A CONCEPTUAL EXPLORATION OF MARINE RESEARCH TOURISM IN AUSTRALIA

A study of the conceptual, supply, and demand nature of marine research tourism in Australia

Thesis submitted by Peter Wood

(BSc, PGDipSc, GCTWM, M Tourism, GCRC)

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Tourism Program, School of Business

James Cook University

DECLARATIONS

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

1 July 2011

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Signature Date

Peter Wood

Declaration of ethics

The research presented and reported in this thesis was conducted within the guidelines for research ethics outlined in the National Statement on Ethics Conduct in Research Involving Human (1999), the Joint NHMRC/AVCC Statement and Guidelines on Research Practice (1997), the James Cook University Policy on Experimentation Ethics. Standard Practices and Guidelines (2001), and the James Cook University Statement and Guidelines on Research Practice (2001). The proposed research methodology received clearance from the James Cook University Experimentation Ethics Review Committee (approval number No. H2492).

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Signature Date

Peter Wood

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ABSTRACT

Marine research tourism (MRT) is defined as marine ecotourism whereby non-specialist volunteers or tourists pay for a volunteer vacation or conservation holiday to help marine wildlife managers in marine research and contribute financially to that activity (adapted from Ellis, 2003a; Benson, 2005). Examples of MRT organisations worldwide are Biosphere Expeditions, Blue Ventures, Coral Cay Conservation, and Conservation Volunteers Australia. Although Hughes (2008) and Dunstan (2009) have presented case studies of MRT, this thesis is the first study of MRT both on a global and regional (i.e. Australia) scale.

This thesis has investigated the conceptual, supply, and demand nature of MRT with a specific focus on Australia. This investigation was supported by three research questions which ask 1) what are the key features of MRT worldwide and in Australia; 2) what are the shared and contested views of different supply-side key stakeholder groups about MRT in Australia; and 3) what are the preferences of potential MRT tourists for specific MRT products in Australia and why?

Each research question was investigated with a specific research study. Study one explores and describes the manifestation of MRT across a representative sample of MRT products (n=85) worldwide and in Australia. Study two acquires and compares the views of supply-side key stakeholders (n=70) about the supply, demand, and potential for MRT in Australia. Study three measures and describes the preferences of potential MRT tourists (n=311) for different MRT products (n=12) across Australia and associated benefits (n=25).

The design and analysis of each study is based on a proposed conceptual framework for MRT that includes; scientific tourism, ecotourism, wildlife tourism, marine tourism, educational tourism, and adventure tourism, volunteer and vacation mindedness; scientific research, environmental conservation, and community development (derived from Benson, 2005; Coghlan, 2007; Ellis, 2003a; Clifton & Benson 2006; Cousins, 2007; Brown & Lehto, 2005; Whatmore, 2008; Lorimer, 2009).

Study one validates the proposed conceptual framework for MRT with the caveat that community development does occur but is not a consistent feature across all MRT products. Orams' (1999) spectrum of recreational marine opportunities and Brown and Lehto's (2005) volunteer and vacation minded concept are found to be dominant influences on MRT. Additionally, SCUBA diving, skilled scientific tourists (e.g. university science students and other marine science enthusiasts), marine wildlife tourism, volunteers and backpackers, were found to notably affect the nature of MRT.

Study one finds that higher quality marine research can be achieved by attracting skilled scientific tourists via MRT products with increased physical adventure, SCUBA diving, evironmental remoteness, offshore sailing, tranquility, higher costs per day, and shorter trips. In constrast, longer term marine conservation is associated with coastal products that involve volunteer tourists and backpackers. These products are associated with lower costs per day, longer duration, and less comfort and hospitality for the tourist.

In world terms, Australia can be considered to be a hotspot for MRT with twenty four percent (n=30) of worldwide MRT products (n=125) occurring in Australia. When compared with MRT elsewhere, Australian MRT is characterised by a prevalence of small and independent organisations (80%). These smaller organisations are typified by liveaboard MRT products that operate in isolated, uninhabited and/or pristine locations, and marine research that focuses on coral reefs, whales, sea birds, sharks, and dolphins. Skilled scientific tourists are more often attracted to those MRT products.

In contrast, MRT elsewhere is dominated by UK or USA owned (87%) larger and/or international MRT organisations (99%) such as The Earthwatch Institute, Coral Cay Conservation, and Greenforce. Those larger organisations are typified by coastal or island-based operations, volunteer mindedness, backpackers, and volunteer tourists, less comfort for the tourist, more skills training, more interaction with local communities, and coral reef and turtle MRT products.

Study two examines the views (n=232) of supply-side key stakeholders about the supply, demand, and potential for MRT in Australia. Eight aspects of MRT are identified and described namely; driving forces, major factors, benefits, physical constraints, opportunities, issues, contested views, and shared stakeholder views. Driving forces for MRT in Australia include an increasingly educated, active, conservation volunteer focused, environmentally responsible, marine documentary watching, and alternative tourist market who are seeking to connect with the marine realm through a MRT product.

Eighty eight percent of respondent views were shared across key stakeholders groups. This can act as a basis for consensus and subsequent collaboration amongst key stakeholder groups for future Australian MRT. However, twelve percent of views were contested. These views indicate that many Australian Government marine researchers and managers will have issues about their involvement in MRT. Their overall issue is that MRT is a tourism enterprise and Government marine research programs are serious endeavours that should not cater to the needs of tourists nor be dependent on funding from tourism.

Study three identifies a set of relationships between, market segments, preferred benefits, and MRT products. Nature documentary viewing, snorkelling experience, SCUBA experience, gender, and age significantly influence the interest of potential MRT tourists for specific MRT products. A MRT tourist‘s interest in MRT products is found to be influenced by their preferences for marine discovery and exploration, learning from experienced researchers, fun, social interaction, and skills training. A key outcome is twelve tables that describe the relationships between MRT market segments, products, and associated benefits.

Findings from studies one, two, and three are then combined to develop an integrated model of the conceptual, supply, and demand nature of MRT. This model shows MRT to be a tourism phenomenon with many interacting governing, supply, and demand factors that given the right external circumstances can develop into many MRT products with important scientific, environmental, and social benefits.

Finally, from this model, MRT is defined as marine ecotourism where skilled and non-skilled scientific tourists explore and discover marine phenomena, and learn through experienced marine scientists and/or enthusiasts. It is also typically focused on charismatic megafauna; governed by the nature of the marine environment; offers a passive and/or active experience; delivers significant marine research, conservation biology, and/or educational outcomes; and a rich tourist experience.

KEYWORDS

Research, science, conservation, marine, ecotourism, volunteer, tourism, typology, supply, demand

> *While efforts to exploit space as the ‚final frontier" for tourism continue, it is clear that the penultimate frontier - the marine realm - still offers much untapped potential.*
>
> Cater & Cater, 2007, p 2

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Chapter 1 Introduction

1.1. Introduction

Research tourism is defined for this study as a form of ecotourism where non-specialist tourists pay for a volunteer vacation or conservation holiday to help wildlife managers in environmental field research and also contribute financially to fund that research (adapted from Ellis, 2003b; Benson, 2005). Marine research tourism is consequently defined as research tourism that occurs in the marine environment (Wood & Coghlan, 2008; Wood & Rumney, 2009; Wood & Zeppel, 2008). The *marine environment* is defined as saltwater environments such as coastal and island zones, seas, open ocean, intertidal zones and estuaries, the water column, the sea bed, and the atmosphere above saltwater environments (Orams, 1999). Examples of well known research tourism organisations that conduct marine research tourism are; The Earthwatch Institute; Blue Ventures; Coral Cay Conservation; Operational Wallacea; and Conservation Volunteers Australia.

Ellis (2003b) called for more research into the theoretical nature of research tourism. The thesis's literature review found that no research into the conceptual nature of marine research tourism in Australian has occurred. For this reason, this thesis is largely a response to that Ellis's (2003b) call and this research gap. Therefore, this thesis aims to explore and describe the conceptual, supply, and demand nature of marine research tourism in Australia.

Outcomes from this research include further knowledge about marine research tourism in Australia and worldwide, and the advancement the conceptual study of research tourism. These outcomes have the capacity to make a major contribution to the development of marine research tourism globally. This chapter's structure is summarised in Figure 1.1.

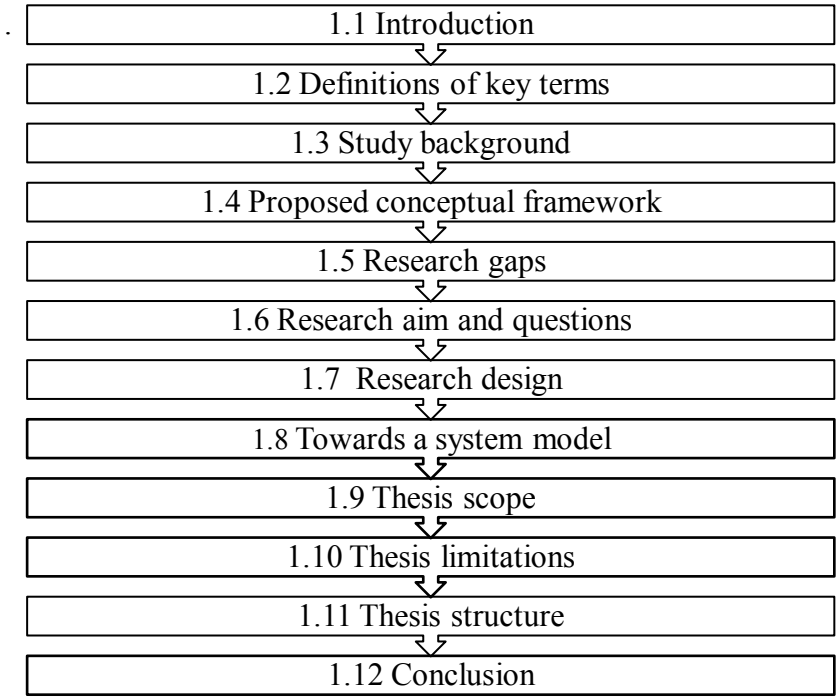


Figure 1.1: Contents of Chapter One

1.2. Definition of key terms

Often this thesis uses a number of terms with explicit purpose including ‗research', ‗tourism product', ‗marine tourism', ‗key supply-side stakeholders' and ‗key MRT element'. These key terms are defined as follows:-

Research is defined to be the use of experience, reasoning, and rigorous testing to discover the truth whereby the method and results are open to public scrutiny and criticism (Walliman, 2005). *Marine research* can be considered to be the application of *research* to the study of marine environments and phenomena. Fields of marine research include marine biology, ecology, conservation, chemistry, geology and hydrography, archaeology, anthropology, engineering, and technology.

Tourism is defined as ~~t~~he processes, activities, and outcomes arising from the relationships and the interactions among tourists, tourism suppliers, host governments, host communities, and surrounding environments that are involved in the attracting and hosting of visitors" (Goeldner & Ritchie, 2006) (Goeldner & Ritchie, 2006, p. 5). A *tourist* is defined as ~~a~~ person who travels from place to place for non work reasons" (Goeldner & Ritchie, 2006, p. 582).

A *tourism-system* is defined as a system that links key features of 1) a tourist's preference for, and choice of a destination, 2) the destination's development and activity, 3) the tourist's travel to and from that destination, and 4) the destination's marketing approach to tourists (Mill & Morrison, 2002).

A *tourist attraction* is defined as ~~f~~acilities developed especially to provide residents and visitors with entertainment, activity, learning, socialising, and other forms of stimulation that make a region or destination a desirable and enjoyable place" (Goeldner & Ritchie, 2006, p. 579). A *tourism destination* is a larger area that can encompass a number of tourist attractions and support services required by tourists (Swarbrooke, 2002).

A *tourist product* is ~~a~~n amalgam of factors including physical resources, people, infrastructure, materials, goods and services, which, taken together provide the tourist experience within specific destination areas" (Hall, 2007, p. 32). The supply of a tourism product is dependent upon available tourism resources, government regulation and the tourism industry (Hall, 2007). ~~A~~ tourism resource is a component of the environment (physical or social) which attracts the tourist and/or provides the infrastructure and services necessary for the tourist experience" (Hall, 2007, p. 33).

Marine tourism is defined as those recreational activities that involve travel away from one's place of residence and which have the marine environment as the destination or attraction (Orams, 1999).

Key supply-side stakeholder groups are defined as; marine research tourism operators, marine tour operators, marine researchers, marine managers, marine conservation groups, marine education groups, tourism destination management organisations, and marine research students (Coghlan, 2008; Cuthill, 2000; Ellis, 2003b; Lorimer, 2009; Musso & Inglis, 1998; Whatmore, 2008).

Key marine research tourism (MRT) elements are defined as discrete concepts that comprise marine research tourism. These elements include; scientific tourism, educational tourism, volunteer tourism, ecotourism, alternative tourism, and niche tourism (Benson, 2005). As such, many characteristics of those concepts are likely to influence the nature of marine research tourism.

1.3. Study background

Marine research tourism can be seen as an emerging form of niche tourism (Robinson & Novelli, 2005). Llyina and Mieczkowski (1992) saw scientific tourism as a form of 'knowledge-orientated' tourism that overlaps with other forms of environmentally friendly tourism, such as ecotourism, adventure tourism and cultural tourism. Benson (2005) described research tourism as a form of scientific, volunteer, educational, ecotourism and alternative tourism. Research tourism is often a form of wildlife tourism (Ellis, 2003b; Coghlan, 2007; Lorimer, 2008). This wildlife

tourism often involves free ranging mammals (i.e. lions, elephants, primates, and whales), turtles, coral reefs, and birds in tropical forest and marine environments (Ellis, 2003b; Whatmore, 2008; Lorimer, 2009).

The genesis of marine research tourism can be traced to trends in educational tourism over the last two centuries. Morse (1997) identifies the origins of scientific tourism in the late nineteenth century when the different scientific disciplines depended on field expeditions to explore the world in search for knowledge. He sees the modern scientific study tour and research tourism as a joining together of an increasing public interest in the scientific field and the tourist‘s desire to obtain a unique experience in mass travel (Morse, 1997). The advent of modern research tourism is traced back to the late 1960s and early 1970s with the arrival of institutions such as The Earthwatch Institute and Conservation, Education, Diving, Awareness and Marine-research (CEDAM) International from the United States of America (USA), and the Scientific Exploration Society from the United Kingdom (UK) (Ellis, 2003b). Llyina and Mieczkowski (1992) view scientific tourism as only the beginning of a worldwide demand for scientific knowledge based tourism.

Tourism operators have responded to this demand for research tourism experiences. From a handful of localised operators in the late 1960s, the research tourism industry has developed to over twenty well known regional and globally focused operators (Cousins, 2007; Ellis, 2003b). Those companies include the Earthwatch Institute, Coral Cay International, Operation Wallacea, Global Vision International and Blue Ventures (Coghlan, 2006; Cousins, 2007; Ellis, 2003b; Lorimer, 2009). The majority of regional or globally distributed research tourism operators are based in the United Kingdom (UK) or United States of America (USA) (Cousins, 2007; Ellis,

2003b; Lorimer, 2009). Globally, the research tourism sector was reported to have at least 39 agencies and at least 887 products (Ellis, 2003b). The present number of research tourism products is not available in the present literature. While the percentage of distribution is not clear across the literature, the distribution of research tourism is global with increased frequency in Southern and Eastern Africa, North America, the Caribbean, Central America, South America, South East Asia (e.g. Indonesia, Malaysia and Thailand), Europe, Australia, New Zealand and the Pacific Benson, 2005; Cousins, 2007; Whatmore, 2008; Lorimer, 2009; Ellis, 2003b).

Academic research that has specifically focused on marine research tourism include case studies of marine research tourism products and locations in Indonesia (Benson, 2005; Clifton, 2004; Clifton & Benson, 2006; Galley & Clifton, 2004); Australia (Dunstan, 2009; Hughes, 2008); and Costa Rica (Campbell & Smith, 2006). Galley and Clifton (2004), Clifton (2004), Benson (2005), and Clifton and Benson (2006) evaluated the dive tourism, ecotourism, sustainable tourism, demographic, motivational and theoretical aspects of Operation Wallacea in South East Sulawesi, Indonesia. Operation Wallacea is a UK-based research tourism operator that has conducted scientific wildlife surveys and community-based conservation work on Hoga and Buton Islands in south-east Sulawesi, Indonesia since 1995 (Galley & Clifton, 2004).

Hughes (2008) described the scientific achievements of Ecocean whale shark Company in Western Australia, and Dunstan (2008) documented the history of the Undersea Explorer marine research tourism Company in Queensland, Australia. Campbell and Smith (2006) studied the values of marine turtle conservation volunteers at Tortuguero, Costa Rica. Their results showed

that turtle research volunteers have multiple motivating values, but particular values dominate such as scientific interest in, the conservation status of, and the charismatic nature of turtles.

While the academic literature primarily focuses on land-based research tourism, much of that literature can be used to study marine research tourism. Studies that specifically focused on land-based research tourism are listed in Table 1-1. Weiler and Richins (1995) investigated the motivational and socio-demographic characteristics of 156 Earthwatch Institute research tourists in Australia. They also highlighted that the potential market for research tourism is not limited to an _extreme ecotourist' segment as there is an increasingly commercialised market where the research tourist seeks a less active, more comfortable, less costly and/or less time-consuming experience (Weiler & Richins, 1995).

Table 1-1: Studies that focus on land-based research tourism

Researcher(s)	**General topic**	**Focus**
Weiler & Richins, 1995	Tourist profile and motivations on an Earthwatch Institute expedition in Australia	Demand
Ellis, 2003a	Global research tourism distribution and product characteristics	Supply
Ellis, 2003b	Global research tourism distribution and product characteristics	Supply
Caissie & Halpenny, 2003	The values and motivations of 10 nature based volunteers in Ontario Canada.	Demand
Coghlan, 2006	Conservation volunteer tourism - tourist preferences	Demand
Coghlan, 2007	Conservation volunteer tourism - product characteristics and typology	Supply / demand
Cousins, 2007	Distribution and product characteristics of UK research tourism operators	Supply
Coghlan, 2008	The different perceptions of conservation volunteer expedition leaders and tourists	Supply / demand
Brightsmith, Stronza & Holle, 2008	Issues between key stakeholders at an Earthwatch Institute expedition in Peru.	Supply / demand
Whatmore, 2008	Distribution and product characteristics of UK research tourism operators. Scientific ecotourism and (post)colonial encounters with wildlife in Sri Lanka	Supply
Lorimer, 2009	Distribution and product characteristics of UK research tourism operators. Concerns with commodification of conservation science	Supply
Cousin, Evans & Sadler, 2009	Commoditisation of science on research tours	Supply

Ellis (2003a) and Ellis (2003b) appear to be the first studies to describe the distribution and characteristics of research tourism on a globe scale. Both those studies identify research tourism as Participatory Environmental research Tourism (PERT) and provided new information about the various scientific research topics, destinations, product characteristics, organisational structures, and marketing aspects of the PERT sector. Importantly for this study, Ellis (2003b) identified many key management issues and future research opportunities for research tourism that form the foundation of this thesis's research agenda.

Caissie and Halpenny (2003) studied the values and motivations of 10 nature based volunteers in Ontario Canada. They found five key motives for participating in the volunteer conservation program namely; 1) pleasure seeking, 2) program ~~"p~~erks," 3) ~~"p~~lace" and nature-based context, 4) leaving a legacy, and 5) altruism. Coghlan (2006) investigated the view that conservation volunteer tourists always seek to make such a difference during their holidays. She found that potential conservation volunteer tourists make a distinction between trips that are; 1) more closely related to ecotourism holidays, and 2) trips that offer a true volunteering experience with an emphasis on altruism and learning. Coghlan (2007) identified four principle classes of conservation volunteer tourism organisations namely; conservation research trips, holiday conservation, adventure conservation, and community holiday trips.

Coghlan (2008) sought to further understand the perceptions of conservation volunteer expedition leaders' about their conservation volunteer tourists, and the expectations of those tourists. She found that expedition leaders are typically more focused on their research rather than their role of tour guide and hospitality provider (Coghlan, 2008). To address this gap, Coghlan

(2008) recommended that expedition leaders receive training that is akin to a tour guide training to help organise, educate, entertain, and socially facilitate the research tourist experience. Similar to Coghlan (2008), Brightsmith, Stronza and Holle (2008) describe some of the issues between ecotourism operators, conservation researchers, volunteer organisations, and volunteer tourists at an Earthwatch Institute expedition in Peru. They found that volunteers were very interested in interacting with the lead researcher(s) and this, along with the intensive training and frequent formal and informal presentations, required a great deal of energy and commitment from researchers (Brightsmith, Stronza, & Holle, 2008).

Cousins (2007), Whatmore (2008) and Lorimer (2009) all investigated the diversity and distribution of UK based research tourism organisations and products across the globe. They voice a concern that research tourism may be primarily driven by consumer demand for projects about charismatic wildlife that occur at popular ecotourism destinations rather than being driven by important conservation priorities. Cousins, Sadler and Evans (2009) investigated if and how the scientific legitimacy of research tourism can be sustained under market conditions. They report that market share for a research tourism product is dependent on maintaining scientific credentials, a quality tourist experience, and economic viability.

1.4. Proposed conceptual framework for marine research tourism

The conceptual nature of research tourism can be understood through Benson (2005) and Coghlan (2007) and supplemented by the other research tourism studies (Ellis, 2003b, Clifton & Benson, Cousins, 2007; Brown & Lehto, 2005; Whatmore, 2008; Lorimer, 2009). Benson (2005) proposed that research tourism can be conceptually understood as a combination of well-known

tourism types namely; alternative tourism, ecotourism, volunteer tourism, scientific tourism, and educational tourism that is situated in a niche tourism context. Coghlan (2007) empirically identified adventure tourism, vacations and sustainable community development as key concepts within research tourism. Research tourism has also been associated with aspects of scientific research, conservation, and community development (Benson, 2005; Brightsmith et al., 2008; Clifton & Benson, 2006; Coghlan, 2008; Cousins, 2007; Ellis, 2003b). Research tourism is also associated with wildlife tourism (Ellis, 2003b; Whatmore, 2008; Lorimer, 2009).

Finally, the concept of volunteer and vacation mindedness (Brown & Lehto, 2005) play an important part in describing the research tourism sector (Weiler & Richins, 1995; Ellis (2003b); Coghlan, 2006; Coghlan, 2007; Cousins, 2007; Caissie & Halpenny, 2003). That is, volunteer minded tourism products occur when volunteerism is the main focus (Brown & Lehto, 2005). In contrast, vacation minded tourism products occur when volunteerism is just one component and leisure, camaraderie, and adventure also play a key part (Brown & Lehto, 2005). Given this, the volunteer tourism component of research tourism can be logically expanded to include the volunteer and vacation minded concept.

Based on these studies, a conceptual framework for marine research tourism is proposed (Figure 1.1). This framework views marine research tourism as a tourism phenomenon that is comprised of thirteen key elements. These thirteen elements can be sub-divided into ten well-known tourism types (e.g. marine tourism and educational tourism) and three intended benefits namely; scientific research, environmental conservation, and sustainable community development.

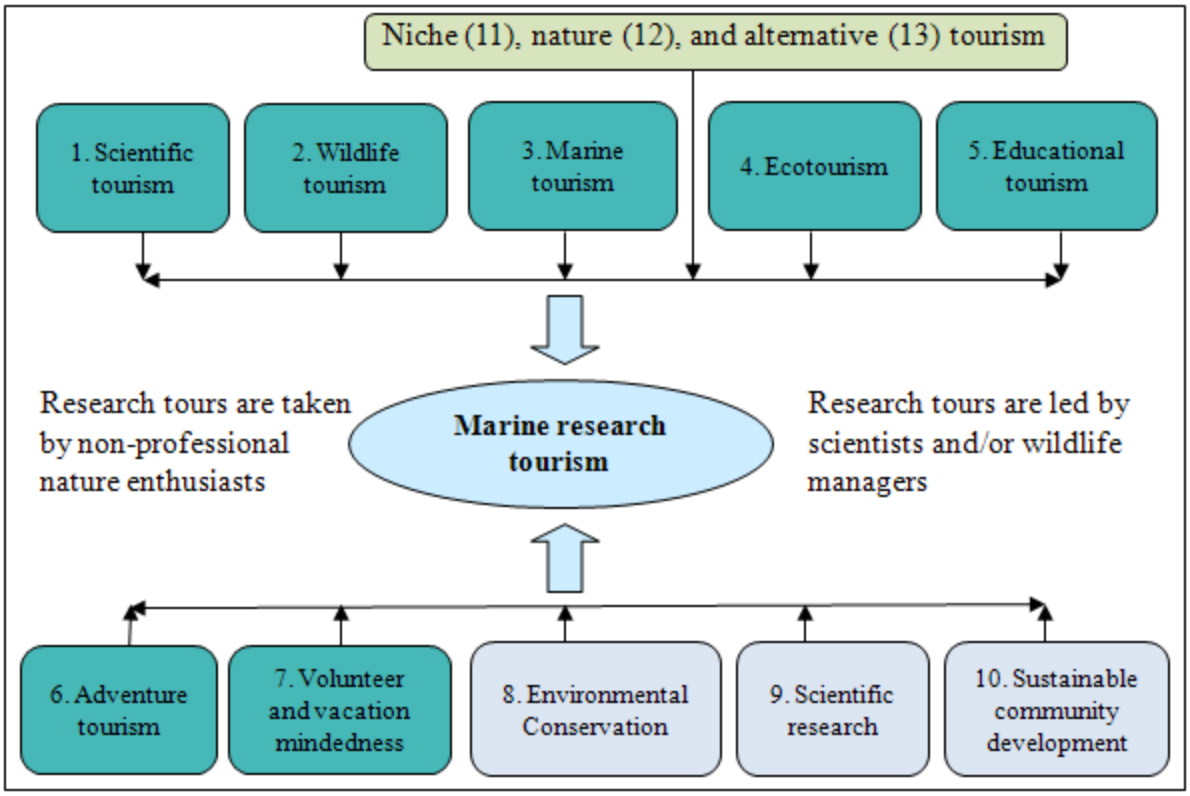


Figure 1.1: A proposed conceptual framework for marine research tourism (derived from Benson, 2005; Coghlan, 2007; Ellis, 2003b; Clifton & Benson, 2006; Cousins, 2007; Brown & Lehto, 2005; Whatmore, 2008; Lorimer, 2009 and reasons given in Chapter Two)

1.5. Research gaps

There are six research gaps identified in the academic literature about marine research tourism that underpin this thesis. Details of these gaps are found in Section 2.7. In brief, those gaps are:

- While marine research tourism has been studied on a case study basis (e.g. Galley & Clifton, 2004; Hughes; 2008; Dunstan, 2009), the study of marine research tourism on a regional scale (e.g. Australia, Costa Rica, and South Africa) has not occurred;

- The conceptual nature of marine research tourism has not been empirically studied;
- The views of different marine research tourism supply-side stakeholder groups have not been investigated;
- The study of the demand preferences of potential marine research tourists for different research tourism products and benefits has not been investigated;
- A study of either land-based research tourism and/or marine research tourism across Australia has not occurred;
- A tourism-system study of research tourism across a large region has not occurred.

