger scale (Figure 5), one can see ecotourism as an alternative to 'consumptive' and more 'resource exploiting' forms of tourism such as mass tourism (Weaver 2001). Therefore, the origins of ecotourism can be traced back to the "paradigm of alternative tourism" that has "[…] been seen as the nature-based version of the same" (Weaver 2001: 19). Given that ecotourism follows the principles of sustainability, it can also be seen as a subset of sustainable tourism.

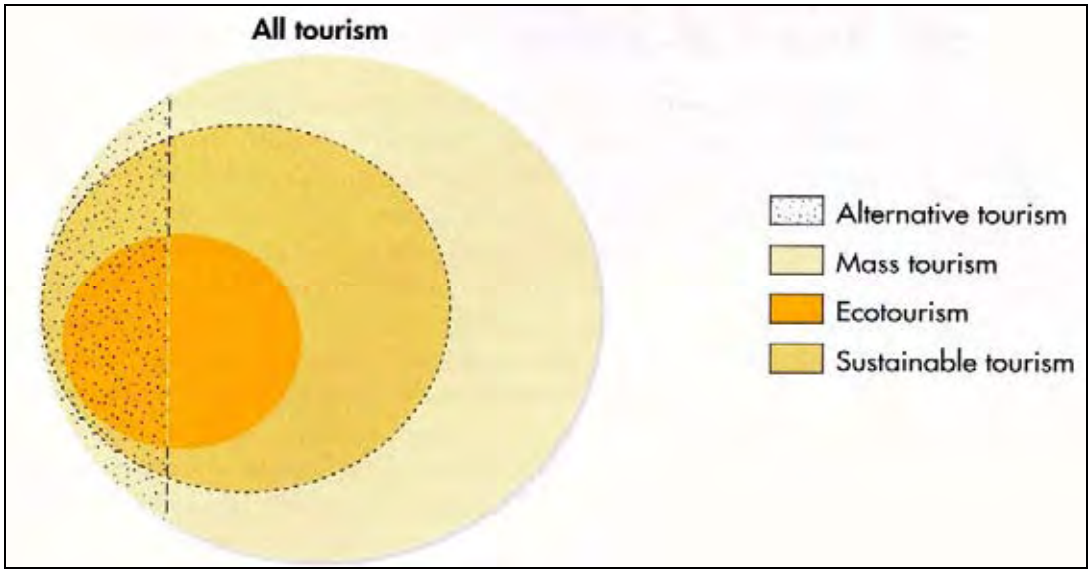

Figure 5: Ecotourism in the context of other tourism forms. Source: Weaver 2001: 21.

Despite the many different ecotourism definitions, ecotourism itself can be defined quite distinctively because we know the contemporary core criteria (cf. section 2.2.3). Even though we know these criteria, some boundaries to the other tourism types just introduced remain blurred and sometimes confusing due to the overlaps between them. It is of importance to see these figures and definitions for what they are:
idealised models only partly reflecting the reality.

2.4 The ecotourism application: dichotomy or unity?

Away from theoretical concepts and focusing more on the application of ecotourism, observers have examined splits in ecotourism relating to group size, duration of visits, different activities, interaction with nature or the learning experience, just to name a few (Acott et al. 1998; Johnson 2006; Weaver 2005; Weaver & Lawton 2007). Some offers are deeply engaged with common ecotourism principles, while others broaden it by providing for a more superficial kind of ecotourism (Acott et. al 1998; Johnson 2006, Weaver 2005).

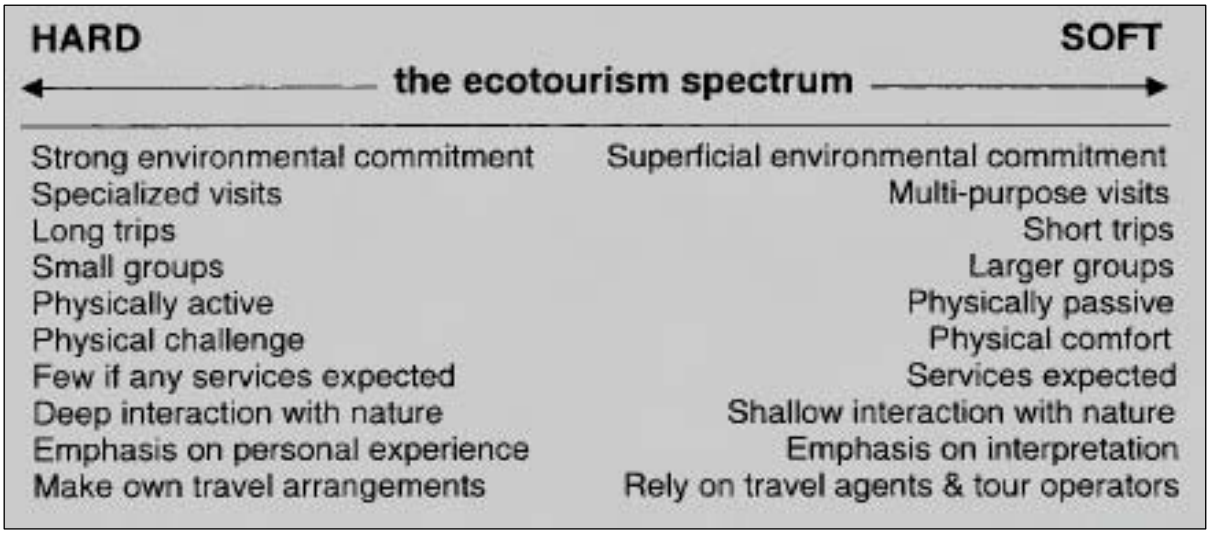

Figure 6: Characteristics of hard and soft ecotourism as ideal types. Source: Fennell & Weaver 2005: 378.

Acott et al. (1998) delivered a framework for the separation of ecotourism into categories based upon philosophical and economic arguments that underlie diverse environmental and sustainability positions (Acott et al. 1998: 251). By classifying ecotourism into '**Deep Ecotourism'** and '**Shallow Ecotourism**', they constructed a dichotomy: biocentric versus anthropocentric forms. They argue that shallow ecotourism does not accommodate all the ecological principles and is mostly focused on the welfare of the visitors (anthropocentric), while deep ecotourism is practiced by low-impact eco-hardliners with a high degree of perceived ecological morality. Therefore, shallow ecotourism is seen as a form of ecotourism that does not contribute to sustainability in the way its counterpart does (Acott et al. 1998; Johnson 2006).

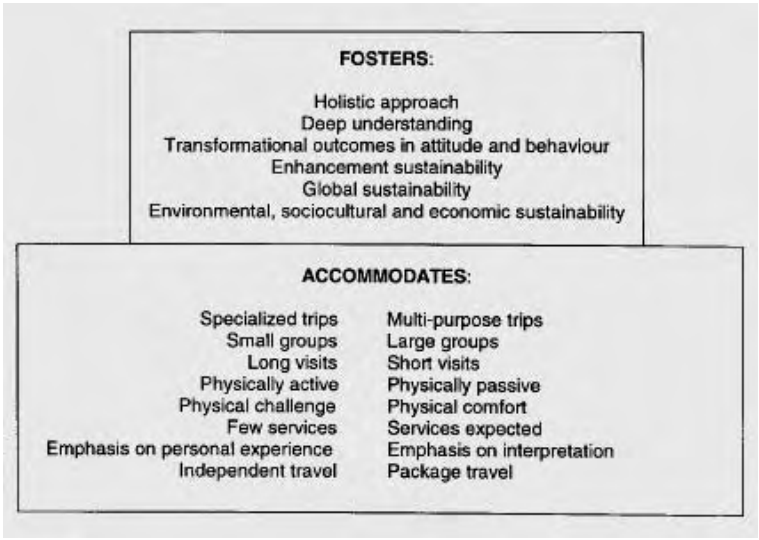

Figure 7: Comprehensive ecotourism model. Source: Fennell & Weaver 2005: 379.

Other scientists have critiqued the same phenomenon but give it a slightly different name (Figure 7); instead of 'Deep Ecotourism', they use 'hard' or 'comprehensive', and instead of 'shallow', they call it 'soft' or 'minimalist' ecotourism (Weaver 2005; Johnson 2006).

In contrast to the judgment that soft ecotourism is considered as low in contributing to sustainability, Fennell and Weaver (2005) - while considering the financial aspect of larger groups participating in 'minimalist offers' - found soft ecotourism in some ways to be more potential and conducive to comprehensive, sustainable outcomes (Fennell, Weaver 2005: 378).

A preliminary end of this dichotomy was set through a more holistic approach (Fennell & Weaver 2005; Weaver 2005) by introducing a 'modified comprehensive ecotourism model' (see Figure 7). This model tries to combine objectives of hard with those of soft ecotourism through fostering the same ideals (e.g. global sustainability, deep understanding) but accommodates different kinds of supply (e.g. variability of group size or duration, high or low class tourism). Weaver underlines the importance of this model to "[…] realize its potential to act as a credible and effective agent of ecological, economic and sociocultural sustainability" (Weaver 2005: 387).

At the same time, it is important to mention that a unified model can only be a quasi-solution for the case of managing different kinds of ecotourism. This approach generalises the circumstances but does not really solve the problem of two different established kinds of ecotourism.

2.5 Characteristics of an ecotourist

Compared to the definitional confusion, there seems to be more general agreement on the characteristics of an ecotourist. Although we can distinguish between ecotourists along the lines of the hard and soft ecotourism spectrum (i.e. the "hard ecotourist" versus the "soft ecotourist") depending on how deeply they are engaged with learning, their commitment to environmental issues, and other topics, there are some general similarities in their characterisation, to which we now turn.

The literature reviewed describes ecotourists as travellers who "demand a higher standard of information than mass tourists" (Gilbert 1997: 51). This might be justified by the fact that ecotourists in general are well educated and often have tertiary degrees. Furthermore, they are keen to leave their homes for a longer period to visit pristine areas and explore special natural and cultural features.

When characterising the ecotourist, it is important to note the individuals concerned, do not tend to define themselves through their whereabouts, but rather through their attitude, behaviour and values towards nature (Acott et al. 1998). Thus, "[tourists] are not necessarily ecotourists just because they visit an ecotourism location". (Acott et al. 1998: 239). The point here is that ecotourists have a specific mindset towards environmental issues that they usually maintain in their everyday life, no matter where they reside.

Furthermore, compared to ordinary tourists, ecotourists are willing to pay more money for their trips and gifts, as long as they know that money has been spent for conservation purposes that might benefit locals and/or contribute to the conservation of nature. Often, they are relatively wealthy travellers who can afford to pay a higher amount of travel costs. These travel costs are usually necessary due to the tourists' points of origin: research has shown that "the vast majority of ecotourists reside in the developed regions, and dominate the ecotourism market in most of the developing world" (Weaver 2001: 47).

2.6 Inconsistencies in ecotourism

The concept of ecotourism is not free of doubts. More cynical observers reduce the ecotourist to an 'ego-tourist' "who travels more to enhance their own status and environmental credentials than to attain any genuine understanding of the destinations they visit. Every new destination is a trophy that adds to this status" (Wheeller 1994, in: Weaver 2001: 121).

Furthermore, the term 'ecotokenism' has also emerged from a critical standpoint towards ecotourism, in order to address a lack of a critical approach related to ecotourism development (Higham & Lück, 2007: 129). Weaver cements this critical standpoint by introducing the notion of an imposition of an 'elitist value system'. It is often assumed that ecotourism is the kind of tourism preferred by local, indigenous communities. In fact, ecotourism is a western social construct (cf. the dominance of academics from the developed world in the ecotourism literature) imposing its panacea-claim on indigenous communities and thus politically can be seen as a "subconscious form of imperialism" and therefore a form of "neo-colonialism", rather than the preferred kind of tourism for locals (Weaver 2001: 121). In particular, "hard ecotourism marketing [sometimes] reinforces this interpretation when it emphasizes travel to 'remote' and 'unspoiled' destinations where 'primitive' cultures with their 'traditional' and 'authentic'

lifestyle wait to be 'discovered' by the tourist" (Munt 1994 & Wheeller 1994, in: Weaver 2001: 121). Instead of socio-economic development empowering local communities, such an approach allows only wealthy and well-educated ecotourists to experience the undeveloped status quo of 'unspoiled' cultures.

Besides many other paradoxes, one inconsistency is crucial for this thesis and is related to transport. As outlined earlier, most ecotourists come from developed countries and travel to major ecotourism attractions in developing countries. Therefore, most of the tourists travel by plane on long-haul routes (McLaren 2003, in: Weaver 2001). It is widely acknowledged that air travel "[…] is the least environmentally friendly form of travel, which contributes significantly to global warming" (Weaver 2001: 125). Figure 8 shows the ratio of primary energy use between the journey to and the stay at the destination.

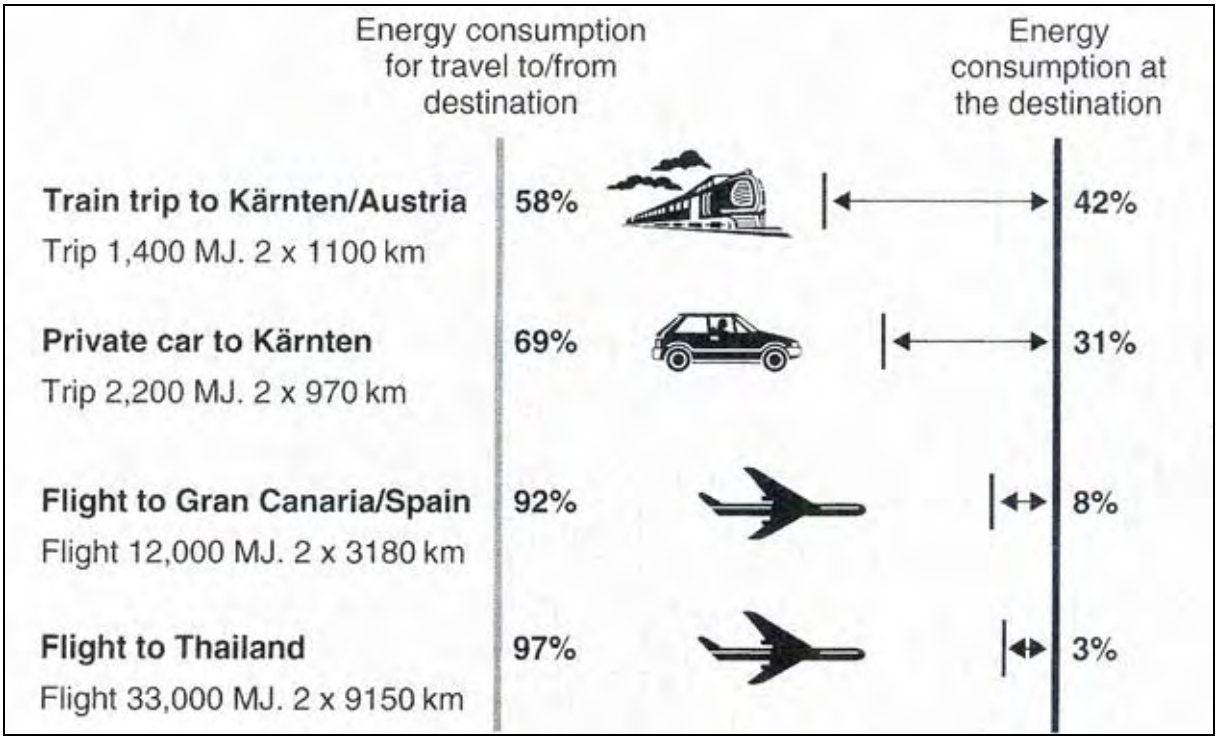

Figure 8: Ratio of primary energy use between the journey and the stay at the destination (country of origin: Germany). Source: Adapted from Gwinner 2001: 170, in: Higham & Lück 2007: 126.

Focusing on the energy consumption for a journey from Germany to Thailand, one fundamental question emerges: What is the point of being an "ecotourist" who treats the environment with care, supports conservation, obeys principles of sustainability and pays attention to energy and resources consumed at the final destination, when more than 90% of the energy used is consumed en route?

A simple example in this matter is a return flight from Frankfurt (Germany) to Auckland (New Zealand). This trip is 36,366km long and produces around four tones of carbon dioxide emissions (C Level 2008). Facing such an 'inconvenient truth', the notion of a German ecotourist flying to New Zealand to explore pristine nature appears to be absurd.

In summary, ecotourism is a desirable form of tourism with high ideals, requiring a certain 'green' mindset of both tourism providers and the tourists themselves. At the same time ecotourism is "[…] rife with contradictions and paradoxes" (Higham & Lück 2007: 129) and thus requires a critical consideration in order to be aware of the issues which can undermine such a well-intentioned tourism concept.

2.7 Urban ecotourism: oxymoron or definitional extension?

One principle, which can be found in almost all ecotourism definitions, is that ecotourism is nature-based and thus relies on relatively pristine environments. At first glance, the notion of 'urban ecotourism' would therefore seem to be impossible but the situation is in fact more nuanced.

Higham and Lück (2002) stated that ecotourism in urban environments *is* possible. They examined three cases where ecotourism takes place in urban environments, one in Auckland's Hauraki Gulf, itself fairly close to Rangitoto Island. They conclude that "ecotourism in urban environments takes place in areas that offer some degree of naturalness in settings that have otherwise been heavily modified by previous human activities. These areas provide much potential for the restoration of sites that have been degraded, impacted or destroyed by industrial and commercial activities" (Higham & Lück 2002: 45).

Given that ecotourism in built-up environments works as stated in the above study, the notion of urban ecotourism is not a contradiction in terms at all – rather a definitional extension.

2.8 Ecotourism in New Zealand

New Zealand is a relatively small and young country of three main and numerous other small islands. With a population of just over 4 million people and an area of about 270,000km², the population density is only at 14.2 people per square kilometre (Statistics New Zealand 2008).

Extending across the latitudes of 34°S – 52°S and thus spanning both subtropical and temperate zones, it offers a rich and interesting biodiversity.

Figure 9: Tourism New Zealand promotion in Paris. Source: Tourism New Zealand 2008.

This is evident in the "large number of endemic species, including 1946 types of higher plant and 76 types of bird, including the iconic kiwi (World Resources Institute 1998, in: Weaver 2001: 273). In addition, New Zealand offers a rich geological diversity expressed through impressive landscapes, ranging from subtropical rainforests and spectacular beaches to volcanic and geothermally active areas and snow-covered mountains. It is this natural diversity "[…] rather than any significant widespread commitment to conservation ideals, which has provided the basis for the nature-based tourism industry in New Zealand" (Orams 2003: 234).

Although this basis has been present since tourism in New Zealand began, "the ecotourism sector […] is in the early stages of development (Higham et al. 2001, in:

Higham & Carr 2003: 19). This "embryonic" state (Weaver 2001: 273)

Figure 10: 100% Pure New Zealand promotion campaign in Asia. Source: Tourism New Zealand 2008.

is not because of the absence or poor representation of ecotourism-related products. It is rather because ecotourism in New Zealand "tends to be included within a constellation of […] outdoor activities that freely combines natural environment, culture (Maori culture in particular), adventure (e.g. white-water rafting and back-country hiking) and 'rurality' (e.g. farm visits and scenic tours of the countryside). It is for this reason that only 42 specialized 'eco-tour' businesses were listed in the 1997 New Zealand Annual Directory […]" (Weaver 2001: 273).

Nevertheless, New Zealand's international reputation as a tourism destination is high and evident in the continuing growth of visitor numbers[4]. This reputation has emerged not only from the variety of natural attractions outlined above, but also from global marketing campaigns promoting New Zealand as a "clean and green" country (Hall 1997, in: Orams 2003: 233). To specify, Tourism New Zealand has set up an extensive global marketing-campaign promoting "100% Pure New Zealand" in its target markets (Tourism New Zealand 2005).

[4] "New Zealand's international visitor arrivals have doubled since 1993, to 2.4 million in 2006. International visitor arrivals are forecast to increase by 4% every year for the next seven years" (Ministry of Tourism 2007: 8).

Judging from these promotions (Figures 9 & 10; Appendix C: “100% Pure New Zealand” video clip), the non-critical observer accepts the impression of this clean and green image quite easily.

As Orams (2003: 234) points out, this image, however, does not reflect the whole truth as “the influence of humans on New Zealand’s natural environments has been massive” (Orams 2003: 246). This influence has led to a loss of species, intensive deforestation and resource exploitation of all kinds (Orams 2003: 246). Furthermore, “destructive exotic species” such as possums and wallabies have had “serious ramifications for New Zealand’s endemic biodiversity” (Weaver 2001: 274). As a result, the featured natural environments are not as ‘untouched’ and ‘innocent’ as the campaign promotes.

Establishing a distinct ecotourism industry, which takes into account the desire for more sustainability in tourism (Ministry of Tourism 2007), remains an important future task for New Zealand. Such a supply-led strong ecotourism voice, related to a national ecotourism definition is seen as the ideal. It would strengthen the ‘clean and green’ – image of New Zealand from the supply side, in turn leading to more faith from the demand side (Weaver 2001: 274).

2.9 Tourism on Rangitoto Island

Rangitoto Island has been a popular day trip destination for Aucklanders ever since it was designated as a public domain in 1890. The opening of the first track in 1897, for instance, attracted 2500 people to the island (Jamieson 2004: 34). In an era of poor infrastructure and few cars, when holidays afar were beyond the reach of most, the opportunity to “get away from everything” so close to Auckland was embraced enthusiastically (Jamieson 2004: 34).

Nowadays, Rangitoto tourism has become more international, attracting visitors from all around the world. The questionnaire analysis by the author showed that 44.1% of respondents were New Zealanders visiting Rangitoto, emphasizing the importance of domestic tourism. Nevertheless, with 55.9% of respondents being overseas visitors coming from 26 different countries and around 80,000 people visiting the site per year (Wilcox 2007), international tourism is dominant.

In terms of a categorisation, Higham & Lück (2002) have seen tourism to geological attractions in Auckland as offering “[…] unique geological tours to fields of volcanoes within the suburbs of the city” featuring “[…] more than 40 eruption centres,

cinder cones and lava flows, explosion craters and volcanic ash layers" (GeoTours 2000, in: Higham & Lück 2002: 45) as examples of urban ecotourism. Therefore, tourism to Rangitoto Island can also be understood within the umbrella of **urban ecotourism**.

Another concept is also appropriate to the characterisation of tourism on Rangitoto: the concept of **'geotourism'**. This kind of tourism "[…] has been recognized as a discipline within the German geoscientific community since the late 1990s" (Frey 1998, in: Dowling & Newsome 2006: 96). Frey defined the term in the meeting of the German Geological Society (1998) as follows:

> "Geotourism means interdisciplinary cooperation with an economic, success-oriented and fast-moving discipline that speaks its own language. Geotourism is a new occupational and business sector. The main tasks of geotourism are the transfer and communication of geoscientific knowledge and ideas to the general public"
> (Frey 1998, in: Dowling & Newsome 2006: 97-98).

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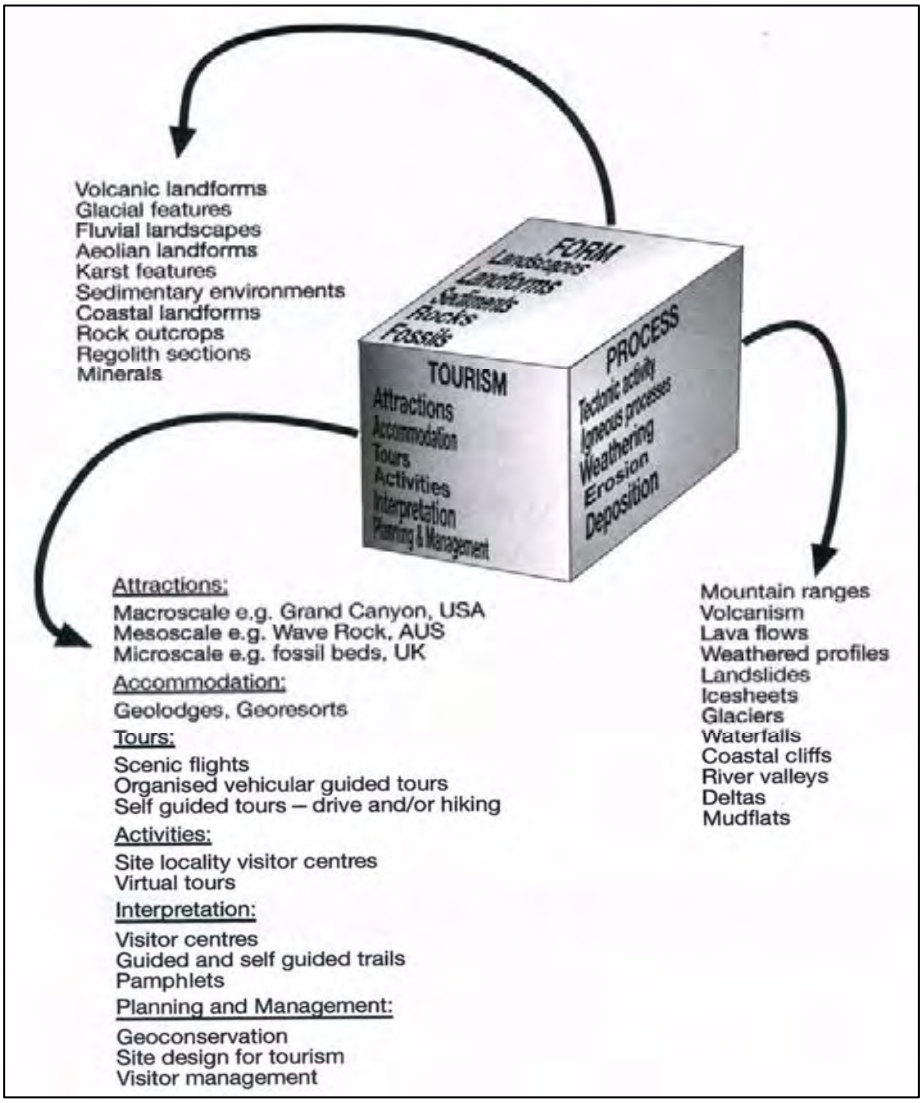


Figure 11: Conceptualization of the nature and scope of geotourism. Source: Dowling & Newsome 2006: 5.

The conception of geotourism is shown in Figure 11, presenting the scope of the term. The model is subdivided into the main categories ‘Form’, ‘Tourism’ and ‘Process’ which are then broken down further. This model, featuring tourism to geologically or geomorphologically significant landforms includes tourism to volcanic landforms. Thus, geotourism - besides urban ecotourism – is also a suitable paradigm in which tourism on Rangitoto can be characterised. As a subset of geotourism, one could also name it **volcano tourism**.

As already stated, literature on Rangitoto from a tourism perspective is absent. This means that further statements on tourism with direct reference to Rangitoto, are not possible at this stage of the thesis.

3. Ecotourism and its intrinsic educational component

While Chapter Two mainly dealt with the notion of sustainability, a historical consideration of different ecotourism definitions, the discourses, paradoxes and shifts around them, this chapter is entirely dedicated to the linkage between ecotourism and its intrinsic educational component. This linkage has already been made through the introduction of Donohoe and Needham's (2006) top six principles of an up to date ecotourism definition, in which education was ranked as the third important ecotourism principle.

To specify, this chapter will define some key terms such as 'environmental education', 'interpretation', and 'interpretive media'. This disambiguation is necessary in order to identify and discuss the interpretive media used on Rangitoto Island.

Moreover, this chapter aims to shine a critical light on linear theories stating that an increase in factual knowledge, as a result of education and interpretation, will automatically lead to an increase in pro-environmental behaviour.

3.1 The link between ecotourism and education

An extensive body of literature referring to environmental and cultural education and interpretation in connection with ecotourism is available and traceable in journals such as the *Journal of Environmental Education*, the *Journal of Sustainable Tourism*, the *Journal of Experimental Education*, the *International Journal of Environmental Studies* or the *Journal of Environmental Psychology*, to name but a few. Reviewing the literature, ecotourism is highly appreciated for the chance to provide people with education (Bogner 1998; Kimmel 1999; Mittelstaedt et al. 1999; Simmons 1998). Focusing on students, outdoor education is cherished as a welcome alternative to regular learning facilities such as a classroom (Kimmel 1999).

An emotional description of what environmental education outside class and lecture rooms might be was delivered by Miles (1991), who argued:

> *"learning about wilderness is not like learning arithmetic or economics or how the political system works. It is more akin to learning what is beautiful about a Mozart concerto, a Rembrandt painting, or a Shakespearean sonnet. To appreciate wilderness is to value a human heritage" (Miles 1991: 6, in: Kimmel 1999: 41).*

This quotation illustrates the particular value of outdoor education and the view that education amongst nature can more easily lead to an appreciation of the environment.

3.2 Environmental education and interpretation: where is the difference?

The academic literature sees education and interpretation as integral parts of ecotourism (Lück 2003: 943). In this context, "the terms 'interpretation' and 'education' are often used synonymously" (Lück, 2003: 944). It is therefore noteworthy to point out the differences among these terms.

Firstly, as Hammitt (1984) stated "environmental education often involves a formal approach to educating while environmental interpretation is almost always informal". Moreover, it was said that, "environmental education involves students, while environmental interpretation involves visitors" (Hammitt 1984: 11, in: Lück 2003: 944). This citation clearly indicates that the more *formal* environmental education usually takes place in formal settings, such as classrooms or lecture halls, addressing a "repeat student as part of a captive audience" (Lück 2003: 944). In contrast, environmental interpretation "often addresses a voluntary 'first' time audience in a natural setting (Lück 2003: 944). In such an *informal* setting, "people participate out of choice, there are no tests or grades. The sites are exciting and often exotic, and participants expect to learn in an enjoyable manner" (Kimmel 1999: 41).

Another fundamental difference is that interpretation is often designed to convey a pro-environmental message. Aldridge (1989: 45) stresses this aspect by defining interpretation as "the art of explaining the significance of a place to the people who visit it, with the object of pointing a conservation message." In this respect, Weaver (2001: 152) states that "product interpretation is crucial to ecotourism […] because of […] its potential for fostering sustainable behaviour." In this context, Butler gives a more specific suggestion of how sustainable behaviour might be achieved by stating, "the assumption underlying interpretation is that awareness leads to knowledge and knowledge leads to understanding. Once people begin to understand the environment, their appreciation deepens, and they begin to respect and even love the environment. Action follows." (Butler 1993: 215). However, does one educational step simply lead to another [nature experience → knowledge increase → commitment → action] as described by Butler, or is the situation more complex?