1.6. Research aim and questions

To address these research gaps, this thesis aims to explore and describe the conceptual, supply, and demand nature of marine research tourism with a specific focus on marine research tourism in Australia. There are three research questions namely:

Question 1. Based on the proposed conceptual framework for marine research tourism, what are the key characteristics of MRT worldwide and in Australia?

Question 2. What are the shared and contested views of supply-side key stakeholder groups about the present and future of marine research tourism in Australia?

Question 3. What are the preferences of potential marine research tourism tourists for different marine research tourism products in Australia and why?

1.7. Research design

Three studies were undertaken to address these three research questions. A pragmatic (Powell, 2001) and mixed methods (Pansiri, 2005) research approach is adopted to guide this research design. Given this, these studies occur within positivistic and interpretivistic epistemologies as needed, and apply a sequence of quantitative and qualitative methods.

1.7.1. Study one

Study one measures, tests, explores, and describes the relationships between ten of the thirteen key elements shown in the proposed conceptual framework for marine research tourism (Figure 1.1). For reasons given in Chapter Three, the niche alternative, and nature tourism elements of that model were not selected for this study. The primary data for study one was obtained through the analysis of a representative sample of 126 marine research tourism product web sites; and a more detailed analysis of a subset of 85 product web sites. The distribution of those products was worldwide so as to best represent the nature of marine research tourism. This sample includes 30 products from Australia. Examples of these marine research tourism products are shown in Table 1-2.

The intended outcome from study one is a new insight into the conceptual nature of marine research tourism worldwide and specifically in Australia. These outcomes can also be used as a foundation for later studies of marine research tourism. Furthermore, as identified by Ellis (2003b), these outcomes could be applied by key stakeholder groups to make educated choices concerning the most suitable approach or type of marine research tourism venture for a location.

Table 1-2: Examples of marine research tourism companies and products worldwide (n=20) (Source: Analysis of 126 MRT product web sites)

ID	Product name
1	Deep Ocean Expeditions - Azores Undersea Volcanoes
2	Coral Cay Conservation - Tobago
3	Deep Ocean Expeditions - Operation Bismarck
4	Cape York Turtle Rescue - Mapoon, Australia
5	The Undersea Explorer - Osprey Reef Shark Encounter, Australia
6	Lizard Island Research Station - Volunteer at a Marine Research Station
7	Tevene'i Marine - Coral Reef Ecology Education Programs, Australia
8	The Oceania Project - Whale Research Expeditions, Australia
9	Landscope Expeditions - Loggerhead Turtles of Dirk Hartog Island, Australia
10	Landscope Expeditions - Wildlife of the Montebello Islands, Australia
11	The Shark Research Institute - Galapagos Islands, Ecuador
12	Eye to Eye Encounters - Great Barrier Reef, Australia
13	Ningaloo Turtles - Western Australia
14	Conservation Volunteers Australia - Broome, Australia
15	Biosphere Expeditions - near Broome, Australia
16	Bunbury Dolphin Discovery Centre - Western Australia
17	The Earthwatch Institute - Lady Elliot Island, Great Barrier Reef, Australia
18	Conservation Volunteers Australia - Coburg Peninsula, Turtles, Australia
19	Frontier - Kenya Whale Sharks
20	Marine Wildlife Adventures - Coral Sea, Australia

1.7.2. Study two

Study two acquires and compares the views of key supply-side stakeholder groups about the supply, demand and potential change for marine research tourism products, locations and activities in Australia. To achieve these outcomes, study two involved 70 supply-side key stakeholders as researcher participants. A sample list of these participants is listed in Table 1-3.

Table 1-3: Sample list (n= 12) of participants in study three (Source: Results of study two)

No.	Interviewee
1	Former executive of the Great Barrier Reef Marine Park Authority
2	Marine scientist at the Australian Institute for Marine Science
3	Owner and operators of a Melbourne based marine research tourism company
4	Owner and operator of a Sydney of a marine discovery centre
5	Two marine managers at the Western Australia Department of Fisheries
6	Director of a marine research station in Northern Queensland
7	Regional Manager of Victorian Parks and Wildlife Service
8	Mexican based director of global research tourism company
9	A marine tour operator from Hobart, Tasmania
10	Director of an Australian National Marine Conservation NGO
11	Director of the environmental arm of a national SCUBA diving organisation
12	Experienced marine research tourism guide from Thailand

Outcomes are presented in terms of a range of shared and contested stakeholder views across two or more stakeholder groups; and a new conceptual model that is based on these views and the key elements for marine research tourism (Figure 1.1). Findings are intended to increase awareness of stakeholder group needs and issues which in turn can lead to increased stakeholder capability to deliver quality marine research tourism products and associated benefits.

1.7.3. Study three

Study three undertakes an online survey of 311 potential marine research tourism tourists to assess their preferences for twelve different Australian marine research tourism products (Table 1-4) and associated benefits. These products are presented to respondents in the form of twelve brochures that are derived from study one results. These benefits are identified through an assessment of the key elements of the proposed conceptual framework for marine research tourism (Figure 1.1). Intended outcomes are a new conceptual model and twelve information tables that describe the relationships between marine research tourism market segments, products, and associated benefits.

Those outcomes will ensure that the expectations of research tourists are being met; and operators are running a business that best meets the needs of their customers and their conservation goals (Coghlan, 2006). They could also assist research tourism managers to match their marketing images with their research tourists‘ expectations, and the research tourism product‘s benefits and activities (Coghlan, 2006; Coghlan, 2007; Brown & Lehto, 2005).

Table 1-4: Twelve Australian marine research tourism product brochures (Derived in Study three from Study one outcomes)

ID	Name of marine research tourism product
1	Work with marine turtles and indigenous rangers in remote northern Australia
2	Volunteer and train at an Australian whale and dolphin research institute
3	Volunteer at a penguin rescue centre on the southern Australian coastline
4	Research, education and adventure across the Whitsundays of tropical Queensland
5	Survey coral reefs and help assess the impacts of climate change on coral reefs
6	Biodiversity and habitat mapping in north Western Australia
7	A bottlenose dolphin education holiday on the southern Australian coastline
8	Day trip to the reef with some marine research as part of the attraction
9	Sail, volunteer and track blue whales in the Southern Ocean
10	A continuous sailing expedition to explore and help research the oceans of Australia
11	A coral spawning research and adventure trip on a tropical coral reef
12	A submersible research expedition to Australia‘s Bon Hommey undersea ridge

1.8. Towards a system model of the conceptual nature of marine research tourism

Key findings from these three studies are then linked within a tourism-system model by Moscardo, Saltzer, Norris and McCoy‘s (2004). That model shows six supply and demand related factors (Figure 1.2) that are likely to contribute to changes in marine tourism over the Great Barrier Reef, Australia (Moscardo et al., 2004). More details of this model are in Chapters Two and Three.

In terms of Moscardo et al. (2004), study one is a conceptual exploration of Factors 1, 2 and 3 of Figure 1.2. Study two matches the supply of different destination characteristics and constraints of (i.e. Factors 1 and 6) and the subsequent selection of MRT products and activities (i.e. Factor 3). Study three matches the preferences (i.e. individual tourist characteristics and constraints) (i.e. Factors 2, 3 and 4) of different marine research tourism tourists for different products, locations and activities. The study of Factor 5 – individual constraints is considered to be study in its own right and is therefore outside the scope of this thesis.

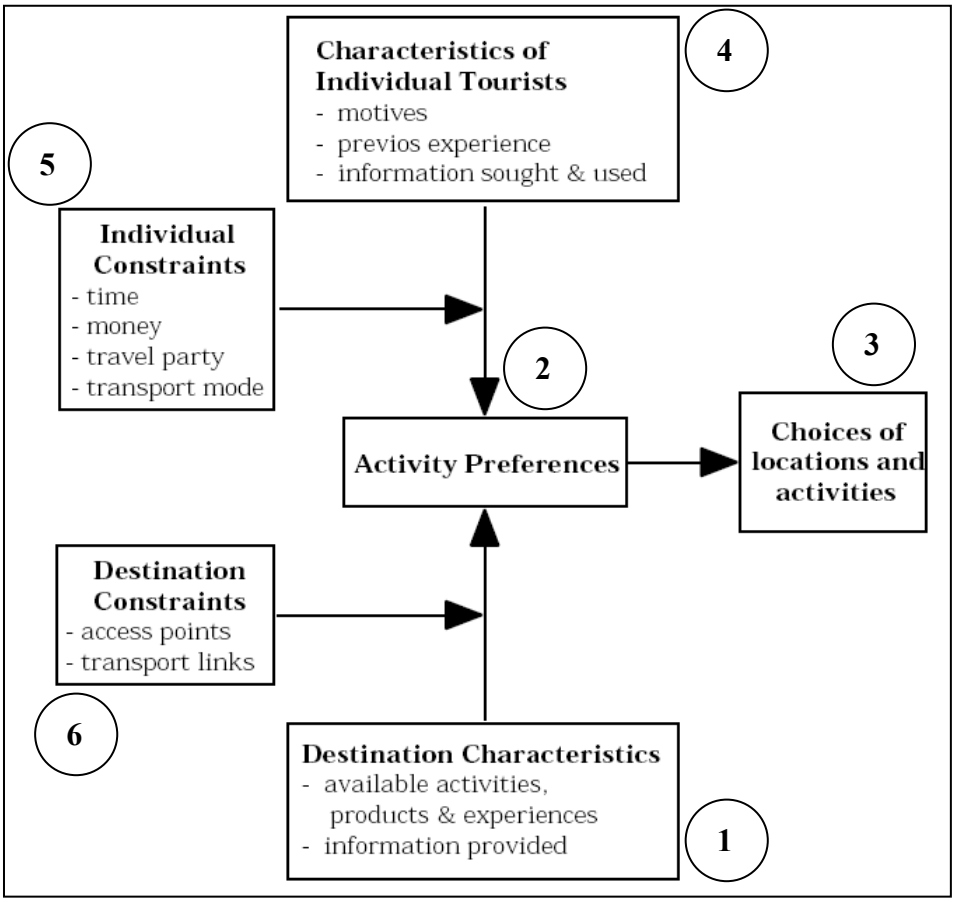


Figure 1.2: Tourism-system model of six main factors that are likely to contribute to change in marine tourism over the Great Barrier Reef, Australia (Source: Moscardo et al., 2004)
Note: The study of Factor 5 – individual constraints is outside the scope of this thesis.

Importantly, the knowledge sought by the three studies is guided by this thesis's proposed conceptual framework (Figure 1.1) and Moscardo et al.'s (2004) model. The benefits of this approach are twofold. First, conceptually established traits that describe the key elements shown in Figure 1.1 can be incorporated into each study. In turn, this leads to outcomes that can be traced to the established academic literature. Second, the results from each study can be linked to derive a tourism-system model (Figure 7.6) that describes the conceptual, supply, and demand nature of marine research tourism in Australia. Based on this model, a new definition for MRT can also be derived to reflect the concepts shown in Figure 7.6 and the key elements presented in Figure 1.1. Finally, as Moscardo et al.'s (2004) model shows many key factors that contribute to change in marine tourism patterns over the Great Barrier Reef then this tourism-system model is likely to show key factors that contribute to change in marine research tourism patterns across Australia.

1.9. Thesis scope

Marine research tourism is a sizeable subject that is well associated with many market segments (e.g. gap year travellers, university alumni, SCUBA divers, and marine volunteers); tourism typologies (e.g. volunteer and educational tourism); environmental management issues; and cultural engagement matters (Ellis, 2003a; Galley & Clifton, 2004; Benson, 2005; Lorimer, 2009). Not all these disciplines are fully investigated within this thesis. The next section outlines the scope of this thesis.

1.9.1. The selection of marine research tourism products for this study

Ellis (2003a) and Ellis (2003b) appear to be the first studies that assessed research tourism on a global scale. So as to be comparable to those studies, this study focused on marine research tourism products that were similar to those assessed in those studies. That is a marine research tourism product can last for one or more days, be advertised publicly, be an English speaking program, take paying tourists or paying volunteers, and operate on a commercial basis (Adapted from Ellis, 2003b). While this study does assess a two volunteer minded marine research tourism products where living costs are payable by the volunteer, they are not the focus of this study. Significantly, this scope is inclusive of the research tourism products studied by Benson (2005), Coghlan (2006), Cousins (2007), Whatmore (2008) and Lorimer (2009). This scope excludes university alumni driven marine research tourism products that are said to be quite typical of USA organised marine research tourism expeditions (Ellis, 2003b; Morse, 1997). The study of those USA based research tourism products is a sizeable study in its own right, and a research topic for the future.

1.9.2. The role of the SCUBA diving sector in marine research tourism

This thesis does not investigate the role of the SCUBA diving industry in marine research tourism in great detail. This is because at the start of this thesis, that sector was not identified as a major player in marine research tourism through initial discussions with key stakeholders and Study one‘s extensive internet search for MRT products as described in Section 3.7.1. However, as this thesis‘s delivered results, it became apparent that the SCUBA diving sector plays a significant role in marine research tourism worldwide including Australia. This role of SCUBA

diving in the exploration, research and conservation of the marine environment can also be observed through SCUBA diving magazines such as Dive Log, Sports Diver, and Australasia SCUBA diver. As such, a detailed study of the role of SCUBA diving sector in marine research tourism is outside the scope of this thesis and represents a research opportunity for the future.

1.9.3. Marine research tourism product design and environmental impact

Miller (2008) divides the realm of marine tourism research into two broad approaches; namely, 1) the design of tourism and 2) the impacts of tourism (Miller, 2008). The design approach focuses on the best way to create a quality biological, social and technological environment that fosters personal growth and responsible personal environmental conduct through coastal and marine tourism (Miller, 2008). The impacts approach focuses on maintaining the quality of tourism for the marine or coastal ecosystem and its components, and the citizenry of the area and human kind at large (Miller, 2008).

This study focuses on the product design aspects of marine research tourism and only addresses those impact aspects of marine research tourism as they relate to the design of marine research tourism products. As such the impacts of marine research tourism sponsored marine research and conservation on the marine environment are not evaluated in any great depth in this thesis. This is a research opportunity for another study of marine research tourism.

1.9.4. Volunteer tourism - the seasonal and episodic fields of guest volunteer tourism

Based on an in-depth assessment of the volunteer tourism literature, Smith and Holmes (2009) derived a conceptual model (Figure 1.3) to assess the holistic study of volunteer tourism. This model brings together 1) volunteer tourism hosts and guests; 2) the volunteering setting (i.e. attraction, destination service, event, and tourist destinations); and 3) the nature of the volunteer contribution (i.e. ongoing, seasonal, and episodic) (Smith & Holmes, 2009).

		Ongoing	Seasonal	Episodic
Host	Attractions	Many tourist attraction volunteers	Most volunteers at seasonal tourists attractions	Some project-based tourist attraction volunteers
	Destination services	Many destination services volunteers	Most volunteers at seasonal destination services	Some occasional destination service volunteers
	Events	Some core volunteers at periodic events		Most event volunteers
Guest	Tourist destinations	Some longer term volunteer tourists		Most volunteer tourists

Figure 1.3: Model of tourism volunteer engagements (Source: adapted from Smith & Holmes, 2009)

Guests (the tourist) are described as a consumer of volunteer tourism experiences and products, and hosts (i.e. the local community) are a producer of tourism through their participation in the tourism workforce (Smith & Holmes, 2009). Hosts will usually volunteer in tourism organisations within their own community, are involved in three main settings: attractions, destination service organisations, and events (Smith & Holmes, 2009). In comparison, guests are those travelling to volunteer as tourists in a destination setting (Smith & Holmes, 2009).

This thesis focuses on the guest volunteer tourist. Furthermore, within Smith and Holmes' (2009) guest volunteer tourist domain, this thesis will focus on the episodic volunteer tourism domain where volunteer tourists are involved on an infrequent, occasional, or short-term basis (Smith & Homes, 2009). Also, this thesis focuses on both the seasonal and episodic fields of guest volunteer tourism as shown in Figure 1.3 This is because marine tourism (of which marine research tourism is a subset) is often affected by the seasonality of ocean conditions, weather conditions, and the migratory patterns of marine wildlife (Birtles, Valentine, & Curnock, 2001; Orams, 1999).

1.9.5. Well-known tourism typologies

Study one seeks to measure the presence and variation of well-known tourism type criteria such as marine, wildlife, educational, volunteer, and adventure tourism criteria across a representative sample of eighty seven marine research tourism products. However, this study is not focused on the validity and refinement of existing tourism typologies and criteria for those tourism types. Rather it is always focused on the conceptual advancement of marine research tourism and research tourism. Furthermore, while acknowledging that the validity of various typologies that describe these well-known tourism types will likely vary, this study assumes that the validity of applied marine research tourism criteria from those typologies is sound. If there are doubts about the validity or usability of certain criteria they are raised in Chapter Three.

1.9.6. System analysis

A tourism system methodology was chosen a way to integrate the conceptual supply and demand nature of marine research tourism. However, the treatment of tourist systems in this thesis is not intended to be extensive. Instead, the focus of this thesis is on the conceptual nature of marine research tourism within a tourism supply and demand system framework.

1.9.7. The implications of this study for the Australian marine research tourism sector

The focus of this thesis is on the conceptual nature of marine research tourism. Inherent in this thesis's outcomes will be observations, features and relationships that describe, explain, and potentially predict future marine research tourism in Australia. However an extended assessment on the potential implications of this knowledge for the future of marine research tourism sector in Australia and elsewhere is outside the scope of this thesis, and an opportunity for another day.

1.9.8. Indigenous Australian views of marine research tourism in Australia

As Indigenous Australians have a deep spiritual and livelihood connection to the Australian marine and coastal environment (Rose, 1996), this thesis considers Indigenous Australians to be important stakeholders in marine research tourism in Australia. However, this study does not directly survey or interview any Indigenous Australians about the specific role of indigenous Australian's in Australian marine research tourism. There are two main reasons for this. First, at least ten representatives of indigenous land and marine management organisations

across Australia were asked to participate in this study. While somewhat interested, they all stated that they could not participate because they had pressing obligations elsewhere. Two representatives also indicated that they could participate, however this number of indigenous participants was not considered to be suitably representative of indigenous Australia. Therefore, the direct collection of the views of Indigenous Australians about Australian marine research tourism is a research opportunity for another study.

1.10. Thesis limitations

Limitations for this study are centred on the validity, reliability and generalisability of research outcomes. Validity is an assessment of whether a key criterion really measures a concept (Bryman, 2001). Reliability is an assessment of whether a criterion's measurement is accurate and repeatable (Bryman, 2001). Generalisability is an assessment of whether research findings can be generalised outside the context in which the research was conducted and is dependent upon how representative a data sample is of the whole population (Bryman, 2001).

The validity of much of this study's outcomes is dependent on the suitable selection of various marine research tourism related criteria to reliably measure various marine research tourism product, tourist or supply-side stakeholder characteristics. In many cases, these marine research tourism criteria are selected from existing tourism typologies and academic literature. When specific marine research tourism characteristics (e.g. level of marine research quality) are not readily identifiable in the research tourism related literature, this study derived new marine research tourism criteria to measure those characteristics. In all cases, care is taken by the researcher to ensure that the selected marine research tourism criteria are valid. A stated delimitation of this study

is that the validity of the applied marine research tourism criteria is sound. Nonetheless, it is a broad limitation of this study that the validity of all used marine research tourism criteria is only as good as initial research that underpins its initial derivation.

Much of this study's reliability is dependent on the internal reliability and inter-observer consistency of measured marine research tourism criteria from Internet web sites and online surveys. Internal reliability is related to whether a research participant's rating scores (e.g. 1 to 5) on one criterion (e.g. level of interest in a specific marine research tourism product) is related to their rating scores on other criteria (e.g. level of interest in the marine research topic) (Bryman, 2001). To demonstrate the internal reliability of many of thesis's numerical outcomes, this study calculated a Chonbach alpha value (Cramer, 2005) of over 0.7 for relevant analyses (e.g. factor analysis).

The generalisability of this study's outcomes is dependent on the type and representativeness of the sampled data samples used in studies one, two and three. Study one, step two sampled 85 marine research tourism product web sites worldwide using an Internet search and sampling method described in Chapter Three. This is 85 (67%) of an identified 126 marine research tourism products worldwide and all of the thirty Australian marine research tourism products that were identified using the Internet. Therefore, it is suggested that the results from study one are likely to be highly generalisable to the study of marine research tourism products worldwide. However, a clear limitation of study one is that marine research tourism products that were not readily identifiable by this study's search methods (i.e. Internet, academic literature, word of mouth, and tourism brochures) are not reviewed. It is not known how many marine research tourism products were excluded due to this limitation.

Study two undertook two anonymous online surveys and semi structured interviews of an estimated 70 marine research tourism supply-side stakeholders. Due to the two anonymous surveys, it is not possible to exactly know who or how many stakeholders completed this study. Much effort was placed into acquiring a representative sample for each key stakeholder group. However, there were key stakeholder groups that were under-represented in one or more of the research steps of study two. For example, research steps one and two; had one and no marine research students respectively. Also, research step two involved just one representative from a tourism destination organisation, albeit via an in-depth interview.

Study three undertook an online survey of 311 marine research tourism tourists. The convenience data sampling approach is described in detail in Chapter Three. Overall, the profile of respondents did match the general profile of marine research tourism tourists from the academic literature (Weiler & Richins, 1995; Clifton & Benson, 2006; Cousins, 2007) and study one (e.g. highly educated nature enthusiasts). However, the literature and study one did indicate that gap year travellers (Simpson, 2005) and backpackers (Pearce, Murphy, & Brymer, 2009) are potential marine research tourism tourists. Therefore a clear limitation in the sampled data is that gap year travellers were just one percent (n=3) and backpackers were fourteen percent (n=42) of the 311 respondents.

Finally, an interpretivistic epistemology is clearly present in two research steps of this study. Research step two of study two, involves the collection and interpretation of key stakeholder group views about the views of other key stakeholder groups. Research step two of study three involves the design of marine research tourism product brochures by the researcher

and the interpretative use of those brochures by respondents. The presence of an interpretivistic approach in both these research steps infers that their research outcomes cannot claim to represent a fully objective and complete picture (Bryman, 2001) of tourist and supply-side stakeholder views about Australian based marine research tourism products.

1.11. Thesis structure

Chapter One of this thesis describes the background, key definitions, key conceptual model, research problem questions, aim, design, scope, and limitations of this study. It highlights that a study of the conceptual nature of marine research tourism has not yet occurred; and this thesis aims to explore and describe the conceptual, supply, and demand nature of marine research tourism in Australia. Such a study is intended to provide further insight into the conceptual, supply, and demand aspects of marine research tourism in Australia and elsewhere.

Chapter Two reviews the existing academic literature that is relevant to the study of marine research tourism and land-based research tourism. This includes what various research tourism related researchers have done, how they did it, and what were their major findings. Subsequently, this information is then used to identify research issues, gaps, questions and opportunities that are relevant to this study of marine research tourism. Finally, this literature review identifies a research agenda and to study the conceptual nature, supply and demand of marine research tourism in Australia.

Chapter Three presents and justifies this thesis's research methodology. First it reviewed the positivistic and interpretivistic epistemologies, and mixed methods approach that underpins this thesis's methodology. Second, it outlines this thesis's research design including; a tourism-system approach, three studies, ethical considerations, conceptual models, methods, research procedures and steps, and research limitations. Chapter Four presents and analyses key results from the study one. Chapter Five presents and analyses important results from study two. Chapter Six presents and analyses key results from study three.

Chapter Seven highlights and discusses the significance contributions of study's one, two and three outcomes to the academic literature. It integrates those outcomes to develop a new conceptual model (Figure 7.6) of marine research tourism in Australia. Based on Moscardo et al. (2003)'s tourism system (Figure 1.2) and this thesis's proposed conceptual framework (Figure 1.1), this new model represents many of the key supply and demand factors that are likely to contribute to change in MRT across Australia.

Chapter Eight then synthesises key findings from this thesis's three studies to describe the conceptual nature of marine research tourism in Australia. It then describes the implications of this thesis for the theoretical study, policy and practice, and methodological study of marine research tourism. Finally, it presents a set of future opportunities to study marine research tourism in Australia and elsewhere.

1.12. Conclusion

This chapter describes the background, key definitions, proposed conceptual framework, research gaps, aim, design, scope, and limitations of this study. Centrally, it reports that a study of the conceptual nature of marine research tourism has not yet occurred. To address this, this thesis studies the conceptual, supply, and demand nature of marine research tourism with a specific focus on marine research tourism in Australia. Such a study would provide further insight into the conceptual, supply, and demand character of marine research tourism in Australia and elsewhere. The next chapter of this thesis reviews the academic literature that is relevant to this thesis‘s conceptual study of marine research tourism in Australia.

Chapter 2 Literature review

2.1. Introduction

This chapter reviews the key academic literature that is relevant to the study of marine research tourism (MRT hereafter) and research tourism in general. First, it provides a brief historical and geographical review of research tourism on a global basis. Second, it assesses fourteen definitions of research tourism; develops a revised conceptual model for research tourism from those definitions; and then outlines some of unique marine tourism aspects of MRT. Third, it evaluates the relevant academic literature to identify a range of significant gaps and opportunities for the further study of research tourism. This includes a study of the USA based research tourism sector; and a tourism-system study of the conceptual, supply, and demand nature of MRT in Australia.

2.2. Historical and geographical assessment of research tourism across the globe

Research tourism emerged in the early 1970s with the advent of organisations such as the Scientific Exploration Society in the United Kingdom (UK), CEDAM International in the United States of America (USA), and the Earthwatch Institute in the USA (Morse, 1997; Ellis, 2003b). From 1986, other research tourism companies began that includes: Coral Cay Conservation (1986), the Earthwatch Institute (1990), Trekforce (1990), Operation Wallacea (1995), Greenforce (1997), Global Vision International (1998), I-to-I (1999), the African Conservation Experience (1999), Biosphere Expeditions (1999), and Outreach International (1999) (Cousins,

2007; Lorimer, 2009). Since 2002, research tourism organisations such as Real Gap, Working Abroad, Projects, The Leap, Blue Ventures, Worldwide Experience, Reef Conservation International, and Gap Year for Grown Ups have also began operations from the UK (Cousins, 2007).

The reasons for this rapid growth are both demand and supply related. Since the early 1970s, increasing consumer demand for research tourism has occurred as a consequence of an affluent and an increasingly urbanised public to reconnect with the natural world through travel and the study of natural science (Morse, 1997; Ellis, 2003b). This demand has also been driven by increased public interest in science and adventure, through popular scientific television shows and other media (Morse, 1997). Supply-side reasons behind the growth in research tourism include 1) financial profits for research tourism operators; 2) an increasing realisation among professional scientists (e.g. from research agencies and museums) that research tourism can bring cost-effective labour, skills, income, and computational power to a scientific project; 3) Government commitment to public education about natural sciences and environmental sustainability; and 4) Government and Non Government Organisation (NGO) needs to attract public support for government funding of the natural sciences and management (Cousins, 2007; Ellis, 2003b; Morse, 1997; Silvertown, 2009).

While the majority of research tourism organisations are USA or UK based, most research tourism destinations are outside the USA and the UK (Ellis, 2003b). Ellis (2003b) states that the USA is the leader in the research tourism sector and this is probably due to a strong history of research tourism, their population size and relative affluence. However, apart from a brief

summary of the role of the Earthwatch Institute in the USA, Ellis (2003b) does not provide significant details of research tourism in the USA. Silvertown (2009)'s description of the citizen science in the USA briefly mentions research tourism (citizen science with paying volunteers such as Earthwatch volunteers) but also does not expand on the USA research tourism sector. There are passing references to Earthwatch Institute operations in the USA (Brightsmith, et al., 2008; Campbell & Smith, 2006; Ellis, 2003a; Lorimer, 2009) but these articles do not elaborate on the number, distribution and activities of research tourism products from the USA. It appears that the extent of academic literature about the USA based research tourism sector is limited.

When compared to the USA research tourism sector, the UK is estimated to be second overall and strongest in the youth market (Ellis, 2003b). In 2005, it is reported that some 7,550 paying volunteers participated in a UK based research tourism trip that involved 19 research tourism organisations (Cousins, 2007). Lorimer (2009) and Whatmore (2008) report that UK research tourism involved approximately 12, 000 research tourists and provided nearly 57,000 weeks of unpaid labour in 2007. In the same year, the total income in 2006-2007 for UK research tourism organisations was approximately £17.27 million generated from 324 programmes in 75 countries. The length of the programmes varied from two weeks to up to five months with an average of 4.6 weeks (Lorimer, 2009; Whatmore, 2008).

UK based research tourism is reported to occur in four main regions (Figure 2.1) across the globe namely; Southern and Eastern Africa (31%), Central America and the Caribbean (14%), the Andes and the Amazon (14%) and the Indonesian Islands (e.g. Indonesia, Malaysia and Thailand, (12%) (Whatmore, 2008; Lorimer, 2009; Benson, 2005). Additionally, Cousins (2007) reports that South Africa has the largest number of UK based research tourism products

(17%) followed by Australia (8%), Costa Rica (6%) and Ecuador (6%). Overall, research tourism programs in those regions accounted for more than seventy four percent of all UK based research tourism products (Lorimer, 2009; Whatmore, 2008). Matching to these studies, Ellis (2003b) reports that all (i.e. UK, USA and other) research tourism products are distributed across Central and South America (approx. 30%), North America (20%), Europe (17%), and Australia, New Zealand and the Pacific (14%) (Ellis, 2003b). Ellis (2003b) also does not explicitly mention the distribution figures for research tourism products and trips in Africa and Asia.

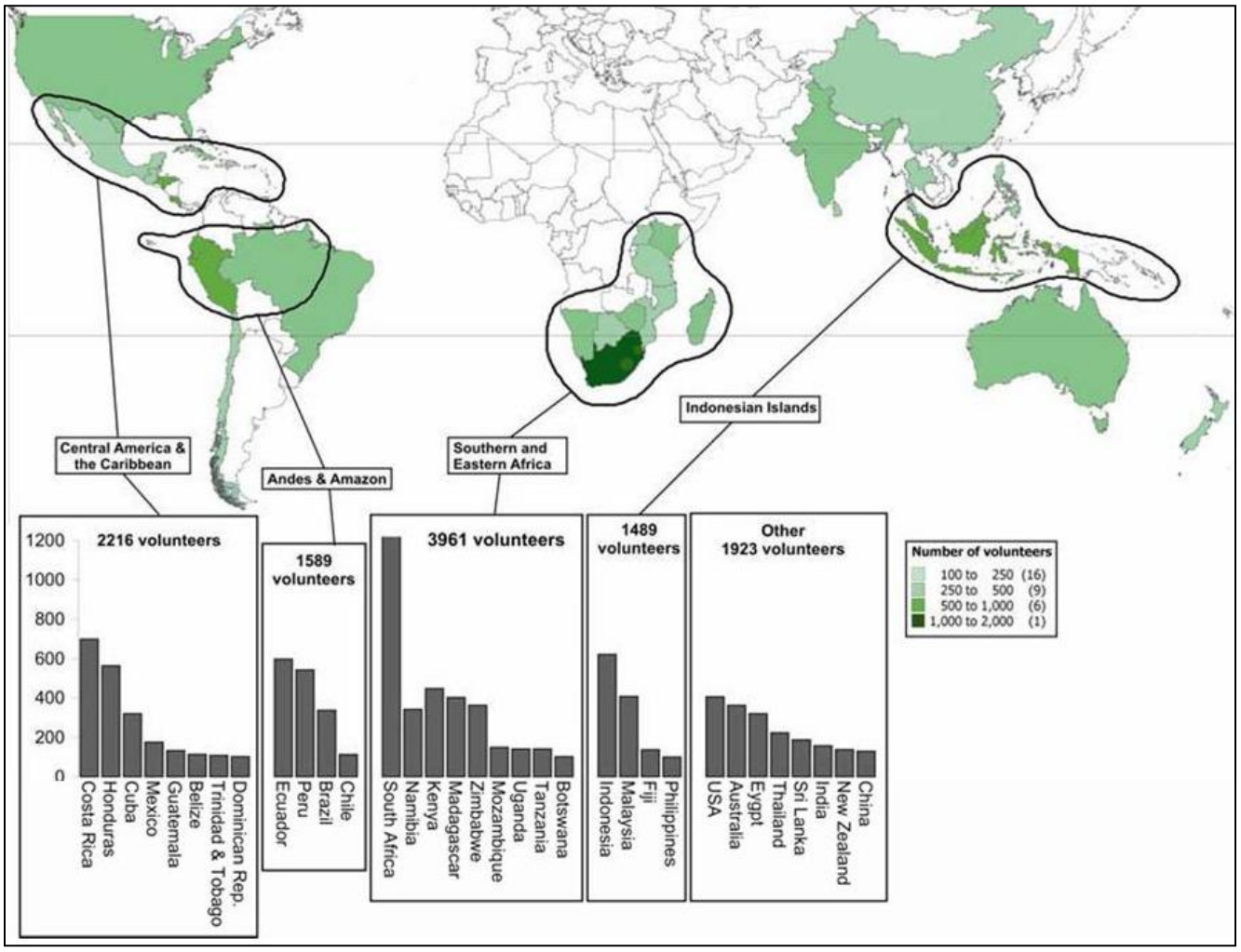


Figure 2.1: The global distribution and national totals of UK conservation volunteer programmes in countries receiving >100 volunteers per annum (Source: Lorimer, 2009; Whatmore, 2008)

UK based research tourism is concentrated in the tropics or sub tropics, with the most popular habitats being tropical forests (40%) and coral reefs (18%) (Lorimer, 2009; Whatmore, 2008). Ellis (2003b) reports that tropical rainforests (31%), tropical savannah (19%) and marine environments (10%) have the largest share. For wildlife specific projects the greatest distribution of projects were mammals (57%) followed by reptiles (18%), fish (12%), birds (6%), plants (4%) and insects (3%) (Ellis, 2003b). Within the mammal group, carnivores (e.g. lions and tigers) have the largest share (33%), followed by whales and dolphins (23%), primates (19%) and elephants (11%) (Ellis, 2003b).

The largest research tourism company worldwide is The Earthwatch Institute which provides volunteers, funding, and academic overview to over 120 peer-reviewed scientific projects (Cousins, 2007). Membership of the Earthwatch Institute is over 20, 000 in the USA and 10,000 from other countries (Ellis, 2003b). While the Earthwatch Institute has grown since 2003, Ellis (2003b) reported that since 1972, the Earthwatch Institute had sponsored 2,900 research projects in 188 countries involving over 65, 000 volunteers, and contributes over US$50m to research and 10 million hours of field work.

2.3. Other definitions for research tourism

This thesis is focused on the conceptual exploration of research tourism with a specific focus on MRT. As well as this study‘s definition of MRT in Chapter One, there are other definitions of research tourism (Table 2-1) that are found in the academic literature. Each of these definitions describes a form of tourism where scientific research and conservation are a central part of the tourist attraction. However, some of these definitions focus on specific or different

features of MRT. The following section assesses those definitions and terms to provide further insight into the conceptual nature of MRT.

Table 2-1: Other definitions for research tourism (n=14)

ID	Definition name	Source
1	Hard core ecotourism	(Lindberg, 1989)
2	Scientific tourism	(Llyina & Mieczkowski, 1992)
3	Extreme ecotourism	(Weiler & Richins, 1995)
4	Scientific study tourism	(Morse, 1997)
5	Participatory Environmental Research Tourism (PERT)	(Ellis, 2003a; 2003b)
6	Research ecotourism	(Galley & Clifton, 2004; Clifton & Benson, 2006)
7	Research tourism	(Benson, 2005)
8	Volunteer tourism	(Caissie & Halpenny, 2003; Campbell & Smith, 2006; Coghlan, 2007; Wearing, 2003),
9	Conservation volunteer tourism	(Coghlan, 2007)
10	Active conservation holidays	(Cousins, 2007)
11	Scientific ecotourism	(Whatmore, 2008)
12	Volunteer conservation tourism	(Lorimer, 2009)
13	Citizen science	(Silvertown, 2009)
14	Conservation tourism	(Cousins, Sadler and Evans, 2009)

Lindberg (1991) described research tourists as a sub group of ecotourists that includes hard-core nature tourists, scientific researchers or tourists specifically interested in nature education, research or conservation. Llyina and Mieczkowski (1992) identified research tourism as scientific tourism and described it as a form of tourism that seeks to study and preserve relatively undisturbed environments under the leadership of highly qualified scientists. They saw scientific tourism as only the beginning of a worldwide expansion of _knowledge-orientated‘ tourism that overlaps with environmentally friendly tourism, such as ecotourism, adventure tourism and cultural tourism. Weiler and Richins (1995) termed Earthwatch Institute research tourists as _extreme ecotourists‘ because their motivations and activity are often have higher extremes of commitment to environmental responsibility, intensity of interaction with the environment, physical difficulty or challenge.

Morse (1997) defined the scientific study tour as an organised tour operated by a scientific institution operated tours that are primarily for scientific educational purposes. Ellis (2003a) on the other hand defined research tourism as non specialist volunteers or tourists who pay for a volunteer vacation or conservation holiday to help wildlife managers in environmental field research and contribute financially to fund the research. Benson (2005) conceptualised research tourism as a form of alternative, ecotourism, volunteer, scientific, and educational tourism that is situated in a niche tourism context. Clifton and Benson (2006) described research tourism as activities consistent with generally accepted definitions of ecotourism which are offered to paying individuals within a research-oriented framework. Such activities are primarily directed towards conservation and monitoring of the natural environment as well as research involving villages and local communities in programmes which may be summarised as ‗sustainable community development' (Clifton & Benson, 2006).

Wearing (2001) identified Earthwatch Expeditions as a form of volunteer tourism whereby scientific research is an activity aligned to volunteer tourism. Volunteer tourism can be defined as a form of tourism that ―makes use of holiday-makers who volunteer to fund and work on conservation projects around the world and which aims to provide sustainable alternative travel that can assist in community development, scientific research or ecological restoration" (Wearing, 2003, p.217). Within the scope of this definition, Coghlan (2007) identified four main types of conservation volunteer tourism organisations namely conservation research, community holiday, holiday conservation, and adventure conservation organisations. Conservation research organisations emphasise wildlife and research aspects of their trips. Community holiday organisations emphasise the cross-cultural understanding aspects. Holiday conservation

organisations emphasise the wildlife viewing and adventure aspects. Adventure conservation organisations emphasise the adventure and personal development aspects.

Cousins (2007) defined active conservation holidays as a specialty sub-sector of the larger ecotourism market, which fuses the ‗hard' ecotourist with the volunteer tourist, in which paying members of the general public travel for the purpose of actively participating in organised conservation work. Active conservation holidays reflect these motives and commonly involve scientific research, general conservation work on reserves and game parks and wildlife rehabilitation (Cousins, 2007). Whatmore (2008) however describes scientific ecotourism as ecotourism trips that are guided by conservation biologists to witness, research and conserve charismatic species. Scientific ecotourism helps to sustain an extensive network of local and international scientists, conservation and welfare organisations and active land management programmes (Whatmore, 2008). Lorimer (2009) defined the conservation volunteer sector as those people who travel from their home country to help support wildlife conservation, research and rehabilitation projects. Silvertown (2009) defined a citizen scientist as a volunteer who collects and/or processes data as part of a scientific enquiry particularly in ecology and the environmental sciences. Cousins et al. (2009) defined conservation tourism as a fusion of ecotourism and volunteer tourism, whereby visitors pay to work as participants on conservation projects. The next section of this chapter links these definitions to provide a revised conceptual model for research tourism.

2.4. A revised conceptual model for research tourism

A summary of the different key words and phrases that comprise these research tourism definitions is provided in Table 2-2, Table 2-3 and Table 2-4. Those key words and phrases can be combined to derive a richer understanding about the research tourism phenomena. Specifically, research tourism can be viewed as a combination of 1) nine well-known tourism types; 2) three types of intended benefits; 3) a set of key participants; and 4) and usual activity (Figure 2.2). Those nine well-known tourism types are scientific tourism, wildlife tourism, volunteer tourism, educational tourism, nature tourism, ecotourism, alternative tourism, adventure tourism, and niche tourism. The three intended benefits of research tourism are environmental conservation, scientific research, and sustainable community development. Key participants and usual activity are non professional nature enthusiasts who are led by scientists or wildlife managers in a volunteer or more passive holiday setting. A brief summary of each of those well-known tourism types and intended benefits is presented in Appendix 1.

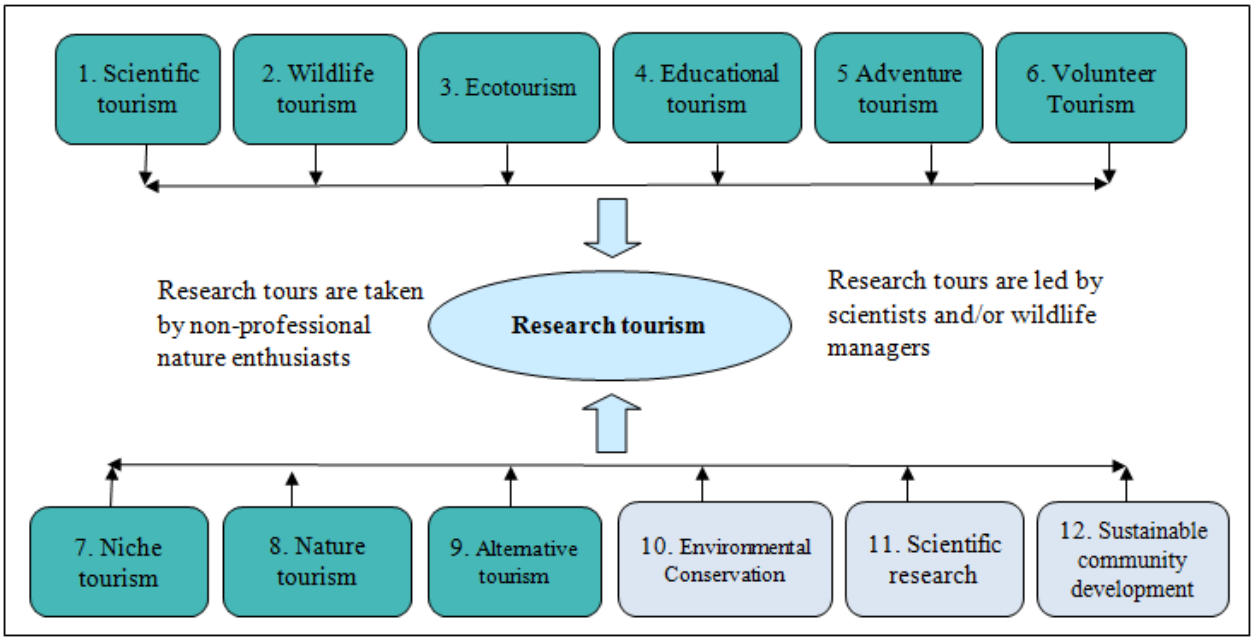


Figure 2.2: A revised conceptual framework for research tourism (derived from Benson, 2005; Coghlan, 2007; Ellis, 2003b; Clifton & Benson, Cousins, 2007; Brown & Lehto, 2005; Whatmore, 2008; Lorimer, 2009)

Table 2-2: Key words or phrases that are associated with better known tourism types found in research tourism definitions

	Better known tourism types									
Term for research tourism	**Scientific tourism**	**Wildlife tourism**	**Volunteer tourism**	**Ecotourism**	**Deeper ecotourism**	**Educational tourism**	**Nature tourism**	**Alterative tourism**	**Adventure tourism**	**Niche tourism**
Hard core nature tourism	✓				✓	✓	✓			
Scientific tourism	✓									
Extreme ecotourism	✓	✓			✓		✓			
Scientific study tourism	✓					✓	✓			
Volunteer tourism	✓		✓					✓		
Participatory Environmental Research Tourism (PERT)	✓	✓	✓							
Research tourism	✓		✓	✓		✓		✓		✓
Research ecotourism		✓		✓						
Conservation volunteer tourism		✓	✓						✓	
Active conservation holidays	✓	✓		✓						
Volunteer conservation tourism	✓	✓	✓		✓					
Scientific ecotourism	✓	✓		✓						
Citizen science	✓		✓							
Conservation tourism			✓		✓					
Count	**11**	**7**	**7**	**4**	**4**	**3**	**3**	**2**	**1**	**1**

Table 2-3: Stakeholder identity and benefit related key words or phrases found in research tourism definitions

	Who		Benefits		
Term for research tourism	**Led by scientists or wildlife managers**	**Non professional nature enthusiasts**	**Fund environmental conservation**	**Fund scientific research**	**Sustainable community development**
Hard core nature tourism and scientific tourism			✓	✓	
Scientific tourism	✓		✓		
Extreme ecotourism		✓			
Scientific study tourism	✓	✓		✓	
Volunteer tourism			✓	✓	✓
Participatory Environmental Research Tourism (PERT)	✓	✓	✓	✓	
Research tourism	✓			✓	
Research ecotourism			✓		✓
Conservation volunteer tourism			✓		✓
Active conservation holidays	✓		✓	✓	✓
Volunteer conservation tourism		✓	✓	✓	
Scientific ecotourism			✓	✓	✓
Citizen Science			✓	✓	
Conservation tourism			✓		
Count	**5**	**4**	**11**	**5**	**9**

Table 2-4: Key words or phrases that describe research tourist activity found in research tourism definitions

	Activity							
Term for research tourism	**Conservation**	**Scientific research**	**Volunteer**	**Holiday**	**Active participation**	**Local community**	**Nature Education**	**Passive participation**
Hard core nature tourism and scientific tourism	✓	✓					✓	
Scientific tourism	✓							
Extreme ecotourism								
Scientific study tourism							✓	✓
Volunteer tourism	✓	✓	✓	✓		✓		
Participatory Environmental Research Tourism (PERT)	✓	✓	✓	✓				
Research tourism		✓					✓	
Research ecotourism	✓	✓	✓			✓		
Conservation volunteer tourism	✓	✓	✓	✓		✓		
Active conservation holidays	✓	✓			✓	✓		✓
Volunteer conservation tourism	✓	✓	✓	✓	✓			
Scientific ecotourism	✓	✓	✓					
Citizen science	✓	✓	✓		✓			
Conservation tourism	✓				✓			
Count	**11**	**10**	**7**	**4**	**4**	**4**	**3**	**2**

2.5. Unique aspects of marine tourism

It is reasonable to suggest that many of the unique aspects of marine tourism will affect MRT and distinguish it from land-based research tourism. To provide further insight into the unique nature of MRT, eight distinctive features of marine tourism from the literature are presented next. Furthermore, a list of marine wildlife species that are known to contribute to marine wildlife tourism is also presented.

First, marine tourism occurs (for the most part) on, in or under an ocean that is alien to humans (Orams, 1999). Second, marine tourism takes place in an environment in which humans do not live and are dependent on equipment such as boats and SCUBA to survive (Cater & Cater, 2007; Orams, 1999). Third, marine tourism operations can often be constrained by poor sea conditions and weather (Garrod & Wilson, 2002). Fourth, safety issues in marine areas can be of greater importance than land-based tourism (Orams, 1999). Fifth, the open nature and inter-connected nature of the marine environment brings special management challenges such as impacts on marine wildlife by marine tourism, and distance from shore challenges for marine management (Cater & Cater, 2007; Miller, 2008; Orams, 1999). Sixth, as a marine tourism attraction, marine wildlife are often highly mobile and unpredictable and can therefore be difficult and costly to sight (Birtles et al., 2001; Garrod & Wilson, 2002). Seventh, supply of marine tourism products can often be governed by high demand and scarce supply and this can increase the cost of marine recreational activities (Orams, 1999). Finally, there are typically high capital requirements for establishing a marine ecotourism business (Garrod & Wilson, 2002).

Birtles, Valentine and Curnock (2001) reported that many free-ranging (i.e. non captive) marine wildlife play a significant part of marine wildlife tourism across Australia (Table 2-5). They forecast that the wide diversity and abundance of marine species and habitat types found along Australia's coastline will continue to drive the growth of free ranging marine wildlife tourism in Australian (Birtles, Valentine & Curnock, 2001).