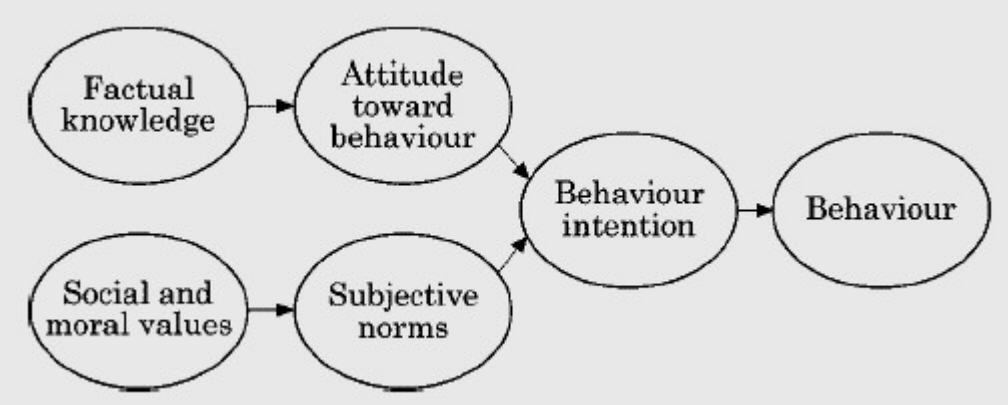


Figure 12: The theory of reasoned action. Source: Ajzen 1985, in: Kaiser et al. 1999: 3.

Russell gives an answer to this question by criticizing "[…] that nature experience is often seen to automatically contribute to environmental awareness, commitment, and action" (Russell 1999: 124). Her paper acknowledges Butler´s view but calls for less linear models than those introduced by some researchers (Ajzen 1985; Bogner 1998; Kaiser et al. 1999).

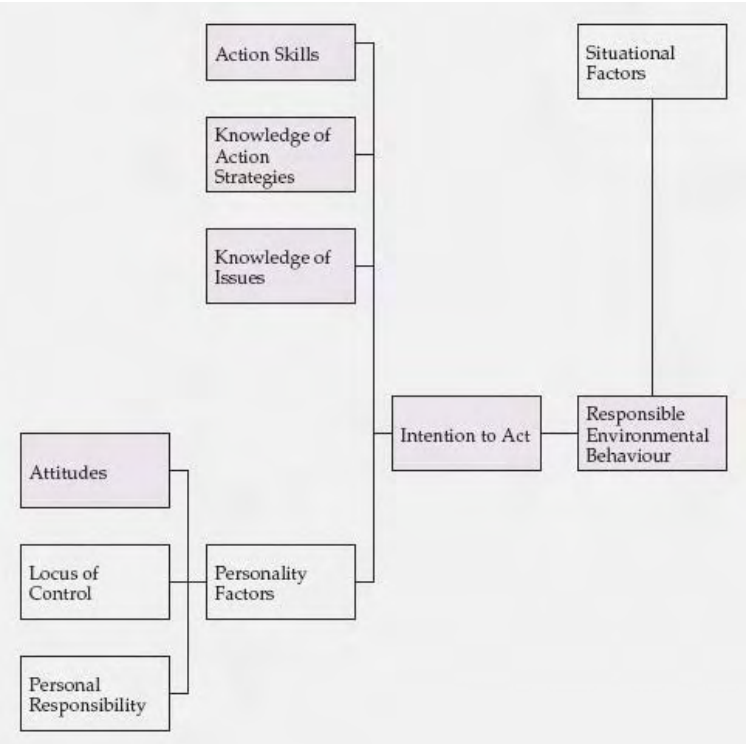


Figure 13: The Model of Responsible Environmental Behaviour. Source: Hines et al. 1986-1987, in: Lee & Moscardo 2005: 549.

Indeed, these linear concepts, leading from an increase in factual knowledge to pro-environmental change in behaviour (Figure 12) have been heavily criticised as too simple-minded, excluding other important dimensions.

As a result, more complex models (Figure 13) have been introduced (Kollmuss & Agyeman 2002; Lee & Moscardo 2005).

At this stage, it is not important to discuss the more complex models. It is just necessary to know about the presence of linear and non-linear models to pro-environmental behaviour. Furthermore, it is fundamental to know that an ecotourism experience does not automatically lead to sustainable behaviour. Hence, it is more difficult to achieve behavioural change and pro-environmental outcomes in a tourism context than often expected.

3.3 Interpretive media

To achieve environmental interpretation 'interpretive media' need to be utilised in order to transport knowledge from the object to its visitor. A variety of media exist, ranging from signs and information plates to brochures, videos, interactive displays (all *non-personal* interpretation) to more *personal* interpretation techniques provided by well-trained guides (Lück 2003; Weaver 2001). The different media can be further categorized into *on-site* and *off-site* media, depending on the location where they are offered (Figure 14).

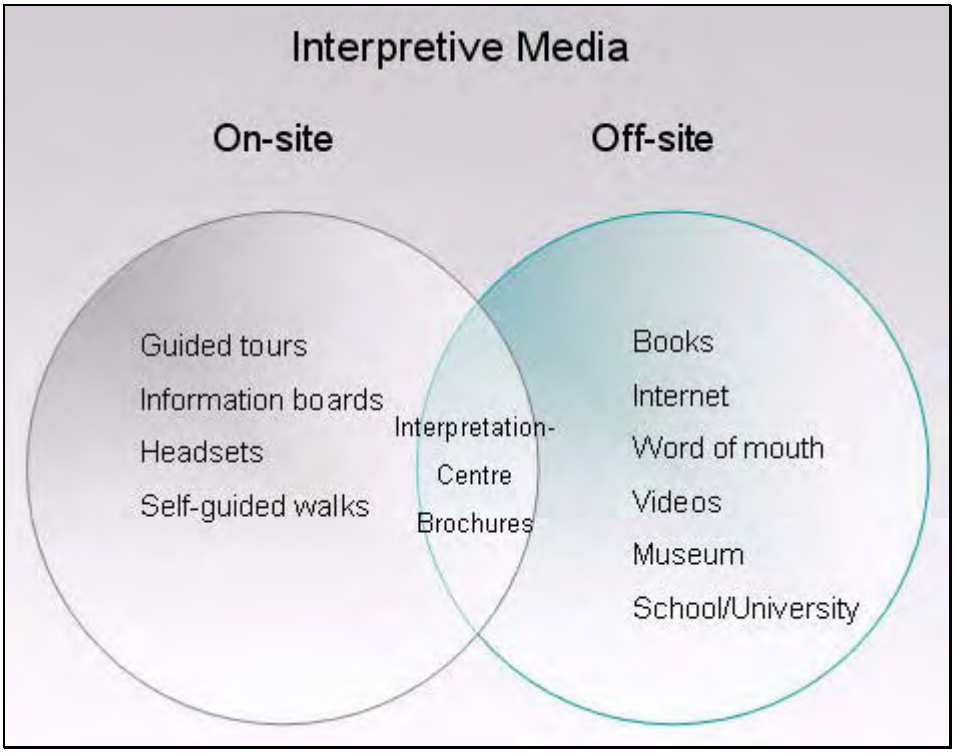


Figure 14: On-site and off-site interpretive media. Source: Adapted from Weaver 2001: 153.

3.4 Which medium is the most suitable?

Although some media tend to fulfil some interpretational aspects better than others do, it remains difficult to state a clear preference for one medium. It is widely acknowledged that personal interpretation is the most effective method because of the possibility of direct interaction with a tour guide. If there are questions, the tourists can ask and the guide can respond individually to the needs of the client (Lück 2003).

Non-personal interpretation techniques are much more challenged in conveying environmental knowledge and messages. This is due to their restricted abilities in attracting visitors and responding to their needs:

> "Self-guided trails, for example, are impersonal and cannot [sic] detect and respond to nuances of audience reaction. Furthermore, they impart just one set of messages to an entire audience, whatever the idiosyncracies of its members. They cannot answer questions or provide an emotive and enthused human face to the experience and they cannot be easily modified if new knowledge comes to light" (after Crabtree 2000, in: Weaver 2001: 155).

At the same time, trails offer more freedom to independent hikers who are not necessarily willing to share their free time with a tour guide.

A recent investigation carried out by Smith *et al.* (2008) found a clear relationship between the number of interpretive experiences visitors had and what they took away from their visit. That is, the more interpretive experiences visitors were exposed to, the better the outcome. Therefore, it can be seen that a reliance on different interpretive media at one location can be more successful in conveying knowledge and pro-environmental messages than a reliance on just one medium.

3.5 Rangitoto's interpretive media

Rangitoto is a good example for a reliance on different interpretive media. This chapter will briefly introduce the on and off-site media Rangitoto has to offer.

3.5.1 On-site media

The Fullers ferry company pays the Department of Conservation (DOC) for a concession to operate a road train in order to take visitors on a fully commentated **guided tour**, which includes a 900m boardwalk to the summit. The tour takes around three hours and costs NZ$50 per adult and $26 per child, including the ferry transfer from and to downtown Auckland (or Devonport).

Figure 15: Guided tractor tour on Rangitoto.

The tour guide sits on a tractor and drives tourists around the island (Figure 15) while providing commentary on the natural and cultural features. A loudspeaker system in the passenger cabin relays this commentary to the passengers. At this stage they have no opportunity to ask questions, but they are able to do so while they

Figure 16: Rangitoto Walking Map. Source: Fullers 2008.

hike with the guide to the summit. Usually, this guided tour is the only one offered on the island. Fortunately, the author could experience some other guided tours on the island throughout his time in the field: Dr. Mike Wilcox (author of the book *'Natural History of Rangitoto Island'*) and Susan Yoffe (an expert on the cultural history of Rangitoto) offered free guided tours throughout Auckland's Heritage Festival (15-30 September 2007). In addition, the author was able to join an interesting field trip led by Johnathan Springs (PhD candidate and tutor at the Auckland University of Technology (AUT)) with his undergraduate class on 'Ecotourism'. Mr. Springs took his students to Rangitoto in order to show them an example of applied ecotourism. He is a knowledgeable guide and an expert in environmental interpretation employing novel interpretation techniques such as exploring parts of Rangitoto under blindfolds.

After contacting the guides in advance, it was possible to join these three guided tours and to carry out face to face interviews with chosen participants. Findings from these interviews will be presented in the results chapter.

As well as the personal interpretation techniques just outlined, there are also non-personal methods in place. Firstly, there are several tracks for hikers who want to explore the island on their own. The most popular and accessible from Rangitoto Wharf is the short Kowhai Walk, Kidney Fern Glen, and the famous Summit Track (including a detour to a series of lava caves (Figure 16). There are informative interpretation stations (i.e. information signs) along the Coastal Track, along the Summit Track and at the summit explaining the natural and cultural features of the island. As these signs are placed next to the trails, they can also be called '**trail-side interpretive signs'**. Besides these, there is an **information shelter** very close to Rangitoto Wharf, informing visitors on aspects which are not directly addressed by the other signs. The installed information posters also include some general rules in the form of "Do's" and "Don'ts" which are applicable for the whole island (e.g. no littering, a fire ban and a no smoking policy). See Appendix A (pp. 4-21) for a detailed visualisation of the media outlined.

3.5.2 Off-site media

Besides off-site media such as the DOC or Fullers Brochure (available at the departure area), many visitors have indicated in the author's questionnaire that they made use of other media.

These are,

- guide books (especially from the ”Lonely Planet” series)
- school books
- school field trips
- tourism brochures
- friends and family
- Auckland City Council
- computer information at Sky Tower (the highest tower in the southern hemisphere) observation deck
- I-Site (New Zealand-wide tourism information centre)
- Department of Conservation website
- informational films
- Auckland Museum (at the time when field work was conducted, an exhibition on volcanoes took place at this Museum, also focusing on Rangitoto)[5]

This investigation, however, will only examine the on-site interpretive media on the island. In order to point out what actually can be interpreted on Rangitoto, the time has come to introduce the natural and cultural history of the volcano. The following chapter will fulfil this task.

[5] See Appendix A (pp. 22-28) for some selected off-site media examples.

4. On 'the rocks': Introducing Rangitoto Island

> *"Rangitoto is an island in the gulf, green, unspoilt. It is natural, untouched, in its primitive state; and it should stay that way. Visually, it makes the harbour so much nicer, the way the blue sea leads on to the green of the bush. There is something about its presence. Rangitoto is symbolic of the greenness of Auckland, of New Zealand. Everywhere in Auckland, we feel its presence: it's just always there and looks the same"* (Vadnjal & O'Connor 1994, in: Wilcox 2007: 169).

This quotation makes clear that no landform is more familiar to Aucklanders than Rangitoto Island (Jamieson 2004; Wilcox 2007). Its symmetrical cone and lava slopes rise gradually from the sea towards the sky making the island an iconic landmark[6]. In order to introduce Rangitoto and its highlights, this chapter will consider the natural and cultural history of the island.

4.1 Natural History

The natural history of Rangitoto is diverse, offering some special features that can hardly be found anywhere else. However, there have been relatively few academic publications on Rangitoto's natural history. This began to change with the impressive work of Mike Wilcox (President of the Auckland Botanical Society), members of the *Auckland Botanical Society* and other passionate scientists, who published the most recent and thorough book with the title '*The Natural history of Rangitoto Island*' in 2007. "From being one of the poorest documented [Hauraki] gulf islands" (Wilcox 2007: 5) Rangitoto now has the most comprehensive publication of the islands. This subchapter will now examine important aspects of the geology, climate and hydrology and the flora and fauna of the island.

4.1.1 Geology

Because of its association with round-the-world yacht races, and latterly with the city's hosting of the renowned "America's Cup", Auckland has been promoted as the 'City of Sails'. With regard to its geological history, one could also call Auckland the '**City of Volcanoes**'. Rangitoto Island is by far the largest of the 50 cones and craters belonging to the Auckland volcanic field (Wilcox 2007). Figure 17 impressively shows the distribution of these volcanoes including the dominant Rangitoto.

[6] See Appendix A (pp. 29-33) for a selection of pictures which illustrate the omnipotence of Rangitoto in the Auckland region.

Interestingly, this map was drawn on the instructions of Ferdinand Ritter von Hochstetter, who led the Novara expedition that started in 1857. His geological investigations impressed the Auckland government so much that, "when the Novara sailed, he was persuaded to remain, to make extended surveys in Auckland and Nelson" (Te Ara² 2008). Indeed, these surveys were the first to examine New Zealand's geology. However, the Auckland volcanic field is only 'dormant' and could erupt again at any time.

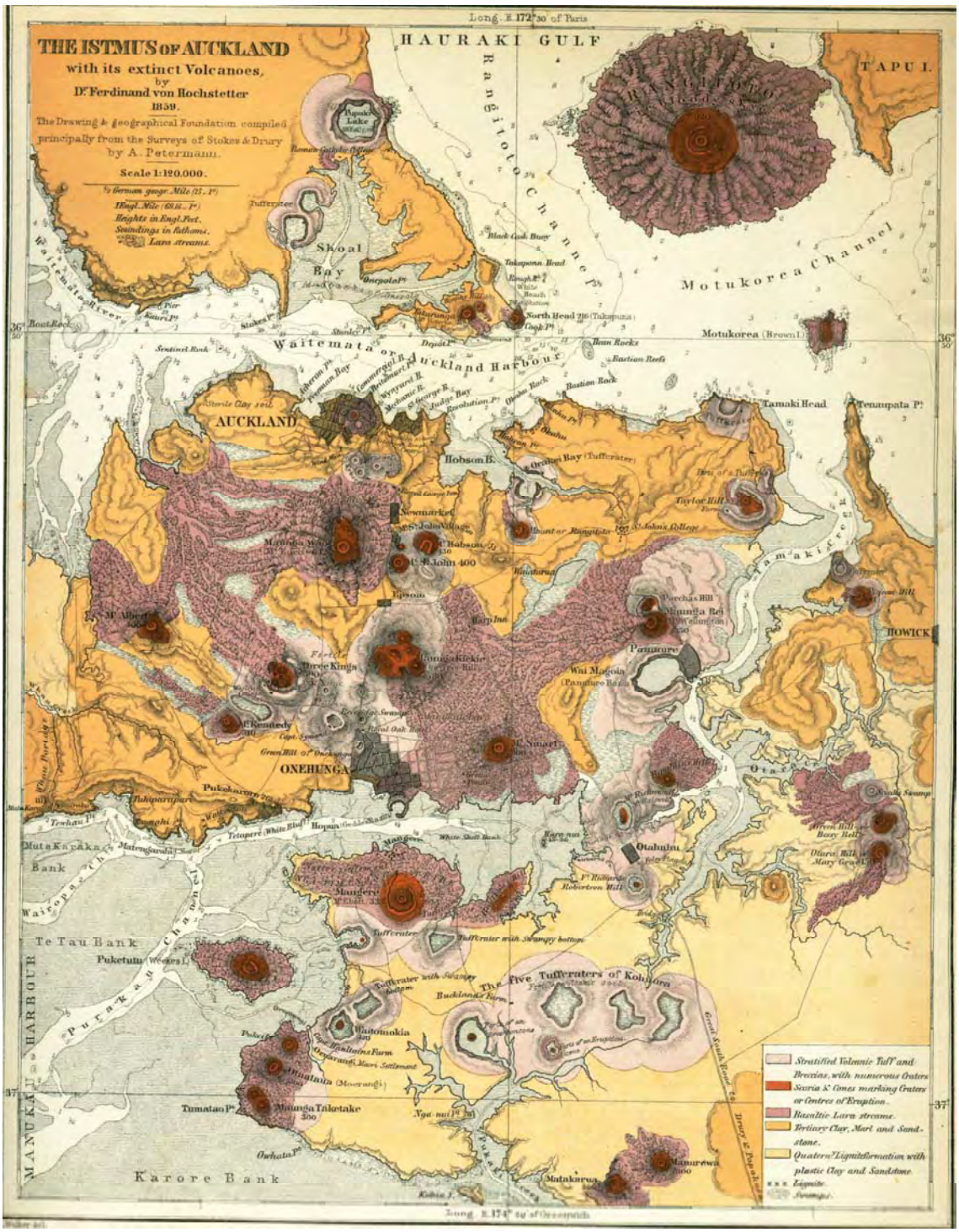


Figure 17: The istmus of Auckland with Rangitoto Island. Source: von Hochstetter 1864: 9.

The Auckland volcanoes "originate in a zone of melting about 100km beneath the surface" (Jamieson 2004: 27). They have been classified as small and monogenetic (Jamieson 2004; Wilcox 2007) volcanoes because every eruption springs from a "separate batch of magma making its way to the surface" (Jamieson 2004: 27). It has hitherto been difficult to predict where and when an eruption in this field will take place.

On the isthmus, where most of Auckland city and suburbs lie, "48 volcanoes have erupted in the past 150,000 years. Most date from only 10,000-50,000 years ago" (Ell 2004: 41). Although the exact year of Rangitoto's last eruption has not yet been identified, it is widely acknowledged that Rangitoto rose from the sea just 600 years ago (Ell 2004; Wilcox 2007). One component of local folklore in Auckland is that Rangitoto was still active only 250 years ago (Jamieson 2004: 25). Therefore, Rangitoto is also the youngest volcano of the Auckland volcanic field.

Figure 18: Rangitoto from the northeast. From the distance Rangitoto appears to have a uniform vegetation cover. These slopes, though, show clearly the mosaic forest of vegetation islands and extensive areas of bare lava. Source: DavidWallPhoto.com, in: Wilcox 2007:49.

In more specific terms, Rangitoto has been classified as a shield volcano (Figure 18), a landform characterised by "broad, gently sloping sides formed by lava flows that spread in all directions from a central summit vent" (Wilcox 2007: 10).

Its emergence from the sea started with an explosive, phreatomagmatic[7] eruption forming a low cone, and depositing ash and volcanic mud over the neighbouring and much older Motutapu Island (Wilcox 2007). These early and most ferocious eruptions were followed by fire fountains of scoria. Jamieson describes that, "the products of at least two phases of scoria cone building can be seen in the summit topography of Rangitoto. The earlier phase forming the smaller outlying hills, the later the main crater and cone" (Jamieson 2004: 24).

There are many different volcanic rocks to be found on the island: The basaltic slopes mostly consist of a'a lava flows[8] of three types:

- Block a'a flows
- Clinkerly a'a flows (broken into smaller pieces)
- Slab flow lava (large pieces of lava, 2-10m)

The latter represents the broken crust that sat above the underlying moving lava (Homer, Moore & Kermode 2000, in: Wilcox 2007: 11). Another type of lava, the ropier and slicker pahoehoe, is present in places along parts of the Summit Track which is considered to be from the earliest phase of lava outpouring (Wilcox 2007). In addition, there are also lava caves on the island; some of which are accessible via small holes in the rock. See Appendix A (pp. 35-38) for pictures of the volcanic features.

4.1.2 Climate & Hydrology

Rangitoto's mean annual temperature is 15.7°C and the mean annual rainfall is 1185 mm, with most falling in winter (Wilcox 2007: 15). The driest part of the island is Boulder Bay, the wettest is the summit and McKenzie Bay (Merrill 1994, in: Wilcox 2007: 15). Due to the ground's volcanic character with its fissures and crevices, there is no significant surface runoff, even after heavy rain. Merill (1994) found that "about 91 per cent of it [rainwater] is returned to the atmosphere by evaporation from the wet *Metrosideros*[9] canopy, from rock-surface evaporation, and by transpiration from the vegetation after being taken up by the roots. The remaining 9 per cent percolate down into the basalt rock to replenish a deep aquifer" (Merrill 1994, in: Wilcox 2007: 15). This lens-shaped groundwater aquifer at a depth of 40-60 metres beneath the surface sits directly on sea water (Merrill 1994, in: Wilcox 2007:15).

[7] Involving external water.
[8] A'a lava is the Hawaiian term for rough scoriaceous lava flow (scoria).
[9] Pohutukawa/Northern Rata hybrid.

Since geologists sunk a bore in 1977 along Islington Bay Road, water from the aquifer has been used as the major freshwater supply at Rangitoto Wharf (Wilcox 2007).

4.1.3 Flora

Botanically, Rangitoto can be seen as a "striking example of primary succession – the colonisation of new land by plants for the first time" (Jamieson 2004:30). Despite the lack of water, the limited availability of soil and the dark lava reaching surface temperatures up to 70°C, the flora could adapt to this challenging environment (Jamieson 2004; Wilcox 2007).

Today, the botanical diversity of Rangitoto is remarkable: It ranges from lichens and moss on bare lava, through scrub on the summit scoria cone, to lush pohutukawa forest. The studies of Wilcox and associates recorded 1181 kinds of plants, lichens, fungi and algae (Wilcox 2007: 168), with some 200 species of native plant including 40 species of fern (Jamieson 2004: 30).

Furthermore, it is noteworthy that the change from naked lava fields to green slopes and crater took place in only a few decades (Figure 19).

Figure 19: Left: Charles Heaphy's 1850s painting shows a bare and topographically exaggerated summit to the island. Fires lit by visitors and the impact of wild goats explain to some degree the absence of vegetation. Source: Alexander Turnbull Library, in: Jamieson 2004: 33. Right: The Rangitoto cone and surrounding area today. Source: Wilcox 2007: 51.

Supplementing the comparison of the two pictures, Norman (60 years old, from Auckland) told the author in a personal interview: "my mum used to go there [in the 1930s] up to the summit and slide down the crater using a stick as balance. When you look at the summit now, it is covered with bush; there is no way to slide down the crater now. That was a totally different experience of Rangitoto she had." This

quotation proves that the development of the present flora must have proceeded quite quickly.

Instead of introducing many of these fast "invaders", it is worth considering some extraordinary features making the plant life on Rangitoto so special. One characteristic common feature to all of the following species is that they grow in completely different ways to anywhere else. For instance:

- Numerous species that are normally epiphytes are terrestrial on Rangitoto and thus Kirk's daisy [*Brachyglottis kirkii*] and puka [*Griselinia lucida*], which usually grow high above the ground on top of tree branches, thrive on Rangitoto's lava.
- Mangroves [*Avicennia marina*], usually found in the mud of tidal estuaries, are also growing directly on the lava.
- An alpine moss [*Racomitrium lanuginosum*] is normally found high in the mountains. On Rangitoto, this moss grows at sea level.

Figure 20: Pohutukawa, which has earned the nickname "New Zealand's Christmas tree", flowers mainly a few weeks before and after Christmas. It reddish blossoms provide a stunning contrast to the black lava rocks.

- Pohutukawa [*Metrosideros excelsa*] (Figure 20) and northern rata [*Metrosideros robusta*] have hybridised freely to produce a bewildering variety of forms.

- The pohutukawa forest on Rangitoto is the largest remaining in the world[10]. (Wilcox 2007)

Although Rangitoto almost looks like a green heaven, introduced mammals and weeds have caused significant damage to Rangitoto's vegetation. The Department of Conservation (DOC) has tried to control their impact by starting campaigns to eradicate animal pests and weeds in order to preserve the island and its astonishing flora (Wilcox 2007: 167-169).

4.1.4 Fauna

Present mammals which have contributed to the damage on Rangitoto's vegetation include stoats [*Mustela erminea*], rabbits [*Oryctolagus cuniculus*], house mice [*Mus musculus*], ship rats [*Rattus rattus*], feral cats [*Cattus cattus*] and hedgehogs [*Erinaceus europaeus*]. Two Australian mammals, also seen as pests, are the brush-tailed rock wallaby [*Petrogale penicillata*][11], which was released on Motutapu Island in 1873 (Wilcox 2007: 23), and the brushtail possum [*Trichosurus vulpecula*] (Figure 22), first introduced in 1931 (Olds 1987, in: Wilcox 2007: 23).

Figure 21: Blue penguin. Source: NZ-seabirds 2008.

Figure 22: Brushtail possum. Source: Animal Archive 2008.

The Australian species were seen as the "two major pest mammals" (Wilcox 2007: 24) which inhabited Rangitoto. They have been eradicated due to traps, DOC's aerial application of the poison 1080 (sodium fluoracetate) and installed bait stations containing cyanide poison. These eradication programmes supported the recovery of Rangitoto's flora, but remain dubious as the brush-tailed rock wallaby is today an endangered species in its native habitat (Wilcox 2007: 23).

[10] See Appendix A (pp. 40-47) for some more pictures on Rangitoto's intriguing flora & fauna.

In addition to the mammals, Rangitoto has an interesting bird life ranging from more permanent residents such as the fantail [*Rhipidura fuliginosa*] and silvereye [*Zosterops lateralis*], to seasonally present birds as the tui [*Prosthemadera novaeseelandiae*]. The most famous Rangitoto bird is the black-backed gull [*Larus dominicanus*] which has a long-established nesting colony dating back as far as 1920 (Wilcox 2007: 26).

For visitors not familiar to coastal areas in Australia or New Zealand, the blue penguin [*Eudyptula minor*] is an attraction on its own (Figure 21). It holds a world record as the smallest penguin species on the planet. The species was first described by German naturalist Johann Reinhold Forster, in 1781 (IUCN 2008). The penguin has also chosen Rangitoto's shores as its home.

Figure 23: Dolphins in front of Rangitoto Island. Source: Private web log (2007).

At least as interesting as the blue penguin are the marine mammals which can be seen from the ferry or along the shore (Figure 23). Most likely to be seen are the orca or killer whale [*Orcinus orca*], the permanently present Bryde's whale [*Balaenoptera edenii*] the bottlenose dolphin [*Tursiops truncatus*] and the common dolphin [*Delphinus delphis*] (Wilcox 2007: 24).

4.2. Cultural History

Although the history of adjoining Motutapu Island is much more significant, Rangitoto's cultural history dates back to early Maori settlement. The Maori called the island 'Te **Rangi** o **toto**ngia a Tamatekapua' ('The day the blood of Tamatekapua was shed') which refers to a major battle between Tamatekapua (chief of a canoe which arrived about 1350) and Ngai Tai at Rangitoto's Islington Bay. Having been guardians over both Motutapu and Rangitoto islands for some centuries, the arrival of Europeans changed the role of Maori. The following chapters will introduce the Maori and European associations with the islands.

4.2.1 Pre-European history: The *tangata whenua*

While there is conjecture about the precise date of the arrival of the native people of New Zealand (the Maori), it is now believed that during the 1200s a number of ocean-going *waka* (canoes) made their way from east Polynesia, to land at various coastal points of New Zealand (Te Ara 2008).

Figure 24: Maori fishing camp similar to those thought to have existed on Motutapu when Rangitoto erupted. Source: Jamieson 2004: 33.

The *tangata whenua* (the original inhabitants of the land) of Rangitoto and bordering Motutapu Island, however, are Ngai Tai, a Maori *iwi* (tribe) tracing its origins to the Tainui canoe. The Ngai Tai people "[…] occupied most of the area around the entrance to the Waitemata Harbour [Auckland Harbour]. The main centre of their occupation was on Motutapu where they had cultivations" (Yoffe 2000: 18). Motutapu "has an occupation history that encompasses virtually the full span of New Zealand settlement. It was one of the earliest places inhabited by Polynesians and later by Europeans in the Auckland region. The earliest evidence for occupation of Motutapu dates to before the eruption of Rangitoto in circa 1400 AD" (Dodd 2007: 1). Although there is no oral account of the eruption, it has been proven that the early Maori witnessed all stages of Rangitoto's emergence from the sea. Cultural remnants and human footprints covered in ash are only two clear pieces of evidence for this statement[12]. According to Phillips-Gibson (2006) it is believed that Maori witnessed Rangitoto's emergence from sites other than Rangitoto: "Fortunately no people were on the island on the fateful day when Rangitoto rose from the sea right next to Motutapu. They had gone to the mainland in search for food. Motutapu was covered in fiery grit which burnt the forests and the villages to the ground. No gardens remained. When the people returned Motutapu was a very different island. It looked like a moonscape" (Phillips-Gibson 2006: 82).

In contrast to the early settlements on Motutapu, Maori have never permanently occupied Rangitoto, due to its rocky terrain. Nevertheless, both islands have been the ancestral *kainga* (home) and *wahi tapu* (a sacred place) of Ngai Tai and the present-day Ngai Tai in Auckland therefore maintain a strong spiritual association with Rangitoto (Wilcox 2007). The extent of Maori use of Rangitoto is relatively unclear (Yoffe 2000), though there is some evidence of coastal fishing camp-sites (Figure 24), the use of Rangitoto's summit as a look-out over the Hauraki Gulf and the use of "the lava caves […] as an urupa [burial site]" (Yoffe 2000: 18-19).

[12] The cultural landscape of archaeological sites is significant including "[…] pre-Rangitoto eruption archaic campsite and adze making sites, 13 pa [Maori fortification], numerous open settlements, midden deposits, storage pits, and agricultural areas" (Dodd 2007: 2). In total, 372 archaeological sites have been recorded so far and it is believed to find many more under the ash surfaces stemming from Rangitoto's eruptions.