Table 2-5: Marine wildlife that underpin free-ranging marine wildlife tourism attractions across Australia (Source: Birtles, Valentine & Curnock, 2001)

Wildlife group	**Wildlife type**	**Species**	**Species**	**Species**	**Species**
Mammals	Whales	Humpback	Southern right	Dwarf Minke	
Mammals	Dolphins	Inshore bottlenose	Indo-pacific humpback	Common dolphins	
Mammals	Dugong	*Dugong dugon*			
Pinnipeds	Seals and sea lions	Australian sea lion	Australian fur seal	New Zealand fur seal	
Birds	Penguins	Little penguins	Gannets	Other sea birds	
Fish	Sharks	Reef sharks	Grey nurse	Great White	Whale Shark
Fish	Rays	Manta rays	Eagle rays	White spotted eagle rays	
Fish	Sea dragons	Leafy sea dragon	Weedy sea dragon		
Fish	Potato cod				
Fish	Other fishes	Queensland grouper	Giant Maori wrasse	Moray Eels	Spotted hand fish
Reptiles	Turtles	Loggerhead turtles	Hawksbill turtles	Olive Ridley	Flatback
Cephalopods	Cuttlefish	Octopus	Nautilus		

Together, sections 2.3 and 2.4 assessed fourteen definition of research tourism and subsequently derived a revised conceptual framework of research tourism (Figure 2.2). Section 2.5 described many of the unique aspects of marine tourism that are likely to be distinctive features of MRT when compared with land-based research tourism. To conceptually distinguish MRT from land-based research tourism, the marine tourism concept (Cater & Cater, 2007; Orams, 1999; Garrod & Wilson, 2002) can be added to propose a new conceptual framework for MRT (Figure 1.1).

To provide further insight into the conceptual nature, supply of and demand for MRT, the next section reviews the key academic literature that is relevant to the field of research tourism. Following that, a set of research opportunities to study MRT is identified.

2.6. The relevant key literature

Table 2-6 summarises the academic articles about research tourism that are relevant to this thesis. Six of these articles (Cousins, 2007; Cousins et al., 2009; Ellis, 2003a, 2003b; Lorimer, 2009; Whatmore, 2008) describe supply and demand of research tourism on a global or regional scale (e.g. Costa Rica). Four of those articles focus on the UK based research tourism industry worldwide (Cousins, 2007; Cousins et al., 2009; Lorimer, 2009; Whatmore, 2008). One article describes the history of scientific study tours worldwide (Morse, 1997). Two articles are case studies that specifically assess the supply-side issues associated with a specific research tourism product (Brightsmith et al., 2008; Coghlan, 2008). Two articles are case studies of MRT in Australia (Dunstan, 2009; Hughes, 2008).

Four articles describe case studies about research tourism at Operation Wallacea in Sulawesi, Indonesia (Benson, 2005; Clifton, 2004; Clifton & Benson, 2006; Galley & Clifton, 2004).Two articles focus on the volunteer tourism related topic of volunteer and vacation mindedness (Brown & Lehto, 2005; Brown & Morrison, 2003). Six articles (Brown & Lehto, 2005; Brown & Morrison, 2003; Caissie & Halpenny, 2003; Campbell & Smith, 2006; Galley & Clifton, 2004; Weiler & Richins, 1995) are case studies (Yin, 1994) about tourist motivations for specific research tourism products. Two articles focused on the effectiveness of marine volunteer programs (Cuthill, 2000; Musso & Inglis, 1998).

Table 2-6: Key studies on the conceptual nature, supply, and demand of research tourism

Researcher(s)	Research topic	Main focus
Weiler & Richins, 1995	Tourist profile and motivations on an Earthwatch Institute expedition in Australia	Demand
Morse, 1997	History of scientific study tours globally	Supply and demand
Ellis, 2003a	The distribution and characteristics of research tourism globally	Supply
Ellis, 2003b	The distribution and characteristics of research tourism globally	Supply
Clifton, 2004	Evaluating dive tourism and research tourism at Wakatobi Marine National Park, Indonesia	Supply
Galley & Clifton, 2004	The motivational and demographic characteristics of research ecotourists at Operation Wallacea volunteers in South-east Sulawesi, Indonesia	Demand
Benson, 2005	The conceptual nature of research tourism - the presence of well-known tourism types within research tourism	Supply
Clifton & Benson, 2006	Research tourism at Operation Wallacea, Indonesia	Demand
Brown & Lehto, 2005	Conceptual nature of volunteer tourism - volunteer and vacation minded typology	Demand
Brown & Morrison, 2003	Volunteer vacations in the USA	Supply and demand
Coghlan, 2006	The preferences of conservation volunteer tourists for different conservation volunteer tourism products	Demand
Coghlan, 2007	A typology of research tourism products	Supply and demand
Campbell & Smith, 2006	The motivating values of marine turtle focused volunteer tourists at Tortuguero Costa Rica	Demand
Caissie and Halpenny, 2003	The values and motivations of nature based volunteers in Ontario Canada	Demand
Cousins, 2007	Global distribution and product characteristics of UK research tourism operators	Supply
Coghlan, 2008	The different perceptions of conservation volunteer expedition leaders and tourists	Supply and demand
Brightsmith, Stronza & Holle, 2008	Issues between key stakeholders at an Earthwatch Institute expedition in Peru.	Supply and demand
Whatmore, 2008	Global distribution and product characteristics of UK research tourism operators. This includes a cases study of scientific ecotourism in Sri Lanka	Supply
Lorimer, 2009	Global distribution and product characteristics of UK research tourism operators, and associated issues	Supply
Cousins et al., 2009	Global distribution of UK research tourism and issues	Supply
Musso & Inglis, 1998	Reliable coral reef monitoring for marine tourism operators and community volunteers on the Great Barrier Reef, Australia	Supply
Cuthill, 2000	Developing volunteer-based coastal monitoring programmes	Supply
Hughes, 2008	The Ecocean company and whale shark research tourism	Supply
Dunstan, 2009	An account of the achievements of the Undersea Explorer research tourism company in Australia	Supply and demand

2.6.1. Tourist profile and motivations of an Earthwatch Institute expedition (Weiler & Richins, 1995)

Weiler and Richins (1995) investigated the motivational and socio-demographic characteristics of 156 Earthwatch Institute research tourists in Australia. Of their sample, sixty nine percent of research tourists were female, sixty nine percent were unmarried, sixty four percent had university qualifications, fifty one percent had professional occupations and twenty one percent were in relatively higher income bracket. Seventy two percent of the group was between the ages of 25 and 55, with a notable age group between 25 and 35 (thirty one percent). Most were students (75 %) who were undertaking a university degree in the natural sciences with the remainder enrolled in environmental courses such as geography or environmental management. Three quarters of the group was more likely to participate in outdoor recreation such as camping and bird watching. Just over half (52%) percent of the group were members of an environmental organisation. The most important reasons for research participants to join the Earthwatch expedition were: 1) to do something meaningful or conservation orientated, 2) attracted to the subject matter, 3) the desire to do something new or be challenged; and 4) interested in helping and working alongside a researcher (Weiler & Richins, 1995). Weiler and Richins (1995) classified this Earthwatch expedition as a ‗deep green ecotourism' (Acott et al., 1998) market. However, they also highlighted that there is an opportunity to study the motives of another research tourism market segment whereby the tourist seeks a less active, more comfortable, less costly, and/or less time consuming research tourism experience.

After assessing Weiler and Richins (1995), Weaver (2001) raised some prospective research questions to assist with understanding the research tourist as a distinct market segment, namely:

1. Why do females and the unattached have a high disposition to engage in ecotourism research field?
2. Do strong biocentric motivations result from high levels of university qualifications and professional occupations, or do those with such attitudes tend to seek education and professional careers?
3. If the former, what is the potential to recruit other well paid professionals into the research tourism segment?

2.6.2. A history of the scientific study tour (Morse, 1997)

Morse (1997) views the modern scientific study tour as a forerunner of research tourism (Morse, 1997). The modern scientific study tour can be traced from before the nineteenth century when British aristocrats visited sites of classical interest in Europe, North Africa and the Middle East; to the advent of large scale museum and university alumni study tours by organisations such as the Smithsonian Institute and The Earthwatch Institute (Morse, 1997). Morse (1997) makes a significant contribution to the study of research tourism because he comments on the nature of the relationships between science, the scientific intuition and the tourist. To Morse, the scientific study tour shows that scientific research is an _object' that not only belongs to science

but also to tourism. That is, the scientific study tour relies on and uses the authority of science to present the world to tourists (Morse, 1997).

> *The fact that science has been cast in this role and the fact that scientific field tours are so popular indicates that science has a powerful social meaning as a medium between consumers of tourism and the world.*
>
> (Morse, 1997, p 257)

Furthermore, ~~"t~~the scientific study tour and research tourism promise a newly expanded and tamed travelling universe" (Morse, 1997, p. 267). Their distinct ability to provide ‗authentic' scientific experience offers a remedy to modern life as well as to mass tourism and (Morse, 1997). ~~"B~~By selling firsthand knowledge of the world, these tours deliver a subtextual message that knowledge about the world is within the commodifying grasp of the tourist and is readily available through scientific institutions and their scientists" (Morse, 1997, p. 268). Whether scientists and scientific institutions are comfortable with this commodification of science for the benefit of tourism is raised and discussed by Cousins (2007), Whatmore (2008), Lorimer (2009), and Cousins, Evans and Sadler (2009).

2.6.3. Participatory Environmental Research Tourism worldwide (Ellis, 2003a; Ellis, 2003b)

Ellis (2003a) identified research tourism as Participatory Environmental Research Tourism (PERT). Her study appears to be the first study that describes the present distribution and characteristics of research tourism on a globe scale. It was followed by a more detailed assessment of research tourism on a global scale by Ellis (2003b). Ellis's (2003a) study conducted semi-structured interviews of 39 PERT operators that offer 887 trips across the globe;

and secondary data analysis of their organisational web sites. The selection of PERT operators was limited to English-speaking research tourism programs that were advertised on the Internet or in written media (Ellis, 2003a). Characteristics that define PERT trips are:

1. Overnight travel plus one-way travel of 40 km or more;
2. Active participation by members (hands-on role) in flora or fauna field research or data collection;
3. Advertised publicly;
4. Participants are volunteers;
5. Trips are less than 1 month in length, using "fixed dates"; and
6. Participants make a financial contribution to the project.

Ellis (2003a)

Ellis (2003a) found that the PERT sector is still relatively small in size, focused on wildlife, with not-for-profit agencies being the dominant operators in the USA and commercial operators being prevalent in the UK. Natural resource managers, governments, scientists, and universities frequently create formal or informal partnerships with commercial research tourism operators or not-for-profit agencies (Ellis, 2003a). The most suitable structure for operating within the research tourism industry was not clear (Ellis, 2003a). For example, some research tourism operators run their own trips while others such as the Earthwatch Institute require scientists to apply for a grant and act as a middleman that links volunteers with scientists (Ellis, 2003a). In some cases, scientists require only a few seasonal trips per year and maintaining a

permanent administration is not feasible (Ellis, 2003a). In these cases, logistics are often coordinated through commercial tour operators or not-for-profit groups (Ellis, 2003a).

The appropriate involvement of government scientific agencies in research tourism is also a concern for research tourism (Ellis, 2003a). For example, a major research tourism issue is the training and management of volunteer tourists to achieve reliable research outcomes, and the occupational health and safety of volunteer tourists (Ellis, 2003a). However scientists are usually solely focused on other issues such as species decline, funding long-term research and monitoring programs through conventional short-term grant processes (Ellis, 2003a).

Using the data collected by Ellis (2003a), Ellis (2003b) identified a range of management issues and future research opportunities for research tourism. One observation was that natural resource managers may seek control of research and conservation programs through licensing or other schemes, rather than allowing private sector involvement as there is perceived clash between profit motives and long term conservation aspects (Ellis, 2003b). Furthermore, due to external research funding sources, research tourism businesses may provide additional competition for tourism operators (Ellis, 2003b). For example, conflict is evident where not for profit research tourism groups directly compete in Hawaii‘s whale watching industry (Ellis, 2003b). Ellis (2003b) also reports that unprofitable or zero profit research tourism trips are likely to be of less interest to commercial tour operations. Other important research tourism management issues are identified to be 1) managing volunteers; 2) health and safety issues of volunteers; 3) estimating demand preferences for different locations, species, and time of year; and 4) insufficient supply of research tourism products (Ellis, 2003b).

Based on these stakeholder issues, Ellis (2003b) identified the following research opportunities in the research tourism sector:

1. Examine the logistical issues of research tourism in terms of; the safety of volunteers, maintaining the interest of volunteers while on tour, and access to locations due to factors such as remoteness and weather;
2. Further explore, describe and explain the episodic (i.e. separated and loosely connected events) nature of research tourism;
3. Further explore, describe and explain how to increase repeat tourists and product loyalty for research tourism;
4. Explore and evaluate how to provide the necessary skills and training to volunteers;
5. Determine whether the extent that the popularity of certain species or groups of species within research tourism is supply (e.g. marine research) or demand (e.g. tourist) driven;
6. Explore and describe the additional costs of undertaking science on tours and its implications for tourism operators;
7. How to further involve research and management agencies in research tourism?
8. What is the most suitable organisational structure for operating within the research tourism sector?
9. Determine the ability of research tourism to provide positive benefits to its stakeholders (e.g. marine managers, tourists, and local communities);
10. Examine the potential growth of research tourism and related management issues;
11. Explore the conceptual relationships between research tourism, volunteering, wildlife tourism, ecotourism and sustainable tourism.

Ellis (2003b) concludes that more theoretical work is needed to further comprehend the operational nature of the research tourism sector. This includes research into the internal variation of the conceptual, supply, and demand components of the research tourism sector (Ellis, 2003b). If utilised, such research could allow key stakeholders (e.g. environmental managers, tourism planners, and tourists) to make an educated choice concerning the most suitable approach or type of research tourism venture for a location (Ellis, 2003b).

2.6.4. Operation Wallacea, South-East Sulawesi, Indonesia (Clifton, 2004; Galley & Clifton, 2004; Benson, 2006; Clifton & Benson, 2006)

Clifton (2004) compared and evaluated the ecotourism performance of a SCUBA dive ecotourism company _Wakatobi Divers' and research tourism company _Operation Wallacea' at Wakatobi Marine National Park in south-east Sulawesi, Indonesia. Operation Wallacea is a UK-based research tourism operator that conducts scientific wildlife surveys and community-based conservation work on Hoga and Buton Islands close to Wakatobi Marine National Park (Galley & Clifton, 2004). Visitors to Operation Wallacea are mainly UK-based higher education students that pay to undertake research and conservation projects that also form the basis for their university dissertation projects (Clifton & Benson, 2006).

Clifton (2004) conducted a series of interviews (number not stated) with the owners and employees of the two companies and the local community about their daily operations, product marketing, and the relationships between local communities and national park authorities of the two companies. Interview outcomes were complemented by participant observation of

informants, informal discussions with some informants, and notes of activities and interactions between local residents and overseas visitors (Clifton, 2004).

Clifton (2004) found that despite the similar labelling of these two companies, they have significantly different economic and social impacts on the local community. For example, the dive ecotourism operation usually relies upon food and other services from outside the local region, while the research ecotourism operation depends upon local suppliers for much of their food and other services such as the operation and maintenance of dive boats (Clifton, 2004). Due to those limited economic benefits to local residents and somewhat neo-colonial attitude by dive ecotourists, Clifton (2004) concludes that the potential for mutually beneficial social interaction between dive ecotourists and local communities will be extremely limited. Conversely, surveys of local residents in both 2000 and 2001 indicated a near unanimous level of support for the continued operation of the research ecotourism operation, with respondents referring to the range of economic as well as the social-cultural benefits that are derived from regular and informal contact between research tourists and local communities (Clifton, 2004).

For Clifton (2004), Operation Wallacea highlights the value of research tourism funded scientific research at a local community level. For example, many of these scientific projects involve university students working with fishermen, women and children from both ethnic groups as part of research programmes (Clifton, 2004). Research projects often also related to 1) the socio-economic aspects of the local community; 2) their relationship with national park authorities; and 3) the park‘s impact upon local livelihoods (Clifton, 2004). Clifton (2004) concludes that in comparison with the dive ecotourism operation at Wakatobi Marine National

Park, research tourism offers considerable economical potential for local communities, and could well serve as a model for future developments, particularly in remote locations that match the interests and needs of the Operational Wallacea tourist market (Clifton, 2004).

Galley and Clifton (2004) sought to determine the motivational and demographic characteristics of 100 research tourists at Operation Wallacea, Indonesia. Specifically, they used self-administrated surveys to identify 1) the demographic characteristics of the volunteers; 2) the categories of ‗ecotourist' according to previous holiday experiences; 3) the tourist's motivations to join Operation Wallacea; 4) to what extent the volunteers were true ‗ecotourists'; and 5) the implications of these findings with regard to the future development of the research tourism.

Results indicate that the surveyed research tourists are distinguished by the fact that they are relatively young (age not given in paper), motivated by the desire to undertake field research and enthusiastic about the environment (Galley & Clifton, 2004). Full details of their profile are listed in Table 2-7. For Galley and Clifton (2004), the fact that these individuals were largely driven by ‗research'-related motives however, clearly emphasises that they are different from most other tourists, and that they are a unique part of the tourism industry and ecotourism market. Clifton and Galley (2004) also report that Earthwatch research tourists (Weiler & Richins, 1995) seem to be more influenced by working alongside a researcher, whereas Operation Wallacea's research tourists would rather undertake their own individual research. Such a finding shows segmentation within the research tourist market and also reflects the different way in which two research tourism organisations can operate (Galley & Clifton, 2004).

Table 2-7: Profile of research tourists at Operation Wallacea, Indonesia (Source: Clifton & Galley, 2004)

Research tourist characteristic
Operation Wallacea research tourists were predominantly female, single, relatively young, and well educated. That is similar to the Earthwatch Institute profile by Weiler and Richins (1995).
A large proportion of the Operation Wallacea volunteers had past experiences of ecotourism, with holidays most frequently involving: _outdoor-based activities', _visiting famous historical landmarks' and _nature-based activities'.
The most common responses for joining Operation Wallacea were associated with _personal development' and _academic achievement', which displayed a strong similarity with the motivations for joining Earthwatch Australia (Weiler & Richins, 1995).
The volunteers demonstrated a high level of awareness and concern for the environment which reflects the fact that the majority of them were studying a science or environmental based degree at university.

Clifton and Galley (2004) conclude that there is a definite potential for growth in research tourism on a global basis. Therefore the characteristics of its participants will have a number of implications upon the characteristics and distribution of research tourism products (Clifton & Galley, 2004). Given the relatively young age and motivations of this sector, they suggest that it is possible that 1) research tourists would probably be more willing and able to travel to very remote locations for their experience; and 2) be more prepared to put up with basic standards of accommodation and infrastructure than more up-market, affluent and possibly elder ecotourists (Clifton & Galley, 2004). It is therefore possible that research tourism could be one of the first steps in opening up new areas for future ecotourism (Clifton & Galley, 2004).

Based on direct field experience with and the academic study of research tourism at Operation Wallacea; Benson (2005) reports that the occurrence of research tourism worldwide is complex and diverse. Research tourism companies seek uniqueness by targeting certain markets, locations, research programs, and/or activities (Benson, 2005). Their research tourism products can be identified when the educational, volunteer and scientific tourism elements overlap and the following characteristics are displayed:

- Characteristics of alternative tourism are present;
- Scientific teams of individual scientists are engaged in research pursuits;
- The fostering and active promotion of learning and education in relation to participants is evident;
- The facilities (e.g. research centre) support and enhance the opportunities for learning and education (e.g. labs, library, lecture theatre, computer equipment, etc.);
- Participants volunteer to participant, although this may or may not involve payment;
- The opportunity for participants to conduct their own research is available, with support from the scientific team or individual scientist.

(Benson, 2005, p. 137)

To conceptualise many of the features of research tourism, Benson (2005) described many of the key features of educational, volunteer, scientific and niche tourism to provide a compelling description of research tourism. Based on this description, Benson (2005) proposed a conceptual framework for research tourism as a combination of overlapping well-known tourism types namely; ecotourism, volunteer, scientific, and educational tourism within a niche and alternative tourism context (Figure 2.3) (Benson, 2005).

While this conceptual model will not account for the full complexity and diversity of research tourism (Benson, 2005), it does provide a compelling tourism typology and that can be used a basis for the further study of research tourism. However, it is worth noting that there are key research tourism concepts that are not shown in this model namely; adventure tourism (Coghlan, 2007), vacations (Coghlan, 2007 Weiler & Richins, 1995), and wildlife tourism (Ellis,

2003b; Whatmore, 2008; Lorimer, 2009). Therefore, adding those concepts to Benson's model would be valid contributions to that model.

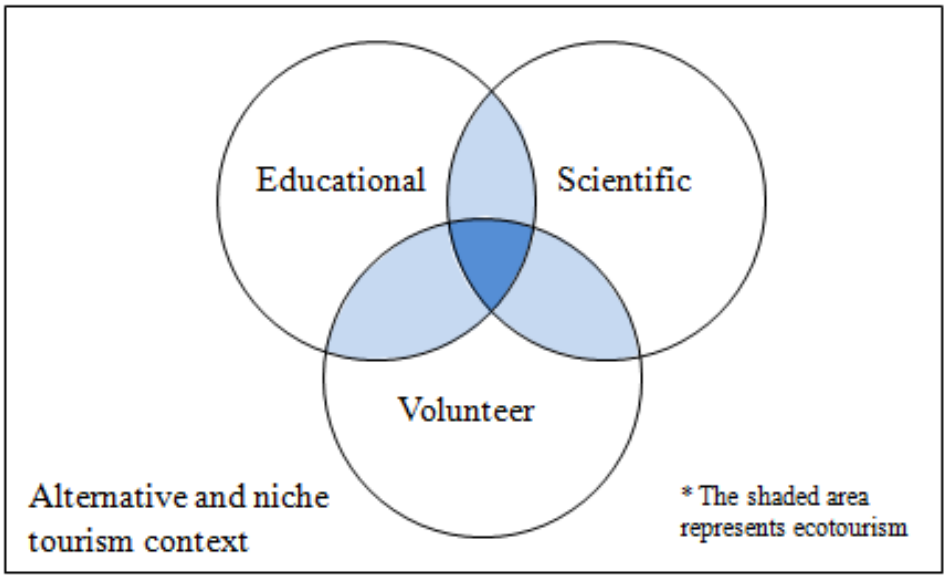


Figure 2.3: A conceptual model for research tourism (Benson, 2005: Based on author's fieldwork)
Note: The shaded area of Figure 2.3 represents ecotourism, demonstrating that research tourism falls within the ecotourism sector, but scientific, volunteer, educational tourism can fall outside that ecotourism concept (Benson, 2005).

Clifton and Benson (2006) profiled 30 research ecotourists at Operation Wallacea. Using self administered surveys, they found that the majority of the research ecotourists (63%) were female, ninety five percent were students in full-time higher education, and seventy five percent of those students were undertaking a degree in the natural sciences (Clifton & Benson, 2006). Furthermore, ninety one percent of their respondents frequently or occasionally read about environmental issues in the media, sixty one percent frequently or occasionally donate money to environmental charities, and thirty four percent claimed to be currently members of such organisations.

They also found that Operation Wallacea research ecotourists have motivations and preferences that are similar to the backpacker (Pearce et al., 2009), and gap year (Simpson, 2005) segments of the tourist market (Clifton & Benson, 2005). These tourists are also different from mainstream ecotourists who focus more on experiencing wildlife and natural areas to the exclusion of interacting with local residents (Clifton & Benson, 2006). For example, many Operation Wallacea research tourists show a –willingness to take on information relating to local norms, cultures, and beliefs, and the desire to incorporate cultural exchange" (Clifton and Benson, 2006, p. 252). This willingness is attributed to the relatively high education and social awareness characteristics of those research ecotourists at Operation Wallacea (Clifton & Benson, 2006). For Clifton and Benson (2006), these traits are more congruent with the _deep green' or _dark green' end of the ecotourist spectrum as described by Acott, La Trobe, and Howard (1998).

2.6.5. The volunteer vacation concept (Brown & Morrison, 2003)

Based on interviews with key officials of 275 volunteer tourism organisations in the USA, Brown and Morrison (2003) identified a form of volunteer tourism experience that they describe as a mini mission. The mini mission concept gives travellers an opportunity to participate in an optional excursion that has a volunteer component and cultural exchange with local people (Brown & Morrison, 2003). Brown and Morrison (2003) subsequently conducted an exploratory study to determine the potential demand for the mini mission concept, which could be instrumental in significantly expanding participation in volunteer vacations in the future. A survey was sent by e-mail to about 7,946 members of the Ambassador Travel Club (i.e. the largest travel club in the USA) in the USA and 323 of those members completed the survey.

Brown and Morrison (2003) found that those who were interested in volunteer vacations include people who volunteer in their home communities, holiday more frequently, have higher household incomes, and have higher levels of education especially postgraduate degrees. Similar to Weiler and Richins (1995), Brown and Morrison (2003) findings indicates that there is considerable potential demand for adding a volunteer component as part of an overall vacation experience. For Brown and Morrison (2003), there is a commercial opportunity for tour operators to vary their products by adding mini missions to their products and subsequently providing attractive travel experiences with memories that may last a life time.

Brown and Morrison (2003) recommend further research on developing an empirical profile of volunteer vacationers and how they differ from other tourists. This information will help tour operators and destinations target volunteer vacationers (Brown & Morrison, 2003). They also recommend further study on the motivational characteristics of volunteer vacationers so as to expand the conceptual knowledge of volunteer vacations and their product preferences. They acknowledge that their survey design was based on their direct experience with mini mission travel rather than theoretical constructs drawn from the academic literature (Brown & Morrison, 2003). By inference, they recommend that further research into volunteer vacation travel should use theoretical constructs (e.g. tourism typologies such as Benson‘s (2005) conceptual model for research tourism) from the academic literature to design the research instrument.

2.6.6. Volunteer and vacation mindedness (Brown & Lehto, 2005)

Following on from Brown and Morrison's (2003) study, Brown and Lehto (2005) conducted focus group sessions and in-depth interviews of 25 experienced volunteer tourists from the Ambassador Travel Club. As a result, Brown and Lehto (2005) proposed a volunteer minded and vacation minded spectrum (Figure 2.4) whereby the volunteer tourism trips ranges from full-time volunteering trips where volunteerism is the main focus of the tour to vacation minded trips where volunteerism is just one component of the tour. Volunteer minded trips are often associated with little or no leisure whereby vacation minded trips are often associated with a leisure experience (Brown & Lehto, 2005). When compared with more serious volunteer minded travellers, vacation minded travellers appear to attach high values to; educating children, bonding with family members, camaraderie, a sense of adventure, and desires for exploration and novelty (Brown & Lehto, 2005). While this classification scheme takes a simplistic approach, it provides a baseline for typology development of volunteer tourists (Brown & Lehto, 2005).

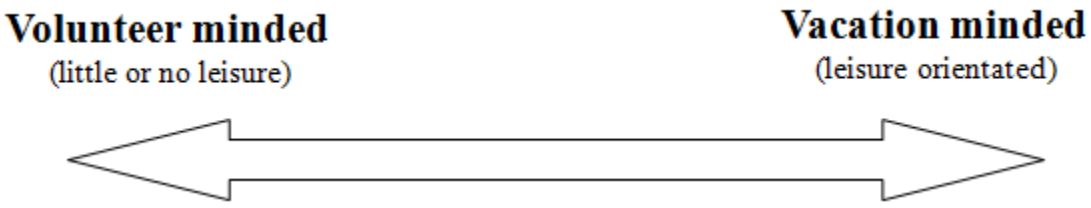


Figure 2.4: Vacation and volunteer minded spectrum (Derived from Brown & Lehto, 2005)

Specifically, vacation minded tourism offers travellers an opportunity to participate in an optional excursion that has a volunteer component, as well as a cultural exchange with local people (Brown & Lehto, 2005). This is similar to the mini mission concept of Brown and Morrison (2003). Often, those optional volunteer encounters are the highlight of the individuals'

vacations (Brown & Lehto, 2005). As such, Brown and Lehto (2005) propose that vacation minded tourism can create authentic cultural experiences unlike any other in the industry (Brown & Lehto, 2005). Like Brown and Morrison (2003), they state that when compared to the volunteer minded tourist market, the vacation minded tourist market is an understudied tourism market segment. They pose the research questions 1) what motivates vacation minded tourists; 2) what benefits do they derive from a vacation minded volunteer experience; 3) what are the highlights of a vacation minded volunteering experience; and 4) how do the volunteer activities influence their overall vacation experience and satisfaction (Brown & Lehto, 2005)?

2.6.7. Conservation volunteer tourism (Coghlan, 2006; Coghlan, 2007)

Coghlan (2006) identified research tourism as conservation volunteer tourism. Much of the research tourism and volunteer tourism literature (e.g. Galley & Clifton, 2004; Wearing, 2003; Weiler & Richins, 1995) concludes that volunteer minded research tourists are largely motivated by need to make an altruistic difference in the world and put something back into the natural or social environment (Coghlan, 2006). Coghlan (2006) investigated this view that research tourists always seek to make such a difference during their holidays. Using self administered surveys, she sought to understand how 60 postgraduate university students from the James Cook University in Australia interpreted the promotional material of 16 research tourism organisations such as Tethys, Earthwatch, Blue Ventures, Biosphere Expeditions, and Greenforce (Coghlan, 2006). The promotional material was identified through a search of the Internet, specialist magazines and relevant guidebooks (Coghlan, 2006). So as to be somewhat

representative of a research tourism market, only students who had an interest in tourism, conservation, biological or tropical science (Coghlan, 2006) were selected for this study.

Coghlan (2006) found that potential research tourists do make a distinction between trips that are 1) more closely related to ecotourism holidays; and 2) trips that offer a true volunteering experience with an emphasis on altruism and learning. This holiday and volunteering phenomenon can be conceptually found in Brown and Lehto's (2005) volunteer and vacation mindedness spectrum whereby a research tourism product can be more or less leisure orientated. She also found that respondents who were more familiar with more volunteer minded research tourism experiences were more critical of research tourism organisations that they described as _holiday' expeditions (Coghlan, 2006). These respondents were looking for benefits such as increasing their skills or knowledge, and were more likely to highlight that some organisations used their volunteers as free labour only without suitable compensation for their efforts (Coghlan, 2006). Conversely, respondents who were less familiar with research tourism were more likely to comment on the attractiveness of the brochure and the _fun or holiday' content of the trip (Coghlan, 2006). These people were likely to focus more on having fun and a memorable experience than on learning and networking (Coghlan, 2006).

Coghlan (2006) recommended further study into the varying perceptions of potential research tourists for different research tourism products. Research into this would help to ensure that the expectations of research tourists are being met, and that operators are running a business that best meets the needs of their customers and their conservation goals (Coghlan, 2006). If utilised, such research could also assist research tourism managers to match the marketing

images they create with their research tourists‘ expectations, and the research tourism product‘s benefits and activities (Coghlan, 2006).

Following Coghlan (2006), Coghlan (2007) empirically derived a typology of research tourism organisations by classifying 27 organisational mission statements, promotional photographs, and research testimonies using content analysis. To triangulate outcomes from this process, a group of 15 biology and 15 tourism postgraduate students also classified the promotional material of 23 research tourism organisations (Coghlan, 2007). Outcomes from each process were then compared to show a strong match (87%) between them (Coghlan, 2007). Much of the thirteen percent difference between them was attributed to the student‘s pre-conceptions about research tourism organisations due to factors such as the opinions of friends and family, such as news reports and books (Coghlan, 2007).

From this classification process, Coghlan (2007) derived a model for research tourism that is comprised of four classes (Table 2-8). These four classes were conservation research trips, holiday conservation, adventure conservation, and community holiday trips (Coghlan, 2007). Conservation research trips place a greater focus on conservation and research of one species or habitat (Coghlan, 2007). Holiday conservation trips place a greater focus on conservation, research, adventure and holidays (Coghlan, 2007). Adventure conservation trips place a greater focus on adventure, personal development and the local community (Coghlan, 2007). Community holiday trips placed greater emphasis on volunteer work, cross cultural understanding, and meeting the locals (Coghlan, 2007).

Table 2-8: Four classes of conservation volunteer tourism organisations (Coghlan, 2007)

Organisation type & characteristics	*Conservation research, expeditions*	*Conservation holiday, expeditions*	*Adventure holiday expeditions*	*Community holiday expeditions*
Mission statement	Conservation		Adventure/ personal development	Cross-cultural understanding
Photographs	Animals & data	Animals & adventure	Volunteers, volunteers with locals, adventure	Locals, volunteers, work, monuments
Testimonies	All themes		'Being useful', organisation promotion, personal development	Meet the locals
Sorting criteria	Conservation		Community	
	Research, focus on 1 species or environment 1 destination	Holiday, several projects and/or destinations, range of expedition themes	Community, holiday, range of projects and/or destinations, range of expedition themes	
Key characteristics	Small-scale local printed information	Larger scale, international, glossy brochures, more expensive		
	On-site training		Some involvement with locals, youth market	
				Longer trips, homestays
Examples	MICS, Tethys, ECCIB	Earthwatch, CCC	Raleigh, Brathay	i-to-i, teaching abroad

Coghlan (2007) demonstrates that it is possible to work towards a typology of research tourism organisations based upon the promotional material of a sample of these organisations. Its significance to the study of research tourism is that it empirically classifies research tourism into four plausible groups, and identifies the presence of adventure and holidays components within the conceptual nature of research tourism. She recommends further study about the varying needs, motivations, and expectations of different market segments for the four identified research tourism classes (Table 2-8). Such research would assist research tourism operators to further understand the images that their promotional material are creating, and assist them to effectively tap into the correct market to meet their project goals and ensure that their tourists' expectations are satisfied (Coghlan, 2007).

2.6.8. The motivating values of marine turtle focused volunteer tourists (Campbell & Smith, 2006)

To assess the motivating values of marine turtle focused volunteer tourists, Campbell and Smith (2006) undertook in-depth interviews of 31 conservation volunteer tourists at Tortuguero, Costa Rica in 1999 and 2000. They focused on topics such as; interest in sea turtles and turtle conservation, motives for participation, and the most gratifying parts of the volunteer experience. Their results show that volunteers hold multiple and complex values for sea turtles, but particular values dominated such as science, conservation, aesthetic, humanistic, and experiential values (Table 2-9). These findings may assist with understanding human–environment relations and the emerging study of nature based volunteer tourism (Campbell & Smith, 2006). A marketing implication is that research tourism operators might try to capitalise on scientific, conservation, aesthetic, humanistic, and experiential values to attract volunteer tourists, particularly in sea turtle volunteer programs (Campbell & Smith, 2006).

Table 2-9: Particular values that dominated for turtle volunteers (Source: Campbell & Smith, 2006)

Motivating value	**Description**
Scientific	Something is valued for its scientific properties or interest (e.g. migrations or life history)
Conservation	Something is valued for its conservation status (e.g. perceived level of threat, population status, success or lack of success in conservation measures)
Aesthetic	Sensuous qualities of environment, its sounds, colours, textures, and smells. They appear in space, the forms of mass, the shapes of volumes, the qualities and patterns of immediate experience
Humanistic	Something is valued because of the strong emotions it invokes strong affection for individual animals or for certain rare species
Experiential	Something is valued for the active experience it provides

2.6.9. The values and motivations of nature based volunteers (Caissie & Halpenny, 2003)

Caissie and Halpenny (2003) used semi-structured interviews to study the values and motivations of 10 nature based volunteers in Ontario Canada (Date of study not given). Volunteers consisted of five females and five males and were aged from 17 to 63. From their results, they derived a schema that illustrates a range of 16 personal and destination related motives that were universally shared by those 10 volunteers (Figure 2.5).

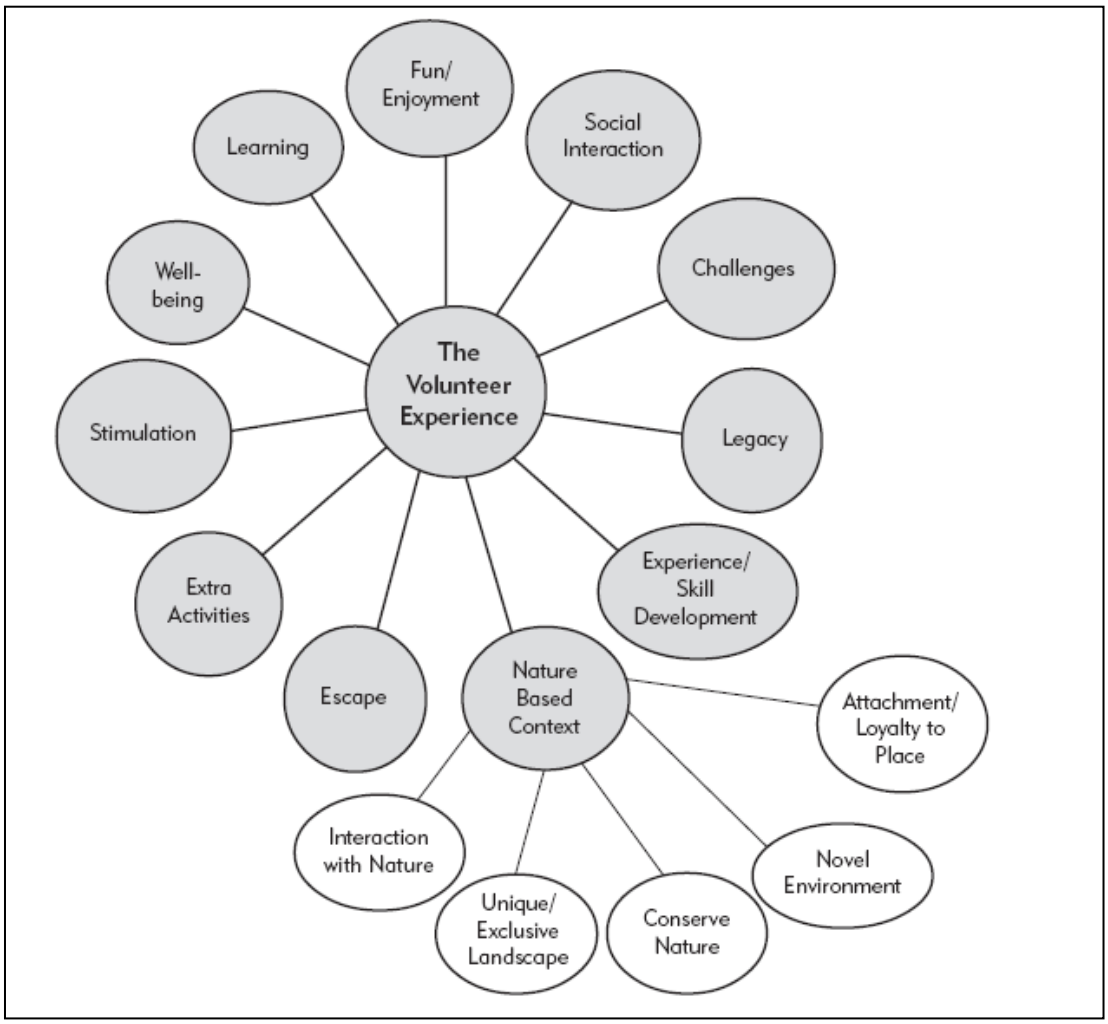


Figure 2.5: Universal values shared by nature based volunteers in Ontario Canada (Source: Caissie & Halpenny, 2005)

One significant aspect of Caissie and Halpenny‘s (2003) schema is that most of the research tourism motives identified from the literature (i.e. Wearing, 2001; Benson, 2005; Brown & Lehto, 2005; Coghlan, 2006; Campbell & Smith, 2006) can be found in that schema (Table 2-10). For example, motives such as fun, enjoyment, social interaction, and novel environment can be found in Brown and Lehto (2005) volunteer and vacation minded concept (e.g. fun, novelty, enjoyment, and camaraderie). Hence, their schema may be viewed as a schema that can unify many of the motivation for both volunteer and vacation minded research tourists.

Table 2-10: Nature based volunteer motives (Caissie & Halpenny, 2003) and other research tourism literature

Caissie & Halpenny, 2005 motive	**Example of matching literature**	**Specific comment**
Learning	Benson, 2005; Morse, 1997	Educational tourism
Fun/Enjoyment	Brown & Lehto, 2005; Coghlan, 2006	Vacation mindedness
Social interaction	Brown & Lehto, 2005; Coghlan, 2006	E.g. camaraderie, bonding with family members
Challenges	Coghlan, 2007; Brown & Lehto, 2005	E.g. adventure challenges
Legacy	Wearing, 2001	Volunteer tourism
Experience/skill development	Wearing, 2001	Volunteer tourism
Extra Activities	Campbell & Smith, 2006	Experiential values
Stimulation	Brown & Lehto, 2005; Coghlan, 2006	Vacation mindedness
Interact with nature	McKercher, 1998	Nature based tourism
Unique/exclusive nature	Campbell & Smith, 2006	Aesthetic values
Conserve nature	Campbell & Smith, 2006; Wearing, 2001	Conservation and humanistic values
Novel entertainment	Brown & Lehto, 2005	Vacation mindedness
Fostering a sense of well being	Wearing, 2001	Volunteer tourism

Interestingly, the motive _fostering a sense of well being‘ can be conceptually located in Campbell and Smith‘s (2006) _spiritual value‘ however they did not find spiritual values to be a dominant value for their turtle volunteers. Additionally, the _escape‘ and _attachment or loyalty to a favourite place‘ motives appear not to be well described in the research tourism literature. Therefore there is an opportunity to study the role of those motives in research tourism.

2.6.10. Supply-side stakeholder issues on research tourism expeditions (Coghlan, 2008; Brightsmith, Stronza & Holle, 2008)

Coghlan (2008) sought to further understand the perceptions of research expedition leaders' about their research tourists, and the expectations of those tourists. To achieve this, Coghlan (2008) used self administered surveys to study 27 expedition leaders or staff from 6 research tourism organisations. She found that expedition leaders are typically more focused on their research rather than a role of tour guide and hospitality provider (Coghlan, 2008). They often see volunteer tourists as a source of funding, labour and entertainment (Coghlan, 2008) They expect volunteers to be hard working, perform at the best of their ability, enjoy the work given, and good sense of humour (Coghlan, 2008).

On the other hand, volunteer tourists can often see themselves as holiday makers and can be motivated by the social aspects of expeditions, developing practical skills, cultural exchange, as well as sightseeing (Coghlan, 2008). This is reaffirmed by Henderson (1981) who advises that volunteer tourism participants often seek substantial personal benefits from their volunteer tourist experience. To address this gap, Coghlan (2008) recommends that expedition leaders receive training that is akin to a tour guide training to help organise, educate, entertain, and socially facilitate the research tourist experience. Due to the scientific nature of expeditions, this new tour guide would be an ecotour guide role as well as a researcher role (Coghlan, 2008).

Similar to Coghlan (2008), Brightsmith, Stronza and Holle (2008) describe some of issues between ecotourism operators, conservation researchers, volunteer organisations, and volunteer tourists at an Earthwatch Institute expedition in Peru. In the absence of traditional funding sources, Brightsmith et al. (2008) highlight that The Earthwatch Institute research tourism model can be an attractive funding option for long-term biodiversity monitoring studies. However, they found that volunteers were very interested in interacting with the lead researcher(s) and this, along with the intensive training and frequent formal and informal presentations, required a great deal of energy and commitment from researchers (Brightsmith, et al., 2008). For example, Brightsmith et al. (2008) found that such commitments amounted to about 21 hours per month of researcher time and can interfere with the logistics of scientific research. Brightsmith et al. (2008) inform that the actual research project they studied received only a small fraction of the income from research tourism. Additionally, research tourism can provide interruptions to the logistics of carrying out a scientific study (Brightsmith et al., 2008). This combined with the effort of supervising a large number of unskilled volunteers may cause some researchers to become disillusioned with that model (Brightsmith, et al., 2008). Consequently, Brightsmith et al. (2008) advise that researchers with limited interpersonal skills and those unwilling to invest time and energy with guests should avoid working with Earthwatch.

2.6.11. UK based research tourism worldwide (Cousins, 2007; Whatmore, 2008; Lorimer, 2009; Cousins, Sadler & Evans, 2009)

Cousins (2007) aimed to explore and describe the scale and diversity of UK based research tourism organisations and products. Specifically, information was derived on the following 1) the current size of the research tourism industry operating from the UK (i.e. number of operators,

products, and research tourists); 2) the growth of this industry; the diversity of organisations involved, their operations including marketing and overseas collaborations, 3) the distribution of conservation holidays across region, biome, activity and species, and 4) the general profile of the volunteers involved; volunteer fees; the allocation of these fees to overseas projects.

Cousins (2007) identified over a 100 organisations across the globe that offer volunteering and wildlife-related holidays. Organisations were identified through a desk-based study of web pages (utilising search engines such as Google and databases such as responsibletravel.com), newspapers (in particular weekend travel supplements), travel and wildlife magazines and travel books (Cousins, 2007). Organisations were selected for Cousins' study if they are registered in the UK and offered at least one international holiday whereby a key objective was practical conservation work. She found it difficult to determine the absolute number of operators. This was partly because of the scattered nature of advertising and partly because of the fluid nature of this industry (Cousins, 2007). However 21 organisations were considered to be a suitably representative sample of the research tourism industry based in the UK in 2005 (Cousins, 2007). Cousins (2007) undertook analysis of these organisation's web sites in terms of the number of available conservation holidays, and their distribution over continents, biomes, conservation activity and species selected for conservation. This information about each organisation was then combined to give an overview of the UK based research tourism industry, and to determine general trends (Cousins, 2007).

Significantly, Cousins (2007) reports that there appears to be a bias by UK based research tourism operators towards a relatively small number of destinations such as South Africa (17%), Australia (8%) and Costa Rica (6%) and this may indicate that a significant proportion of the

industry is led by consumer preferences and not necessarily conservation priorities. Cousins (2007, p. 1029) emphasises that "knowledge of the decision making processes leading to project selection and international collaboration will be important to understanding how the conservation tourism landscape is shaped, and will be studied in depth as part of future research". Research opportunities identified by Cousins (2007) included:

1. A detailed investigation into marketing strategies and techniques used by the research tourism industry;
2. An in-depth study of the nature of the partnerships formed between research tourism operators and overseas conservation organisations;
3. An investigation into the role and limitations of research tourism organisations in contributing to global conservation;
4. Further studies to build a worldwide picture of the research tourism industry - allowing comparisons to be made between countries offering conservation tourism.

As well as the identified research opportunities, there are at least two other significant contributions by Cousins (2007) to the study of research tourism. The first contribution is that by comprehensively describing the UK based research tourism industry, Cousin (2007) has built on Ellis's (2003a, 2003b) first broad scale study of research tourism on a global basis. The second contribution is that Cousins (2007) voices a concern that the UK based research tourism industry may be primarily driven by consumer demand for projects about charismatic wildlife that occur at popular ecotourism destinations rather than being driven by possibly more important conservation priorities with less appealing wildlife and destinations. This concern is followed up by Whatmore (2008), Lorimer (2009), and Cousins, Sadler and Evans (2009).

Following the same line of enquiry of Cousins (2007), both Whatmore (2008) and Lorimer (2009) undertook a review of the UK based research tourism sector across the globe. They reported on the size, value, key organisations, and countries, species and habitats of focus of that sector. Both articles appear to be largely based on the same primary data. This data was obtained by 1) an assessment of the web site and published literature of 23 research tourism organisations (including 324 volunteer programs); and 2) semi-structured phone (n=23) and/or face to face interviews (n=12) with senior managers from those organisations. Those 23 organisations included the 15 largest operators (i.e. sending greater than100 conservation volunteers to more than one country per year) and eight smaller operators who were selected to represent different taxa, geographic regions and modus operandi (Lorimer, 2009). Overall, that sample accounted for ninety percent of all volunteers who worked overseas with UK based organisations (Lorimer, 2009).

An important difference between the two articles is that Whatmore (2008) refers to research tourism as scientific ecotourism while Lorimer (2009) refers to research tourism as volunteer conservation tourism. This reaffirms the multiple tourism-type nature (Benson, 2005; Coghlan; 2007) of research tourism whereby research tourism can be seen as form of ecotourism and volunteer tourism. Another major difference is that Whatmore (2008) focuses on how elephant hunting in Sri Lanka in a colonial era has transformed into a volunteer tourism product that seeks to care for elephants. Importantly, Whatmore (2008) identifies a gap for the systematic research on international research tourism, and standardising the research tourism sector to regularly product quality outcomes for wildlife, volunteers, and local communities.

Significantly, Lorimer (2009) provides a considered interpretation of how UK research tourism operators design their research tourism ventures in accordance to business priorities rather than conservation priorities. For example, when Lorimer (2009) asked a range of research tourism managers how they set priorities, none of the managers mentioned any global conservation programs. Instead, they explained that prioritisation in the sector is conservative, reactive and market-driven (Lorimer, 2009). That is, the UK based research tourism industry is dependent on the availability of conservation projects that suit the tourist's needs and the willingness of research tourists to sign up and pay for those projects (Lorimer, 2009).

> *Managers know from past experience which projects work and sell well, they continuously gauge and channel volunteer enthusiasms and then seek to establish or solicit similar ventures. Conservation priorities emerge from the machinations of these negotiations, which are driven by two sets of factors – the availability of possible projects relates to the history and politics of global conservation, while the volunteer market closely reflects the cultural preferences of Western volunteers.*
>
> (Lorimer, 2009, p. 357)

Such a western tourism market focused approach to achieve conservation raises concerns with Lorimer (2009). That is, ~~t~~here are currently many species and areas lacking charisma, whose conservation practices are not appealing to volunteers or who inhabit parts of the world too remote or dangerous to be readily commodified for the market and sold to secure sustainable funding" (Lorimer, 2009, p. 359). Again, ~~t~~he need for encounters with charismatic species leaves vast holes in the menagerie of species that could realistically be targeted by volunteer-led conservation" (Lorimer, 2009, p. 358). However, there is some optimism as research tourism does somehow appear to often target its resources towards species and ecosystems considered to be of global conservation importance (Lorimer, 2009). Nonetheless, this achievement appears to

happen more by default than design and research tourism organisations are conservative, reactive and market driven (Lorimer, 2009). In the longer term, Lorimer (2009) concludes that many less charismatic, visible and/or accessible species and locations will not be well served by the current UK research tourism model.