4.2.2 Maori Myths and legends of Rangitoto

There are several myths associated with Rangitoto (Graham 2005; Phillips-Gibson 2006). One myth is that the erupting volcano was used by the first canoes arriving at the shores of *Aotearoa* (New Zealand) as a navigation point. The captain of the famous Arawa canoe, Tamatekapua, "and others in the Great Fleet were guided by the light and smoke from the volcano when bringing canoes to Aotearoa. It was there that the Tainui and the Arawa met" (Phillips-Gibson 2006: 80). This 'myth' forms the background to the subsequent battle on Rangitoto, in which the captain was wounded, giving Rangitoto its name. At the same time, the appearance and look of Rangitoto at the period of its eruption reasons another origin of its name: "In the middle of the Waitemata Harbour the sea boiled and fire heaved itself skywards. The sky itself turned blood-red" (Phillips-Gibson 2006: 80). The Maori translation for blood is *toto* and for sky is *rangi* resulting in Rangi-toto – "Island of Bloody Skies" (Maori dictionary 2008).

Figure 25: Left: Tiriwa, the Turehu chieftain, drops Rangitoto in the sea at the entrance of the Waitemata Harbour (Auckland Harbour). Right: The arrival of the Arawa canoe using the Rangitoto's bloody sky for navigation. Source: Phillips-Gibson 2006: 77, 81).

Besides others, there is the 'Turehu Myth'. Every once in a while, important people of the Turehu tribe met on a hill at Auckland's west coast where, they acted out sacred rituals and gave demonstrations of their powers. "Sometimes their power went much too far and a large part of the landscape changed its shape quite

dramatically" (Phillips-Gibson 2006: 76). In a competition, the Turehu chieftain decided to shift Rangitoto, a mountain on the west coast, in order to show that his supernatural powers were superior (Figure 25). The chief "strode over to the volcano and chanted karakia [ritual chant, prayer] to lighten its immense weight. He was then able to lift the mountain east over the Waitakeres to the Waitemata Harbour. Then he began to carry the volcano out to the sea. The water was very cold. This caused him to drop Rangitoto in the place where it is found today […]" (Phillips-Gibson 2006: 76).

4.2.3 European history

The European history officially began in 1854, when Rangitoto was sold for £15 to the crown by its Maori owners. The island became a public domain in 1890 and subsequently a popular spot for Aucklanders. During the 1920s and 1930s, prisoners were brought to the island where they built the main infrastructure: the roads and tracks, a seawater swimming pool at nearby Rangitoto Wharf, as well as a stone tennis pavilion (later to become the hall of the island) (Wilcox 2007). The prisoners had their own quarters on a site near the McKenzie Bay Road entrance to the Kidney Fern walk. "Bach" (holiday home) sites were leased to support the financing of the island's development. For over 80 years, there have been small numbers of people on the island, including a few permanent residents (DOC 2003). The role of baches will be considered more fully later in the chapter.

With the construction of several structures such as the causeway between Rangitoto and Motutapu, the Yankee Wharf, a Fire Command Post at the summit, and the Controlled Mine Base and gun emplacement in Islington Bay, Rangitoto became the scene of military activities and an important spot for the Auckland Harbour defence during World War II. Information signs on this can be found at the summit (See Appendix A, p. 20).

The control of Rangitoto was vested in 1968 in the Hauraki Gulf Maritime Park Board administered by the Department of Land & Survey, and managed for the preservation of its flora and fauna and for recreation (Wilcox 2007). In 1987, the Department of Conservation took over the administration of the island. It is now classified as a Scenic Reserve within the Hauraki Gulf Marine Park. This park was set up in 2000 "to provide an integrated approach to care and management of all the islands in the Hauraki Gulf.

Oversight is provided by the Hauraki Gulf Forum made up of the Auckland Regional Council, the city and district councils and relevant government departments within the Auckland region, and representatives of the tangata whenua" (Wilcox 2007: 19).

4.2.4 Bang, Boom, Bach: A unique New Zealand holiday home takes over

According to Kearns & Collins "the term 'bach' is unique to New Zealand, and has its origins in the word 'bachelor': single men living in simple accommodation were historically said to be 'baching', and an abbreviated form of this term was extended to basic holiday cottages and shacks" (Orsman & Orsman 1994, in: Kearns & Collins 2006: 228). These baches are typically small, single-level housing, often built in a

Figure 26: A typical New Zealand bach on Rangitoto Island. This one houses the Bach Museum

"do it yourself" manner with family labour, made from second hand materials, not always on land legally owned by the builders, and often lacking electricity and proper plumbing systems (Kearns & Collins 2006).

From 1919 to 1935, bach settlements sprang up at Beacon End, Islington Bay and Rangitoto Wharf (Wilcox 2007; Yoffe 2000). Since 1937, no more baches have been permitted to be built. Today, of the original 140 baches only 35 remain, "the others having been demolished or abandoned" (Wilcox 2007: 17).

Yoffe (2000) described the way of life of the Rangitoto island communities as a pleasant one. Particularly, the community at Rangitoto Wharf organised many socialising events such as fancy dress parties, swimming competitions and the communal festivities at New Year's Eve and other times. They even had their own band entertaining the island. The gratefulness and happiness of the people who lived on the island before the Second World War began is expressed in interviews: "I feel it has been a great privilege for us to have been on that island. I really feel that way because we all love the island" (Interview, in: Yoffe 2000: 40). "Millionaires would pay millions to experience the same thing we got for five pounds a year. We had some wonderful times there" (Interview, in: Yoffe 2000: 41).

Today, a museum in one of the remaining baches (Figure 26) gives visitors insights into these 'wonderful times' and into the interior of a bach. Some of the original permanent settlers and/or their descendants, however, regularly come back to their baches to relax and interact with nature (see Appendix A, pp. 49-51). Very close to Rangitoto Wharf are information signs examining the history of baches on the island (see Appendix A, p. 15).

Due to the work of DOC and the Rangitoto Island Historic Conservation Trust, the baches are under protection and recognized as "a marker of an element of national identity", "placial icons" and as "reminders of a pioneering spirit that not so much tamed but made peace with a harsh volcanic landscape" (Kearns & Collins 2006: 234).

5. Methodology

The authenticity and legitimacy of academic knowledge is often determined by the validity of the approach or methodology employed in the research (Rose 1997). Given this academic significance, the value of both data collection and data analysis techniques and the successful implementation of these are most important for every research project. The selection of these techniques is both indicative of the overall conceptual and ontological perspective of the chosen methodological framework and of the type of data that is sought (Rose 1997). The following chapters will introduce the data collection and analysis techniques applied within this study.

5.1 Approach

In order to draw conclusions on the use and efficiency of interpretive media in relation with Rangitoto tourism, a methodological triangulation approach was employed. Triangulation provides the opportunity of combining research methods; in this case both qualitative and quantitative methods. More specifically, primary data were generated from face to face interviews, tourist observations and a questionnaire.

Merging the three socio-scientific research methods through such an approach allows the consideration of the issues from different angles, thus providing for the cross-checking of results by comparing the outcomes of each single method (Reuber & Pfaffenbach 2005). Therefore, the implementation of three methods should lead to a more thorough exploration of the research topic.

The advantages of this approach are manifest in the quality of the data collected and the ability to effectively analyse and examine it. Additionally, a triangulation approach offers the appreciative possibility of balancing the weakness of one method with the strength of another: a questionnaire, for instance, fails to gain a deeper understanding into why respondents answered a question as they did; interviews, by contrast, can contribute to a deeper understanding through verbal interaction between the interviewer and the interviewee. Interviews, in turn, can not deliver a vast amount of quantitative data as questionnaires do. This simple example illustrates that one method can work for the other within the chosen approach.

The constraints in undertaking this approach should equally be considered. A common pitfall is to combine data which have primarily focused on different intentions; “data generated by different methods cannot simply be aggregated, as

they can only be understood in relation to the purposes for which they were created" (Brannen 1992a: 13, in: Winchester 2005: 12). It is the responsibility of the researcher to carefully analyze and compare the data and thus avoid drawing the wrong conclusions.

An alternative approach would have been to apply only one of the outlined research methods. It is likely that this approach would have been either qualitative or quantitative. Within tourism research such an approach is common, particularly in situations in which face to face interviews or questionnaire surveys are carried out (Weaver 2001). The author has not found a study in which a triangulation approach was employed and thus this approach seems to be an innovative, interesting and promising one to evaluate interpretive media in their ability to transfer knowledge and to characterise tourism on Rangitoto Island.

5.2 Data collection techniques

The outlined methods were carried out at five strategically well located points between 1 September 2007 and 3 January 2008.[13]

Respectively, at...

- Auckland Harbour (Pier 2) – where people waited for the Rangitoto ferry and were asked to fill out a questionnaire before they went to the island (pre-group).
- Rangitoto Summit – where visitors were asked to fill out a questionnaire after they had visited Rangitoto (post-group).
- Rangitoto Wharf – where face to face interviews were conducted while visitors waited for the departure to Auckland.
- Ferry boat – where visitors were counted and sometimes asked for a personal interview after their Rangitoto experience.

[13] Post-test survey (Rangitoto Summit): 15, 22, 23 September & 4 October 2007 (9.15am – 4pm)
Pre-test survey (Pier 2, Auckland Harbour): 29, 30 September & 3 October 2007 (9.15am– 4pm)
Observations (Summit Track): 11, 15 November 2007
Interviews (Rangitoto Wharf, Ferry, Bach Museum): 1, 19 September, 4 October (AUT students) & 3 January 2008.
The weekends were preferred for field work due to a higher frequency of visitors.
The visitation numbers for the…
15th September were 162 visitors (9.15am) and 195 visitors (12.15pm)
22nd September were 136 visitors (9.15am) and 141 visitors (12.15pm)
23rd September were 168 visitors (9.15am) and 177 visitors (12.15pm)
4th October were 110 visitors (9.15am) and 149 visitors (12.15pm).

- At selected information signs along the Summit Track – where visitor observation took place.

The following chapters, however, will briefly explain the ethical issues around the research project, how the methods were employed in the field and which techniques were used to analyse the data deriving from the methods.

5.2.1 Ethical considerations

The ethical considerations within this research were significant. Kearns *et al.* (1998) suggest that most academic ethical dilemmas derive from issues of consent, deception and privacy, and as such, these aspects were considered before field work began.

Particularly when the method of interviewing people is applied, the issue of consent is most significant during the collection of primary data. In order to overcome this aspect, the consent of all interviewees to participate in a research project was obtained through a consent form (Appendix B2). Connected to this ethical aspect, the potential for deception was also important. This characteristic of ethical research had to be taken into account by ensuring, that all people involved in the research process understood the purpose of the study and the later use of their participation. Related to the survey, this was guaranteed through a prepared statement at Rangitoto Summit and Auckland Harbour, explaining the reason for this study. Furthermore, a one-page participant information sheet (Appendix B2) within the questionnaire explained the scope and purpose again. In addition, the presence of the researcher and his assistant during the survey was an advantage to providing the ability to clarify potential misunderstandings further.

In terms of the terminology within a questionnaire, it is of upmost importance to consider that the language used is up to date (i.e. meanings or terms might change over time) and that it avoids being patronizing (age), stereotyping (culture or gender), marginalizing (disability), or discriminating (Walliman 2006: 152). These aspects were of particular significance as the researcher's native language is German and not English.

Last but not least, the privacy of interviewees was also a significant issue and was often a determinant of whether people chose to participate in the research. Therefore, it made sense to ask for people's personal data at the end of the questionnaire (Section C), because asking such questions from the beginning might have kept them away from participating due to a lack of mutual trust.

Once participants see that the questions do not ask something intimate, they feel more comfortable to subsequently provide personal data (Pilshofer 2001).

Privacy, however, is generally achieved either through confidentiality or anonymity. Due to the fact that this research did not deal with “awkward” topics, issues of confidentiality were most likely. Thus, confidentiality of interviewees was maintained where desired by the participants. Furthermore, the questionnaires from the survey were collected by the researcher and put directly into a box labelled with the University of Auckland logo, indicating to participants that their privacy was being taken seriously.

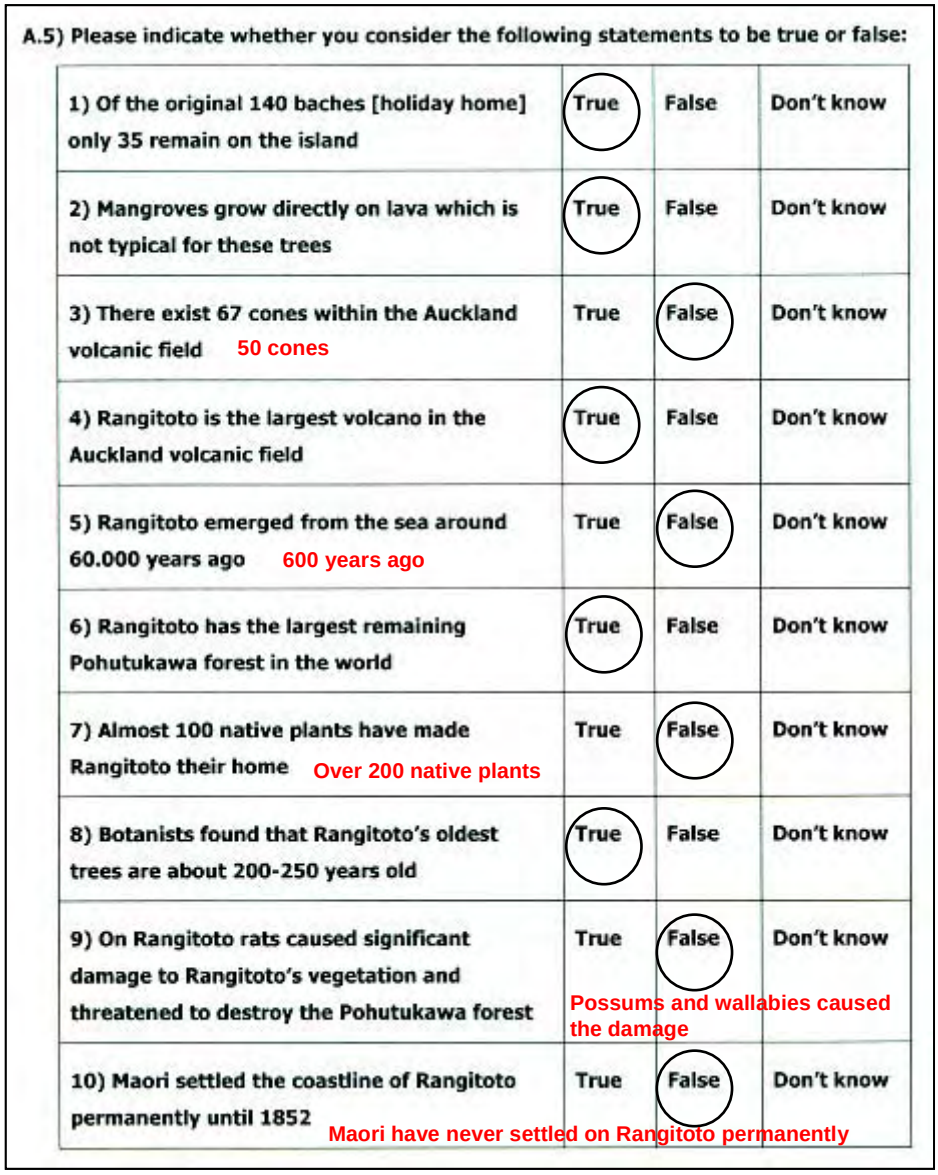
The observation in this research took place undercover. Therefore, the researcher did not know the names of the visitors observed and they did not recognize him. Data derived from such anonymous observation, as long as analysed in an ethically responsible manner, can be used without further considerations in regard to ethics.

In order to receive permission to carry out the research, the ethical issues identified had to undergo an official evaluation by the University of Auckland Human Participants Ethics Committee (UAHPEC). An eleven page long ‘Research Project Application Form’ plus Tourist Consent Form for the interviews, Participant Information Sheets, the detailed questionnaire and all the face to face interview questions (Appendix B1) were handed to the Committee on the 20th July 2007. The committee approved the Ethics Application for a period of three years on the 15th August 2007 giving this research project the official reference number 2007/258 (Appendix B2).

5.2.2 Questionnaire

As the main method of primary data collection, this research employed a visitor survey using a questionnaire with mainly closed-format questions. In general, questionnaires are characterised by their simplicity in application and their ability to be suitable for both quantitative and qualitative data (Wallimann 2006).

For visitors too, this method is in most cases seen to be more comfortable due to their very structured format, the limited influence of the researcher, and the possibility to answer embarrassing questions more truthfully (Wallimann 2006). Although questionnaires generally ask only simple questions, they can deliver, depending on the sample size, a vast amount of data.



A.5) Please indicate whether you consider the following statements to be true or false:

1) Of the original 140 baches [holiday home] only 35 remain on the island	(True)	False	Don't know
2) Mangroves grow directly on lava which is not typical for these trees	(True)	False	Don't know
3) There exist 67 cones within the Auckland volcanic field 50 cones	True	(False)	Don't know
4) Rangitoto is the largest volcano in the Auckland volcanic field	(True)	False	Don't know
5) Rangitoto emerged from the sea around 60.000 years ago 600 years ago	True	(False)	Don't know
6) Rangitoto has the largest remaining Pohutukawa forest in the world	(True)	False	Don't know
7) Almost 100 native plants have made Rangitoto their home Over 200 native plants	True	(False)	Don't know
8) Botanists found that Rangitoto's oldest trees are about 200-250 years old	(True)	False	Don't know
9) On Rangitoto rats caused significant damage to Rangitoto's vegetation and threatened to destroy the Pohutukawa forest	True	(False)	Don't know
10) Maori settled the coastline of Rangitoto permanently until 1852	True	(False)	Don't know

Possums and wallabies caused the damage

Maori have never settled on Rangitoto permanently

Figure 27: This quiz was part of the pre and post-group questionnaire. The circles indicate the right answers. The information in red gives the correct statements.

In order to examine whether visitors had learned about Rangitoto from information signs or the guided tractor tour, the questionnaire was designed for a pre/post-survey. This is a common approach for measuring a knowledge gain (see Hughes & Morrison-Saunders 2002).

In this case among those who have not visited the island but are willing to do so (pre-group) and those who have already had their Rangitoto experience (post-group) and thus can be expected to have gained knowledge about the site.

More specifically, a ten question-quiz (Figure 27), included in the questionnaire for the pre-group and in the questionnaire for the post-group, was set up to measure the knowledge gain. Throughout the quiz, participants had to indicate if ten statements on selected cultural and natural Rangitoto-specific features were “True” or “False”. If participants were unsure of the answer, the response “Don’t know” was generated. The ten statements were formulated from a convergence of what visitors can learn from the guided tractor tour and from the information signs. If a visitor has carefully listened to the guide or carefully read each information sign along the path to the summit, it was possible to pass the quiz with all answers correct. In order to diagnose the difficulty of the quiz, tour guide Glenn Fowler was asked to fill out a questionnaire. He answered all questions correctly but indicated that questions 7, 8 and 9 were quite difficult. Therefore, the quiz, with special attention paid to questions 7, 8 and 9, was accepted as an appropriate method to measure if people gained knowledge from the signs and the tour.

More broadly, the post-group questionnaire consisted of three main sections. In Section A, participants were asked to announce their main reason(s) for their visit (A.1), if they had visited the site before (A.2), if they had prior media experiences (A.2.1), if they had any prior knowledge about Rangitoto (A.3) and the sources of information (A.4). These questions are of importance for the subsequent data analysis. For instance, only visitors who indicated in A.2 that they were first time visitors became valid candidates for the measurement of knowledge gain, because returning visitors might already have knowledge about the site from prior visits. The quiz itself is also included in this section (A.5). Question A.6 asked for the sources of information the visitors used and thus indicates whether they booked the guided tractor tour or made use of other sources such as the information signs. Question A.7 asked if visitors walked the Summit Track, where most of the information signs are, and, if so, how they read them (A.8).

The following question, A.9, is the only open one in the questionnaire and asks visitors for their suggestions for improvement of the site. This open-ended question was chosen since it can uncover intelligent opinions that would not have shown up in closed questions.

This feature is important, as the surveyor needs to focus on the unique comments and answers too. Because of the pre/post-survey design, questions A.6 – A.9 were not included in the pre-group questionnaire.

Covering general questions on outdoor education, question B.1 asks to what extent the statements ‘learnt about the environment’, ‘educative media on site are helpful in transferring knowledge’ and ‘i enjoyed learning about Rangitoto through the educative medium I have experienced’ apply. Participants could indicate their answers on a four-point scale ranging from ‘strongly applies’ to ‘doesn’t apply at all’. As visitors who have not been on the island cannot answer this question, it was not included in the pre-group questionnaire either. Although these ranking questions can be done in many ways, the author chose this even four-point scale to leave out a middle group and thus to slightly force the respondents to decide positively or negatively.

Question B.2 asks for the issues visitors consider to be important in a tourism context and should indicate how ‘green’ (i.e. environmentally conscious) visitors are. This question is important to ask in order to characterise tourism on Rangitoto from the demand-side. In order to discuss whether Rangitoto can be seen as an ecotourism destination, participants could choose from seven possible answers ranging from personal issues such as ‘recreation’ to issues belonging to the common principles of an up to date ecotourism definition such as ‘nature-based’, ‘conservation of nature’ or ‘education’ (see Donohoe & Needham 2006).

Section C, however, asks for general information about the participants, such as sex, age, nationality and occupation. This socio-demographic data is important to further characterise Rangitoto’s visitors and thus tourism on the island.

With regard to the implementation of the survey, it is noteworthy to say that people at Rangitoto Summit and at Auckland Harbour participated as part of a random sample. As many people as possible were asked for their participation as long as they were sixteen years and older. Due to the presence of the researcher and his assistant, a ‘controlled setting’ was established which means that people were unable to search for the information they needed to correctly answer the quiz. This particularly applies for both locations, summit and harbour, where no information signs or a guide who could help was in reach. In addition, participants were politely asked to fill out their questionnaire independently.

Nevertheless, a few participants made use of their Rangitoto brochures and communicated with each other while filling out the questionnaire. This aspect will find further critical consideration within the discussion chapter.

5.2.3 Semi-structured personal interviews

Interviews provide the possibility to ask deep-ranging questions. Therefore, they are seen as a worthwhile supplement to more simple, standardised and closed questions addressed by the questionnaire. Semi-structured interviews in particular are characterised by including only some prepared questions. This feature grants the ability to follow and emphasise individual aspects which can develop during the conversation between the participant and the interviewer. Even if this conversational part, in which much of the conversation is directed by the participant, rather than the interviewer (Dunn 2000), shifts away from the topic, the semi-structured nature of the interview and thus a reliance on some fixed questions helps to reconsider the main topic. If such a shift occurs, the researcher just needs to apply polite interjections.

Unlike quantitative methods or alternative interviewing techniques, the validity of the data produced is not empirically tested (Baxter & Eyle 1997). Therefore, this method is of pure qualitative value and thus can either verify or falsify outcomes from the other methods or bring new results.

Problematically, the relative position of the interviewer to the interviewee, especially in contrast to a questionnaire survey, and the implicit power relationship between them, can also affect the authenticity of the responses given.

In spite of the inherent dangers of losing the thematic thread, of subjectivity and positionality, this research technique was utilised in order to produce richer data than other interviewing methods such as structured or unstructured interviews would have done. Therefore, semi-structured personal interviews were seen as ideal for this study. Turning in the implementation, on Rangitoto Island it was appropriate to randomly ask visitors for their willingness to be interviewed while they waited for the return ferry at Rangitoto Wharf. Judging from observations previously undertaken, people normally wait around Rangitoto Wharf for ten to sixty minutes. The pilot test had indicated that this was the right time to ask, because visitors had finished their trip and were in a very good mood to answer questions. The interviews were tape-recorded after tourists had given their declaration of consent.

The author started with some site-specific questions such as ‘Why have you chosen to use the source of information?’, ‘In what ways do you find the medium you have experienced helpful/not helpful in transferring knowledge about this site to you?’, and ‘Can you give a preference for one of the three Rangitoto media?’. These questions led to new knowledge because of their difference to the questionnaire questions. Furthermore, the interview questions enabled the recording of some in-depth answers. Section B asked general questions such as ‘How important is it for you to gain knowledge about the environment while undertaking outdoor activities?’, ‘In what ways do you consider environmental learning to be an important part of a tourist experience?’, or ‘How often do you visit places like this within a year?’ These questions further characterise Rangitoto’s visitors and also highlight the ecotourism principle of education (i.e. knowledge gain, environmental learning). Further visitor characterising questions of a socio-demographic nature were asked in section C.

5.2.4 Observation

Observation of visitor behaviour, especially in the Rangitoto case, is an important method to generate data which is not accessible through any other method used in this approach. This fact in itself justifies the application of visitor observation in the field. Furthermore, this method enables to observe how many visitors who hiked the trail spent time, and here how much time they spent, on studying the information signs and how many of them just passed them.

Instead of asking, this method records activities through looking. As a result, all forms of observations bring the problem of positioning of the researcher in relation to the subject of the research (Winchester 2005). Therefore, a position has to be adopted before observations can be undertaken. There is a range of levels of involvement which was classified as follows: complete observer, observer-as-participant, participant-as-observer and the complete participant (Gold 1985, in: Walliman 2006: 95-96). This investigation made use of the complete participant approach. It enabled the researcher to take part as a tourist without being recognised as an observer by the observed. This ‘undercover work’ allowed carrying out research without influencing a visitor’s behaviour and thus generated the most authentic results.

5.2.5 Pilot Study

The personal interviews and the questionnaire were tested on 22 August 2007, after the Ethics Committee had approved the application. Three Rangitoto visitors participated in the face to face interviews. All of them, part of a random sample, fully understood the aims of the research and had no problems with the interview questions. Furthermore, people answered the questions enthusiastically and it took less time to conduct the interviews than expected (around fifteen minutes). Therefore, the set of questions remained un-modified for the actual primary data collection in the field.

In contrast, the pilot test of the questionnaire survey led to other results. Ten participants were asked to fill out a questionnaire at Auckland Harbour (Pier 2) before they went to the island (pre-test). At the same time they were asked to meet the researcher again after their arrival at Rangitoto's summit in order to fill out another questionnaire including the same ten-question quiz (post-test). A lottery, including Maori Art paintings donated by Art student Samuel Emery, was offered as an incentive to increase the participation quota. Every participant filled out the pre-test, but the completion of a second questionnaire remained unrealized. Only four of the ten participants returned to the researcher and asked for the second questionnaire. Once they got it and saw that the same ten questions had to be answered again, one participant denied to continue and one participant complained about repeating the same task. Therefore, the pilot test led to valuable results.

To specify, it became clear that more than 50% of the visitors were not willing to fill out a second questionnaire, even though there was an incentive to do so. Furthermore, those who were willing to return to the researcher for the second questionnaire reacted with frustration once they saw that the quiz questions were the same. As a result, the survey design was changed to ensure that participants were asked to fill out only one questionnaire.

Therefore, visitors now participated in the pre-test at Auckland Harbour *or* in the post-test at Rangitoto Summit. Although testing the same group of people would *seem* to provide the best means of comparison, Lee and Balchin (1995) note that this method can create bias because the respondent's awareness of the displays has been highlighted by the pre-visit test. Studies such as Tubb (2003) purposely use different but statistically comparable samples to avoid this issue. Consequently, this was also the methodic approach adopted for the main questionnaire study.

5.3 Analytical techniques

The results of the questionnaire, interviews and observation, are of little use if they are only presented as raw data. It is not the duty of the reader to make sense of them; rather it is the responsibility of the researcher to relate them to the research questions (Walliman 2006).

Due to the closed nature of the questions, the questionnaire is generally more suited for a quantitative data analysis. The data resulting from the questionnaire thus will be partially analysed by Microsoft Office Excel 2007, but mainly by using the Statistical Package for the Social Sciences (SPSS 15) to generate broader analysis. This allows for descriptive statistics such as means and frequencies, but also significance tests and cross tabulations. The open-ended questionnaire question (A.9) asked for visitors' suggestions for the improvement of the site and will be analysed in a qualitative way (transcription), allowing a focus on individual visitor responses.

In contrast, the interviews are more qualified for a qualitative data analysis. Therefore, selected parts of the interview transcripts will serve to verify or falsify data stemming from the questionnaire analysis.

. The data generated through observation can be analysed in a quantitative and qualitative way. In order to examine how much time visitors spend in front of an info sign or how many visitors were counted on the ferry; simple descriptive statistics (frequencies & mean) will be applied, using Microsoft Excel 2007. More general visitor observations can be analysed in a qualitative way.

To summarise, the rich qualitative and quantitative data derived from the described data collection techniques and the analysis of these should lead to a comprehensive understanding that is able to answer the research questions. The following results and interpretation chapter will make the link between the research outcomes and the research questions and hypotheses.

6. Results & Interpretation

This chapter is sectioned into three subsections. The division was decided upon after the different methods were applied in the field: First, the results of the questionnaire will be introduced, giving scope for a quantitative data analysis. Second, the findings from the face to face interviews which have been analysed in a qualitative way will be presented. Finally, the results from tourist observations will be presented.

6.1 Questionnaire

The following data originates from a group of 310 questionnaires which were filled out correctly, 108 questionnaires from the pre-test and 202 from the post-test. Remarkably, only 4 out of 314 people requested refused to fill out a questionnaire. The 310 computed surveys represented an excellent quota, particularly considering that the pre-test was three and the post- test four pages long. In addition, most of the visitors were curious about the research, asked questions about the study and wished the researcher well for finishing his degree.

The results from this survey have been coded in order to transfer visitor responses into two Excel files – one for the pre-test and one for the post-test. These Excel files had been modified and transferred into SPSS for further data processing (see Appendix C for the code sheet and the original Excel and SPSS files containing the raw data).