Following on from Cousins (2007), Whatmore (2008), and Lorimer (2009), Cousins, Sadler and Evans (2009) explored the views of UK based research tourism operators about the role of legitimate science and conservation in research tourism in South Africa. In 2006 and 2007, they undertook interviews with managers of 16 UK based research tourism operators who operate in South Africa. These research tourism organisations were identified using the selection criteria discussed in Cousins (2007). Their analysis and interviews addressed subjects such as 1) how research tourism operator's link with conservation projects; and 2) how can the scientific legitimacy of research tourism be sustained under market conditions (Cousins et al., 2009). They found that;

> *Scientific legitimacy authenticates conservation tourism and is constantly balanced against the quality of the volunteer experience, and many of the companies in the sector are highly reflexive about this tension, both in terms of their own practices and those of their competitors. Authenticity is seen as a selling point and as a point of principle to the organisations, underpinning the financial and moral economy of conservation tourism. Rather than being reduced to the logic of the market, the desire for authenticity remains in tension. It is constructed and contested within conservation tourism networks and atomized throughout a transnational network of actors who are both scientists and business people, and who rely on personal and professional opinions and relations. Market share is based on achieving a balance between maintaining scientific credentials and appealing to the emotive needs of volunteers, all in as cheap a way as possible. This tension has driven the emergence of hybrid organisations within the sector, as a spectrum of companies coexist with varying orientations toward commerciality and conservation.*
>
> (Cousins et al., 2009, p.15)

The significance of Cousins et al. (2009) to the overall field of research tourism is at least twofold. First, Cousins et al. (2009) provide information about hitherto undocumented research tourism sector in South Africa and added to the existing knowledge base about research tourism on global or regional scale. Second, while acknowledging that research tourism has its limitations for conservation as identified in Cousins (2007) and Lorimer (2009), research tourism still has potential to be an important resource for global conservation (Cousins et al., 2009). To become an equitable mechanism for global conservation Cousins et al., (2009) recommends that the research tourism's progressive commodification of conservation should be tempered by some form of effective regulation.

Cousins et al.'s (2009) concerns about what appears to be the role of conservation science in tourism can be identified in Morse's (1997) philosophical views that scientific research in research tourism is an object that not only belongs to science but also to tourism. Similarly, conservation science has become an object that can belong to both science and tourism. Research tourism seeks to fund and conduct legitimate conservation science. On the other hand, by harnessing tourist demand for science and conservation, both research tourism operators (Ellis, 2003a; Cousins, 2007; Lorimer, 2007) and university alumni and museum groups (Morse, 1997) have developed what seems to be a commercially viable tourism sector.

Hence, research tourism can be seen as a form of conservation science as well as a form of tourism. However, research tourism operators, scientists, environmental NGOs and tourists can have different priorities (Whatmore, 2008, Cousins et al., 2009; Lorimer, 2009; Coghlan, 2008) and this can lead to disagreements. Further study that identifies and compares the

important differences and similarities between such stakeholders could lead to more collaborative opportunities to better manage and/or develop more research tourism products.

2.6.12. Collaborative frameworks for effective marine volunteering (Musso & Inglis, 1998; Cuthill, 2000)

While not unique to the research tourism sector, Musso and Inglis (1998), Cuthill (2000), developed collaborative frameworks to assist effective marine volunteer monitoring and research. Cuthill (2000) provided a range of guidelines for effective stakeholder involvement in marine research volunteering and monitoring programs. Specifically, Cuthill (2000) proposes that the volunteer program manager should draw together 1) the program's scientific objectives, the; 2) the volunteer's motivations, skills and knowledge; and then 3) consider multiple inter-related objectives in the design and implementation of the program. Those inter-related objectives include:

1. The development of appropriate communication strategies to volunteers;
2. The contribution to broad-scale and specific conservation objectives and management;
3. The provision of personal learning opportunities to volunteers;
4. The promotion of long-term conservation commitment from those involved;
5. Adding quality and meaning to the volunteer experience;
6. Achieving scientific outcomes;
7. Evaluating the volunteer's abilities and interpretative needs.

(Cuthill, 2000)

Appropriate consideration of the volunteer's abilities, motivations and interpretative needs will reap ample longer term rewards for marine volunteer programmes (Cuthill, 2000). These rewards will relate to meeting the aims of research agencies, deriving reliable data, satisfying volunteers, the safety of participants, the long term commitment of volunteers, and individual and community empowerment (Cuthill, 2000). To do this requires understanding of:

1. Who are the likely participants for any proposed marine research volunteer program?
2. What are the interests, motivations, needs and desires of volunteers?
3. What they are prepared to commit to the research program in terms of time, effort and money?
4. What their attitudes and values are towards program outcomes?
5. What volunteers already know about a proposed research program?
6. What are they capable of undertaking based on physical and educational abilities?
7. How are volunteers influenced to value the research program, objectives and outcomes?

Cuthill, 2000

Musso and Inglis (1998) evaluated the scientific reliability of volunteer MRT tourists (n=46) on coral reefs at the Great Barrier Reef (GBR), Australia in 1996. Many of stakeholder motivations and issues of volunteer coral reef monitoring that can affect key stakeholders were documented (Table 2-11).

Table 2-11: Motivations, objectives, desired outcomes and possible constraints across stakeholders, for coral reef volunteer monitoring - part (Source, Musso & Inglis, 1998)

	VOLUNTEERS (COMMUNITY GROUPS - GENERAL PUBLIC)	VOLUNTEERS (DIVE TOURISM OPERATORS_	CORAL REEF ENVIRONMENTAL MANAGERS	MARINE SCIENTISTS
Motivations and objectives for monitoring coral reefs	Concern for local environment. Response to specific problems (e.g. Anchor damage). Direct involvement in management. Dedication to marine environment. Recreational activity.	"Looking after" regular dive sites. Educational, nature based activities for customers. Information management (sustainability of activities). Information useful for planning commercial operations.	Detecting impact of human activities. Evaluating management strategies. Obtaining data on nature environment for policy development.	Describe broad scale spatial and temporal patterns. Estimating population parameters. Detecting effects of natural and human induced disturbances.
Desired outcomes of monitoring programs	Information for management of local issues. Wise use of the local environment.	Management for sustainable development of tourism on the GBR. Interpretative/educational materials.	Information basis for decision making. Re-assessment of management policies/strategies (adaptive management).	Development of ecological theories. Publication of results.
Possible constraints to collaboration among groups	Local politics. Logistic constraints. Resources.	Poor understanding of requirements for scientific monitoring. Logistics (especially tight time schedules). Lack of motivation of individuals involved.	Uncertainty about the reliability of data. Lack of resources. Concerns for impact of volunteer-based monitoring.	Scepticism about data quality. Issues of intellectual property. Competition with volunteer groups for research funds. Lack of professional incentives for involvement in community-based projects.

Similar to Cuthill's (2000) advice that the many stakeholder group objectives should be considered, Musso and Inglis (1998) recommend that:

1. The aspirations of each of the key stakeholders involved must be met (e.g. tourists, scientists and community groups);

2. There must be continued input of time and resources from several different sectors (e.g. resource managers, scientists and community groups) ;
3. There must be arrangements for program management and coordination, technical design, and training of participants;
4. They also advise that each stakeholder group may initially have different expectations for the program and, therefore, different standards by which they will judge its success or failure.

(Musso & Inglis, 1998, p. 108)

2.6.13. The marine form of research tourism (i.e. marine research tourism) (Hughes, 2008; Dunstan, 2009)

Hughes (2008) describes a research tourism company „Ecocean" from Western Australia in some detail. Ecocean uses thousands of whale shark photos from volunteer SCUBA divers or snorkellers to advance the research and conservation of whale sharks (Hughes, 2008). Volunteers submit these photos over the Internet to marine researchers who use image processing software to analyse the visual data and generate meaningful and useful knowledge about whale shark's behaviour and biology (Hughes, 2008). Consequently, Ecocean's whale shark project has become an international network of data gathering whale shark enthusiasts (i.e. tourists and volunteers) on a global scale (Hughes, 2008). In 2009, Ecocean's whale shark project is the major marine research attraction for the Earthwatch Institute's annual whale shark research tourism expeditions at Ningaloo reef in Western Australia (Earthwatch, 2009).

While now a successful enterprise, Ecocean is said to have had initial difficulties in gaining recognition and funding for the importance of whale sharks and their conservation, and obtaining adequate funding for research, conservation and promotion activities (Hughes, 2008). Funding issues were often related to a reliance on expensive technical equipment coupled with operational costs of running a research vessel in a remote region of Western Australia (Hughes, 2008). Initially, Brad Norman the founder of Ecocean, carried out his work using sporadic funding from research grants coupled with his own financial backing (Hughes, 2008). However, national and international campaigns for the whale shark‘s conservation were launched with eventual success in terms of gaining support and recognition via the Rolex Awards in 2006 (Hughes, 2008).

Dunstan (2009) provides a substantial coffee table book that chronicles the exploits and achievement of the now defunct research tourism venture named Undersea Explorer (Undersea, 2009) that operated out of Port Douglas Australia from 1995 to 2009 (Undersea, 2009). The Undersea Explorer was a live aboard marine tourism venture that sought to harness the tourism dollar to fund marine research and the conservation of the Great Barrier Reef (Dunstan, 2009). Andy Dunstan was Research coordinator and Operations manager on the Undersea Explorer from 1995 to 2007. Marine research achievements of the Undersea Explorer include dwarf minke whale research, tiger shark research and tagging, and turtle research at Raine Island (Dunstan, 2009). Research tourists were deeply involved with the marine research through close interaction and discussions with the marine researchers. However, they were usually vacation minded tourists (Brown & Lehto, 2005) and passively involved with the marine research activity via observations of marine researchers in action (Dunstan, 2009).

There are other academic studies that relate to the Undersea Explorer. However, they focus on 2) tourist interactions with dwarf minke whales (Birtles, Arnold, & Dunstan, 2002; Valentine, Birtles, Curnock, Arnold, & Dunstan, 2004); and 2) outcomes from science conducted on the Undersea Explorer (Arnold, Birtles, Sobtzick, Matthews, & Dunstan, 2005; Dunstan, Sobtzick, Birtles, & Arnold., 2007). Therefore, while Dunstan (2009) is not a peer reviewed academic article, it appears to be the only fully documented account of the benefits, opportunities, and issues for developing and operating a MRT venture in Australia, and particularly the Great Barrier Reef. For further information, a summary of the life and times of the Undersea Explorer (Dunstan, 2009) is provided in Appendix 2.

2.7. Research gaps

The previous discussion has reviewed the academic literature that is relevant to the study of MRT. Based on this literature, six research gaps about research tourism can be identified. These research gaps are presented next.

2.7.1. The conceptual nature of marine research tourism

Ellis (2003b) identifies a need to further explore the conceptual relationships between research tourism, volunteering, wildlife tourism, ecotourism, and sustainable tourism. Subsequently, Benson (2005) proposed a model for research tourism whereby research tourism is a conceptual combination of volunteer tourism, scientific tourism, and educational tourism within an ecotourism, alternative tourism and niche tourism context. Based on Benson (2005), Coghlan (2007) and other relevant literature, this chapter proposed a new conceptual framework

for MRT (Figure 1.1) that consists of ten well-known tourism types and three intended benefits of MRT. However, this new conceptual framework has not been empirically validated and explored. If validated and developed, such a model could advance the typological studies of research tourism by Benson (2005); Brown and Lehto (2005); and Coghlan (2007). Therefore, there is a clear opportunity to test, explore, and advance this model across a representative set of MRT products. Such a study would be a response to Ellis's (2003b), Brown and Lehto's (2005), and Coghlan's (2006) call for a further study into the conceptual nature of research tourism.

2.7.2. Supply-side stakeholders of marine research tourism

In many cases, the academic literature (Brightsmith et al., 2008; Coghlan, 2008; Cuthill, 2000; Musso & Inglis, 1998) highlights that understanding and satisfying the needs of different MRT stakeholders is likely to lead to increased stakeholder collaboration and a more effective research tourism product. However, based on the literature it appears that all of the identified studies about the supply-side of research tourism (Ellis, 2003a; Ellis, 2003b; Cousins, 2007; Whatmore, 2008; Lorimer, 2009; Cousins, et al., 2009) focus only on acquiring the views of research tourism operators.

It appears that a study that investigates the views of other key stakeholder groups (e.g. scientists, environmental managers, conservation groups, and other tourism operators) about research tourism has not occurred. It may be that some of their views are strikingly different than those of research tourism operators. There is therefore a significant research opportunity to undertake such a study. Furthermore, that study could evaluate some or many of the issues from the academic literature as summarised in Table 2-12.

Table 2-12: Identified opportunities to study the supply of research tourism products and services (Derived from this literature review)

Research focus	Research issue, opportunity and/or question	Source
Tourist services	How to manage research tourists and their safety?	Ellis, 2003b
Tourist services	How to better satisfy research tourists?	Ellis, 2003b
Tourist services	How to better provide the necessary skills and training to tourists?	Ellis, 2003b
Logistics	How to better deal with logistical factors such as remoteness and weather?	Ellis, 2003b
Logistics	How to deal with the episodic nature of many research tourism ventures?	Ellis, 2003b
Science and conservation	How to develop research tourism products to benefit so called less charismatic wildlife species or remote destinations?	Lorimer, 2009
Science and conservation	How to further involve research and management agencies in research tourism?	Ellis, 2003b
Science and conservation	How effective is research tourism in contributing to conservation?	Cousins, 2007
Science and conservation	An in-depth study of the nature of the partnerships formed between research tourism operators and overseas conservation organisations.	Cousins, 2007
Science and conservation	Determine whether the extent that the popularity of certain species or groups of species within research tourism is supply or demand driven.	Ellis, 2003b
Business	How to improve the commercial viability of research tourism businesses?	Ellis, 2003b
Business	Undertake a detailed investigation into marketing strategies and techniques used by the research tourism industry.	Cousins, 2007
Business	Determine the ability of research tourism to provide positive benefits to its stakeholders.	Ellis, 2003b
Business	Further describe research tourism on a regional scale across the globe.	Cousins, 2007; Whatmore, 2008
Business	How to standardise and regulate the research tourism industry so as to ensure satisfactory outcomes to all key stakeholder groups?	Cousins et al., 2009; Whatmore, 2008
Business	Examine the potential growth of research tourism and related management issues	Ellis, 2003b
Business	What is the most suitable organisational structure for operating within the research tourism sector?	Ellis, 2003b
Business	Provide information about existing and potential types of the research tourism so that key supply-side stakeholders to make an educated choice concerning the most suitable approach or type of venture for a location.	Ellis, 2003b

This study would be a new and significant contribution to field of research tourism because the views of other research tourism stakeholder groups have not been directly acquired and then reported in the literature. Such a study could identify stakeholder related opportunities and impediments to the growth of research tourism. It could also identify stakeholder views that are shared or contested across two or more key stakeholder groups. Shared views could form the basis of increased cooperation between stakeholder groups and subsequent growth in research tourism. Contested views could act to decrease stakeholder collaboration and subsequent growth.

2.7.3. The demand side of marine research tourism

The academic literature contains a number of research opportunities about the demand side of MRT. These broadly focus on further understanding the preferences of potential research tourists for different MRT products (Ellis, 2003b; Caissie & Halpenny (2003); Brown & Lehto, 2005; Coghlan, 2006; Campbell & Smith, 2006; Coghlan, 2007). For example, the affect of volunteer minded or vacation mindedness on a tourist‘s preference for different research tourism products is a research opportunity (Brown & Lehto, 2005). Similarly, the importance of nature volunteer motives (Caissie & Halpenny, 2003) and/or conservation volunteer values (Campbell & Smith, 2006) in determining research tourist preferences could be further studied.

Also, the preferences of different potential MRT markets for varying levels of the thirteen key MRT elements from the revised conceptual model MRT (Figure 1.1) is a research topic with great potential. For example, varying levels of ecotourism, marine remoteness, volunteer and vacation mindedness, education, adventure, scientific research and/or environmental conservation that are sought by a potential research tourist are likely to influence

a tourist‘s preference for different MRT products. The study of such a topic would allow for a range of tourism typologies, science, conservation and community development criteria to be measured and integrated towards a conceptual model about MRT tourist preferences.

An empirical study of the preferences of different potential MRT tourists would provide further insight into the potential MRT market. Coghlan (2007) identified that such a study could assist MRT organisations to 1) further understand the imagery of their promotional material; 2) assist them to tap into the correct market; and 3) ensure that their volunteers‘ expectations match their experiences (Coghlan, 2007). Research questions such as 1) what motivates vacation minded tourists; and 2) what benefits can they receive from a vacation minded experience (Brown & Lehto, 2005) could be addressed? Other questions could be 1) how can repeat research tourism be increased (Ellis, 2003b); 2) how could less-charismatic marine wildlife species better appeal to the MRT market (Lorimer, 2009, Whatmore, 2008); and 3) what wildlife species could attract MRT tourists to remote or less popular destinations (Lorimer, 2009, Whatmore, 2008).

2.7.4. Research tourism in Australia

The academic literature that describes research tourism across Australia is limited. Ellis (2003a), Ellis (2003b), Cousins (2007), Whatmore (2008), and Lorimer (2009) all refer to the existence of research tourism in Australia but do not provide any real detail of those occurrences. For example, Ellis (2003b) reports that fourteen percent of the identified global research tourism operations had research tourism trips in Australia, New Zealand or the Pacific. Furthermore, five percent of research tourism organisational headquarters were based in Australia and they operated nine percent of her identified studied research tourism trips (Ellis, 2003a). However,

apart from these general figures Ellis (2003b) does not expand on research tourism in Australia. Cousins (2007) identifies that Global Vision International (GVI) and the Earthwatch Institute have office in Australia, but does not describe those occurrences in any detail. Whatmore (2008) and Lorimer (2009) both inform that approximately 300 scientific ecotourists are present in Australia on an annual basis (Figure 2.1), but also do not provide any detail.

The academic literature that describes Australian based research tourism in any detail is case studies by Hughes (2008), Dunstan (2009), and Weiler and Richins (1995). As described earlier, Hughes (2008) documents the scientific achievements of Ecocean whale shark expeditions in northern Western Australia, and Dunstan (2008) documents the history of the Undersea Explorer MRT Company in northern Queensland, Australia. Weiler and Richins (1995) report on the socio demographic and motivational characteristics of 156 Earthwatch Institute research tourists in Australia. They describe The Earthwatch Institute as Australia‘s main research ecotourism organisation that offers eleven research tourism projects on topics such as honey bees, flying foxes, kangaroos and coral reefs (Weiler & Richins, 1995). However, apart from this, they did not provide any detail about the distribution or characteristics of research tourism across Australia.

In summary, there is a clear research gap in the body of knowledge about land-based and MRT across Australia. Given this, and the confirmation that Australia clearly has a research tourism industry (Ellis, 2003b; Whatmore, 2008; Hughes, 2008; Cousins, 2007; Hughes, 2008; Dunstan, 2009; Weiler & Richins, 1995), a study of research tourism across Australia is a warranted research opportunity.

2.7.5. Marine research tourism as a research topic

Across the identified major studies of research tourism at a regional scale, both land-based research tourism and MRT are often referred to within the same article but the focus is on land-based research tourism. Ellis (2003a), Coghlan (2007), Cousins (2007), and Lorimer (2009) all describe many of the geographic, business, conservation, wildlife and motivational aspects of research tourism but do not report on MRT in any real detail. For example, Ellis (2003a) reports that twenty nine percent of eight hundred and eight seven research tourism trips focused on marine mammals, seventeen percent on sea turtles and eleven percent on marine biology but does not expand on these trips. Similarly, Lorimer (2009), Coghlan (2007), and Cousins (2007) highlight the importance of marine mega fauna such as turtles, cetaceans, and coral reefs as key MRT attractions but do not provide further detail. Also, MRT organisations such as Coral Cay International, The Earthwatch Institute, Frontier and Operation Wallacea are mentioned in that literature (Coghlan, 2007; Cousins, 2007; Ellis, 2003a; Lorimer, 2009) but their MRT related operations are not described.

The academic literature that does focus on the MRT sector is case studies that describe specific MRT products or destinations (Benson, 2005; Campbell & Smith, 2006; Galley & Clifton, 2004; Clifton, 2004, Clifton & Benson, 2006; Dunstan, 2009; Hughes, 2008). However, apart from Hughes (2008) and Dunstan (2009), they report on the generic supply and demand aspects of research tourism rather than any particular marine aspect of research tourism. Hughes 2008) and Dunstan (2009) are case studies that provide insight into the marine related nature of MRT. However, a study about MRT across a global, continental, or regional scale (e.g. country such as

South Africa or Costa Rica) is noticeably absent from the literature. There is therefore a clear opportunity to further study MRT on a global, continental, and/or regional scale.

2.7.6. The study of research tourism using a tourism-system approach

This section provides a brief description of a tourism systems-approach; identifies that the academic study of research tourism using a tourism-system approach has not occurred; and concludes that the tourism-system study of research tourism is an opportunity to integrate the conceptual, supply, and demand components of research tourism into a new model of research tourism.

Tourism is often described in terms of a system (Farrell & Twining-Ward, 2004; Leiper, 1990; Morrison, 2002; Pearce, 2005). A tourism-system (Figure 2.6) is said to link four main tourism components 1) a tourist‘s preference for, and choice of a destination; 2) the tourist‘s travel to and from that destination; 3) the destination‘s development and activity; and 4) the destination‘s marketing approach to tourists (Mill & Morrison, 2002). These four components are inter-related by four main processes 1) the shape of travel demand; 2) the selling of travel; 3) the travel sales message reaching the market place; and 4) the travel purchase by the tourist (Mill & Morrison, 2002). The benefit of a tourism-system approach is that it envisages the inter-relation of different system components and processes to provide a unified picture of the flow of tourists from a generating region to a destination region (Hall, 2005). For instance, a tourism-system approach can be used to link the design of tourism products with tourist preferences for those products and supply-side stakeholder‘s ability to supply those products.

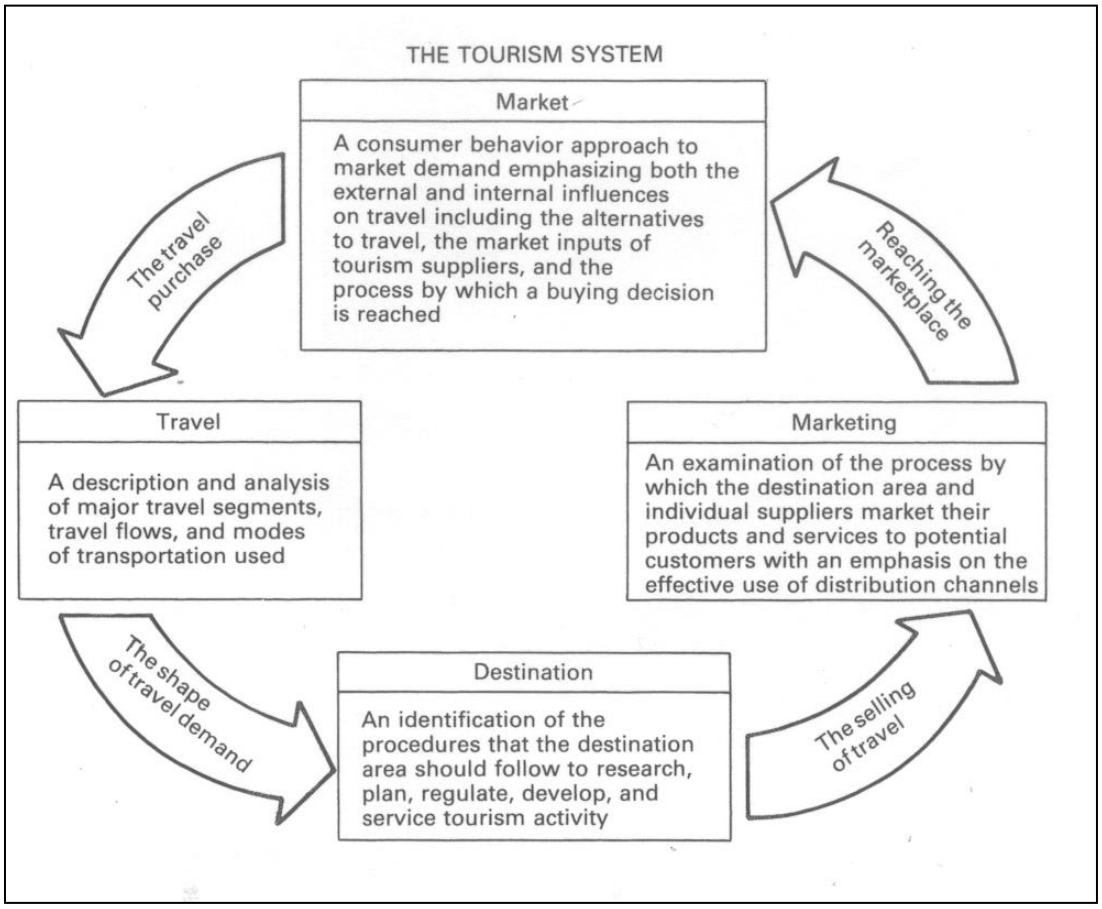


Figure 2.6: A tourism-system (Source: Mill & Morrison, 2002)

There is research tourism literature identifies many aspects of a research tourism-system. For instance, when describing the supply and demand of research tourism on a global basis, Ellis (2003a) and Ellis (2003b) identify many of the key features and processes of research tourism that may be readily incorporated into a research tourism system. Also, by devising a conceptual model (Figure 2.3) that envisages research tourism as a combination of well-known tourism types (e.g. volunteer and ecotourism), Benson (2005) identified an opportunity to apply relevant well-known tourism type models to systematically study research tourism. Similarly, Coghlan (2006 and 2007) linked many supply and demand aspects of research tourism by matching the

promotional material of research tourism products with research tourist preferences to create a research tourism model that is comprised of four classes (Table 2-8).