The survey results can be subdivided into three major themes:

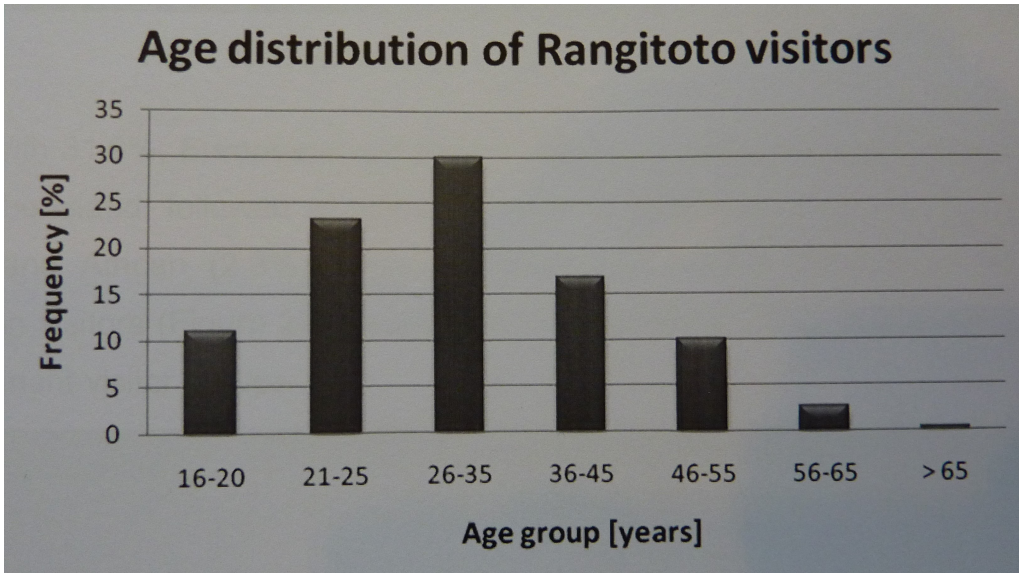
- Demographic knowledge which enables the creation of a Rangitoto visitor profile. Results of this kind are crucial for subsequently classifying Rangitoto tourism from the demand-side.
- Interpretive media specific knowledge which gives important insights into the relationship between Rangitoto visitors and the interpretive media in place and
- General Rangitoto knowledge, which basically aims to address visitors' suggestions for improvement of the site.

6.1.1 Demographic knowledge

The results from this section stem from an investigated unit of 310 people and thus represent the sum of the pre and post-test. The analytical techniques used for this subdivision are based on descriptive statistics such as means and frequencies.

The distribution between the sexes for the entire study is 44.8% male and 48.7% female (6.5% of respondents did not state their gender). The distribution of age can be seen in Table 1. The highest value results for the age group between 26-35 years (30%), followed by age group 21-25 (23.2%). The lowest frequencies of Rangitoto visitors can be found in the age groups 46-55 (10%), 56-65 (2.6%) and over 65 years (0.3%). The median for this distribution is exactly 3.0, which directly refers to age group 26-35. The precise values can be seen in Appendix C.

Table 1: Age distribution of Rangitoto visitors (n = 310).



In order to classify tourism on the island, it is of course necessary to know about the origin of its visitors. Figure 28 clearly expresses that 44.5% of visitors come from Oceania[14]. Interestingly, 44% of this 44.5% consists of New Zealanders and thus reflects purely domestic tourism.

[14] See Appendix A (pp. 52-54) to see which countries belong to the categories Oceania, Asia and Europe. The establishment of these geographical categories was necessary after 27 different countries had been indicated in the survey. This later categorisation into fewer categories helps to make the data presentation more clearly to the reader.
Table 2 represents another later categorisation to classify 41 different indicated jobs into 17 broader categories. Please see the section 'Job categorisation' in Appendix C in order to know which jobs have been classified in which category.

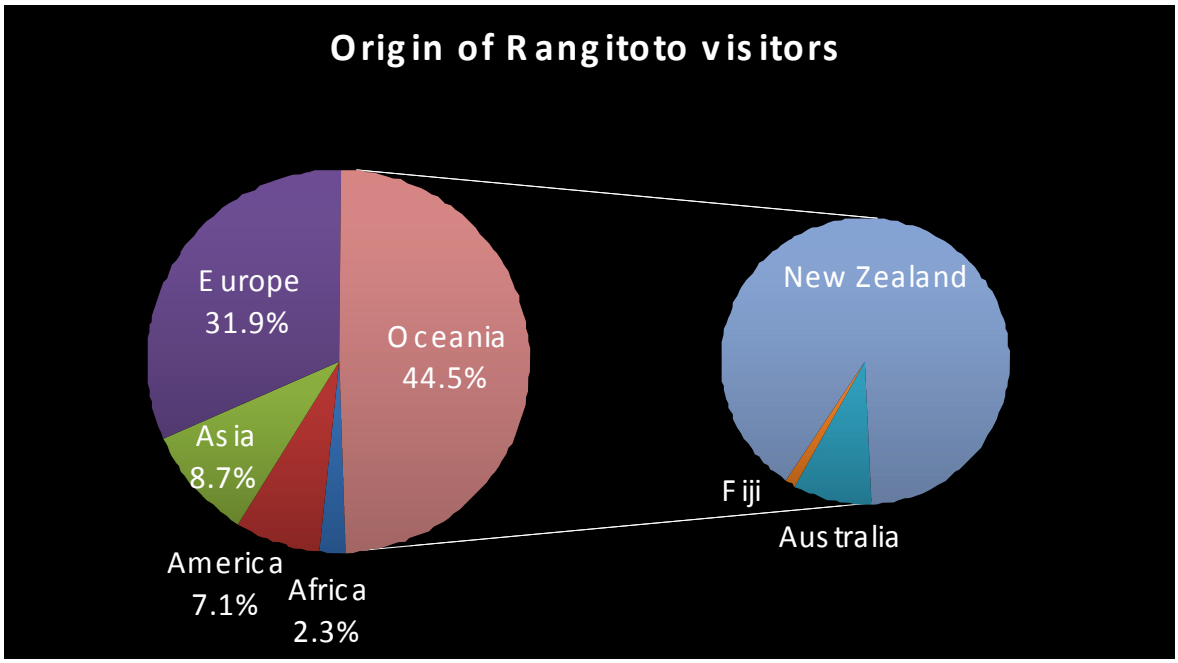


Figure 28: origin of Rangitoto visitors. Missing value was 5.5%.

With 31.9%, Europeans are the second most numerous group of people who visited the island, followed at some distance by people of Asian (8.7%), American (7.1%) and African (2.3%) origin. A closer look at the distribution among the European visitors (Figure 29) clearly identifies Germans (35%) and British (34%) as the dominant visitor groups.

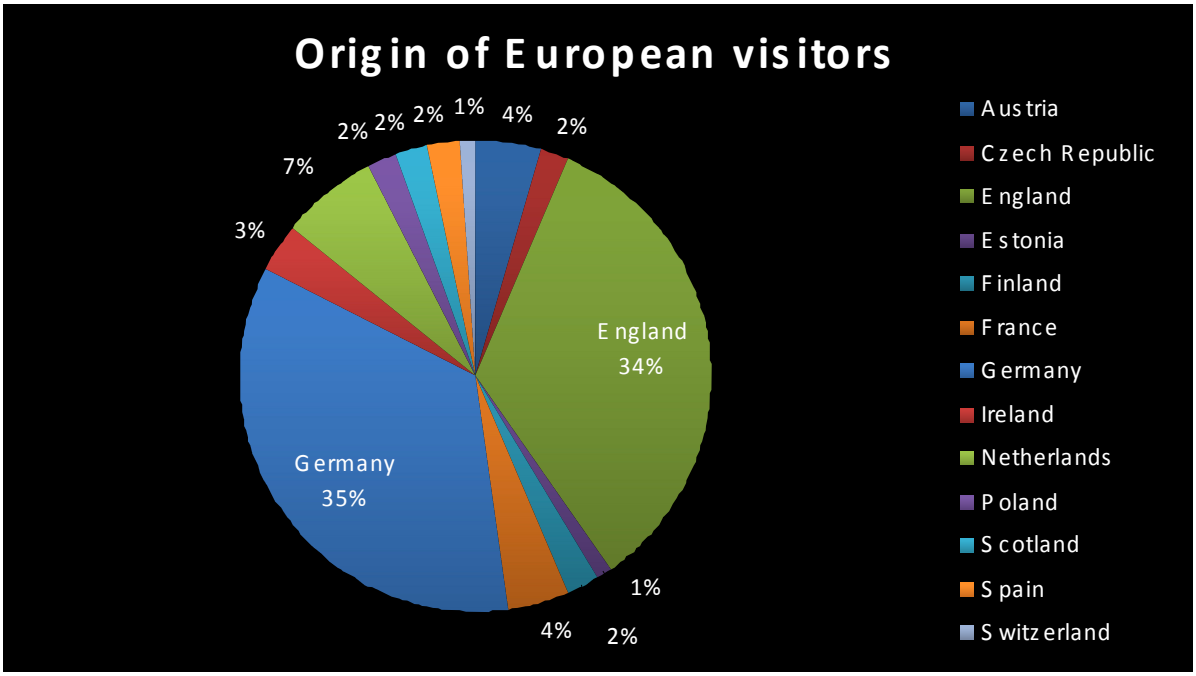


Figure 29: Distribution of European Rangitoto visitors.

With regards to occupation (Table 2), most visitors indicated that they were students (22.3%). The second highest grouping consisted of people in administrative jobs (14.5%) followed by occupations in the financial (7.1%) and health care sectors (7.1%). Although the study did not ask a question on the level of education of its participants, it is still possible to make a statement in this respect. The raw data revealed that 122 visitors were working in jobs[15] which require a tertiary education. This indicates that around 40% of visitors already have or, in the case of students, will have at a minimum a university degree.

Table 2: Occupational pattern of Rangitoto visitors.

Occupation		Frequency	Percentage
Valid	**Administration**	**45**	**14.5**
	Agriculture	4	1.3
	Architecture/Construction/ Planning	11	3.5
	Art	6	1.9
	Computer/IT	17	5.5
	Engineering/Technician	13	4.2
	Finance	**22**	**7.1**
	Health care	**22**	**7.1**
	Media	8	2.6
	Retired	3	1.0
	Science	15	4.8
	Service	17	5.5
	Social/cultural	1	0.3
	Student	**69**	**22.3**
	Teaching	18	5.8
	Unemployed	11	3.5
	Missing Value	28	9.0
	Total	310	100

Further interesting survey results illustrate visitor intentions (Figure 30) and are also of value to consider. The vast majority (75.2%) indicated that their main reason for visiting Rangitoto was for 'Leisure'. Within the ranking, 'Hiking' (36.5%) makes up the second main reason for a visit, followed by 'Learning' (10.6%) and 'Other[16]' (9.7%).

[15] Teacher, Scientist, Doctor, Architect, Lawyer, Engineer, Government employee and Student.

[16] In this case 'Other' refers to the following statements: "friend's birthday, family day out, guiding a kayak trip, view, beautiful landscape, appreciating nature, trail-running, cultural identification → i.e. Maori chief burial ground, part of Auckland Pass."

Of the 310 surveyed people, 30,6% indicated in question A.2.1, that they are returning visitors and made use of the guided tractor tour (13%), the information shelter (50%) and the information signs (84%) during a previous visit[17]. At least in some respect, this explains why 62.9% of visitors declared that they had knowledge about specific cultural and natural features on Rangitoto. Aside from this, all participants were asked (question A.4) to point out other sources of information. They indicated that friends/family were one important source of information (27.7%), but also that the available Fullers (25.5%) and DOC brochure (22.6%) on Rangitoto, as well as the Internet (22.6%) were perceived sources of information. The category 'Others'[18] was used by 29.4% of respondents.

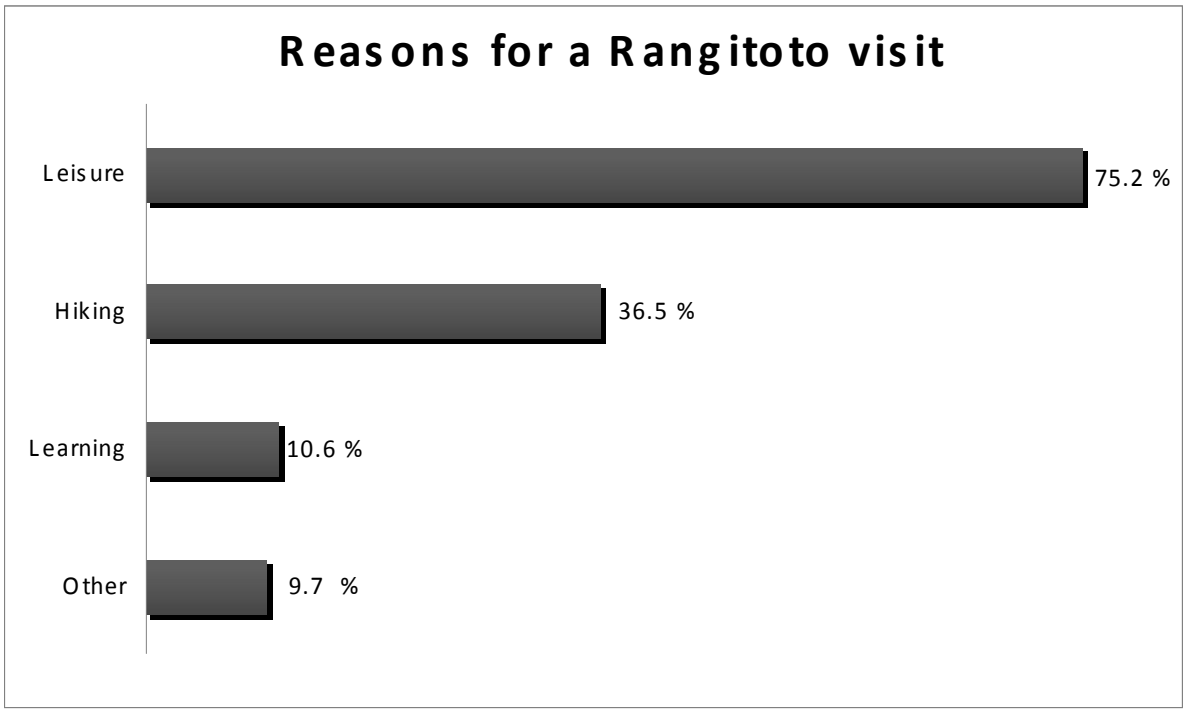


Figure 30: Main reasons for a Rangitoto visit. Sample size *n* = 310. Multiple responses were possible.

In order to see how environmentally conscious the surveyed group of 310 people was, tourists were asked to indicate what issues they considered to be important in a tourism context. Once again, this question allowed multiple responses. Figure 31 shows the outcomes of this question. In terms of a ranking, 76.1% of the survey group (236 people) made 'conservation of nature' the number one topic. Furthermore, 'Education' was second highest with a frequency of 62.6%.

[17] In questions A.2.1 and A.4, multiple answers were possible.
[18] Participants specification for this category were: "Guide books (1. Lonely Planet, 2. Auckland N-Z Guide, 3. Rough Guide), Auckland Museum Volcano Exhibition, School Geography (school trips, school books), Previous job, Auckland City Council, Information at Sky Tower Observation Deck, General knowledge, I-Site, News, DOC-website, informational film on Northhead."

With 43.5%, the third position was occupied by the category 'nature-based'. Interestingly, these three categories are three core criteria of the introduced ecotourism working definition. The other issues, however, are related to 'recreation' (42.6%), 'low Impact' (33.5%), 'development' (9%) and 'other' [19] (1.9%).

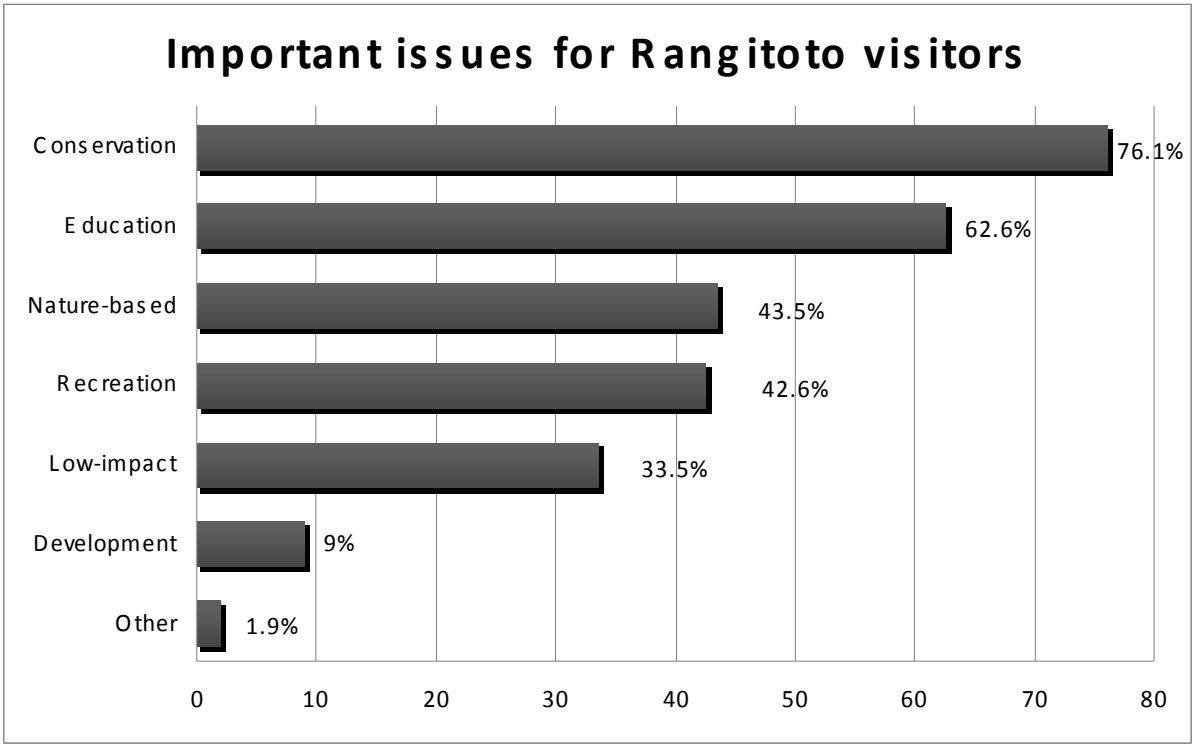


Figure 31: Ranking of the issues Rangitoto visitors considered to be of most importance in a tourism context.

In order to investigate if any correlations between these issues and the age group of the respondents exist, the variables were cross tabulated.[20] The result can be seen in Figure 32. First, it is crucial to point out that the age groups of the 46-55, 56-65 and the visitors over 65 years do not support a statistically valid connection. This is simply because the few people covered in these groups are not statistically representative. For instance, only 0.3% of the surveyed population is over 65 years and the group is therefore underrepresented. This has a strong effect on the comparability among the other age groups. Thus, a statement that the age group of 26-35 is much more dedicated to conservation (over 30%), whereas the age group of the visitors over 65 is almost not (0.3%) would be dangerous and simply misleading.

[19] Answers to this open question were: „Planning, beautiful views, rubbish free, sustainable development."

[20] A cross tabulation displays the joint distribution of two or more variables. They are usually presented as a contingency table in a matrix format. Whereas a frequency distribution provides the distribution of one variable, a contingency table describes the distribution of two or more variables simultaneously. Each cell shows the number of respondents who gave a specific combination of responses (Janssen & Laatz 2003). The contingency tables for all cross tabulations can be seen in Appendix C.

As this applies for all of the three mentioned age groups, only the first four groups will undergo a further consideration.

First, it is clear that interest in all the environmental issues increases from the youngest (16-20) to the age group of the 26-35 years old. One possible interpretation could be that issues of conservation, education, development, low-impact behaviour, nature-based tourism and recreation become more important the more mature and older people participating in nature-based tourism are.

Another explanation might be that the older participants have visited more places, have more life-experience and have therefore gained more knowledge about environmental topics that in turn makes them more environmentally conscious compared to younger people. Of course, this image of a lifelong learner who is always interested and keen to gain knowledge which makes him increasingly think and act in a pro-environmental manner, is the ideal for human interaction with nature. This interpretation has to be treated with care, precisely because it only reflects the results for the first three groups from an ideal perspective.

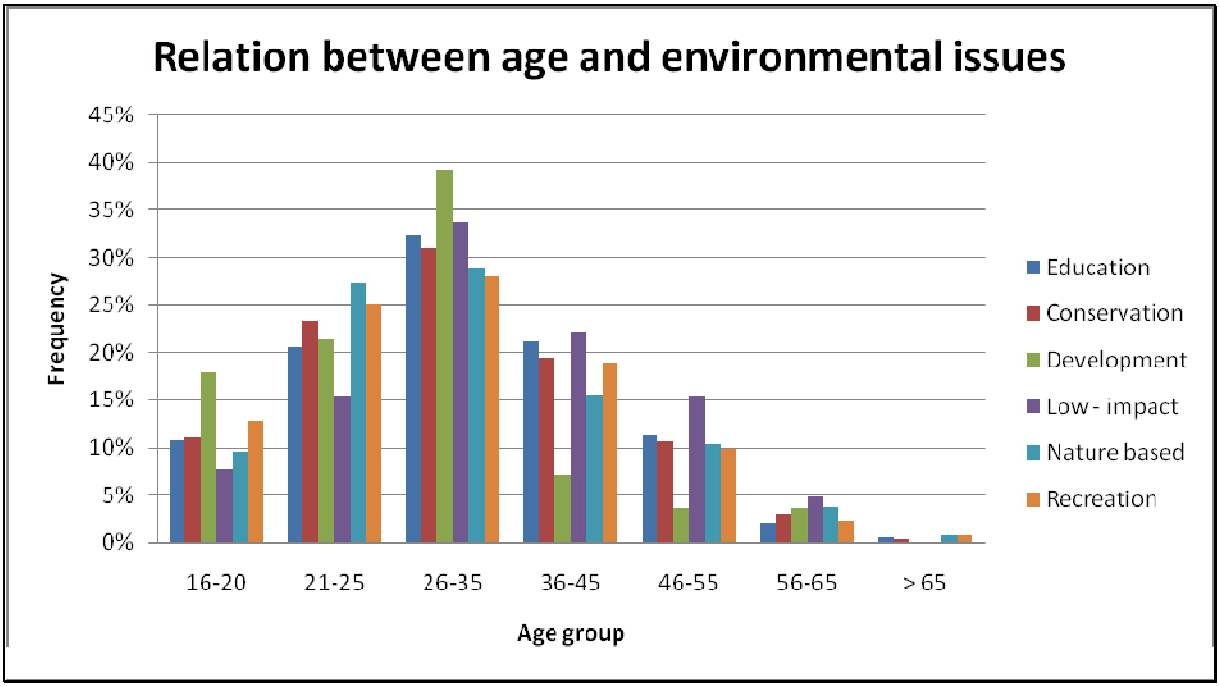


Figure 32: Cross tabulation between the variables 'Age group' and 'Frequency' aiming to express a correlation between the age of the visitor and his/her environmental attitude.

Secondly, there is a considerable drop in environmental interest from the age group of 26-35 to 36-45. At first sight, it appears as if the later age group is not as interested in environmental issues as the group of the 26-35 years old. In addition, the group is even less interested in issues such as conservation than the group with

21-25 year olds. The author in fact expected that the interest for environmental issues would continue to grow, but this figure appears to demonstrate the opposite.

6.1.2 Interpretive media specific knowledge

This subsection will first present the results from questions A.6, A.7, A.8 and B.1 before introducing the quiz results that represent the core of this investigation. The surveyed population *n* for these questions is 202, due to the fact that only the post-group received these questions. The pre-group would not have been in a position to answer them, simply because they are directed at visitors who have just undergone their Rangitoto experience. The SPSS menu, however, allows a fragmentation of the dataset by chosen cases. Particularly the dichotomisation of the dataset into the pre-test data and the post-test data is of up most importance at this stage of data analysis.

The results of question A.6 (Figure 33), however, "What sources of information did you make use of today" demonstrate well that the vast majority (69.3%) made use of the information signs, whereas only 6.9% (14 people out of 202) had tickets for the guided tractor tour. At least 19.3% of respondents made use of the information shelter at Rangitoto Wharf, while some respondents had "other" sources of information, such as "brochure", "DOC", "family", "books" or "our kayak guide" and others who did not make use of any source of information (12.4%).

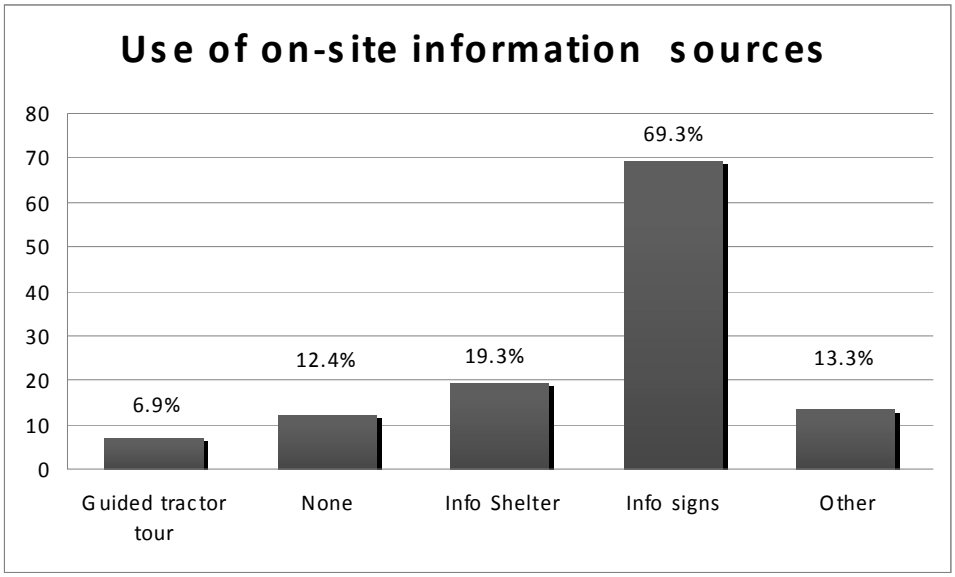


Figure 33: Sources of on-site information Rangitoto visitors made use of before they participated in the survey. Multiple responses were possible.

Of the surveyed population (*n* = 202), 88.1% (Frequency: 178) walked the popular Summit Track. Those who walked it were asked if they read the signs along

the track (signs on geology, botany and history), if they read the signs from the beginning to the end and if they enjoyed reading them. The answers to these questions are presented in Table 3.

Table 3: Interpretive sign-specific questions directed to those visitors who walked the Summit Track and were attracted by the signs.

		Frequency	Percent
I read the signs along the summit track			
	Yes	130	64.36
	No	45	22.28
	Missing Value	27	13.37
	Total	202	100
I read them from the beginning to the end			
	Yes	50	24.75
	No	113	55.94
	Missing Value	39	19.31
	Total	202	100
I enjoyed reading them			
	Yes	112	55.44
	No	29	14.36
	Missing Value	59	29.21
	Total	202	100

The results indicate that of the 178 people who walked the Summit Track, 64.36% read the signs along the way to the summit. This means that, when related to the population which indicated to have read a sign (n = 130), at least 73% of people who walked the Summit Track were in some ways attracted by the signs. In other words, three out of every four people stopped when a sign appeared. In addition, 55.4% of respondents indicated that they enjoyed reading the signs and only 24.8% indicated that they read them completely.

Related to the new population, this means that 112 of 130 people enjoyed reading the signs, leading to 86.2% for this group and to 38.5% for the group that entirely read the signs.

The four-point Likert scale[21] for the chosen statements on environmental interpretation resulted in 52.4% of visitors stating "strongly applies" and "slightly applies" for the statement "I learnt about the environment" (Table 4). For the statement "Interpretive on-site media are helpful in transferring knowledge" 63.2% decided to vote for "strongly" and "slightly applies" and 62.8% decided to do so for the statement "I enjoyed learning about Rangitoto through the medium I have experienced". Although it was the author's intention to use a four-point Likert scale (instead of a five-point Likert scale with a neutral middle category such as "neither applies "or" does not apply") in order to gently force the respondents into one direction (i.e. it rather applies not), there are now mean values with 2.5 (for the first statement), 2.29 (second), 2.29 (third) which match or come close to a statistical middle category.

Table 4: On a four-point Likert scale respondents had to indicate (question B.1) to what extent the three statements applied to their visit.

Statements	Strongly applies [%]	Slightly applies [%]	Applies rather not [%]	Does not Apply at all [%]	Mean
I learnt about the environment	13.9	38.5	31.5	16.1	2.5
Interpretive on-site media are helpful in transferring knowledge	22.7	40.5	22.2	14.6	2.29
I enjoyed learning about Rangitoto through the medium I have experienced	22	40.8	22.7	14.5	2.29

Please note: 1 = strongly applies; 2 = slightly applies; 3 = applies rather not; 4 = does not apply at all.

Therefore, this ranking question, although the majority of respondents chose for "strongly applies" and "slightly applies" for all statements, does not show a clear

[21] A Likert scale is a psychometric scale commonly used in questionnaires and is the most widely used scale in survey research. When responding to a Likert questionnaire item, respondents specify their level of agreement to a statement (Bühl 2008).

trend in one direction. This is due to a high frequency in the categories “applies rather not” and “does not apply at all”.

To spend further attention on visitors’ enjoyment related to their media experience, the analytical method of cross tabulation was applied again in order to investigate if there were differences in the degree of enjoyment between those who did the tractor tour and the individual hikers who indicated that their source of information were information signs (question A.6). This time the term ‘information signs’ applies to all the signs on the island and not only to the signs along the Summit Track. Therefore the population for this test (Table 5) is slightly different (*n* = 140).

Table 5: Cross tabulation for visitor’s enjoyment with information signs. The population (*n* = 140) is made up of those who indicated that they made use of the information signs during their Rangitoto visit.

Visitors’ enjoyment with information signs			Today’s information sources - Information signs	Today’s information sources - Information signs
			announced	announced
I enjoyed learning about Rangitoto through the interpretive medium I have experienced	Strongly applies	Frequency	32	32
		% of Today’s information sources – Information signs	22.9%	24.8%
	Slightly applies	Frequency	61	61
		% of Today’s information sources – Information signs	43.6%	47.3%
	Applies rather not	Frequency	25	25
		% of Today’s information sources – Information signs	17.9%	19.4%
	Does not apply at all	Frequency	11	11
		% of Today’s information sources – Information signs	7.9%	8.5%
	Missing Value	Frequency	11	-
		% of Today’s information sources – Information signs	7.9%	0%
Total		Frequency	140	129
Mean value = 2.12		% of Today’s information sources – Information signs	100%	100%

Please note: 1 = strongly applies; 2 = slightly applies; 3 = applies rather not; 4 = does not apply at all

Of the 140 people, 93 indicated ('strongly applies' and 'slightly applies') that they enjoyed learning about Rangitoto with the help of the information signs Furthermore, 19.4% (related to a population excluding the missing values) stated 'applies rather not' and only 8.5% indicated 'does not apply at all'. The results of the four answering categories lead to a mean value of 2.12 indicating that the visitors generally enjoyed making use of the info signs.

In contrast, the results for the guided tour are a little different. First it is most important to point out that of the 202 post-test candidates, only 14 chose to explore the island by tractor. This is just 6.9% of the underlying population. Therefore, it is questionable if the results (Table 6) make sense in this context, due to the very small sample size.

Nevertheless, 85.7% of people strongly or slightly agreed with the statement. Interestingly, nobody indicated 'applies rather not', but 14.3% stated that they did not enjoy the tour at all. It would have been very interesting to ask these visitors in what ways they did not enjoy their experience. The mean value for this analysis is 1.79, demonstrating a higher degree of enjoyment compared to the visitors who made use of the information signs.

Table 6: Cross tabulation for visitor's enjoyment with Fuller's guided tractor tour. The population (*n* = 14) is made up of those who indicated that they made use of the tour during their Rangitoto visit.

Visitor's enjoyment with the tractor tour			Today's information sources - guided tractor tour
I enjoyed learning about Rangitoto through the interpretive medium I have experienced	Strongly applies	Frequency	7
		% of Today's information sources - guided tractor tour	50.0%
	Slightly applies	Frequency	5
		% of Today's information sources - guided tractor tour	35.7%
	Does not apply at all	Frequency	2
		% of Today's information sources - guided tractor tour	14.3%
Total Mean value = 1.79		Frequency	14
		% of Today's information sources - guided tractor tour	100%

It is possible that the entire experience, the tractor ride itself, the service-oriented nature of the tour, the commentary and the areas independent hikers can not reach in their restricted time-span collectively positively influenced the result. Nonetheless, this all remains speculation with such a small sample size.

The analysis of the quiz, also lead to some interesting outcomes (Figure 34). In order to correctly analyse the knowledge gain between the two different groups (pre-group = control group and post-group = test group) the population valid for this statistical test needed to be identified. Therefore, the population is first made up of all the people who indicated (question A.2) that they had never visited the island before. This has been done in order to guarantee that the surveyed people are not familiar with the content of the information signs which would otherwise influence the outcome. Furthermore, the group has been split into two groups: Group A is made up of the people who were surveyed before they went to Rangitoto (pre-group), whereas Group B is made up of all the other people who were surveyed after their Rangitoto experience (post-group) and also indicated (question A.6) that they had made use of the information signs. As a result, of the 310 people who filled out the questionnaire correctly, only 167 people were considered for this test. In addition, the 'Missing values' have been excluded from the data analysis and all 'Don't know'- answers have been recoded into 'Wrong'.

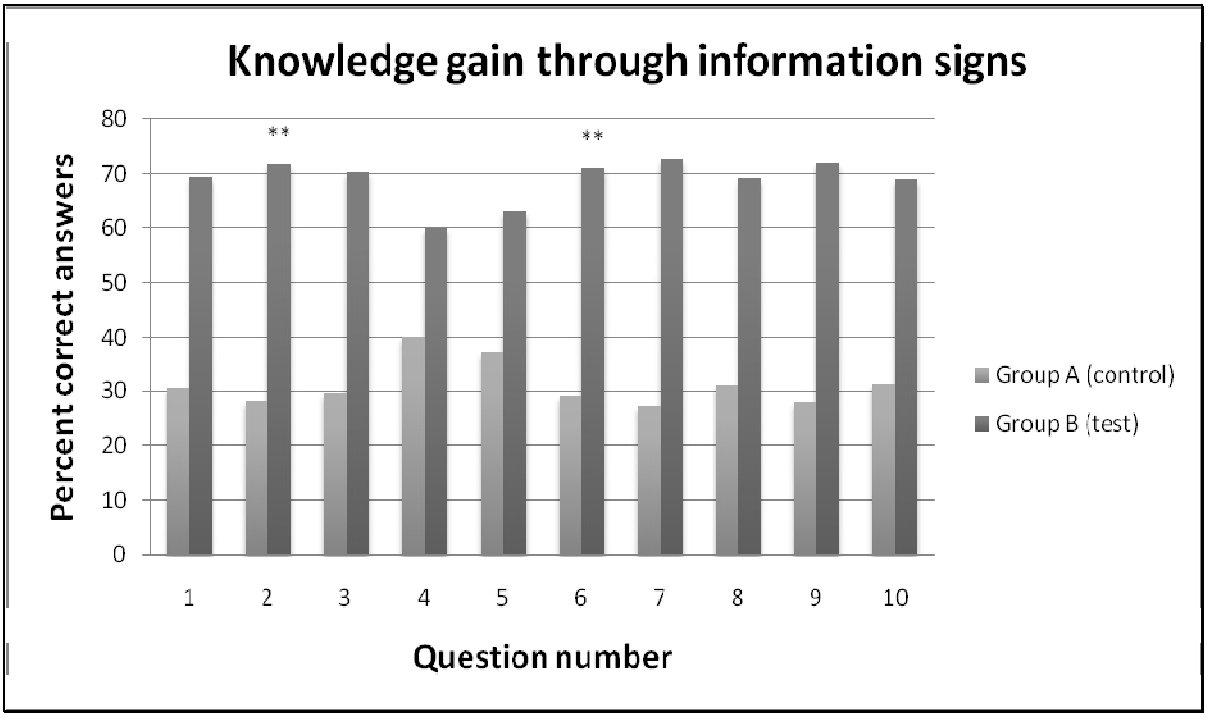


Figure 34: Knowledge gain through information signs: The proportion of correct answers for the pre-group (control group) and the post-group (test group) at Rangitoto Island. ** indicates that pre and post-group are significantly different. *n* = 167.

After these preconditions had been taken into account, the variables were cross-tabulated. In order to better illustrate the results of both groups, only the percentage of correct answers to the quiz questions has been visualised.

In general, the proportion of correct answers was higher in the test group for all questions. For two out of the ten questions (questions number 2 and 6), the difference between both groups is statistically significant[22]. The difference is particularly pronounced in question 1 (Δ=38.77%), 2 (Δ=43.48%), 3 (Δ=40.67%), 6 (Δ=41.9%), 7 (Δ=45.45%), 8 (Δ=38.2%), 9 (Δ=44%) and 10 (Δ=37.55%). The precise values including the p-values can be seen in Appendix C. At this stage, the author has to admit a cardinal error. In order to measure a knowledge gain, one usually has to compare results from one and the same person, prior to and directly after an experience. For logistical reasons, this study recorded pre and post-test data, but not from the same people. Therefore the knowledge gain results, although showing a general trend, are biased. A further discussion of this issue will be presented in the subsequent chapter.

In order to draw conclusions on the efficiency of information signs in comparison with the guided tour (Figure 35), the quiz results of those visitors who had never visited Rangitoto before and participated in the guided tractor tour (n = 10) needed to be compared with the visitors who made use of the signs. The result for question number one is revealing because none of the guided tour participants knew the correct answer. However, in seven out of ten questions, the proportion of correct answers was higher for the guided tour participants.

Another critical shortfall within this data presentation is that the group of non-returning visitors who did the guided tour was made up of only ten people. This is too few to actually compare this group with the other group. Therefore, it remains doubtful whether anything useful can be taken out of this comparison.

[22] Significance: In statistics, a result is called statistically significant if it is unlikely to have occurred by chance. In this case, it means that there is statistical evidence of a difference between the results of the test and the control group. In order to express how significant a correlation is, there are different levels of significance. In the Social Sciences, common significance levels are: $p > 0.05$ (not significant), $p \leq 0.05$ (significant), $p \leq 0.01$ (very significant), $p \leq 0.001$ (highly significant). For example, a 0.05 level of significance means that only in 5 percent of the entire population the correlation would have occurred by chance (Bühl 2008). The p-value for quiz question two is 0.034 and 0.024 for question six and thus significant on the 0.05 - level.

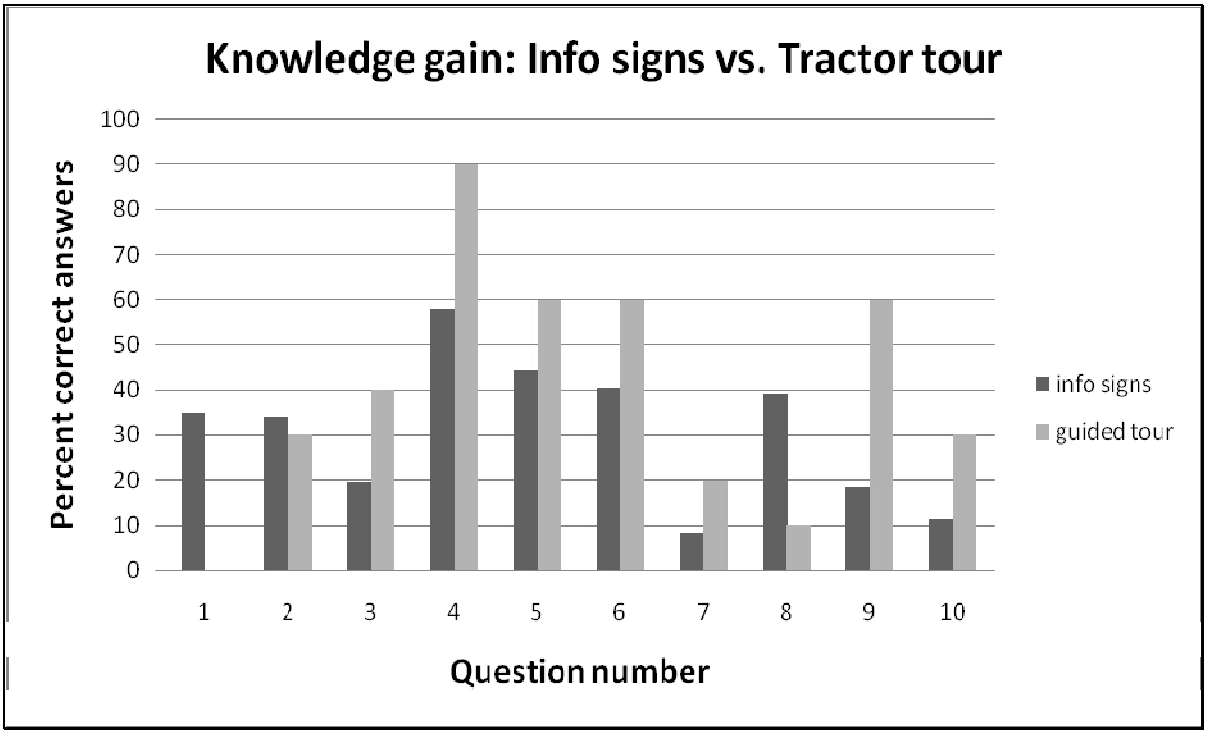


Figure 35: Knowledge gain: Info signs vs. guided tractor tour: The amount of correct answers for Rangitoto visitors making use of the information signs compared to those who made use of the guided tour.

At this point it is beginning to show that future research should address this shortfall by spending more time in the field in order to increase the sample size which would lead to more comparable results.

6.1.3 General Rangitoto knowledge

In an open-format question (A.9), visitors were asked what could be improved on Rangitoto. Of the 202 people surveyed, 72 responded with written answers on the questionnaire. As multiple responses were possible, the answers of the 72 respondents led to 86 statements. All of them have subsequently been categorised into the groups ‘infrastructure’, ‘on-site media’, ‘transport’ and ‘compliments’. Most of the answers concerned with issues of infrastructure (50%) and on-site media (31.4%). In addition, many people gave compliments (16.3%) to express the satisfaction resulting from their Rangitoto experience (Table 7).

Table 7: Visitors' responses (quantitative) on what they thought could be improved on Rangitoto. Multiple answers were possible.

What are your suggestions for improvement of the site?		Frequency	Percent
Infrastructure		43	50
On-site media		27	31.4
Transport		2	2.3
Compliments		14	16.3
Total amount of comments		86	100

The original visitor comments on 'compliments' were "it is beautiful as it is", "it was a very interesting learning experience", "the signs are very good", "DOC are doing an excellent job in protecting this amazing natural historical site", "it was a very interesting learning experience", "the signs are very good", "keep it as it is", "it is beautiful as it is" and "great track". Particularly the statements "it is beautiful as it is" and "keep it as it is" appeared several times. The 'transport' statements were "more boats to stay later at night" and "more ferries during the day".

The original visitor comments on issues of 'infrastructure' and 'on-site media have been collated in Table 8 and 9. Some of the comments have been found more than once, however, the analysis of this question only makes sense when analysed in a qualitative way. Repeated comments have been marked with an asterisk (*).

Table 8: Visitors' responses (qualitative) on what they thought could be improved on Rangitoto with regard to the infrastructure. Multiple answers were possible.

	Infrastructure
Sanitation	
Drinking Fountain*	
Long drop toilet facility at top	
More toilets*	
Track	
Better hiking trail*	
Make a track in the crater	
Rubbish	
More rubbish bins at summit*	
More messages to refrain from dropping rubbish including orange and banana skins	
More do not litter signs	
Emphasise no litter in boat commentary	
No smoking signs more prominent at summit	
To make the rubbish clearance easy, it would be great to have bins along the walking track, it was sad to see certain people throwing rubbish along the way	
Cultural/Natural	
Build a Maori reservation & sell Maori goods	
Protected bird sanctuary	
Recreation	
A couple more areas on the way down Rangitoto (the other side) to rest (not too many)	
Refreshment areas	
Picnic tables at the summit	
Restaurants	
Café	
View	
360° map at top*	
Telescope at summit	
Easy access to the roof of the concrete building at the summit so we can all enjoy the 360° views	

Within the infrastructure-category the comments have been ordered by content and sub-categorised into the groups 'sanitation', 'track', 'rubbish', 'cultural/natural', 'recreation' and 'view'. Comments such as "install a drinking fountain" or "more toilets" and "better hiking trail" were given several times. The most popular ones amongst all the comments were addressed in issues of littering (e.g. "more rubbish bins") and the wish for a 360° panorama map at the top of the volcano.

Table 9: Visitors' responses (qualitative) to what they thought could be improved on Rangitoto with regard to the on-site media. Multiple answers were possible.

On-site media
Brochures
Have information brochure available at bottom in waterproof case
Small information book
Guides
Guided walking tours discussing geology & plant life
Robot guides
Information signs
More information along route
The information signs could be less extensive and more comprehensive instead
Update the information signs along the track. More fun facts, not so boring
Need more information sign boards along the tramping track
All of the sign content was very basic
Give brief summaries
Upgraded signs
The information signs are a bit old and tired
Multi-lingual information signs*
Direction signs
More direction signs
Get walking times correct. Add maps to show the route
Content
At the summit there should be a sign pointing out the geography & names of all the islands and which way is north*
Photographic satellite map at top to show geographic locations towards view of city i.e.: other volcano
More information about history
More information about birds
More detailed information on notices
I'd like to see some labelled plants
Sign at bottom describing the exact terrain of the upward paths - it would help families with small children etc. i.e. whether or not to take a pram - we did but left it half way up because it was too rocky

Within the on-site media category the comments have been sub-categorised into the relevant interpretive media such as 'brochures', 'guides', 'info signs', 'direction signs' and 'content'. Comments such as "multi-lingual info signs" and "at the summit there should be a sign pointing out the geography names of all the islands and which way is north" were the most popular ones among the other answers.

6.2 Personal interviews

This section aims to introduce the interviewees and will reveal the results from the face to face interviews. Anonymity of the participants is not an issue at this stage because the data used to describe the interviewees cannot reveal their identity. However, all of the participants agreed to appear in this study with their first name, age and country of origin. The interviews were held with people who made different Rangitoto experiences: a young couple from the UK hiked the Summit Track in the morning and did the guided tractor tour at lunchtime, four middle-aged people from Auckland experienced a free guided tour with two knowledgeable guides during Auckland Heritage Week, two young Taiwanese students experienced an 'Ecotourism field trip' guided by their lecturer and based on experiential education,[23] a type of outdoor education appealing to the senses (hearing, smell, touch and feel), and a very motivated couple, also from the UK, who experienced Rangitoto on their own and hiked independently. In order to introduce commonalities and differences among the interviewees, the main outcomes of each interview will be introduced and interpreted. The detailed interview transcripts can be found in Appendix B3.

Mike (27) & Karen (27) from England (Interview on the ferry)

The young British couple were backpackers who were visiting New Zealand and the island for the first time. Highly motivated, they arrived on the first boat and hiked up the Summit Track without paying any attention to the signs. Mike stated that they were interested in gaining knowledge but explained "*we did not read them because we were too concentrated to walk up the stony ground.*" If this was their only reason to not spend attention on the signs or if they were simply not interested remains speculation at this point. In fact, the ground is very uneven and rocky but when reading a sign people usually do not continue to walk; they just take a short break from the climb. A logical explanation could be that the couple tried to not waste time because their previously booked tractor tour departed at lunchtime back down at Rangitoto Wharf. Mike and Karen, however, truly enjoyed their Rangitoto experience, particularly the independent walk and the views over the surrounding areas. As they "*did not have the time to discover everything on the island*" they are interested in returning to it.

[23] The German term would be "Erlebnispädagogik" or "Lernen mit allen Sinnen".

When asked for their suggestions for improvement of the site they came up with important constructive criticism containing the wish for "*more guidance and definitely an improvement of the safety. If something happens on the island there is no phone or man available to help*". Mike continues,

> "*we enjoyed the tractor tour and the good comments but there is a lack of instructions. For instance, when the guide gives us some time to explore the lava caves we would have appreciated to know if we are allowed to crawl into the dark caves or not. Moreover, I think for the tour price they should provide torches and helmets for the people who would like to explore the caves. Furthermore, they should give instructions for water and food. There is nothing available on the island. Why do they mention this on the ferry and not prior the vessel departs? [Karen:] Because they want to make money by selling their products on the ferry*."

Within this quotation, Mike pointed out three major issues: Safety, guidance throughout the tour guide, and the monetary side of things. Issues of safety are definitely a concern to consider: the ground is very rocky and one could easily be injured through the sharp edges of surrounding lava. In addition, the track is very rocky and one can easily twist one's ankle or disrupt one's ligaments. Throughout the field work, the author witnessed more than five people climbing down the summit limping with faces contorted with pain, one child cutting his fingers on exposed lava rocks and the author himself tore one of his ligaments during the data collection process.

Figure 36: Picture of the emergency sign and the wooden box where the emergency phone is usually located.

However, Mike's statement that there is no phone or man available to help is a little exaggerated. Usually, a DOC ranger is working on neighbouring Motutapu Island and there usually is a telephone in a wooden box in the information shelter near Rangitoto Wharf. This phone (Figure 36) has been installed for emergency cases, but paradoxically, the phone was not in the box for several weeks during the investigation. However, for the couple the most important issue was related to the price/performance ratio of the tractor tour:

Both interviewees were not very satisfied with what performance they received for the price they paid: torches to explore the dark lava caves, helmets for security reasons in the caves and clear instructions related to entering the caves were things both participants missed. A further criticism was that Fullers announces that food and drinks are unable to be purchased on the island only once the passengers are aboard the ferry, so that the only opportunity to acquire food and water is to purchase it on the vessel (Appendix C, captain's announcement). Economically speaking, this method might be a successful sales strategy but one which is surely not appreciated by Rangitoto visitors. In support of Fullers, it is to be noted that apparently only those visitors who undertake a very spontaneous trip run the risk of arriving on the island without sunscreen, food, water or a torch.

Those people who plan their trips more carefully take information from Fullers' brochure or their homepage where it is explicitly said "*make sure you take plenty of water, a hat, sun screen, snacks/lunch and sturdy walking shoes (some of the terrain is quite rugged). A torch may also be useful if you wish to explore the lava caves. Note that Rangitoto has no shops, so the last opportunity to buy food or drink is on the ferry*" (Fullers 2008).

<u>Bridget (52) & Hannah (49) from Auckland (Interview in the Bach Museum)</u>

Living in Auckland, both participants are familiar with Rangitoto, have been there before and would like to come back for another time. This time Bridget and Hannah came "*to learn about the island and especially the baches".* Having read the announcement in the Auckland Heritage Week brochure they both followed the invitation to a free guided tour with bach-culture specialist Susan Yoffe and botanist Mike Wilcox.

When asked about the information signs and to what degree they find them helpful in transferring knowledge, Bridget stated,

> "*I found them very helpful. Usually you see these things but do not know anything about it. Signs basically gave us the knowledge and I read them whenever a sign appears. It's just that my daughters [10 & 12 years old] do not like to wait for me because they find the signs quite boring*".

This sign appreciating quotation demonstrates a very important aspect of environmental learning: whereas specific age groups [people in her age] are highly interested in environmental learning and feel attracted by interpretive media, other age groups [e.g. teenagers] "*find signs boring*".

This implies that teenagers are not attracted by information signs, not attracted by their content, or both. In fact, the cross tabulation (Figure 30) of environmental issues and age groups (questionnaire) shows similar results: It shows that the 16-20 year old age group is much less interested in education compared to the age group of the 21-25 or 26-35 years old.

It would be a complete different study and is truly not the topic of this thesis but the question how young people can be attracted to environmental and cultural issues is worth asking.

However, when asked if the participants could state a preference for either information signs or a guided tour Hannah answered,

> "*I actually find it more helpful when you go on a guided tour because you can ask questions about the things you see. I like guided tours for that reason but I would not come over to pay NZ$30 or $40 just to go on a guided tour. [Bridget:] I think the tractor tour is too expensive, especially for a family*."

Once again, the later statement stresses Fullers' prize for the guided tractor tour. The prize for an adult is NZ$55[24] and $27.5 for children over five years. In fact, if a family with two children books a tour it would cost them $165 which is quite a considerable amount of money. Hannah continued,

> "*I actually quite like both [guided tour and information signs] and it is good to have more opportunities. If you choose to go on your own you can pick up the information from the signs or you can go for the guided tour if you want. Because we live in Auckland, I would rarely pay for a guided tour, but if I was from around the area I would probably be happy to come over and go for the tour. I am quite happy to bring my children over and go with them for a walk. Unfortunately, there is not much said about the baches but I can tell them at least a bit after the tour today*."

[24] This equates to €25.59 (exchange rate of the 22th October 2008).

In terms of a preference Hannah prefers a variety of interpretive media to a single medium. Indeed, recent research results have proven that there is "[…] a clear relationship between the number of interpretive experiences the visitor had and what the visitor took away from their visit. That is, the more interpretive experiences visitors were exposed to, the better the outcome" (Smith & Weiler 2008).

Norman (60) & Donald (57) from Auckland (Interview on the ferry)

Norman and Donald do also come from Auckland and visited the site for the very same reason (Auckland Heritage week). They both grew up with Rangitoto in their neighbourhood. Therefore, they have a good basic knowledge on its features. Norman stated, "*I know about the Maori history, where it is today, and other things I learned long time ago in school. There are always articles in magazines and newspapers about the island.*" When asked about the information signs he stated "I have never seen the information signs. My previous visit was before DOC got involved with managing the site [1960s]." Norman did also not experience the information signs on this visit because the guided tour only focused on the coastal baches.

Nevertheless, he enjoyed the guided tour very much, as *"it was very informative and the guide was knowledgeable about a lot of things."* When asked for a interpretive media preference Norman answered in a very professional way, stating,

> "*they all have their advantages and disadvantages. The guided tour is good because you hear and learn things that are not in the signs. Then again the guided tour is restricted in where they are going and you can not go off. The signs and the posters are good because it means that you can go at your own pace and choose to read it or not and move on to the next one. But I certainly enjoyed the guided tour*."

Norman's statement is close to the one Hannah made. He appreciates more than one medium and is not willing to rank them, because "all have their advantages and disadvantages". He also makes the point that it is important to have media in place which are addressed to people who do not want to be part of a captive audience and rather prefer to walk and gain knowledge independently. Norman likes the signs for this reason and for the reason that everyone can walk at his own pace. He criticises the spatial restriction every tour is subject to and also the lack of freedom to not walk independently. Nevertheless, he highlights his enjoyment resulting from the guided tour.

Tom (21) & Eric (25) from Auckland (Interview on the ferry)

Tom and Eric are two young Taiwanese students from the Auckland University of Technology who undertook a field trip to Rangitoto with their third year class on 'Ecotourism'. Their Rangitoto experience has been a complete different one compared to all the other people asked. Being a specialist in outdoor interpretation and an experienced tour guide, lecturer Jonathan Springs used a concept that should give his students an experience with all senses.

For instance, Jonathan split the group into pairs and blindfolded one partner of each group. The other partner had the task to carefully guide the classmate, allowing them to experience the volcanic environment in a very different way. In addition, Jonathan did not always stick to the path and sometimes the students found themselves in the middle of a lava field or in the forest of the island. The two students were quite excited about this kind of teaching. Tom said,

> *"I really liked to walk for a few hours on Rangitoto. This makes me feel more impressive about it. Everything I saw and I touched. This is much better than sitting in the class and listen to the lecturer. We can learn much more from that.*"

This quotation expresses Tom's appreciation for learning in non-formal settings. As a matter of fact, it is often the case that pupils, students and teachers favour a non-formal setting over a formal setting such as a school or lecture hall. (Kimmel 1999). Throughout the interview, however, Tom introduced his own interpretation of the trip's intention:

> "*I think this trip has two advantages: exercise for mind and body. First is the kind of knowledge we can learn from the field trip. You do not learn these kind of things in class. Here you can touch and you can smell. Second, we usually travel in our own cars or go shopping and I think this here is a good practice for your body and to increase your stamina*."

This quotation shows that also the physical part was important to Tom, which of course is always an important part of an ecotourism activity. When asked whether they prefer a tour guide or information signs, Tom stated,

> "*I prefer to be guided. Rather than just reading a brochure or an information sign, I prefer the guided tour to any other interpretive media. You can only read information signs whereas a tour guide can respond to questions.*"

Compared to the statements from the other interviewees, this quotation is the first one declaring the guided tour as the best medium. Eric agreed with Tom's definite preference for a guided tour and added,

> *"I think that you learn more from a guided tour. When you hike independently and read signs you might forget the knowledge you learned from this medium. In contrast, a guided tour offers a much deeper learning experience – one that is hard to forget*. *Through a guided tour a visitor can become a mindful visitor. This is more important than just learning from the media*."

Eric's statement emphasizes two points: First, he is convinced that a guided tour offers a deeper learning experience than other media do. He thinks that such a guide-related learning experience may result in knowledge people are able to install in the long-term memory ("deeper learning"). Secondly, he states that visitors can become "mindful" due to the influence of a guide. In this case, it is most likely that the term "mindful visitor" refers to a concept which has been introduced by Gianna Moscardo (1996). Her paper argued that "[…] interpretation can play a critical role in sustainable tourism by educating tourists about the nature of the host region and culture, informing them of the consequences of their actions, enhancing their experience and encouraging them to engage in sustainable behaviors" (Moscardo 1996: 378). Therefore, Eric's statement indicates that, besides the conveyance of factual knowledge, tour guides are the ones who can transport pro-environmental messages and provide interpretation aiming to 'produce' mindful visitors who are aware of environmental and cultural issues and are more willing to behave and act in a pro-environmental way than other tourists are.

When asked if they see Rangitoto as an ecotourism destination, Tom stated,

> "*I think so because it is a very natural place. One very important point is when it comes to rubbish. If you start to have garbage bins, than people would bring more rubbish to the island. And even without bins some people are already leaving their rubbish on the island. A very basic point is that we have to protect the environment."*

Within this quotation, Tom clearly expresses his concern for people littering the island. He stresses the point that people bring their rubbish and leave it on the island, although people are asked to take out what they take in. This observation goes along with the results from the questionnaire (A.9), in which many people share the same concern.

In contrast to the allowances for rubbish bins (A.9), Tom's statement explains why there actually are no rubbish bins and why it should stay this way: because it would attract people to bring and leave their rubbish on the island. Of course another factor is that it would attract unwanted animals which could disturb the ecosystem.

When asked for their suggestions for improvement, Tom said, "*we saw birds and trees but no signs naming the species. Thus people do not know these spectacular things but they should.*"

Once again, this statement supports the questionnaire results (A.9) in which people also indicated that they would appreciate more information on birds and labelled plants.

Patt (57) & David (59) from England (Interview at Rangitoto Wharf)

Patt and David are experienced travellers. The two farmers are happy to have spent time in America and South Africa and it took them a long time to finally travel to New Zealand. With regards to Rangitoto, the British couple are first time visitors on holiday. Friends of theirs who live in Auckland and their tour organiser in England recommended a trip to Rangitoto. Waiting for the return to Auckland Harbour at the wharf, the couple looked satisfied and relaxed when asked for an interview. Patt enjoyed the "good walk" and the spectacular views from the summit. Furthermore, she also found it highly interesting "to see the geographical features of an extinct volcano." As preparation, Patt read about the island in the Lonely Planet series. Once on the island, the couple made use of the posters and the info signs.

About the information shelter, Patt stated,

> "*the posters are very good. I think only from what we have seen they could be a little bit more informative about the state of the path because we saw one poor couple struggling with a baby pushchair and they had to leave it half way up. I think they could be a bit clearer as to what sort of path it is. But the information on the geographical features and the other things of interest are quite good."*

Once again, there is a desire for more information on the state of the path to avoid people thinking they could easily use a pushchair on their way up. When asked if they enjoyed the info signs Patt answered,

> "*yes, they are quite informative but not totally clear. Some of them could be a bit clearer probably explaining a little bit more about what you are actually seeing at a certain point. Particularly at the summit there could be something that says 'you are looking over certain extinct volcanoes or a certain island'. There is not even a north, south, east, west. I think*

> *something like that would be interesting at the top. Particularly for visitors it is easy to identify the city but not the islands and other features you can spot from the top."*

This sequence once again supports the often mentioned wish for a geographical map at the top, naming the surrounding areas. When asked for a preference of a medium Patt answered,

> "*you could have an audio guide but like going on a tractor tour you cannot ask questions. It is always so much better if you have somebody you can ask a question to and they can answer. So, if I had a preference it would be for a guide, but it is difficult then because somebody else is setting the pace. So, in a small group this would work. I think the signs I would prefer to somebody talking to me all the time because you can choose whether you read them or not and it gives you a pause on the way up. Furthermore, the signs are more cost-effective because everybody can use them for free whereas you have to pay for a guide. Thus, in terms of a ranking, first would be an individual guide, second would be the signs and third would be the tractor tour."*

This very skilled citation demonstrates that the British couple is familiar with the use of interpretive media. Formulated in a very clear and fluent way, there are certain commonalities with the other interviewees such as issues of pace, independent hiking, and price. A new aspect is that Patt separated the tractor tour from a guided tour because "you cannot ask questions" while the guide is driving. As a result, she ranked a guided tour (small group size, agreeable guide and fair price) first, directly followed by the information signs. The guided tractor tour was ranked last.