However, based on the explicit absence of tourism-system theory within their literature, it appears that a specific tourism-system study of research tourism has not occurred. Given this and the stated benefits (Mill & Morrison, 2002; Hall, 2005) of a tourism-system approach; there is an innovative opportunity to study research tourism using a tourism-system approach. Such a study would integrate many of the supply and demand related aspects of research tourism towards a new and comprehensive model of research tourism.

2.8. Summary of research gaps

Based on the academic literature and relevant to marine research tourism in Australia, six research gaps are identified from the literature. These are:

1. While marine research tourism has been studied on a case study basis (e.g. Galley & Clifton, 2004; Hughes; 2008; Dunstan, 2009), the study of marine research tourism on a regional scale (e.g. Australia, Costa Rica, and South Africa) has not occurred;
2. The conceptual nature of marine research tourism has not been empirically studied;
3. The views of different marine research tourism supply-side stakeholder groups have not been investigated;
4. The study of the demand preferences of potential marine research tourists for different research tourism products and desired benefits has not been investigated;

5. A study of either land-based research tourism and/or marine research tourism across Australia has not occurred;
6. A tourism-system study of research tourism across a large region (e.g. Australia, Costa Rica, and South Africa) has not occurred.

These gaps underpin this thesis's aim to explore and describe the conceptual, supply, and demand nature of MRT with a specific focus on MRT in Australia. Such a study would lead to unique insight into the conceptual nature of MRT in Australia and elsewhere.

2.9. Conclusion

This literature review has reviewed the academic literature that is relevant to this thesis. First, it provided a brief historical and geographical assessment of research tourism on a global basis. Second, it assessed fourteen definitions of research tourism; created a conceptual model to describe research tourism (Figure 2.3); and outlined some of unique marine tourism aspects of MRT. It then evaluated the relevant academic literature to identify a range of research gaps about research tourism. It is these gaps that underpin this thesis's study of the nature of MRT in Australia. This thesis's next chapter presents and discusses the research methodology used to undertake that study.

Chapter 3 Research methodology

3.1. Introduction

Chapter Two summarised the previous literature and research opportunities that underpin this thesis. It also identified a research agenda to systematically study the conceptual, supply, and demand components of MRT in Australia. This chapter presents the research methodology used for that study. This includes information about the relevant research paradigms, design, studies, ethical considerations, methods, procedures and steps. The structure of this chapter is shown in Figure 3.1.

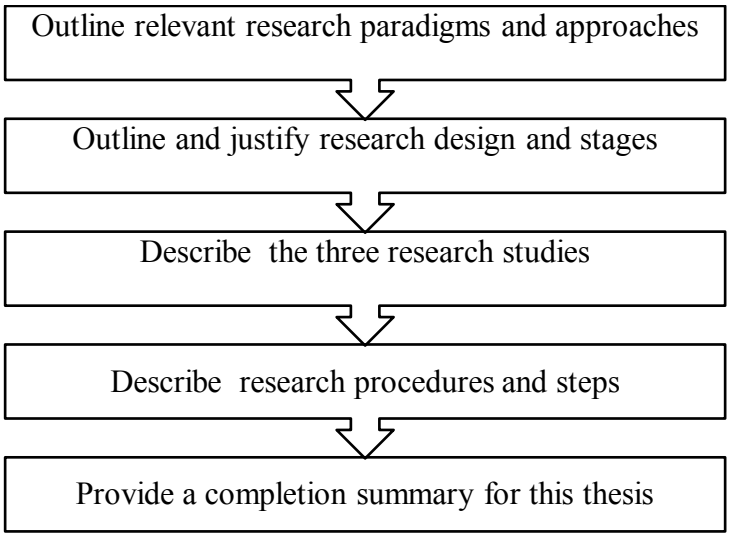


Figure 3.1: Structure of Chapter Three

3.2. Research paradigms

A researcher‘s paradigm influences what should be studied, how research should be done, and how the results should be interpreted (Bryman, 2001). It is determined by the research aim and objectives; and the researcher‘s values and beliefs from which distinctive conceptualisations and explanations of phenomena can be (Gray, 2004; Jennings, 2001; Pansiri, 2005). Values and beliefs are determined by the researcher‘s response to three types of philosophical questions about their study (Guba, 1990; Jennings, 2001). These are:

> Ontological – What is the nature of the _knowable‘ or _reality‘?
>
> Epistemological - What is the nature of the relationship between the researcher and reality?
>
> Methodological - How should the researcher go about finding out knowledge?
>
> (Guba, 1990)

Questions of ontology are concerned with the nature of physical (e.g. electrons, atoms, molecules) and social entities (e.g. people‘s views) (Bryman, 2001). Epistemology considers the criteria for determining what constitutes and what does not constitute valid knowledge (Gray, 2004). Validity is whether a concept or criteria has been accurately and credibly, measured and described to reveal its true meaning (Jennings, 2001; Gray, 2004). Methodology is the way the researcher produces knowledge, and the choice of methodology centres on the research topic, the researcher‘s paradigm, and acceptable research limitations (Jennings, 2001).

Tourism can be defined as ~~the~~ the processes, activities, and outcomes arising from the relationships and the interactions among tourists, tourism suppliers, host governments, host communities, and surrounding environments that are involved in the attracting and hosting of visitors" (Goeldner & Ritchie, 2006, p. 5). Therefore, questions of tourism ontology will be concerned with 1) the nature of physical entities such as natural processes and environmental impacts; and/or 2) the nature of social entities such as tourists, tourism suppliers and their relationships.

Physical entities are studied through the epistemology of the scientific approach (Walliman, 2005; Bryman, 2001). The scientific research approach is based on the use of experience, reasoning, observation, and rigorous testing to discover the truth whereby the method and results are open to public scrutiny and criticism (Walliman, 2005). There are five major assumptions underlying the scientific approach namely:

1. There is a belief that some kind of order exists in the universe. This is linked to the idea of determinism, the assumption that events have causes, and that the links between events and causes can be revealed;
2. In order for people to gain this understanding of the universe, there must be agreement between people that external reality exists, that people recognise this reality, and this reality can be empirically verified through observation;
3. There is an assumption that human perception and intellect can derive reliable knowledge through their reasoning and memory;

4. The explanation of phenomena should be parsimonious. That is, researchers should aim to achieve the most elegant and simple theories; and
5. There is an assumption that there can be valid relationships between derived knowledge and the external world.

(Cohen & Manion, 1994)

Social entities can be considered to be objective or subjective entities whereby objective social entities have a reality that is external to the actors (i.e. research participants); and subjective social entities are social constructions built up from the perceptions and actions of social actors (Bryman, 2001). Questions about objective social entities are studied through the epistemology of positivism (Bryman, 2001). Questions about subjective social entities are studied through the epistemology of interpretivism (Bryman, 2001).

This thesis focuses on social entities such as MRT tourists, suppliers and their relationships amongst themselves and their relationships with different MRT products. For most of this thesis, these social entities are treated as objective entities and subsequently studied with a positivistic approach (Gray, 2004; Jennings, 2001; Bryman, 2001). However, in a few cases of studies two and three of this study, these social entities are considered to be subjective social entities that are best studied with an interpretivistic approach (Gray, 2004; Jennings, 2001; Bryman, 2001).

Before describing the various research approaches, methods and procedures used in this thesis, this next section briefly describes positivism, interpretivism and their associated limitations; and justifies why pragmatism was chosen as this thesis‘s overarching research approach. The former

is particularly important as the limitations associated with an epistemology influence the reliability and generalisability of a study's outcomes (Jennings, 2001; Bryman, 2001; Clark, Riley, Wilkie, & Wood, 1998).

3.2.1. Positivism and interpretivistic epistemologies

Positivism is an epistemological position that advocates the application of the scientific approach to empirically study social reality (Bryman, 2001; Walliman 2005). For positivism, relationships between social entities are derived by the observation or testing of facts from which generalisations can be made and then extrapolated to explain future occurrences and/or behaviour of a phenomenon (Bryman, 2001; Jennings, 2001). Key features of positivism are:

1. Inquiry should be based upon the principles of the scientific research method (i.e. used for physical entities) and therefore empirical inquiry (Jennings, 2001; Gray, 2004);
2. Only phenomena and hence knowledge confirmed by the senses can genuinely be warranted as knowledge (Gray, 2004; Bryman, 2001);
3. The relationship between the researcher and the social entity is one that is value free (Jennings, 2001; Bryman, 2001; Pansiri, 2005);
4. Concepts can be operationalised so they can be measured (Gray, 2004); and
5. Research results can be presented as objective facts and established truths (Gray, 2004).

There are a number of concerns about positivism. For example, the principles of applying the scientific method for physical entities are not always applicable to the study of social entities (Bryman, 2001). Additionally, the scientific method approach is usually based on extending existing theories rather than creating new ones (Gray, 2004). Also, notwithstanding empirical

rigour, researchers with different backgrounds and skill can sometimes interpret scientific results differently (Jennings, 2001). Lastly, concepts that are not directly amenable to observation cannot be considered to be genuinely scientific (Bryman, 2001).

Interpretivism advocates that unlike physical entities, social entities cannot be objectively measured and require subjective interpretation by the researcher to ‗know' that reality (Bryman, 2001; Gray, 2004). Consequentially, interpretivistic methods and outcomes are bound by the values and beliefs of the researcher (Pansiri, 2005). The implication of this is that the measurement and interpretation of a social entity by two or more researchers may result in different interpretations about the same social entity. Therefore, in interpretivism, social reality can often mean different things to different people and hence, the positivist approach cannot be used to describe and explain all social reality.

There are acknowledged limitations to the outcomes of interpretivistic research. These include that the researcher can never be absolutely sure that they have acquired the world view of the people they study nor have they validly interpreted the correct meanings of the information they acquired (Clark, Riley, Wilkie, & Wood, 1998) Furthermore, there is always a risk that the researcher finds too much meaning in the acquired information or even finds meaning that does not exist (Clark et al., 1998). Clearly, while interpretivistic research is very useful to further understand social reality, such limitations should be well understood by the users of such research. Otherwise, research outcomes can be inappropriately represented as an external and objective reality while they really represent an interpretative effort to further understand social reality.

Interpretivistic research is said to use a range of research approaches such as; symbolic interactionism, phenomenology, phenomenography, empirical realism, critical realism, hermeneutics, heuristic inquiry, naturalistic inquiry, ethnomethdolology, and ethnography (Grey, 2004; Bryman, 2001; Jennings, 2001; Marton, 2000). The selection of a researcher's interpretivistic approach is dependent upon 1) the researcher's aim; 2) the depth the researcher is seeking from the research topic; 3) the time and resources that the researcher has to pursue a certain interpretivistic approach (Jennings, 2001; Bryman, 2001). To illustrate this, the differences between phenomenology and phenomenography are briefly outlined.

Phenomenology seeks to gain an in-depth knowledge about the meanings of an individual's behaviour, whereby the researcher often seeks to put themselves in the position of the person they are studying (Gray, 2004; Bryman, 2001; Jennings, 2001). In contrast, rather than focus on the richness of an individual's experience, phenomenography aims to map key variations in the perception of a phenomenon across a group of individuals (Marton, 2000; Orgill, 2009). Study two of this thesis uses a phenomenographical approach to study the variation of key MRT stakeholder views about MRT in Australia. Given this, a more detailed description of phenomenography as it relates to this thesis is provided in Appendix 3.

3.2.2. Pragmatism

The selection of a certain research epistemology and methodology for a research project is said to be dependent upon whether the researcher believes that there is some sort of external _truth' to discover (i.e. positivism), or the research task is to explore and further understand people's multiple

perspectives in a natural field settings (i.e. interpretivism) (Gray, 2004) . However, when beginning a research project, Creswell, Clark, Gutmann, and Hanson (2003) argue that instead of epistemology and methodology being paramount over the research design, the most important approach is to first ensure that the research problem is addressed. After this has been established, both research epistemology and methodology can then logically follow (Creswell et al., 2003). That is, while mindful of the relevant epistemology, researchers should have freedom of choice regarding the methods, and procedures of research that best meet their needs and purposes (Creswell et al., 2003). This research approach is termed pragmatism and is focused on a theory's capacity to solve problems over unreasonable adherence to epistemological rigidity (Powell, 2001).

While accepting the existence of an external world that is independent of people's minds, pragmatism rejects positivism as a comprehensive epistemology, on the grounds that no theory can satisfy the demands of positivism (e.g. objectivity, falsify-ability, the crucial experiment) (Pansiri, 2005; Powell, 2001). Pragmatism also rejects interpretivism as a comprehensive epistemology because it is argued that virtually any theory could satisfy its requirement for a subjective interpretation (Powell, 2001). Nevertheless, pragmatism also accepts that the researcher's values can play an important role in conducting research, interpreting results and determining whether a research problem has been suitably addressed or not (Pansiri, 2005). This thesis does not adopt pragmatism as a rejection of positivism or interpretivism, but rather adopts pragmatism as an overall research strategy to direct the choice of research epistemologies, methodologies, and methods needed to suitably address this thesis's research questions.

3.2.3. A mixed methods research strategy

A research methodology that involves different research methods towards addressing a research objective is the mixed method approach (Pansiri, 2005). The mixed method approach is defined as ~~"t~~he collection or analysis of both quantitative and/or qualitative data in a single study in which the data is collected concurrently or sequentially, and involve the integration of the data at one or more steps in the process of research" (Creswell et al., 2003, p. 212). In mixed methods, the relative strengths of qualitative and quantitative methods enable researchers to optimally address important questions at different stages of a research inquiry, thereby generating knowledge that single method studies are unable to create (Pansiri, 2005). Given this usefulness and the thesis's pragmatist approach, this thesis adopts mixed methods as the overarching research strategy to complete the intended three studies. Before describing the thesis research methods and procedures in detail, the next section describes the thesis's research design, three studies, ethics and overall research procedure.

3.3. Research design, three studies, ethics and overall procedure

This next section of this chapter describes this thesis's overall design, the three studies that are undertaken, methods, procedures, steps, and related conceptual models. This thesis's the overall research design is based on the application of Moscardo et al.'s (2004) supply and demand tourism-system model (Figure 1.2). This model was chosen for four main reasons. First, the three studies of this thesis can be broadly matched with four of the six factors shown in Moscardo et al. (2004) model. Second, the model focuses on factors that are likely to result in change within a marine tourism destination (i.e. the Great Barrier Reef) and this is a marine setting relevant to MRT. Third,

the model was proposed through an extensive literature review of tourism-systems by the authors, and tested on 6,119 visitors to the Great Barrier Reef from 1996 to 2001. Fourth, it is relatively contemporary as the model was recently published in 2004.

As previously raised in Chapter One, this thesis's three research questions can be broadly found in five of the six factors shown in Moscardo et al.'s (2004) model. That is, research question one can be seen as a conceptual exploration of Factors 1, 2 and 3 of Figure 1.2. Research question two can be matched with the supply of different destination characteristics and constraints of (i.e. Factors 1 and 6) and the subsequent selection of MRT products and activities (i.e. Factor 3). Research question three can be matched with the preferences (i.e. individual tourist characteristics and constraints) (i.e. Factors 2, 3 and 4) of different marine research tourism tourists for different products, locations and activities.

3.3.1. Three studies

Also previously discussed in Chapter One, each of the three studies (Figure 3.2) is designed to address this thesis's three research questions. Study one is an assessment of the conceptual nature of MRT products worldwide and in Australia. Study two identifies and compares the views of key supply-side stakeholders towards the supply of MRT products in Australia. Study three assesses the preferences of different tourists for different MRT products and associated benefits.

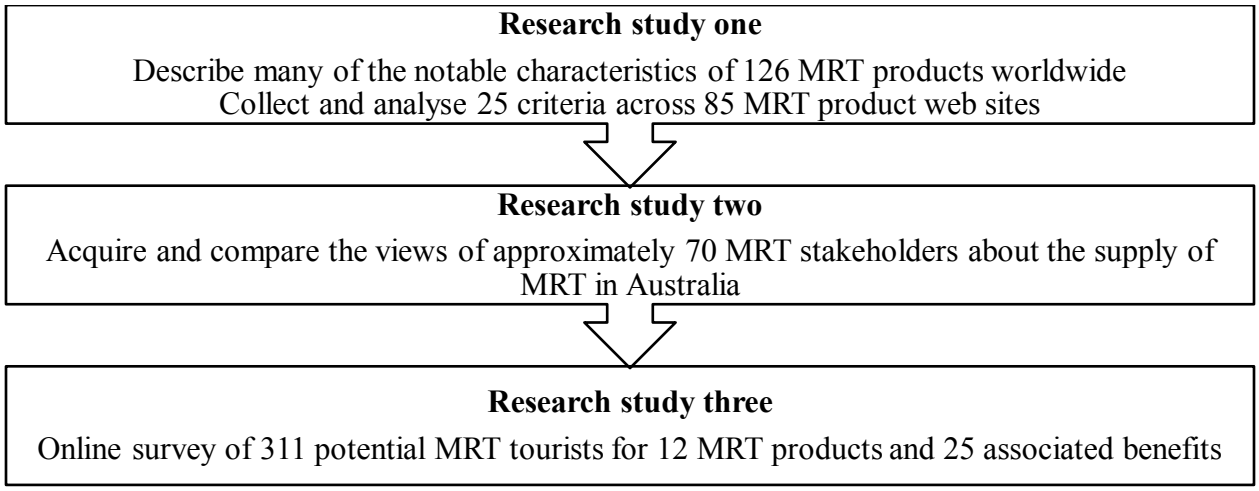


Figure 3.2: This thesis's three studies

3.3.2. Research procedures and steps

Each of these three studies has a research procedure that is comprised of a series of procedures, methods and steps. The choice of methods for each procedure was influenced by the methods used by previous research tourism academics (e.g. Weiler & Richins, 1995; Ellis 2003b; Brown & Morrison, 2003; Coghlan, 2006; Coghlan, 2007; Cousins, 2007). The final procedures and steps were also guided by the need to operate within the PhD's budget and schedule. Table 3-1 and Table 3-2 provide additional information about these procedures, methods and steps.

Table 3-1: Studies, procedure, methods and steps for study one

Step	Procedure and steps
1	Identify and describe the distribution and characteristics of MRT products (n=126) worldwide
2	Empirically measure the presence and absence of key MRT elements across a (n=85) of MRT products from the 126 MRT products
3	Identify and describe key characteristics of a representative sample (n=85) of MRT products worldwide
4	Measure and analyse the relative level of 25 key MRT criteria across 85 MRT products
5	Measure and describe the likely market segments for MRT worldwide
6	Analysis of contextual indicators, key MRT criteria and MRT tourist types
7	Describe the conceptual nature of MRT in Australia

Table 3-2: Studies, procedure, methods and steps for studies two and three

Study No.	Step	Procedure and steps
Two	1	Elicit initial views of different key stakeholders groups (n=45) about MRT in Australia
Two	2	Further understand the diversity of key stakeholder (n=44) views towards future MRT
Two	3	Acquire and compare the views of different key stakeholder groups (n=33) about outstanding stakeholder issues
Three	1	Identify criteria to market segment potential marine research tourists
Three	2	Identify an range of MRT criteria to support tourist preference and benefit segmentation
Three	3	Develop twelve MRT product brochures
Three	4	Online survey of the preferences of potential marine research tourists (n = 311) for different MRT products (n=12) and benefits (n=25)
Three	5	Develop a tourism preferences model based on the benefits and product preferences of different market segments
Three	6	Describe and compare the different preferences of different potential marine research tourists (n=311) for different Australian MRT products (n=12) and associated benefits (n=25)

3.4. Research ethics

In October 2006, an ethics application for this research was submitted to the James Cook University Human Ethics Sub Committee. In November 2006, ethics approval (No. H2492) to proceed with this study was received from the James Cook University Human Ethics Sub Committee. The identified ethical issues were 1) the unintended distribution of commercial in confidence information through publication of the thesis or associated research publications; 2) and the need to correctly identify if the research participant is speaking personally or on the behalf of the organisation they were involved with. The first ethics issues was important because MRT is a commercial and/or government business and it is quite likely that many MRT stakeholders will need to protect their business interests. The second ethics issue was important because many research participants would not want their views represented as official views of their organisations.

Ethical issue one was overcome by both the research participant and researcher discussing any possible confidentiality issues. It was proposed by the researcher to the research participant that

if there were confidentiality issues, the researcher would exclude any confidential information from the thesis and associated publications; and generalise the identity of the research participant and/or confidential information beyond recognition by the reader. In all discussions, when this issue was raised with each research participant, they did not express any concerns that any confidential information would be treated inappropriately.

Ethical issue two was overcome by the researcher treating the collected data as it does not represent the official views of a research participant's organisation, but rather the private views of the participant. Furthermore, the identity of the research participant was generalised to their stakeholder group. This has the affect of treating the research participant's contribution as anonymous but still allows for the variation of views across stakeholder groups to be acquired.

Prior to every research step that involved human participation, the informed consent of the research participant was obtained. There were three approaches to informed consent and this was governed by whether the research method was an online survey, phone interview, or in-person interview. For the online survey, information about the PhD and the informed consent form were on the survey web site. The respondent was informed in writing on the survey form that by starting the online survey (e.g. click start button) they were confirming that they had been suitably informed about the PhD research and possible ethical issues. Prior to both the phone and in-person interviews, the interviewee was e-mailed an informed consent form and PhD information sheet. The informed consent form stated that by being interviewed, interviewees acknowledged that they were suitably informed about the PhD research and any possible ethical issues.

3.5. Interpretivistic research and its possible limitations

This thesis's three studies are mainly conducted within a positivistic research environment. However, there were two steps of those studies where due to the subjective nature of that research, an interpretivistic epistemology is clearly present. The first interpretivistic research step is in study two. This study measures the variation of different key stakeholder group views about various MRT topics in Australia. Step two involves semi-structured interviews and is interpretivistic because many key stakeholders will often have a different perception about the status of MRT in Australia; likely benefits, issues and opportunities for MRT in Australia; and the relationships between different MRT stakeholder groups. These differences may occur within the same key stakeholder group and also across two or more key stakeholder groups. Subsequently, this research step is studied within an interpretivistic epistemology, and in this case, phenomenography is chosen as the interpretative research approach.

There are three possible limitations of this interpretative approach. First, it cannot be claimed that the complete set of views of stakeholder groups about different MRT topics in Australia have been acquired. Second, it cannot be claimed that the view of key stakeholder groups about the issues and benefits of other key stakeholder groups truly reflect the views of those other stakeholder groups. Third, as Clark, Riley, Wilkie and Wood (1998) highlights about the interpretivism, there is always a risk that the researcher can find too much meaning in the acquired information or even find meaning that does not exist.

The second interpretivistic research component is found in study three where a set of twelve MRT product brochures were designed and created by the researcher. The twelve MRT product brochures (Appendix 4) were designed to be representative of the potential for different MRT products across Australia. They were then used in study three as part of an online survey questions about potential MRT tourist's different preferences and products. Interpretative research occurs when the researcher selects relevant text and images from each relevant MRT product web sites and adds them to the corresponding brochure. It is this selection and corresponding inevitable exclusion of certain text and images from the brochures that forms the interpretative part of this study. An implication of this selection and exclusion process is that the intended product description for each brochure may not be fully illustrated. Given this, the respondent may not receive the intended information within the brochure and subsequently may not be able to satisfactorily answer one or more survey question about the MRT products in those brochures. An indicator that intended information was suitably received by a respondent will be if the survey results have a clear and overall sensibility. Those results are presented and discussed in Chapter Six.

3.6. Quantitative research methods and procedures

Prior to presenting the details of these research procedures and methods, the next section outlines some of the more notable quantitative research methods used in studies one and three. Specifically, these are guidelines for data sampling; descriptive and exploratory statistic analysis; heat map display methods for tabular data; conceptual modeling and integration; and conceptual models of well-known tourism types.

3.6.1. Guidelines for data sampling

The academic literature that is relevant to research tourism provides an indication about the methods and sample size used to study research tourism products, tourists and supply stakeholders. For example, Ellis (2003a) studied 39 research tourism operators with 887 trips, Coghlan (2006) studied 16 research tourism operators, Cousins (2007) studied 21 research tourism operators, and Lorimer (2009) studied 23 research tourism organisations with 323 products. These studies used web site analysis as a central method to obtain and assess information about their identified research tourism products and operators. The advantage of this method is that it is very cost and time effective. Study one also uses web site analysis to obtain the desired information about MRT products and tourists. A description of why and how various MRT products were selected is provided in Section 3.7.1.

3.6.2. Descriptive and exploratory statistical analysis

Study‘s one and three use a range of descriptive and exploratory statistics to analyse rating scale data. In most cases, this rating scale data ranges from 1 to 5 in terms of level of relative abundance; 1 to 5 for relative level of interest; or 1 to 3 for relative level of importance. The statistical methods used are presented in Table 3-3 and are further described below. In this study, each rated value is assigned an error margin that is equivalent to a significance (p) value of .05 (5%) of the full range of a rating scale (Cramer, 2005). For example, a 1 to 5 rating scale (with a full range of 4) is assigned nominal error margin of +/- 0.20 (i.e. 5% of 4). If the difference between any two

rated values of the same criteria is less than the nominal error range then this study treats the difference between those two values as not significant.