However, it became clear why the ranking question was answered in such a professional way when asked if they had experiences with other interpretive media:

> "*Well, being a teacher quite a lot: Films, books, talks, meetings and much more. I always think hearing somebody talk with visual images is more interesting and people tend to respond more. Especially youngsters like interactive things where they can have their hands on. I believe they are more interested in that. I do think interactive things help. We have got an underwater sea-centre which opened recently in the UK and there are lots of things where the kids can actually get their hands on and move and make happen. I think they learn more from that compared to reading things. They would not take the time to read the signs along the track. They would glimpse at the pictures but they would not read everything and take it in. You would probably almost need a little mini cinema, an I-Max, to attract youngsters. An educational facility like that would be nice and could be placed where the information centre is. But then you have got the problem to generate the power. Maybe you could then use eco-friendly solar panels*."

This quotation picks up the relation between informal learning and age of the learner for a second time. Whereas Hannah stated that her kids would find information signs boring and would not be attracted by them at all, Patt believes that interactive media are an appropriate mean to catch the youngsters' attention. Her suggestions for a practical implementation such as an I-Max or other interpretation facilities at the info shelter are interesting to consider.

However, when finally asked for their suggestions for improvement of the site, they answered,

> "*explain the state of the path more clearly to make sure that people do know what they walk on. I think this [the information shelter] could be set out a little bit more clearly and a little bit more to draw you in before you set off on the walk. To be honest, we walked straight past it this morning because we did not realise it was what it was. It is the balance between doing too much and spoiling what is natural here. You have to be careful not to do too much*."

The citation shows that the couple had been satisfied with their experience and they only wish a more precise explanation of the state of the path, an upgraded information centre and the installation of a map at the summit. Furthermore, the quote also emphasizes that a mature balance of doing something and doing too much must be maintained when it comes to the point where suggestions for improvement on Rangitoto find a practical implementation.

6.3 Tourist observations

The results from the tourist observations did not bring as rich data as done by the other methods. This was due to logistical problems and a lack of time for conducting field work. A very important outcome is that the method of measuring how much time visitors spend in front of a sign is quite difficult to apply in the field. Besides errors of measurement, stemming from the use of a stop watch and its user (reaction time), other problems became visible when research on Rangitoto was conducted: First, it was very hard to decide when to start and end a measurement. This is mainly because visitors do not just read a sign and move on to the next one. Most of the observed people discussed the signs with their friends or family. Some people even became so fascinated about the information signs that they took pictures of them. Whenever people interrupted the examination of a sign for one of the outlined reasons, the author stopped the measurement and abandoned the result.

Table 10: Presentation of the time visitors spend in front of the information sign -series on geology. The data was generated on the 11th November 2007.

***n* (visitors)**	**time [min]**
1	1:05:33
2	2:17:12
3	3:17:24
4	1:58:17
5	1:23:12
6	2:15:03
7	1:16:46
8	2:31:19
9	2:28:57
mean	2:03:45

Table 10 stems from observations at the beginning of the Summit Track, where the three signs on the geology can be found (Appendix A, p. 16). Those visitors (*n* = 9) who just focused on the signs, without an interruption, spend between one minute and six seconds and a maximum of three minutes and seventeen seconds in front of them. The mean for this information sign series is two minutes and four seconds. As there are only nine people who were observed, the value is not very meaningful. At this stage, another logistical problem can be clarified. More observed visitors[25] would have definitely led to more reliable results but when alone in the field, it is only possible to observe a certain number of people. To specify, when visitors start to hike up the Summit Track, there is usually a group of 50 – 400 people (depending on season and day of the week) on their way up. Some people just pass the signs, others read them and everything happens very quickly. After only ten minutes most of the people have passed the first information point at Summit Track and thus a second measurement is not possible for this group anymore.

Of course, there could have been more measurements with different groups on different days, but after the interviews and the questionnaire survey had been conducted there was hardly time left for a further investigation.

A similar situation (Table 11) applies to the observation of tourists (*n* = 4) at the sign on Rangitoto's flora and fauna (Appendix A, p. 18).

[25] Sample sizes less than 30 are for most of the cases considered to be too small (Reuber & Pfaffenbach 2005: 59).

The minimum time the four visitors spent in front of the sign was around twenty two seconds and the maximum at around one minute and twenty nine seconds, resulting in a mean value of almost one minute. Prior investigations found that visitors in general spend not more than a maximum time of twenty seconds in front of an information sign (Cole et al. 1997, in: Hughes & Morrison-Saunders 2002: 122). Although the author's sample size is too small to rebuke such a statement, the conclusion of Cole et al. appears to be doubtful and could be contested at this point. To do so would require further research in the field in order to have a more reliable data set ($n > 30$).

Table 11: Presentation of the time visitors spend in front the information sign on flora and fauna. The data was generated on the 15th November 2007.

***n* (visitors)**	**time [min]**
1	01:29:13
2	00:22:02
3	00:58:46
4	01:08:58
mean	00:59:45

Besides the time measurement, however, more general observations have been made too: with respect to the information signs, Rangitoto visitors can therefore be classified into those who…

… simply pass the signs and are not interested in sign-based interpretation at all (Type 1)

… read the signs in a very shallow way and spend less than the average time in front of a sign (Type 2)

… read the signs in depth, are very interested and keen to spend much more than the average time in front of a sign (Type 3).

7. Discussion

The responsibility of this section will be to link the results from the questionnaire survey, the face to face interviews and from the observations to the theoretical framework of the study. This will be done by reconsidering the research questions and hypotheses in context with the main outcomes of the study. In addition, this chapter gives scope for a critical review and discussion on the methods applied in the field. In turn, this will lead to the identification of sources of error and failures but also to suggestions for future research.

7.1 Rangitoto tourism: ecotourism?

Due to its natural character, Rangitoto Island can be viewed without any doubt as a good example of nature tourism. Focusing on the demand side, the results have shown that at least 40% of the surveyed population was made up of academics or academics to-be. In fact, the reviewed literature indicated that there is a strong correlation between ecotourists and their educational achievements. Possibly, the results would have been even stronger if the author would have asked for participants' level of education rather than just asked for their 'occupation'. From this point of view, one can say that the surveyed population is relatively well educated. In addition, with 62.6% of people (*n*=310) ranking 'education' as second highest important issue in a tourism context, one can say that education was a meaningful issue for many participants. At this point, it is of importance to note that the correlation between level of education and participation in ecotourism activities is of a statistical nature and shows general trends. It should not be interpreted in such a fashion that only visitors with a university degree can be ecotourists, acting in an environmentally conscious manner. There are of course academics, which do not even separate their rubbish or recycle and there are to be sure non-academics who are engaged in environmental organisations and are ecotourists when travelling.

With regards to the other issues, visitors found 'conservation' important, being ranked first with a high value of 76.1%. The category 'nature-based' came third (43.5%), followed by 'recreation' (42.6%). These three categories were also declared as the first three core criteria of an up-to date ecotourism definition (Donohoe & Needham 2006: 196). Interestingly, 'recreation' was ranked only fourth, putting even more importance on issues not related to visitors' personal enjoyment.

Besides the criteria listed, the questionnaire gave three more options to tick: 'low impact', 'development' and 'other'. Instead of using these in the questionnaire, it would have been much better to incorporate Donohoe and Needham's three remaining core categories such as 'sustainability', 'benefits to locals' and 'ethics, responsibility and awareness'. Particularly the latter is an important one, because of its potential to influence the individual and to foster pro-environmental behaviour.

Judging from the fact that Rangitoto visitors do possess a relatively high level of education and match the three highest ranked ecotourism core criteria, one could summarise that Rangitoto tourism can be classified as ecotourism. The very fact that the tutor of a university course on ecotourism uses Rangitoto as a case study to give his students a relevant experience only strengthens this argument.

But although Rangitoto tourism can be classified as ecotourism, one has to distinguish between deep and shallow ecotourism. This dichotomy became evident in the contrast between people who were more actively engaged with the use of interpretive media, and others, who interacted in a very superficial way.

Indeed, the fact that many visitors commented on people littering the site shows that some of Rangitoto's visitors did not even understand the basics of appropriate travel behaviour and are anything but ecotourists.

Furthermore, ecotourism is favoured for its potential to not only increase factual knowledge, but also to address pro-environmental messages to visitors that might positively influence their behaviour at natural sites. None of the media investigated specifically address this point.

Moreover, even if the relatively small annual visitation numbers of about 80,000 people (Wilcox 2007), also speak in favour of an ecotourism classification, fully defining Rangitoto tourism as ecotourism remains difficult. This is due to the complex nature of ecotourism and to the fact that this study only investigated the demand-side. An investigation of the supply-side (DOC & Fullers) would need to be carried out and critically analysed in order to give a more precise answer. Although it is known that DOC and Fullers share a mutual stewardship for the island and that DOC reinvests in the conservation of Rangitoto, more research needs to be carried out in order to gain knowledge that reveals in what ways both parties contribute to the conservation of the island. Without this knowledge, it is not possible to satisfactorily classify Rangitoto tourism as an ecotourism destination.

7.2 Knowledge questions

The quiz and the pre/post design have led to some meaningful results. Of the ten knowledge questions, the number of correct answers was higher in the post-group for all questions. For two out of the ten questions, the difference between both groups was even statistically significant. Therefore, the hypothesis 'The provision of interpretive signs on Rangitoto Island is helpful because visitors who make use of them gain knowledge of the site' can be verified.

Nevertheless, there are shortcomings to admit, which should be avoided in further research projects. First, the people in the post-group should be exactly the same people as in the pre-group. It was explained in the methods section why an implementation of such a design was hardly possible in the field. This was mainly for logistical complications which had become apparent in the pilot study. Nevertheless, it would have been more reliable to compare the quiz results from the pre-test and post-test from one and the same person. Results of this kind are more authentic than results coming from the applied design. In a future study, more thought would need to be given to how logistical problems can be solved while still keeping the research design.

Secondly, ten questions were too many for the participants. Although the results for the last three questions are still meaningful, it is likely that people tended to guess if too many questions are demanded. In addition, throughout the pilot study, three Rangitoto tour guides were asked to fill out the questionnaire. With one exception, all answered the ten questions quickly and correctly but indicated that some questions (7, 8, 9) were quite tricky. Therefore, it would have been better to leave these questions out in order to shorten the questionnaire. However, in terms of the possible responses ('right', 'wrong', 'don't know'), it was beneficial to include the 'don't know' – category. This is because the author is convinced that the option to answer 'don't know' kept people from guessing and thus led to more reliable results. Of course, there is always the risk that visitors might be dishonest when answering the questions but at least this is likely to be consistent between the pre-group and post-group.

Thirdly, although most participants were happy to fill out their questionnaire independently, some people, particularly couples, preferred to work in pairs.

In addition, some respondents even made use of their DOC or Fullers information brochure to answer the quiz. As this could be observed at both locations, however, the bias is likely to have balanced itself out.

With regards to a comparison between information signs and the tractor tour, the data shows that in seven out of ten cases the tractor tour led to a higher knowledge gain. Moreover, the level of satisfaction for the tractor tour (mean: 1.79) was higher than to the information signs (mean: 2.12). But, when considering that only ten out of 202 people were valid tractor tour participants (first time visitors without prior Rangitoto knowledge) it becomes clear that such conclusions need careful thought. Surveying more people who took part in the tour would be a necessity in order to have more valid comparisons between groups who made use of different interpretive media. Therefore, increasing the sample size of the tractor group by extending field work would lead to more reliable data and might be a point worth considering for future research. Hence, the hypothesis 'Visitors who participate in a guided tour have a higher level of satisfaction and a higher knowledge gain compared to visitors who make use of information signs can neither be proven nor disproven at this stage.

7.3 Suggestions for improvement

This section wishes to inspire those people who are managing Rangitoto Island and are bringing tourists to the site. It considers all the useful comments visitors who participated in the survey and in the interviews left. Therefore, these results can be seen as a first response to the work the Department of Conservation and Fullers have done. Before giving this response, the author wishes to acknowledge the amount of time, work and money DOC and other groups have invested to support what Rangitoto is today – a beautiful and unique island in the Hauraki Gulf, opened up for domestic and international tourism. The sheer number of compliments that were made by New Zealanders and tourists from all over the world only underline this. Therefore, the author hopes that the suggestions will be understood in a constructive way.

First, the interpretive-media specific suggestions for improvement will be discussed, as this is central to the study. Secondly, all other useful comments visitors made will be discussed.

7.3.1 Information signs

The information signs are a very good medium to inform people about the environmental and cultural features of Rangitoto. The fact that 69.3% (*n* = 210) of visitors made use of them and that 72.1% of this population enjoyed using them verifies this statement. The results from the knowledge gain only strengthen this aspect.

Nevertheless, there are suggestions for improvement to be considered. Many comments were directed at the content of the signs: “update the info signs along the track”, “all of the sign content was very basic”, “the info signs could be less extensive and more comprehensive instead”, “multi-lingual info signs”, “give brief summaries”, “upgraded signs”, “the information signs are a bit old and tired”, “more fun facts, not so boring” were some of the comments that addressed this issue.

As the signs are quite old, maybe twenty years old, there should be a discussion if they are still appropriate or need an update. In this context, ‘old’ does not mean that everything old has to be replaced simply because of its age, rather it refers to the fact that interpretation research has brought new insights into media which should find an implementation at visitor sites. There are supportive publications and handbooks on the design of ‘the perfect sign’, stemming from recent academic investigations and planning institutions (often indoor publications). Good examples of these are the ‘Guide to the Design and Assessment of Marine Educational Signage’ (Lassiter 2007) or the ‘Parks Interpretation Strategy’ of the Auckland Regional Council (2004).

However, the desire for multilingual signage has been stated several times. Although English is the ‘world language’, some people were neither able to understand the sign content nor to fully participate in the survey. This particularly applied for people of Indian and Asian origin. Of course, it is not possible to translate all of the sign content into two or three other languages, as this would lead to very large sign dimensions. Nevertheless, maybe there could be basic summaries for each information sign in different languages. This would ensure that more people understand the content and give respect to the culture of the visitors.

Another theme of comments such as “more information along route”, “more inquiries about the history”, “more info about birds”, “more detailed information on notices” and “I'd like to see some labelled plants” addressed the wish for more information. In this case, “more information along route” could mean the same as given in one of the face to face interviews where a participant stated *“[the signs] are quite informative but not totally clear. Some of them could be a bit clearer probably explaining a little bit more about what you are actually seeing at a certain point.”* The meaning of this quote becomes very clear when standing in front of the three signs on volcanism (Summit Tack), where the Auckland volcanic field and the emergence of volcanism (i.e. plate tectonics, magma currents) is explained in general terms but

Figure 37: The sign on the Kowhai tree is a good example for interpretation close to the object and should be used as a forerunner model for more signs explaining flora and bird life.

nothing is mentioned about the surrounding lava fields, different types of volcanic rocks and what visitors can observe at this point. Therefore, there should be a sign explaining the landscape and all the elements people can spot at this specific point.

The desire for more information about birds and labelled plants were detectable in the survey and interview results. The quotation “*we saw birds and trees but no signs naming the species. Thus people do not know these spectacular things*

but they should" clearly expresses why and how DOC could answer to this wish: There is one good example (Figure 37) on the island which demonstrates a cost-effective response. The sign on the Kowhai tree has been placed adjacent to it and explains everything visitors need to know in a didactically simplified way. Such small signs should be installed at various spots in order to explain the native bird life as well as other prominent plants such as pohutukawa, northern rata and other elements of Rangitoto's flora.

With regards to Maori history, there were only two comments addressing the wish for more information. Nevertheless, the author considers this to be an important aspect. As the interpretive media mainly consider natural and European history, pre-European history is clearly underrepresented. This uneven distribution of knowledge might be due to the fact that more than one Maori *iwi* claim a relationship with Rangitoto. Although it is widely acknowledged that the Ngai Tai have the strongest associations with the island (Wilcox 2007), the Department of Conservation has not installed a sign on the Maori associations with the site to date. The presence of such a sign would enable visitors to learn more about the history of settlement and the full history of Rangitoto and neighbouring Motutapu Island. Particularly because New Zealand does not have as long a recorded history as most European countries have, this early history would be an enrichment, making cultural heritage more accessible to visitors.

A last but crucial point is the need for the installation of a sign at the summit pointing out the surrounding areas and places of interest. This was by far the most repeated comment. This desire is understandable, as the summit offers a spectacular 360° view, stretching over the surrounding islands and the mainland.

Figure 38: Panorama picture taken from Rangitoto Summit showing Browns Island, several volcanic cones, Auckland's North Shore, Auckland City with the Sky Tower, Auckland Harbour Bridge and much more. Source: Panoramio 2008.

The panorama picture (Figure 38) only shows a very small part of what visitors can see when they have reached the top. Although this view offers a fantastic interpretation opportunity, there is nothing explaining the environment, "*particularly at*

the summit there could be something that says 'you are looking over certain extinct volcanoes or a certain island'. There is not even a north, south, east, west. […] something like that would be interesting at the top. Particularly for visitors it is easy to identify the city but not the islands and other features you can spot from the top."

Stemming from an interview, this quote summarises perfectly what is missing. One answer to this lack of information would be a large sign displaying an eye-catching and geographically correct map of the Hauraki Gulf from a Rangitoto

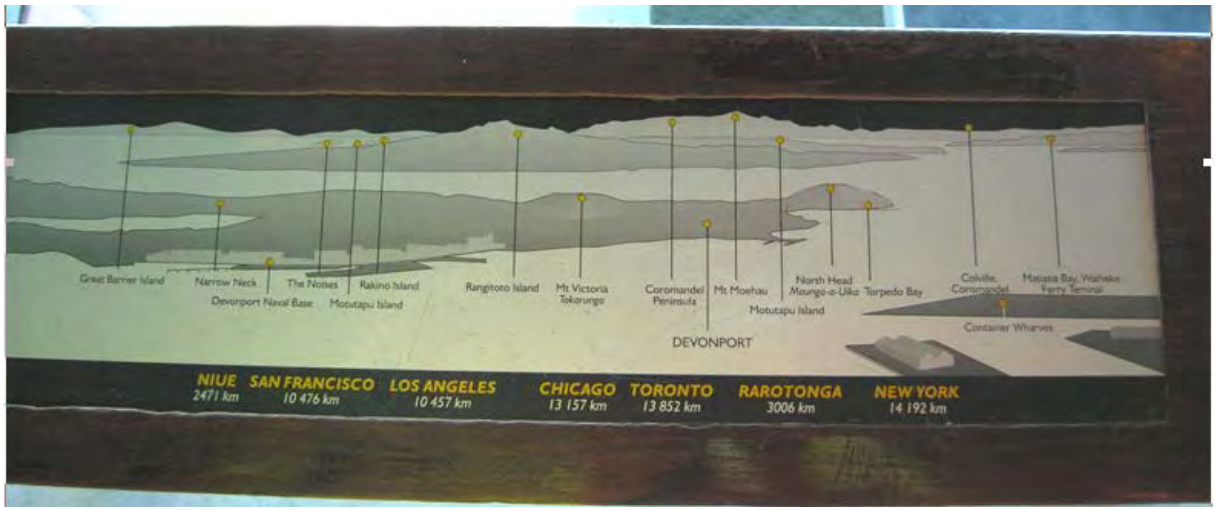


Figure 39: Example of a panel effectively locating points of interest that can be seen from the Observation Deck at Auckland Sky Tower.

perspective. Another response to the comments could be a sign for each direction pointing out what exactly can be seen when standing right in front of it. An existing example of this can be found at the Sky Tower Observation Deck (Figure 39). The observation deck offers panorama views for each angle and each perspective is accompanied by its own sign. Something similar on Rangitoto would be an appealing solution to give visitors an orientation over the points of interest surrounding Rangitoto.

7.3.2 Information centre with posters

The questionnaire comments such as "drinking fountain", "more garbage bins" or "there is no phone or man available if help is needed" give evidence that people did not really read the information posters at the information centre. The posters clearly explain that there is a drinking fountain providing people with fresh water, that it is DOC's intention not to have rubbish bins because they want visitors to take out what they bring in and that there are ways to cope with cases of emergency.

In fact, the questionnaire results indicated that only 19.3% of visitors made use of this facility, whereas over 80% ignored it. The interviews, however, have shown that there is need to direct visitors' attention to the information shelter in order to provide more people with important details.

> *Patt stated "I think this [the information shelter] could be set out a little bit more clearly and a little bit more to draw you in before you set off on the walk. To be honest, we walked straight past it this morning because we did not realise it was what it was."*

Figure 40: Information shelter at Rangitoto Wharf.

To attract visitors to this shelter (Figure 40) would be a challenging task but one worth undertaking. In addition, one should not forget that this part of the infrastructure has considerable future potential to increase interpretation on the island. In order to attract age groups who are not interested in the signs because they appear too 'boring' to them, this shelter could offer a possibility to engage youngsters with more hands-on informal education. In this respect a teacher from the UK introduced an attractive idea:

> *"Especially youngsters like interactive things where they can have their hands own. I believe they are more interested in that. I do think interactive things help. You would probably almost need a little mini cinema, an I-Max, to attract youngsters. An educational facility like that would be nice and could be placed where the information centre is.*

But then you have got the problem to generate the power. Maybe you could then use eco-friendly solar panels."

Although this idea might be seen as over-optimistic and most notably very cost-intensive in the implementation it is of value to consider, particularly because nowadays interactive media play an important role in product interpretation.

7.3.3 Guided (tractor) tour

With regards to the tractor tour, most people enjoyed their experience (mean 1.79). At the same time, it is remarkable that only 14 out of 202 visitors took part in the tour. A reason for this could be the fact that nearly half the visitors were New Zealanders, who often hold the view that 'doing things on your own' is the 'do best approach'. Therefore, one would not expect to find a New Zealander with good hiking experience amongst international visitors doing a tractor tour.

Another reason that has been mentioned in the interviews was the tour price. *Bridget and Hannah from Auckland stated "I like guided tours […] but I would not come over to pay NZ$30 or $40 just to go on a guided tour. I think the tractor tour is too expensive especially for a family*." Fullers could address this issue by lowering the tour price. This would attract more potentially also international visitors to participate in the tour and make the tour more profitable for the company in the long run.

Besides the cost aspect, there were issues of safety and instructions: A young English couple stated "*we enjoyed the tractor tour and the good comments but there is a lack of instructions. For instance when the guide gives us some time to explore the lava caves we would have appreciated to know if we are allowed to crawl into the dark caves or not. Moreover, I think for the tour-price they should provide torches and helmets for the people who would like to explore the caves."* Indeed, best response to this comment would be the provision of torches and helmets along with more clear instructions coming from all operating tour guides.

With regard to guided tours in general, all the interview participants who were guided (university field trip, Heritage Week tour) truly enjoyed their tour and ranked them very highly against the other media. Consequently, visitors stated their desire for permanent guided tours on the island on specific issues. The comment "guided walking tours discussing geology & plant life" is only one example which could find future consideration.

The guides the author had the fortune to made contact with would be perfect candidates for more permanent guided tours explaining plant and bird life (Mike Wilcox), the bach history of the island (Susan Yoffe), or the natural and geological history (Jonathan Springs) of the area. Each of the guides has special knowledge and an ability to capture the interest of tour participants.

For instance, in a month there could be three topic-oriented tours focusing on special issues. These tours should be provided for an appropriate amount of money that is affordable to everyone. As the Heritage Week tours specifically were mostly attended by locals, this would also address their demand for more, different guided tours on the island.

7.3.4 Brochures

In terms of the information brochures, visitors indicated that they would appreciate to have more information brochures available at Rangitoto Wharf in a waterproof case. A waterproof case has been installed at the information shelter but apparently it was empty when the people who made this comment visited the island. A solution for this could be that people who regularly work on the island (DOC rangers, Fullers guides) could ensure that there are more brochures available. Another visitor expressed the desire for a ‘small info book’. In fact, there is a variety of brochures available which put together could lead to a small book:

There are brochures addressing…

- The Prison Camp (Rangitoto Island Historic Conservation Trust)
- Historic Baches (Rangitoto Island Historic Conservation Trust)
- Vegetation & flora (Auckland Botanical Society)
- Multiple topics (Fullers)
- Multiple topics (DOC)

However, there is no brochure explicitly dealing with the geology or the Maori associations with Rangitoto. Although the brochures of Fullers and DOC are quite informative and attractive to look at, the content of the other brochures, as they give more detailed information, should also be available for everyone. Nevertheless, it remains a matter for debate if the content of all the brochures should be brought together into one larger document or if the variety of separate brochures should continue. Given that everybody willing to travel to Rangitoto is aware of this variety and able to collect different brochures at the ferry terminal, on the vessel or on Rangitoto, the author prefers this approach to a single, compiled medium.

7.3.5 Other suggestions

There are three issues of note to consider within this section, namely visitors' desire for more toilets – particularly at the top of the island ("long drop toilet facility at top") – more resting places and not to forget issues of littering. The latter received most of the comments such as "more rubbish bins at summit", "more messages to refrain from dropping rubbish including orange and banana skins", "more do not litter signs", "emphasise no litter by boat commentary", "no smoking signs more prominent

Figure 41: Rubbish left on the island - just one example for inappropriate visitor behaviour.

at summit". The issue of placing rubbish bins has already been discussed in the results chapter but it is important to put an emphasis on the other comments. More do not litter signs or a better positioning of these signs could be one way of discouraging people from littering the island leading to scenes such as Figure 41.

While the signs are explicit and directly address the issue, they might not be seen by everyone. This point is more understandable when considering that Figure 42 shows a small sign which is positioned at least ten metres away from the track.

Besides the signs on the island, the same strategy should apply for the brochures. They gently request the obedience on issues of littering and others but these requests become lost among the amount of other information. Designing signs and brochures in a more appealing and eye-catching way could improve the situation.

Figure 42: 'Remove rubbish' sign on Rangitoto.

In addition, one visitor proposed emphasising these important issues in the boat commentary. This is definitely a good idea to think about. Emphasising these aspects and others[26], through a better positioning on-site, in the brochures and by boat commentary, could positively influence the status quo.

[26] Further aspects are:
- Dogs and cats are not allowed on the island
- Open fires are not allowed
- Walking off the marked tracks is forbidden
- Picking up natural features (e.g. plants or lava rock) or cultural artefacts is not allowed
- Leaving rubbish is forbidden
- No firearms, no camping, no mountain bikes.

Turning to infrastructure issues, people asked for “a couple more areas on the way down Rangitoto (the other side) to rest” and for “refreshment areas” and “picnic tables at the summit”. When considering such issues, it is noteworthy that one has to carefully balance maintaining what is natural on the island with what should be improved. This particularly applies for comments asking for picnic tables, more toilets or even cafés.

However, one worth considering point is the provision of more resting areas along the Summit Track and the alternative routes from the summit to the wharf. Especially in summer, the sunrays directly hit the ground and heat up the black volcanic rocks, leading to an intense warming of the island. As a result, one can become exhausted from walking quite easily. This particularly applies to families with children and older visitors who are not frequent hikers. Giving these people more opportunities to rest, preferably in a shaded place, would certainly make their experience even more pleasant.

7.5 Limitations

Before ending the discussion chapter, the author wishes to outline the limitations intrinsic to this study. First of all, it is important to reconsider that field work took place from the end of July to the middle of November and thus outside of the peak visitor season. In terms of the sample sizes for all of the applied methods, it would have been more profitable to start research in November and end in February as these months best represent the New Zealand summer, when visitation numbers reach its annual maximum. Nevertheless, due to the temporary restricted nature of an academic year overseas it was not possible to use this period of time, leaving the five months in the low season. As a result, fewer people participated in the research, whereas higher sample sizes (e.g. $n>500$) would have led to more significant results particularly for the comparison (i.e. knowledge gain measurement) between visitors who made use of the information signs and those who participated in the tractor tour.

Another aspect which might also have affected the results is that visitors from 26 nations participated in the survey. Therefore, the study might be biased regarding cultural differences and linguistic problems some participants might have had when they filled out a questionnaire.

A further noteworthy point is that although the author himself is familiar with the English language, he is not a native speaker. As a result, he might not have understood everything either.

This fact became apparent when a participant indicated that one possible option to question A.1 ('Please indicate your main reasons for a visit') did not match the New Zealand idiom. To specify, instead of using the term 'hiking', which is not a well known term in New Zealand, it would have been better to use the term 'tramping' or simply 'walking'. Nevertheless, the author tried his best to carefully prepare the interview questions and develop the questionnaire.

According to the questionnaire, there is also the suspicion that the Participant Information Sheets (PIS) might have influenced the participants and thus biased the survey results. Because they informed visitors of the purpose and object of the study before participants filled out the questionnaire, this argument is justified. The author, however, tried to formulate these sheets in an objective way that would not influence the survey participants. But still, possibly the participants tended to answer in a more pro-interpretive media manner than they would have answered without this knowledge. Nevertheless, in New Zealand, information sheets are a necessity when conducting research involving human participants and are just one element of an ethics application (Appendix B1 – B2).

7.6 Future research

In order to add further knowledge to the results of this investigation, this section seeks to address new aspects for future research. First of all, it would be interesting to find out what DOC and Fullers think about the hypothesis that Rangitoto tourism is ecotourism. This would add a supply-side dimension to the study, necessary to prove or disprove the assumption. This could be done, for instance, by interviewing key players who are engaged with Rangitoto as a tourism product and Rangitoto as a conservation site. In this regard, it would also be interesting to uncover the monetary side of things. To specify, it would be important to find out how much of the tourism revenues are reinvested for the conservation of the site, how much of the money visitors can donate via donation boxes on Rangitoto flows back into conservation, if money from the DOC concession, purchased and periodically renewed by Fullers, flows back into the upkeep of the area and if Fullers itself reinvests some of its own revenues for the conservation of the island.

In addition, it would be interesting to present to DOC and Fullers the results of this study and to discuss their views on the suggestions for improvement. Thinking positively, one could also presume that there is room for cooperation between the different involved parties, with the common aim of putting some of the findings into

practise. This would be a desirable subsequent outcome because the aim of the improvements section has been to support the conservation work and thus a sustainable form of tourism on Rangitoto.

Secondly, further research must learn from the mistakes the author made within his study. To specify, there should be higher sample sizes for all questions in order to receive more significant results; a knowledge gain should be done with pre/post-group pairs consisting of the same people; research should be undertaken in peak season and the questionnaire should find a little modification based on the shortcomings detected.

Last but not least, it would be very interesting to have results stemming from a measure of behavioural change. In contrast to measuring a knowledge gain, this measurement requires a long-term study. Results of this kind could be able to prove or disprove whether and in what ways an increase in factual knowledge influences visitors' attitudes and behaviour towards the environment.

8. Conclusion

The overall purpose of this study was to examine and compare different interpretive media at Rangitoto Island (Auckland, New Zealand). A further aim was to characterise tourism at Auckland's marine volcano through recorded demographic knowledge. In total, four interpretive media were investigated, representatively information signs, a guided tractor tour, posters at an information shelter and temporary guided tours. The major aim was to determine what media were used most, how much visitors learned from them and if they could state a clear preference for one medium.

This was done by conducting a questionnaire survey (n = 310), personal interviews and tourist observations. Following this methodological approach enabled the author to operationalise the outlined aims leading to many interesting outcomes. Most clearly, there is an increase in knowledge (for those who made use of the information signs) from the pre-group to the post-group of at least 19.8% for all ten questions in the questionnaire section. Furthermore, with 69.3%, the information signs were ranked first as the medium visitors used most. Interestingly, the guided tour was booked by only 14 out of 202 (6.9%) of participants and thus a comparison of the knowledge gain between both post-groups (information sign vs. tractor tour) remains marginal for such a small population. In terms of a preference of a medium, many people appreciated the information signs because they allow the visitor to see what they want, to walk at their own pace, and to give as much information as the visitor needs.

Nevertheless, interview participants who participated in guided tours stated a clear preference for them, mainly because they allow interaction between the participant and the guide – usually a treasured and unique feature of guided tours.

Alongside other results, the recorded knowledge revealed further interesting aspects: with almost half of the visitors (44%) being of New Zealand origin, Rangitoto Island is clearly an important destination for both domestic and international tourism. Further demographic data such as age, profession and gender brought more insights characterising Rangitoto's visitors. One of the most important results in this respect was the attempt to detect how environmentally conscious the participants were.

Using an ecotourism working definition to find out if principles of an up to date definition coincide with what visitors found to be most important in a tourism context led to the following results: in terms of a ranking, 76.1% of the survey group (*n* = 310) and thus 236 people made “conservation of nature” the number one topic. Furthermore, “education” also reached a high frequency of 62.6%. With 43.5%, third position was occupied by the category “nature-based”. Interestingly, these three categories are also amongst the first three core criteria of the ecotourism working definition. Nevertheless, respondents to the survey and participants in the interviews commented on visitors littering the site. This leads to the natural assumption that not all visitors have a pro-environmental attitude. Moreover, these results basically stemming from the tourism demand-side, are too one-dimensional and thus insufficient to fully characterise Rangitoto tourism as ecotourism.

With regards to suggestions for the improvement of the site, 86 visitor statements from the questionnaire and about a dozen statements from the interviews provide a very good basis to address issues of infrastructure, transport, and on-site interpretive media. These comments give valuable insights of what could be improved on Rangitoto and can thus be seen and should be understood as a first response to the work Fullers and the Department of Conservation have carried out on Rangitoto. Results of this kind are crucial to guarantee and improve the sustainability of Rangitoto tourism. Of most value were the comments targeted at the interpretive on-site media. Further discussion of these comments is desirable because after all, „if one sees tourists as playing a central role in the creation of more sustainable tourism, then effective interpretation […] can make a substantial contribution to the sustainability of tourism” (Moscardo 1996: 393).

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Appendix A

Unless stated otherwise, all figures and photos are the work of the author.

Rangitoto Island - visitors

Below: Visitors entering and leaving the island via ferry boat

Right: Tourists walking the 900m board walk to the summit

Rangitoto Island – visitors

Left & above: Tourists walking the popular Summit Track

On-site interpretive media

Guided tours

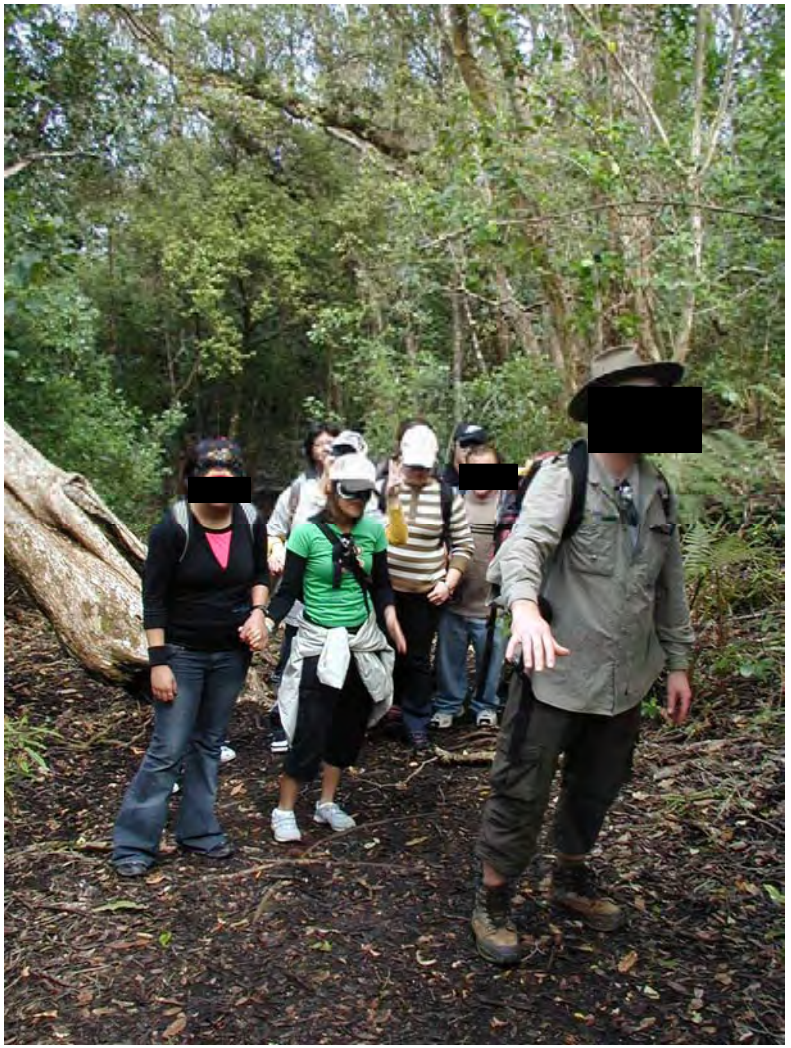
On-site interpretive media: Guided Tours 1

Left: Auckland Heritage Festival brochure cover. Source: Auckland City Council

Above: Ms. X and Dr. Y guiding visitors on Rangitoto **Below**: Rangitoto tour announcement (from festival brochure)

Rangitoto Island: Bach and prison camp tour **Free**
Sun 16, Wed 19, Sat 22, Wed 26 and Sun 30, 10am and 1pm
Join a free guided walk around archaeological sites in the Rangitoto Wharf area. Learn more about the history of the island's baches and finish at the bach museum. Gold coin donation appreciated, plus discounted ferry fare. Meet at the Department of Conservation information shelter to the right of Rangitoto Wharf.

On-site interpretive media: Guided Tours 2



Field trip with university students from the class on "Ecotourism", guided by Mr. Z (AUT)

On-site interpretive media: Guided Tours 3

Right: Fuller's guided tractor tour stopping in a lava field.

Below: Visitors to Rangitoto.

On-site interpretive media

Information shelter

On-site interpretive media: Information Shelter

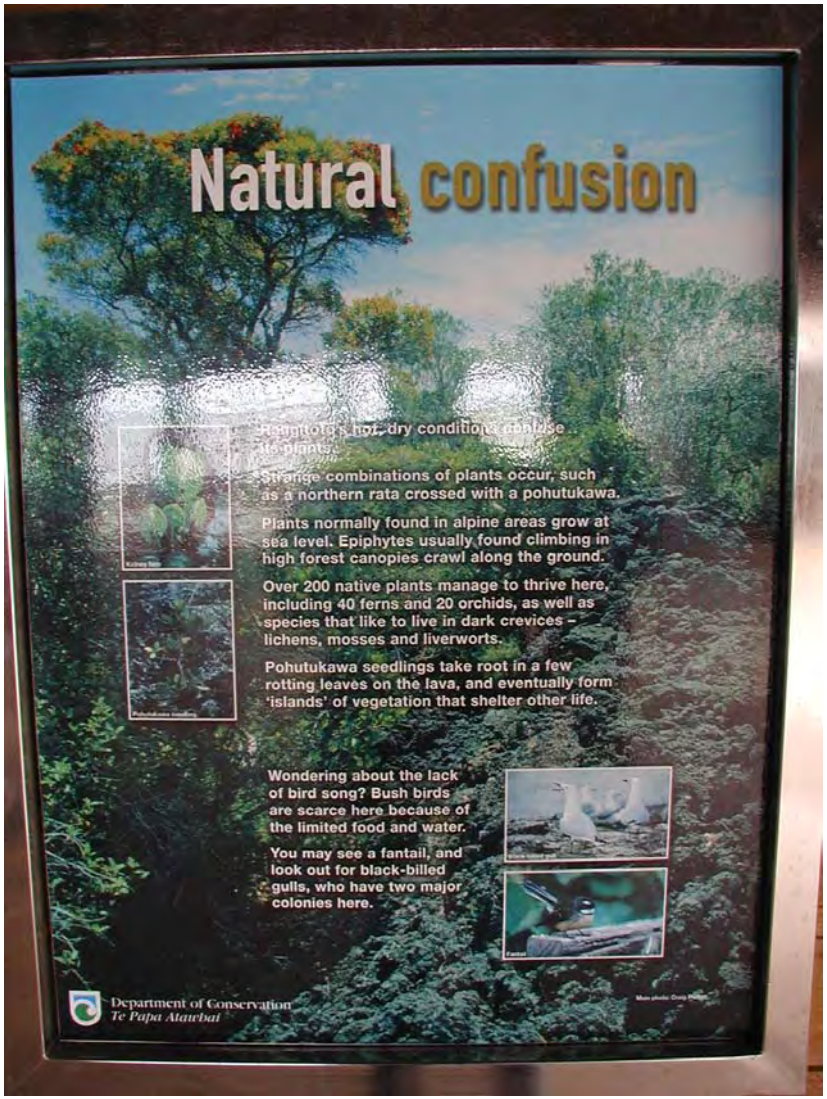
Below: The information shelter at Rangitoto Wharf offers important information to visitors

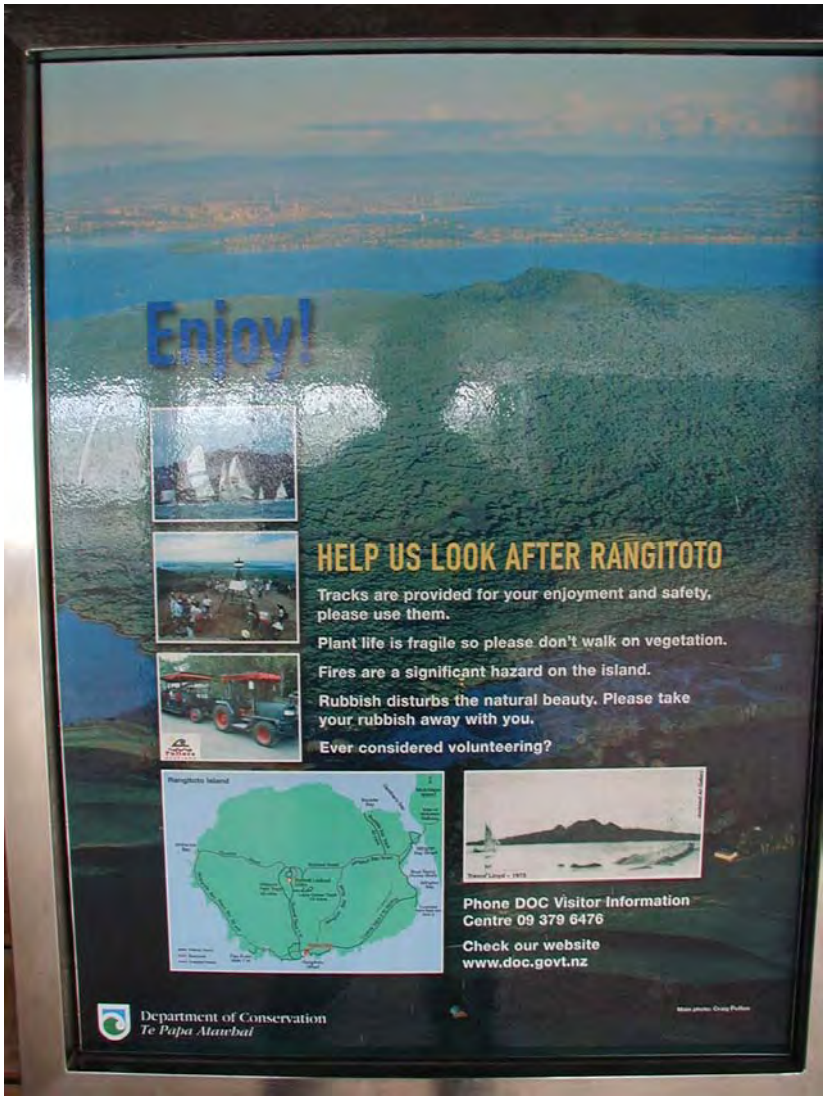
Left: Welcome poster

On-site interpretive media: Information Shelter posters 1

On-site interpretive media: Information Shelter posters 2

On-site interpretive media: Information Shelter posters 3





On-site interpretive media: Information Shelter posters 4

On-site interpretive media

Trail-side interpretive signs

Trail-side interpretive signs 1

Right: Interpretive signs on mangroves and other Rangitoto curiosities

Below: Signs on cultural features such as the local and unique building style [Bach culture]

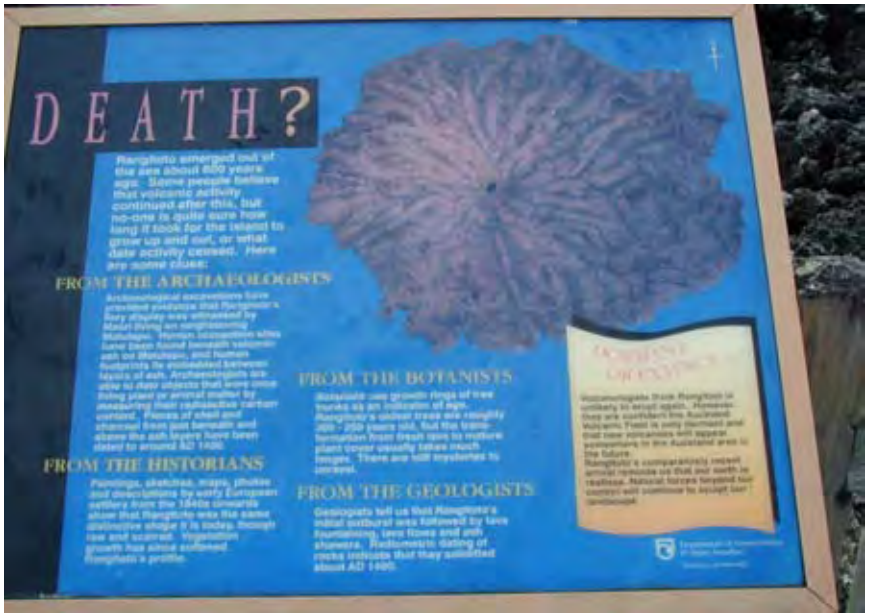
Pictures were taken near Rangitoto Wharf/Coastal Track

Trail-side interpretive signs 2

Every day, visitors read the signs along the Summit Track.

This three sign-element is located at the lower part of the summit track and explains volcanism.

Trail-side interpretive signs 3



From general knowledge to the specific:

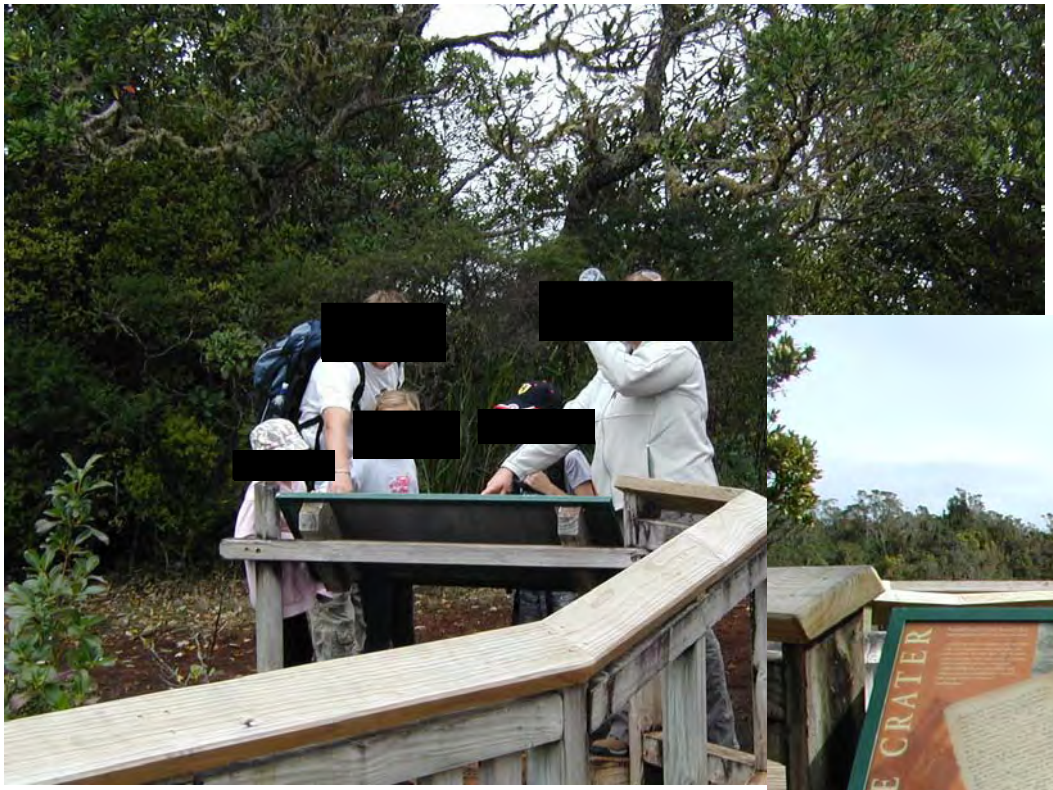
The signs start by explaining the basics of volcanism, before focusing on the Auckland volcanic field and Rangitoto in particular.

Trail-side interpretive signs 4

Left: This sign is located at the upper part of the Summit Track and points out the special features of Rangitoto's vegetation.

Below: DOC has also installed signs giving direct appeals to visitors. This particularly applies to rubbish. There are no bins on Rangitoto and thus visitors are requested to "carry out what [they] carry in."

Trail-side interpretive signs 5



Above: Learning about Rangitoto can be an enjoyable experience for the whole family.

Right: This sign is located at the volcano's crater where a wooden platform allows wonderful views into it.

Trail-side interpretive signs 6

Right & Below:

The last two interpretive signs consider the military history of the island.

They are located in an old building at the summit of Rangitoto.

Interpretive sign along Kowhai Walk

There is one more interpretive sign on the island. It can be found along Kowhai Walk. The sign emphasises the interesting Kowhai plant.

Off-site interpretive media

A few selected media

Auckland Museum

Left: Since 2007, Auckland Museum has been the host of a permanent volcano exhibition. A highlight of this exhibition is a mock coastal property visitors can sit in while simultaneously experiencing a dramatic eruption close to Rangitoto.

Some visitors to Rangitoto indicated in the questionnaire that they gained knowledge about the area from the exhibition.

Right: This footprint, preserved in ash and found on Motutapu, bears witness to the presence of Maori at the time of Rangitoto's emergence.

Interactive Display at the Sky Tower Observation Deck

Left: Auckland's Sky Tower. Source: www.skycityauckland.co.nz.

Below: An interactive display on the tower's observation deck explains all the features in sight, in this case Rangitoto.

Above: View from the 360° Panorama Deck towards Rangitoto Island and Auckland Harbour.

Fullers Brochure (outside)

ABOUT RANGITOTO

Sitting majestically just off the Auckland coast, this unique volcanic island boasts a fascinating landscape of rugged lava crops, lush native bush and sandy coves. Rangitoto is a public reserve, managed by the Department of Conservation.

GEOLOGY: Rangitoto Island erupted from the sea in a series of dramatic explosions around 600 years ago. This makes it the youngest island in the Hauraki Gulf, and the last and largest volcano to be formed in the Auckland volcanic field.

FLORA & FAUNA: Famed worldwide as a botanical gem, Rangitoto is home to New Zealand's largest Pohutukawa forest. There are now more than 200 species of native plants including 40 species of fern. Many of the plants are unusual hybrids and very rare.

PEOPLE: Today Rangitoto has no permanent population, but in the early 20th century there was a small community living in 'baches' (simple holiday houses) scattered along the shoreline. Further building was prohibited in 1937, and many of the original baches have disappeared over the decades leaving just the few you see today.

Rangitoto literally means "bloody sky" in Maori, but it is derived from the phrase "Te Rangi i totongia a Tamatekapua" – "the day the blood of Tamatekapua was shed", a reference to an injury to a chief during a battle fought on the island.

WHAT YOU NEED TO BRING

- Plenty of water.
- A sun hat and sun screen.
- Snacks/lunch (there are no shops on the island, but you can buy provisions on the ferry).
- Sturdy walking shoes.
- A torch if you wish to explore the lava caves.

LOOKING AFTER RANGITOTO

- Dogs and bikes are not permitted on the island.
- Open fires are forbidden as they can easily get out of control.
- Please take all your rubbish off the island with you.
- Do not remove or disturb any plants or historic artefacts.
- Keep to the tracks so you don't disturb plant life or endanger yourself on the lava.
- Please allow vehicles to pass and stand aside.

FERRY TIMES & PRICES

RANGITOTO RETURN FERRY

DEPARTS AUCKLAND	DEPARTS DEVONPORT	DEPARTS RANGITOTO (until April 27th)	DEPARTS RANGITOTO (from April 28th)
9.15 am	9.25 am	9.45 am	9.45 am
10.30 am	-	-	-
12.15 pm	12.25 pm	12.45 pm	12.45 pm
-	-	3.30 pm	3.30 pm**
-	-	5.00 pm*	4.00 pm*

*Weekends and public holidays only. **Weekdays only.

FARES: ADULT $20 | CHILD $11 | SENIOR $18 | FAMILY $52

RANGITOTO VOLCANIC EXPLORER TOUR

GUIDED ROAD-TRAIN TRIP OF THE ISLAND WITH FULL COMMENTARY

DEPARTS AUCKLAND	DEPARTS DEVONPORT
9.15 am *	9.25 am*
12.15 pm	12.25 pm

Tour duration including ferry travel is 4 hours. Bookings advisable.

*No tour on weekdays 5 May to 30 September 2008. No tour on Christmas Day.

FARES (INCLUDES FERRY): ADULT $50 | CHILD $26

DON'T GET STRANDED!
Please check the time of the last ferry at the start of your trip – a clock on the wharf will indicate the last departure each day.

ENQUIRIES AND BOOKINGS:
09 367 9111 enquiries@fullers.co.nz www.fullers.co.nz

TICKET DEFINITIONS

CHILD: 5–15 years inclusive.
SENIOR: 65+ years.
FAMILY: 2 adults and 2 children.

INFANTS: 0–4 years travel free on our ferries. However if a seat is required then a child fare must be paid.

Advance bookings are advisable for all tours. All departures are subject to change or cancellation due to weather, marine or operational requirements. All prices in this brochure were correct at the time of printing and are inclusive of GST. Fullers reserves the right to change all departure times without notice. Full terms and conditions available from all Fullers Ticket Offices on request. Fullers gratefully acknowledges the support of the Department of Conservation in its role as custodians of the island destination in the Hauraki Gulf.

WWW.FULLERS.CO.NZ

Rangitoto Island

INCLUDING VOLCANIC EXPLORER TOUR

EXPLORING THE ISLAND
GUIDED TOUR DETAILS
ISLAND MAP
POINTS OF INTEREST
FERRY TIMES & PRICES

Effective 1 April 2008

25 MIN TRIP TO ISLAND

Fullers
We'll take you there

WWW.FULLERS.CO.NZ

Source: www.fullers.co.nz

Fullers Brochure (inside)

EXPLORING THE ISLAND

Rangitoto Island can be explored either on foot or by vehicle on a Fullers guided tour. There are many bush walks you can do or our Volcanic Explorer road train will take you to the island's key sights.

The recommended walk to the summit takes about an hour at an easy pace, where spectacular 360° views of Auckland and the Hauraki Gulf islands await you. Lookouts along the way provide some stunning views as you climb, and a short detour will find you exploring the Island's lava caves. Other tracks that skirt the coastline are signposted from the wharf.

RANGITOTO VOLCANIC EXPLORER TOUR

Combine your ferry trip to Rangitoto with a guided tour of the island on our 4WD road-train. On arrival, your island ranger guide will greet you as you leave the ferry and direct you to the tour vehicle nearby. You will journey through the unique volcanic landscape, whilst your guide talks to you about the history and geology of the island. The tour vehicle will take you to the base of the summit, where it takes approximately 20 minutes to walk up steps and along a wooden boardwalk to the very top. After taking in the panoramic views, you rejoin the tour vehicle for the return trip to the wharf, which takes in the western side of the island.

POINTS OF INTEREST

1. **BLACK BACK GULL COLONY**
The largest NZ colony of this species. Breeding from October to late January.

2. **KIDNEY FERN WALK**
A cool bushy glen of the rare kidney fern.

3. **KOWHAI GROVE**
Native trees which have lovely yellow flowers in spring and summer.

4. **MACKENZIE BAY & BEACON LIGHTHOUSE**
Ideal swimming, fishing and picnic spot.

5. **CRATER RIM TRACK**
This 15 minute walk circles Rangitoto's large crater at the summit.

6. **SUMMIT LOOKOUT 259M**
Breathtaking views of the harbour.

7. **LAVA CAVES**
Narrow caves originally formed from flowing lava. Take a torch!

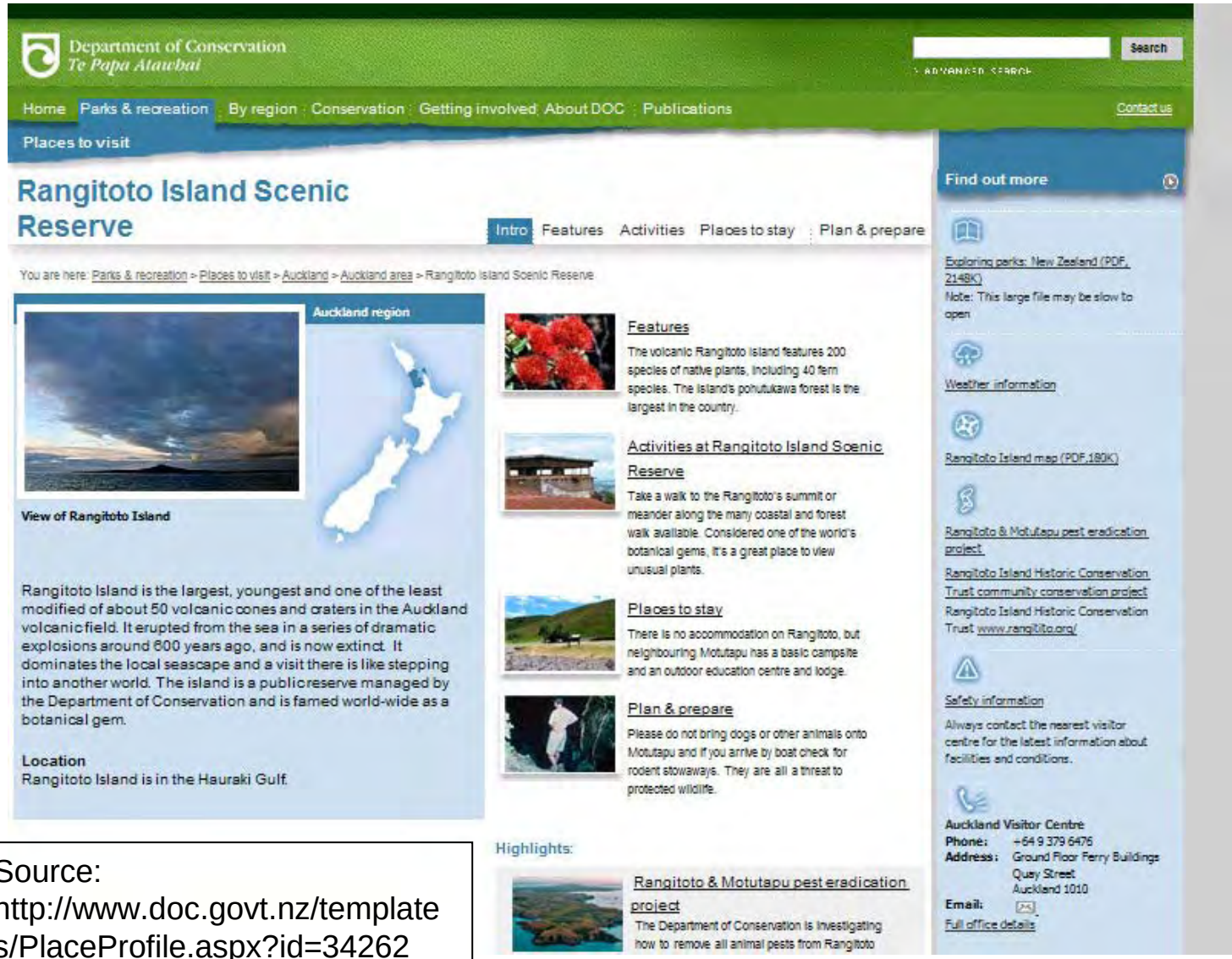
8. **CONTROLLED MINE BASE SITE**
Site of WWII buildings from which the harbour's minefields were operated.

9. **ISLINGTON BAY**
Popular anchorage for local yachties.

10. **MOTUTAPU ISLAND CAUSEWAY**
Cross the causeway for further walks on Motutapu Island.

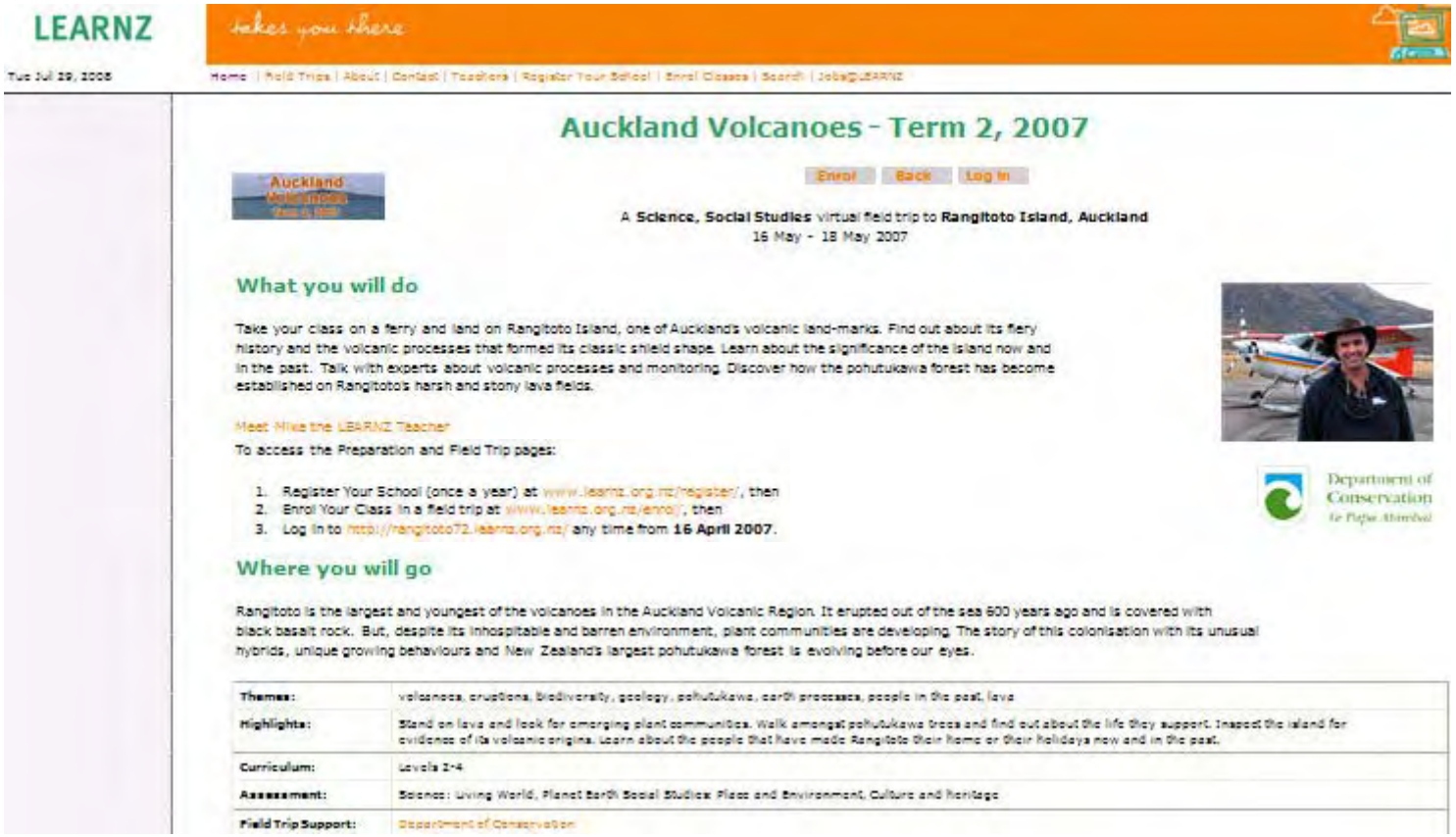
11. **BOULDER BAY**
Site of old slipwrecks.

Homepage: Department of Conservation (DOC)



Source:
http://www.doc.govt.nz/templates/PlaceProfile.aspx?id=34262

Homepage: LEARNZ



LEARNZ is an online education programme for students in New Zealand state, private and integrated schools. School teachers and their students can undertake ***virtual field trips*** to many unique New Zealand-Spots including Rangitoto.

Source: http://www.learnz.org.nz/index.php

Rangitoto Island: An Auckland Icon

The New Zealand Herald – Auckland section headline

Tourism Auckland logo

Selwyn College logo

Street sign in Remuera, Auckland.

Rangitoto stamps from 1952-2007

Auckland rugby team logo

Ellerslie school children were given the task of painting what they associate with Auckland.

Elevation Cafe logo, Waitakere Ranges, Auckland.

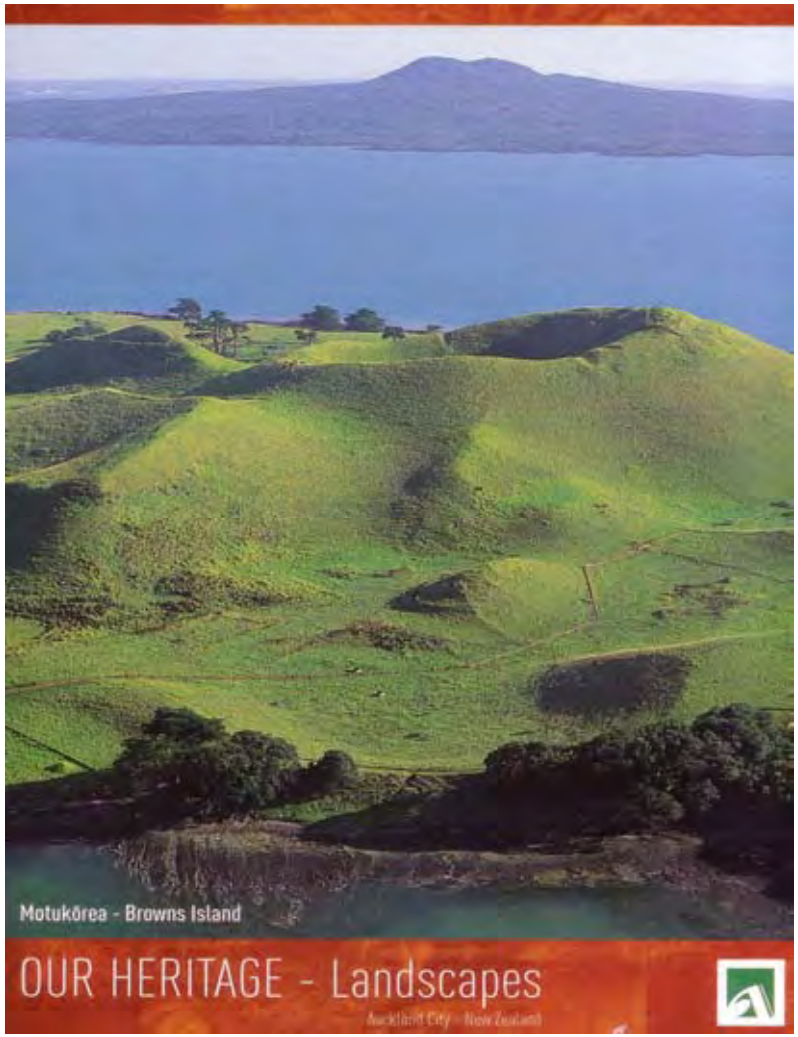
Lava restaurant, Mission Bay, Auckland.

Mural at Auckland Central Playcentre, Ponsonby.

Above: Rangitoto on a public bus, Queen Street, Auckland City.

Left: Mural in a shop in Karangahape road, Auckland.

Below: Rangitoto stamping on a public toilet, Waiheke Island, Auckland.



Above: The Auckland Regional Council donated 100 postcards showing Browns Island and Rangitoto. The postcards were gifted to participants during the data collection.

Rangitoto Island Historic Conservation Trust

Above: Historic Conservation Trust logo.

Source: www.rangitoto.org

AUCKLAND BOTANICAL SOCIETY

Above: Auckland Botanical Society Logo. Source: Wilcox 2007 brochure.

Left: Book cover.

Source: Phillips-Gibson 2006.

Geology of Rangitoto Island

Geology of Rangitoto

Top left: A‘a lava field near Flax Point.

Top right: Scoria slope, north of summit.

Left: Slab lava flow at McKenzie Bay road.

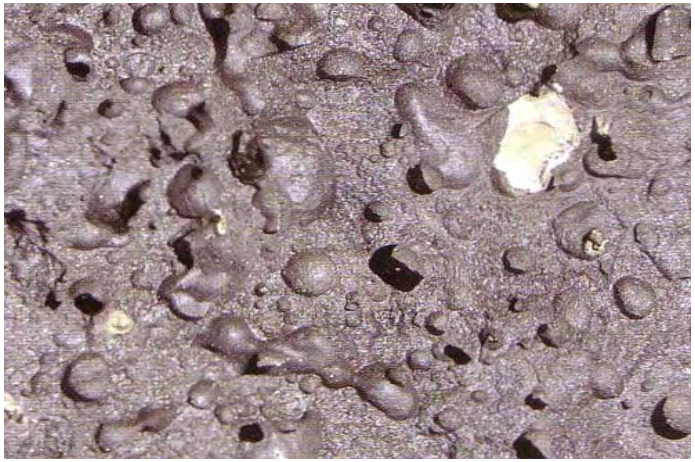
Right: Pahoehoe lava on the coast beside McKenzie Bay Road

Source of all four pictures: Wilcox 2007: 12.

Geology of Rangitoto

Rangitoto with lava flows reaching the sea.

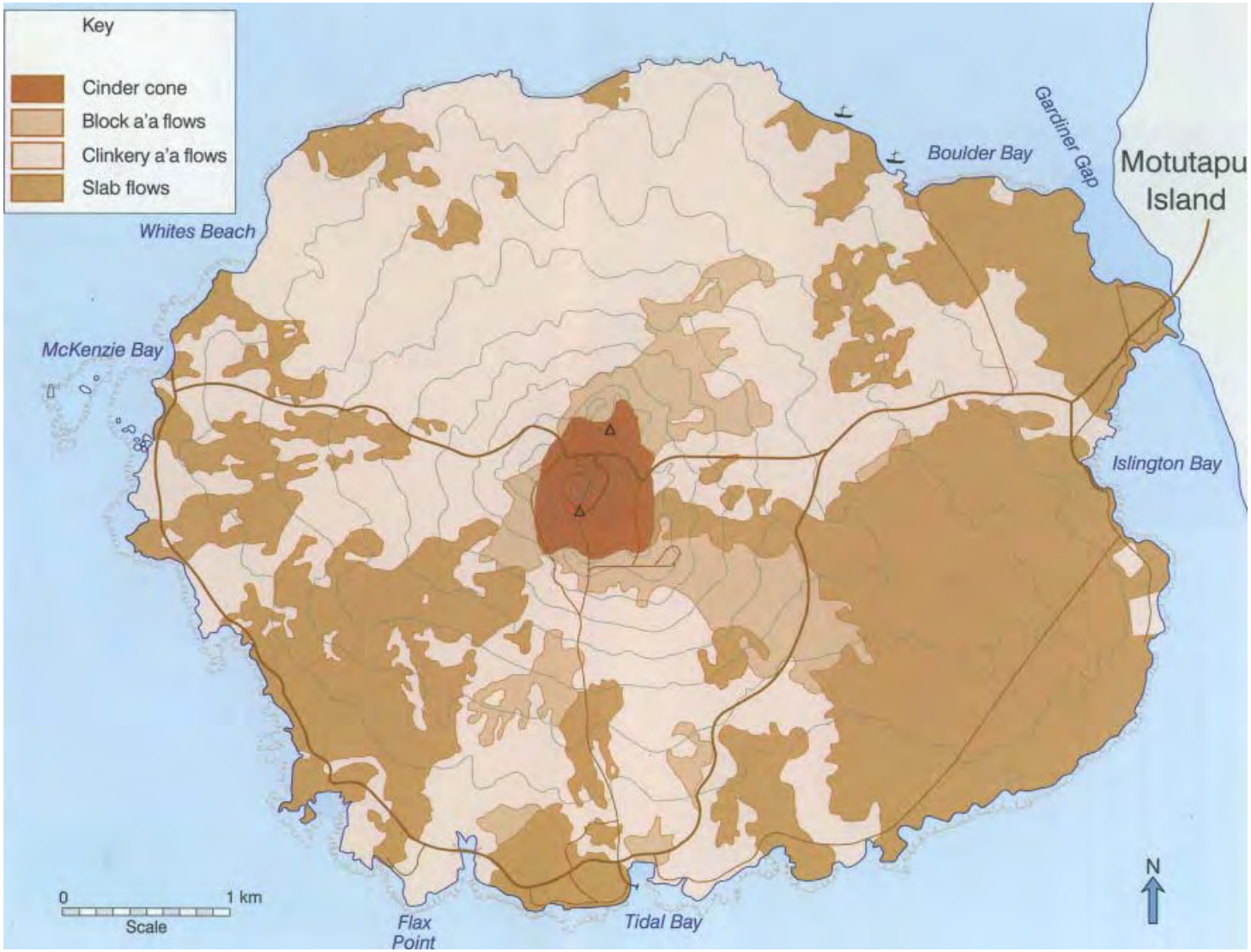
Source of pictures: Wilcox 2007: 13, 27.



Vesicles (trapped gas bubbles) in lava near Rangitoto Wharf.

Baked mud in lava flow, off McKenzie Bay Road.

Geology of Rangitoto

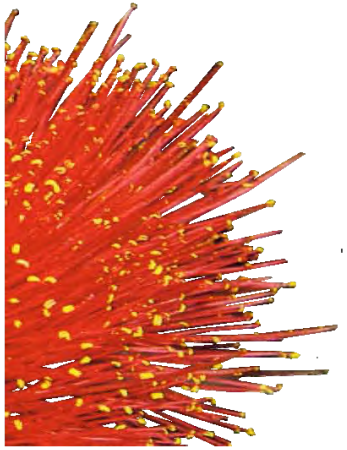


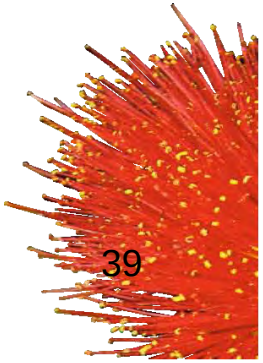
Rangitoto lava flow map. Source: Wilcox 2007: 14.

Geology of Rangitoto

Interior and exterior of Rangitoto‘s lava caves. Historical records state that the caves had been used by early Maori as burial sites (Yoffe 2000).

Flora & Fauna of Rangitoto Island





Rangitoto's Flora

Native orchids. Source: Wilcox 2007: 82

Hot rock fern. Source: Wilcox 2007: 61

Rangitoto's Flora

Above: Lichen [*Cladonia confusa*].

Right: Manuka, famous for its honey. Source: Wilcox 2007: 72.

Rangitoto's Flora

Above: Kowhai – grows along Kowhai walk.

Source: http://upload.wikimedia.org/wikipedia/commons/thumb/8/87/Kowhai_flowers.jpg/532px-Kowhai_flowers.jpg

Kirk's tree daisy. Source: www.bushmansfriend.co.nz/site/images/32085.jpg

Rangitoto's Flora

Above: Kidney fern.

Right: Mangroves growing directly on lava.

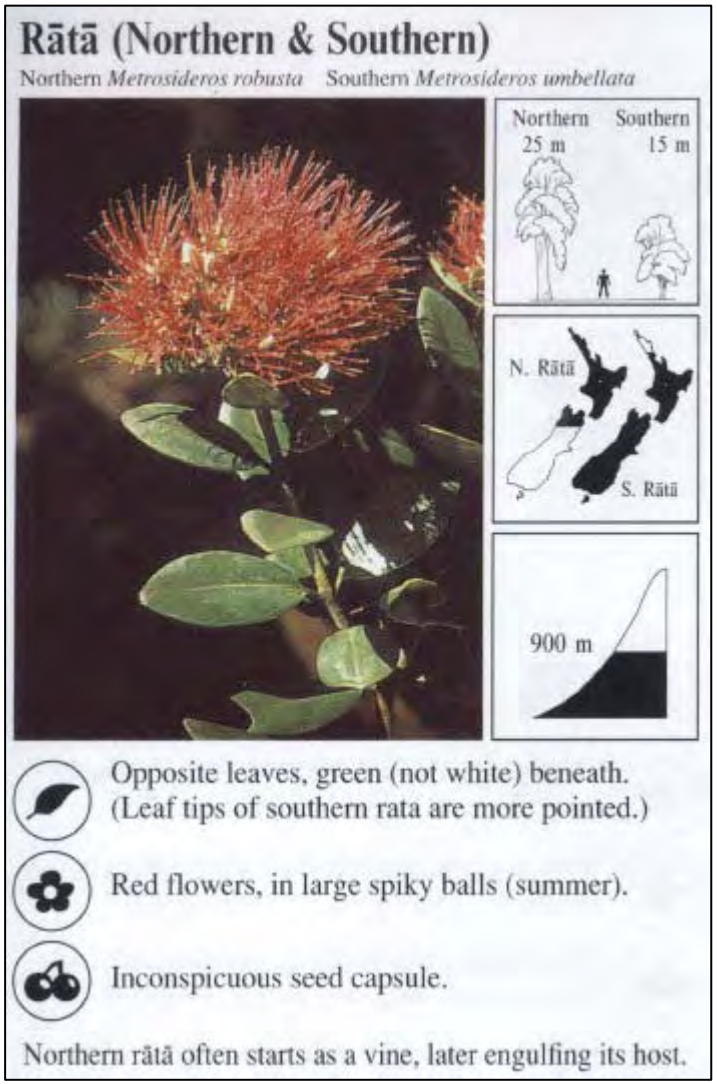
Rangitoto's Flora

Group	Number of species, subspecies and varieties
Vascular plants	582
Mosses	94
Liverworts & hornworts	67
Lichens	194
Fungi	170
Algae	74
TOTAL	1181

Above: Closed-canopy tall pohutukawa forest. Source: Wilcox 2007: 45

Right: Number of species, subspecies and varieties. Source: Wilcox 2007: 168.

Rangitoto's Flora



These figures demonstrate well the differences between Rata and Pohutukawa. These two species have hybridised on Rangitoto. Source: Crowe 2007:14-15

Rangitoto's Fauna

Left: Silvereye at the summit. Source: Wilcox 2007: 25.

Right: Tui in the Kowhai grove. Source: Wilcox 2007: 25.

Left: Fantail. Source:www.mtlees.com/mtlees/images/fantail_piwakawaka.jpg

Above: Black-backed gulls roosting east of Rangitoto Wharf. Source: Wilcox 2007: 26

Rangitoto's Fauna

Above: Brush-tailed rock wallaby.

Source: www.abc.net.au/reslib/200711/r205658_782625.jpg

Right: Little blue penguin. Source: www.hickerphoto.com

The Baches

Baches

Left: Historic baches along the coastline, just five minutes away from Rangitoto Wharf.

Top right: Historic Conservation Trust notice at the Bach Museum.

Baches

„*Many of the baches on Rangitoto lack modern amenities. Shirley Collins (above) usually cooks on a fire in an out building and a kerosene fridge in the kitchen has blackened the walls. While some baches have generators, many use gas for cooking, and hot showers and flushing toilets are luxuries most do without*“

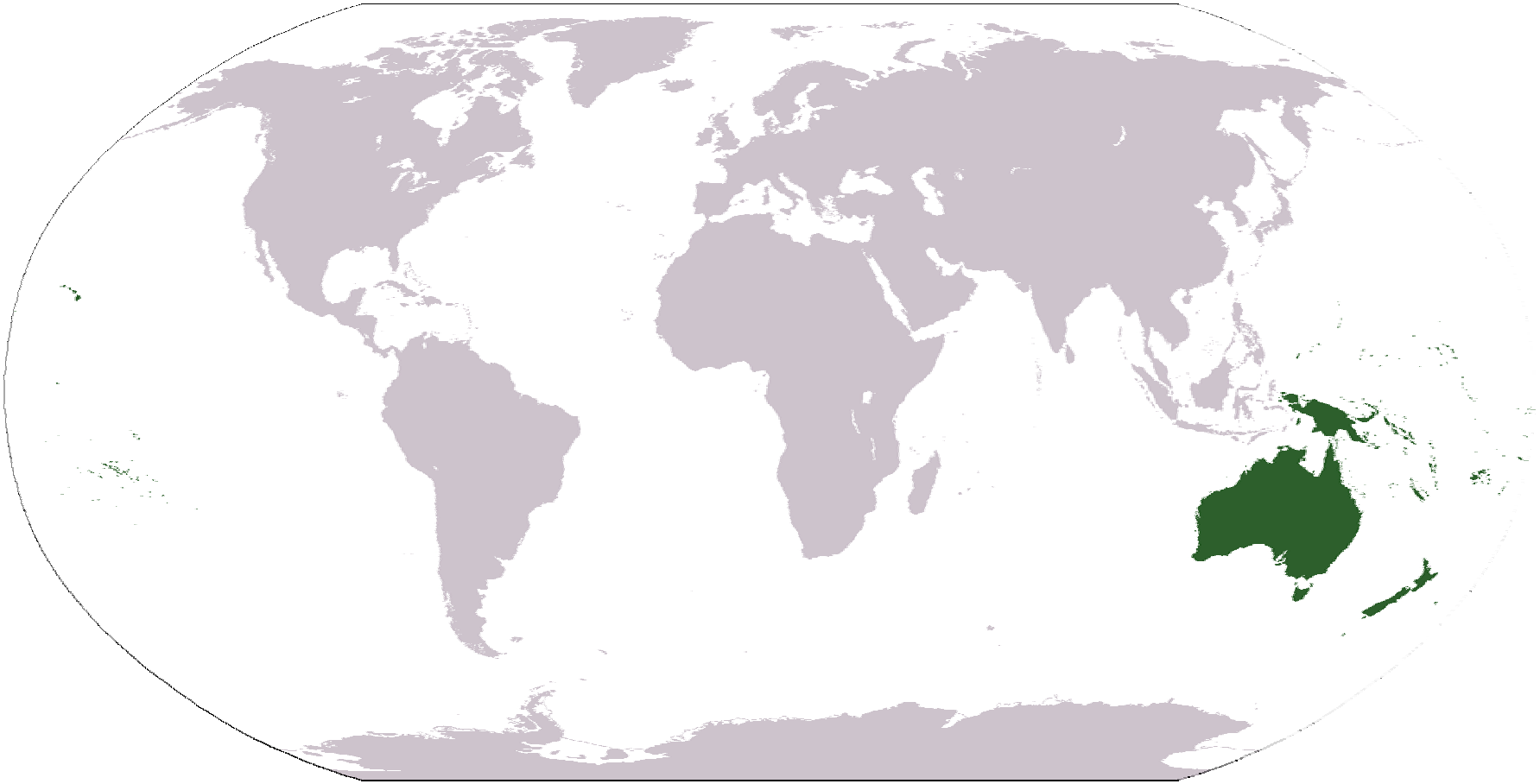
Source of pictures & quotation (Jamieson 2004: 30-31)

Baches

„*One of the oldest baches (above) was erected in 1919 at Gardiner Gap, near Motutapu and is now owned by 88-year-old Mrs M. Te Hira. Her son, Sam, cuts flesh from small hammerhead sharks netted nearby. He regards the dried meat as a delicacy. As a child, Sam attended school on Motutapu, where the 10 pupils were supervised by a single teacher*“

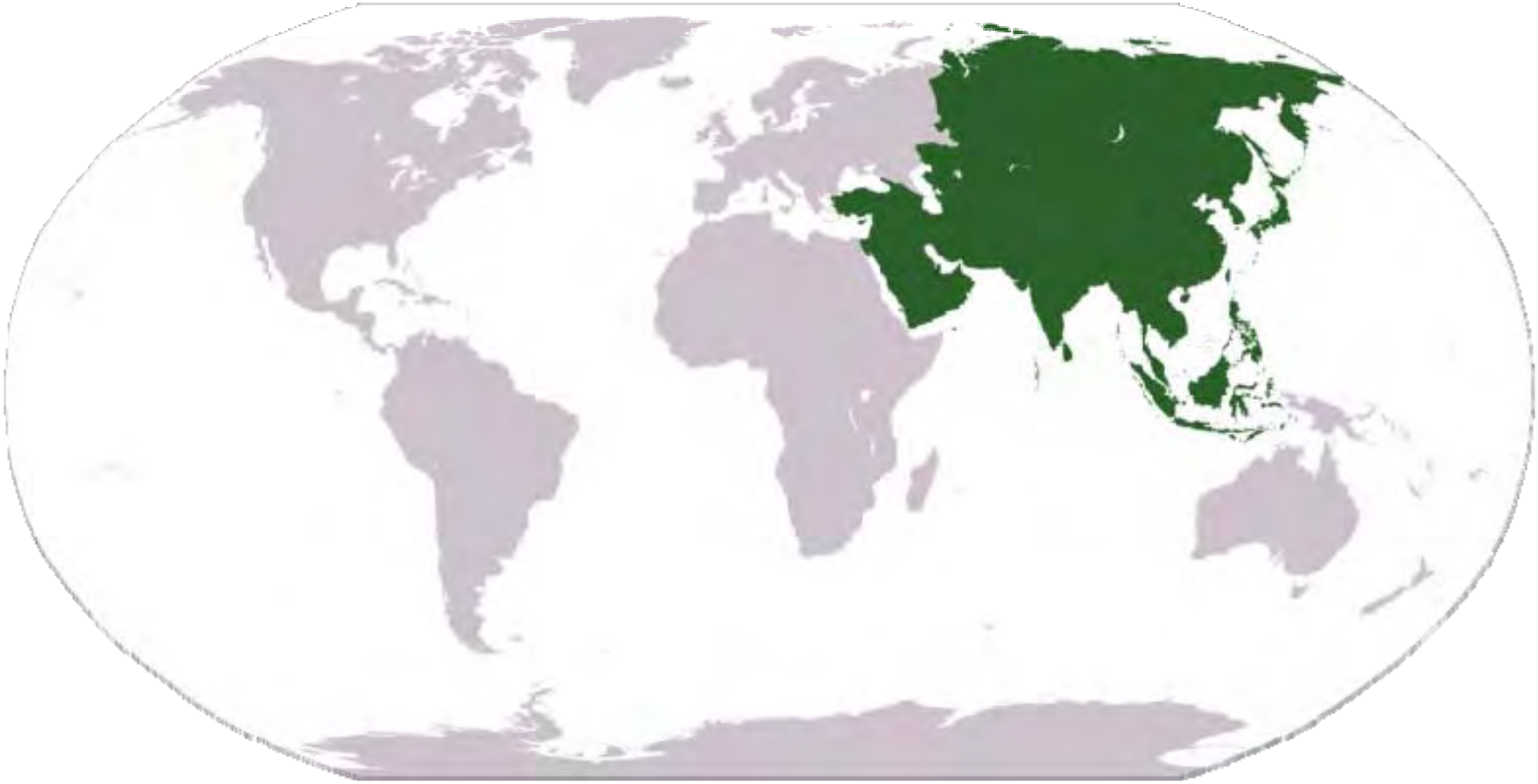
Source of pictures & quotation: Jamieson 2004: 22.

Definition of Oceania



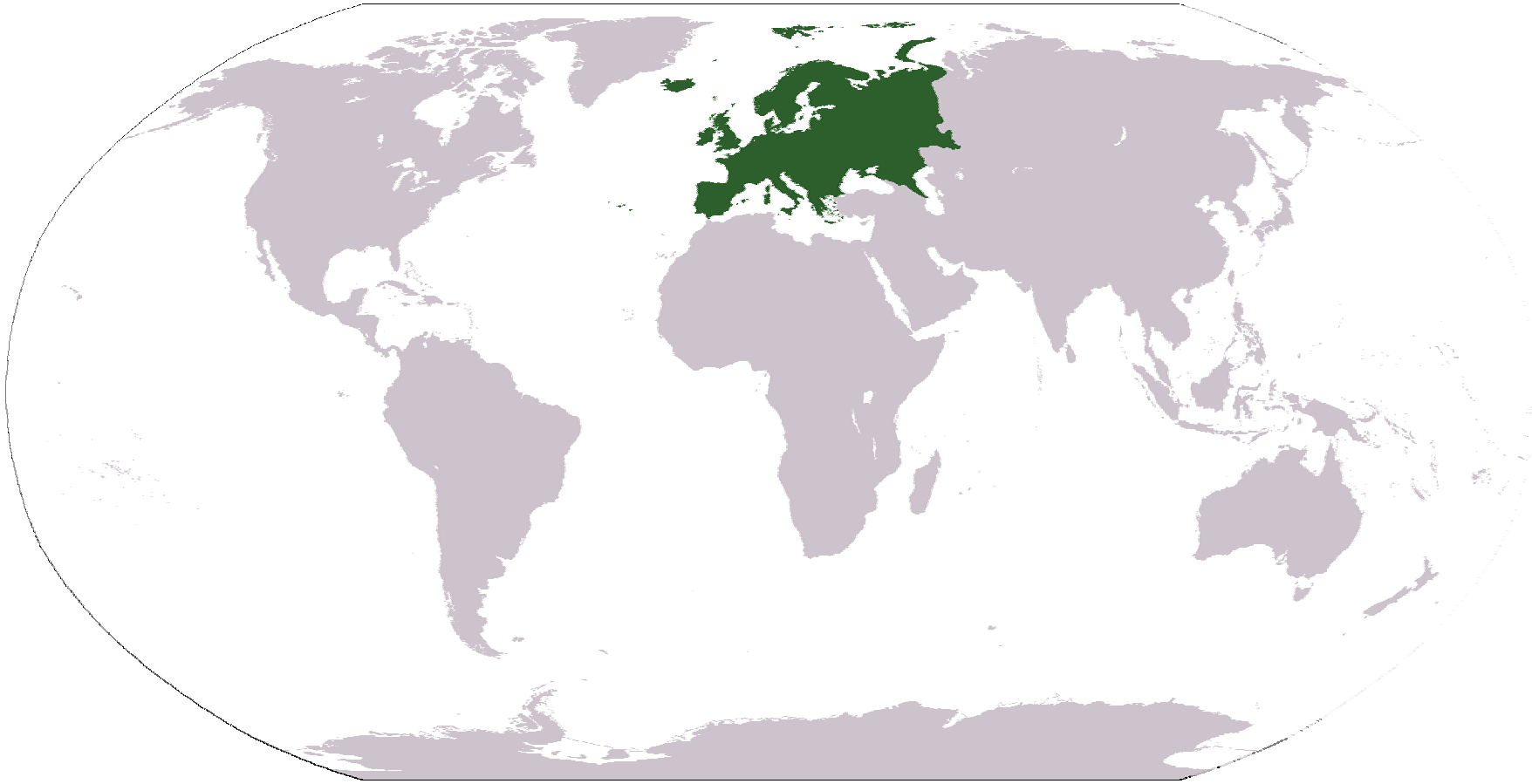
http://de.wikipedia.org/wiki/Ozeanien

Definition of Asia



http://de.wikipedia.org/wiki/Asien

Definition of Europe



http://de.wikipedia.org/wiki/Europa