Table 3-3: Descriptive and exploratory statistical methods used in this study

Statistical method	**Description**
Factor analysis - varimax rotation	Used to obtain meaningful factors or constructs from rating data (Hair, Anderson, Tatham, & Black, 1998)
Correlation analysis (Pearson r coefficient)	Used to identify moderate to strong linear associations between MRT products, tourist types, tourist preference
MDBV analysis	Used to compare means across different MRT products, tourist types, tourist preferences and stakeholder views. This measure is similar to the T-Test but divides the maximum difference between values (MDBV) by the range of the values.
MANOVA analysis	Used to assess the statistical significance between different groups (Hair et al., 1998)
AHC Euclidean and furtherest neighbour analysis	Derive clear groupings of MRT products and tourist types that have similar characteristics (Hair et al., 1998)

Factor analysis

Factor analysis is used in studies one and three to identify key factors (i.e. groups of synergetic criteria) that explain the underlying variance of those datasets (Hair et al., 1998). Factor analysis also acts to reduce a large number of criteria to a smaller number of factors where the large number of criteria precludes modeling and/or communicating all the criteria individually (Hair et al., 1998). Specifically, a principle component analysis method and varimax rotation method was used in those studies. The reasons for the selection of principle component analysis method and varimax rotation methods are presented in Appendix 5.

Finally, factor analysis outcomes need to be interpreted for their practical and statistical significance (Hair et al., 1998). This thesis uses these significance guidelines to select and combine various criteria into factor groups. Practical significance involves a rule of thumb whereby factor

loadings less than +/- 0.30 are not considered significant in any way (Hair et al., 1998). A factor loading is the correlation of the variable and the factor (Hair et al., 1998). A factor loading greater than +/- 0.30 is considered minimally important. Loadings greater than +/- 0.40 are considered more important and loading greater than =/- 0.50 are considered practically significant. Practical significance should be considered in tandem with statistical significance (Hair et al., 1998).

Statistical significance is related to the sample size and the minimum value of a factor loading before a factor can be considered to be reliable outcome (Hair et al., 1998). For example, a sample size of 85 requires a factor loading of 0.6 before the related factor can be considered to be statistically significant (Hair et al., 1998). Guidelines to assist the identification significant factor loadings based on sample size are shown in Table 3-4.

Table 3-4: Guidelines for identifying significant factor loadings based on sample size (Source: Hair et al., 1998)

Factor loading	**Sample size needed for practical significance**
0.30	350
0.35	250
0.40	200
0.45	150
0.50	120
0.55	100
0.60	85
0.65	70
0.70	60
0.75	50

Significance (p) value of statistical tests

For many statistical tests (e.g. Factor analysis and MANOVA) on normally distributed data samples, a significance (p) value is generated to determine if a relationship between any two criteria is valid. This p value is the smallest significance level at which a null hypothesis can be rejected from a data sample (Weiss & Hassett, 1987). The null hypothesis assumes that any kind of difference or significance you see in a set of data is due to chance (Hair et al., 1998). In this thesis, if a statistical test a normally distributed data sample generates a p value is less than 0.5, then the null hypothesis is refuted and an alternative hypothesis (e.g. a correlation from a factor analysis) can be considered to be valid (Weiss & Hassett, 1987). This alternative hypothesis is usually what the researcher thinks is the cause of a phenomenon (Hair et al., 1998). In this thesis, a p value < 0.05 is considered to be significant and a p value < 0.005 is considered to be very significant (Hair et al., 1998). Often in this thesis, a significant p value is marked with a * character.

Correlation analysis (Pearson, r value)

A correlation analysis is used to identify possible linear relationships between two or more measured criteria within a dataset (Cramer, 2003). The importance of these possible relationships can be identified by using the Pearson (r) coefficient from a correlation analysis (Cramer, 2003). The importance placed on different ‗r' values by this study is shown in Table 3-5. For example, according to Table 3-5, strong and moderate correlations ($r > 0.5$ or $r < -0.5$) are interpreted as a notable association between two criteria (Derived from Cramer, 2003). In this thesis, these associations are not interpreted as some form of causal process between the criteria unless there is

other compelling evidence. Such evidence may be in the academic literature, from another independent measurement of the association, or derived through a logical rationale.

Table 3-5: Guide to interpreting the importance of Pearson (r) values in this study (Source: Cramer, 2003)

Pearson (r) value	**Interpretation**
Between 0.7 and 1.0	A strong and direct correlation between two criteria
Between 0.5 and 0.7	A moderate and direct correlation between two criteria
Between 0.35 and 0.5	A low and direct correlation between two criteria
Between 0 and 0.35	No significant correlation between two criteria
Between 0 and -0.35	No significant correlation between two criteria
Between -0.35 and -0.5	A low and inverse correlation between two criteria
Between -0.5 and -0.7	A moderate and inverse correlation between two criteria
Between -0.7 and -0.1	A strong and inverse correlation between two criteria

Average of means analysis – MDBV analysis

A simple ‗average of means' statistical method termed a MDBV analysis is used regularly throughout this thesis. This MDBV approach was used to gain a more intuitive indication of difference across values. It is similar to a Tukey multiple comparison or Student-Newman-Keuls test (StatistiXL, 2009), however, the MBDV value is not divided by the standard error and converted into a probability value. Specifically, a MDBV analysis calculates the maximum difference between rating values (MDBV) across a row or column of a data table and then divides by the absolute range (i.e. A 4 value for a range between 1 and 5) for those values to derive a percentage value (% MDBV).

A visual inspection of resulting % MDBV values and related criteria is the final step in assessing the importance of different criteria. The higher the % MDBV for certain criteria, the higher the degree of variation across the data table, and the more likely that those criteria are

noteworthy in terms of the underlying variation across the data sample. If the MDBV is similar to or less than five percent of a particular rating scale's range (i.e. 0.20 for a 1 to 5 rating scale), then it is treated as unreliable.

To demonstrate how the MDBV analysis works, Table 3-6 shows an example of how four MRT criteria (e.g. Level of hospitality for the tourist) may vary across a sample of 85 MRT products in terms of the likely presence of skilled scientific tourists. A skilled scientific tourist is defined as a marine scientist or marine research student who pays to participate in a MRT product (Adapted from Benson, 2005). Each coloured cell in Table 3-6 shows the average level of each criterion as rated (low [1] to high [5]) by three independent observers across the sample. The corresponding nominal error (i.e. significance value [p=5%]) for this example is 0.20.

In this example (Table 3-6), the average rated value for the relative level of skill pre-requisites for MRT products that are likely to attract skilled MRT tourists is 2.7 (or near moderate on a scale from 1 to 5). The average rated value for level of skill pre-requisites for MRT products that are not likely to attract skilled MRT tourists is 1.8 (or quite low). The maximum difference between those two values (MDBV) is 0.9. The % MDBV value is calculated by dividing the MDBV value by the absolute range of the rating scale (i.e. 5 – 1 = 4). As such, the level of pre-requisites criterion has the highest % MDBV value of 26%. Other criteria with high MBDV values are level of environmental remoteness (Orams, 1999) (21%), and level of SCUBA diving (28%). By contrast, the relative level of hospitality has a MDBV value (0.2) (i.e. equal to a nominal error of 0.2). This indicates that based on Table 3-6, any observed difference between the level of hospitality and the likely presence of skilled scientific tourists is not reliable.

Table 3-6: An example of MDBV analysis on four key MRT criteria across 85 MRT products (Source: this thesis)

Key MRT criteria	Likely skilled scientific tourists	Not likely to attract skilled scientific tourists	MDBV	% MDBV
Skill pre-requisite to participate	2.7	1.8	0.9	26%
Environmental remoteness (Orams, 1999)	3.8	2.9	0.9	21%
Level of SCUBA diving	2.9	2.2	0.7	18%
Level of hospitality for the tourist	2.6	2.4	0.2	5%

Note 1: Red is relatively low mean value of a MRT criterion and blue is a relatively high mean value of MRT criteria. Range is 4 (i.e. 5 [max] – 1 [min])

MANOVA analysis

Studies one and three often use a MANOVA (i.e. Multiple ANOVA) statistical procedure to test the significance of observed MDBV differences. Specifically, a MANOVA reports on whether there is a significantly linear relationship (i.e. a probability value [p]) between one categorical factor (e.g. a key MRT criteria) and multiple ordinal variables (i.e. MDBV values) (Cramer, 2003). For this study, if that p value is equal to or less than 0.05 (i.e.5%), then it is reasonable to conclude that there is a likely significant linear relationship (Cramer, 2003). Such a p value suggests that there may be a causal relationship, and further empirical investigation and/or rationale is warranted to confirm this.

To demonstrate this, Table 3-7 illustrates that there is a likely significantly linear relationship between 1) the presence of skilled scientific tourists level and the level of pre-requisite skills (p=0.0005); and 2) the presence of skilled scientific tourists and the level of environmental remoteness (Orams, 1999) (p=0.001). In contrast, Table 3-6 indicates that a likely significant

relationship between the presence of skilled scientific tourists and 1) the level of SCUBA diving (p=0.059); and 2) level of hospitality for the tourist (p=0.096) is not likely.

Table 3-7: An example of MANOVA and MDBV analysis on four key MRT criteria across 85 MRT products (Source: this thesis)

P value	Key MRT criteria	Likely skilled scientific tourists	Not likely to attract skilled scientific tourists	MDBV	% MDBV
0.0005*	Skill pre-requisite to participate	2.7	1.8	0.9	26%
0.001*	Environmental remoteness (Orams, 1999)	3.8	2.9	0.9	21%
0.059	Level of SCUBA diving	2.9	2.2	0.7	18%
0.096	Level of hospitality for the tourist	2.6	2.4	0.2	5%

Note 1: * indicates a very significant linear relationship between a MRT criteria and the presence of skilled scientific tourists
Note 2: Red is relatively low mean value of a MRT criterion and blue is a relatively high mean value of MRT criteria. Range is 4 (i.e. 5 [max] – 1 [min])

AHC cluster analysis

Based on study one outcomes, study three uses AHC (Analytical Hierarchical Classification) cluster analysis to classify 85 MRT products into six classes of MRT products. In this AHC cluster analysis, all products are repeatedly compared to derive a taxonomic tree of the likely relationship between different products (Everitt, 1980). In turn this taxonomic tree can be interpreted to derive a set of naturally distributed clusters (i.e. MRT product classes) that represent similar products (Everitt, 1980). The collected data for this study is always an ordinal and of a similar and/or standardised scale. Hence, cluster analysis in this thesis used Euclidean Distance matrix to identify similar values (StatistiXL, 2009). Additionally, to identify and then accentuate patterns across datasets, cluster analysis in this study used the furthest neighbour algorithm to group similar values into classes (StatistiXL, 2009).

3.6.3. Heat maps

Studies one and three also uses a heat map display method to show tabular results from web site and survey analysis. A heat map is a graphical representation of data where the values taken by a variable in a two-dimensional map are represented as colors (Labescape, 2010). Table 3-8 is an example of a heat map used in this thesis. A relatively low value (e.g. 1) is shown as red, a relatively moderate value (e.g. 2) is shown as light orange, and a relatively high value (e.g. 3) is shown as darker blue. In this thesis, often the units for these heat maps are 1) a relative level of importance; and 2) a relative level of interest assigned to a specific MRT criterion by a research participant.

Table 3-8: An example heat map (Source: Chapter Three)

Product name	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6
MRT Product 1	2.0	2.2	2.6	2.6	2.4	2.5
MRT Product 2	1.1	2.1	2.3	2.6	2.4	2.5
MRT Product 3	2.1	2.3	2.1	1.9	2.1	2.5
MRT Product 4	2.1	2.4	2.4	2.1	2.0	2.3
MRT Product 5	1.9	2.2	2.0	2.1	2.0	2.3
MRT Product 6	2.1	2.4	2.4	2.3	2.0	2.3
MRT Product 7	2.2	2.3	2.3	2.2	2.4	2.7
MRT Product 8	2.0	2.0	2.1	2.1	1.9	2.1
MRT Product 9	2.1	2.3	2.5	2.5	2.2	2.3
MRT Product 10	2.0	2.2	2.2	2.6	2.2	2.0

Note: A value of 1 (red) is low (e.g. not interested), 2 (light orange) is moderate (e.g. somewhat interested), and 3 (darker blue) is higher (e.g. very interested)

3.6.4. Conceptual modelling and integration

Conceptual schemas refer to the use of well defined and interconnected concepts as summary and explanatory tools in elucidating the tourism ventures and systems (Pearce, 2005). The format in which conceptual schemes can be expressed is variable (Pearce, 2005). They may be verbal statements specifying relationships or typologies and taxonomies that are either categorical or ordinal systems (Pearce, 2005). They may also be models that portray relationships amongst factors and variables (Pors, 2000, cited in Pearce, 2005). Models are a particularly important sub category of conceptual schemes since diagrammatic and spatially portrayed links between variables and forces tend to have considerable power as a mechanism for the communication of ideas (Blalock, 1969, cited in Pearce, 2005).

When analysing study one and three datasets, this thesis seek to identify key features and processes that describe those datasets. At certain stages of studies one and three, a combination of factor and correlation analysis results is used to derive a table that specifically illustrates the key underlying elements and possible processes of MRT. Table 3-9 shows an example outcome from a factor analysis in this thesis. This example involves 10 token MRT criteria. Factor groups are used identify explicit factors that are comprised of a number of criteria. In this example, these factor groups are comprised of criteria with similar factor loadings that are greater than 0.5. To highlight this, Factor 1 loadings are coloured blue and Factor 2 loadings are coloured red. Factor 1 is comprised of six criteria, and Factor 2 is comprised of 4 criteria. Factor 1 has an explained variance of 52.9% and Factor 2 has an explained variance of 47.1%.

Table 3-9: An example of a factor analysis matrix used in this thesis

	Explained variance (%)	52.9	47.1
Factor group	**Criteria**	**Factor 1**	**Factor 2**
1	Criteria 1	0.92	-0.28
1	Criteria 2	0.91	-0.22
1	Criteria 3	0.78	-0.40
1	Criteria 4	0.74	-0.61
1	Criteria 5	0.72	-0.54
1	Criteria 6	0.69	-0.59
2	Criteria 7	0.16	-0.96
2	Criteria 8	0.35	-0.83
2	Criteria 9	0.48	-0.78
2	Criteria 10	0.48	-0.75

Note: Higher values (i.e. blue) and lower values (i.e. red) indicate a similar and notable factor loading among criteria

Table 3-10 shows the matching correlation table (Pearson r) for Table 3-9. It show that the matching p value for each correlation is less than 0.5 (i.e. likely to be a significant relationship) by displaying an asterix (i.e. *). Information from Table 3-9 and Table 3-10 are merged to create a combined factor and correlation analysis table (Table 3-11). A guide to interpreting such tables is shown in Table 3-12.

Table 3-10: A matching correlation (Pearson r) table for Table 3-9

Criteria	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Criteria 5	Criteria 6	Criteria 7	Criteria 8	Criteria 9
Criteria 1									
Criteria 2	-0.54 *								
Criteria 3	-0.58 *	-0.33 *							
Criteria 4	0.57 *	0.6 *	-0.65 *						
Criteria 5	0.61 *	0.72 *	-0.53 *	0.61 *					
Criteria 6	0.8 *	0.34 *	0.62 *	0.65 *	0.41 *				
Criteria 7	0.6 *	-0.74 *	0.62 *	-0.73 *	-0.57 *	0.53 *			
Criteria 8	0.79 *	-0.71 *	-0.67 *	-0.3 *	0.78 *	0.71 *	0.72 *		
Criteria 9	0.76 *	0.61 *	0.72 *	0.74 *	0.57 *	-0.76 *	0.3 *	-0.3 *	
Criteria 10	0.61 *	0.28 *	0.66 *	0.72 *	-0.49 *	0.74 *	-0.47 *	-0.4 *	0.65 *

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange
Note 2: * shows a likely significant relationship ($p < 0.05$) between criteria

Table 3-11: An example of a combined factor and correlation analysis table

Factor names

		Factor name	**Factor 1**						**Factor 2**			
		Explained variance (%)	52.9						41.7			
Factor group	**ID**	**Criteria ID**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	1	Criteria 1										
1	2	Criteria 2	0.74 *									
1	3	Criteria 3	-0.63 *	0.66 *								
1	4	Criteria 4	-0.76 *	0.65 *	0.72 *							
1	5	Criteria 5	0.8 *	0.61 *	0.57 *	-0.77 *						
1	6	Criteria 6	0.65 *	0.72 *	-0.65 *	0.74 *	0.57 *					
2	7	Criteria 7	0.34 *	0.28 *	-0.33 *	0.61 *	-0.54 *	0.6 *				
2	8	Criteria 8	0.41 *	-0.49 *	-0.53 *	0.57 *	0.61 *	0.61 *	0.72 *			
2	9	Criteria 9	0.53 *	-0.47 *	0.62 *	0.3 *	0.6 *	-0.73 *	-0.74 *	-0.57 *		
2	10	Criteria 10	0.53 *	-0.44 *	0.5 *	-0.69 *	0.6 *	0.58 *	-0.62 *	-0.7 *	0.69 *	1.0

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange
Note 2: * shows a likely significant relationship ($p < 0.05$) between criteria

Table 3-12: Guide to interpreting combined factor and correlation analysis tables (e.g. Table 3- 11)

Table feature	**Description**
ID	These columns and rows show a unique identification number that corresponds to each criterion. This ID is particularly useful for identifying a column that relates to a specific criterion.
Criteria	This column shows the criteria that were measured. These criteria can relate to aspects of MRT such as product attraction, tourist preferences and stakeholder values.
Explained variance (%)	This row shows the estimated percentage variability of a particular factor across a data sample. For example, a value of 52.9% indicates that factor 1 account for approximately 52.9% of the variability of the data sample.
Factor name	This is a name assigned to best describe the factor that accounts for a significant percentage of datasets variability. For example an element 1 could be _marine tourism‘ or _volunteer mindedness.
Coloured values	These coloured values usually show correlation (Pearson r) values that are considered to be significant associations between two criteria. This is often r values that are greater than 0.5 and less than -0.5.
Factor group	This column shows a grouping of criteria that have similar factor loadings across the data sample. For example, criteria 1, 2, 3, 4, 5 and 6 have been assigned to criteria group 1.

Using Table 3-12 as a guide, Table 3-11 can be interpreted as follows. For this particular MRT topic (not specified), there are two main factors that explain much of variance across the data sample. These are ‗Factor 1' and ‗Factor 2'. Factor 1 accounts for 52.9 % of the variability and Factor 2 accounts for 41.7% of the variance. The remaining variance of 5.4 % is not accounted for in this factor analysis.

These two factors can be considered to be key features of MRT. The strong and moderate correlations assigned to each Factor can be considered to be internal associations or possibly significant processes between criteria within each element (i.e. Factor 1 or Factor 2). The other strong or moderate correlations shown in Table 3-11 can be considered to be associations, and/or likely processes between criteria, from different factor groups. For example, Table 3-11 shows that criteria 10 from Factor 2 is strongly and negatively correlated ($r = -0.69$) with criteria 4 from Factor 1.

Figure 3.3 demonstrates the outcomes from this example factor and correlation analysis as a system flow chart. In particular, Figure 3.3 shows that the key features of this MRT topic are Factor 1 and Factor 2. Within those key elements are many strong internal associations or likely processes between criteria. Also, between those key are elements are some strong external associations or likely processes between criteria. In study three, this study uses these system flow charts to derive, organise and display relevant MRT tourism models. Guidelines that this study used to develop system flow charts are presented in Appendix 6.

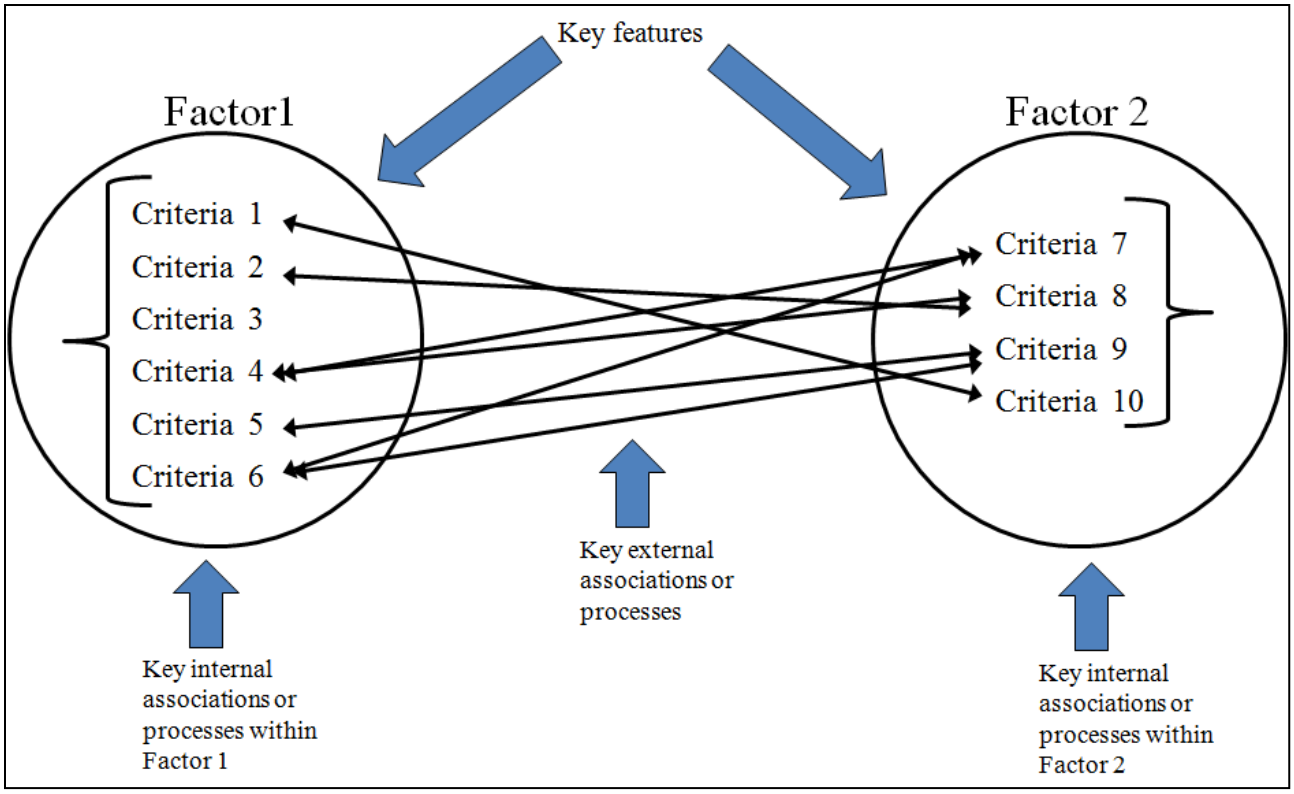


Figure 3.3: An example of system flow chart (i.e. conceptual model) that can be derived from the combined factor and correlation analysis table (Table 3-11)

3.6.5. Related conceptual models of well-known tourism types

In studies one and three, conceptual models and criteria from the academic literature are used to design the survey questions. These conceptual models relate to the well-known tourism types shown in Figure 1.1. These seven models and/or criteria are:

1. Marine tourism – A spectrum of marine recreation opportunities (Orams 1999);
2. Volunteer tourism - A conceptual framework for volunteer tourists (Callanan & Thomas, 2005);
3. Adventure tourism – Tourism activity spectrum (Swarbrooke, Beard, Leckie, & Pomfret, 2003, adapted from Fennel & Eagles, 1990);

4. Adventure tourism - Conventionality of an adventure tourism venture (Swarbrooke et al., 2003);
5. Ecotourism – Hard and soft ecotourism characteristics (Weaver & Lawton, 2001);
6. Wildlife tourism popularity (Swarbrooke et al, 2003).
7. Educational tourism (Ritchie, Carr, & Cooper, 2003)

Details of these conceptual models are presented in Appendix 7. When appropriate, they are described further in this chapter as they are applied. However, it is important to note these models are not tested and/or advanced in this thesis but are used only to identify and select valid criteria to reliably study MRT. A study that applies this study's collected data to the revision and advancement of well-known tourism type models is a research opportunity for the future.

It is also important to note that three well-known tourism types shown in Figure 1.1 are excluded from this thesis. These were nature tourism, niche tourism, and alternative tourism. There are three reasons for this. First, nature tourism is considered to be a broad concept that is too generic to suitably investigate specific characteristics of MRT. Second, investigating the niche characteristics of MRT is considered to be a large and unique research project in its own right and is subsequently outside the scope of this thesis. Third, measuring alternative tourism criteria in MRT products and/or tourists is a sizeable interpretivistic research challenge and is also outside the scope of this thesis.

3.7. Study one - methods and procedures

Study one measures, tests, explores, and advances this thesis's proposed conceptual framework (Figure 1.1) across a representative sample of MRT products. This study is comprised of

seven research steps (Figure 3.4). Primary data for this procedure was obtained through the interpretation of a representative sample of 126 MRT product web sites worldwide by six research participants. The web site data collection approach was similar to the interpretation of web sites and/or tourism brochures by Ellis (2003b), Clifton (2004), Coghlan (2006), Cousins (2007), Whatmore (2008), and Lorimer (2009). Examples of the sampled MRT products are presented in Table 1-2. The full list of 126 identified MRT products is presented in Appendix 8.

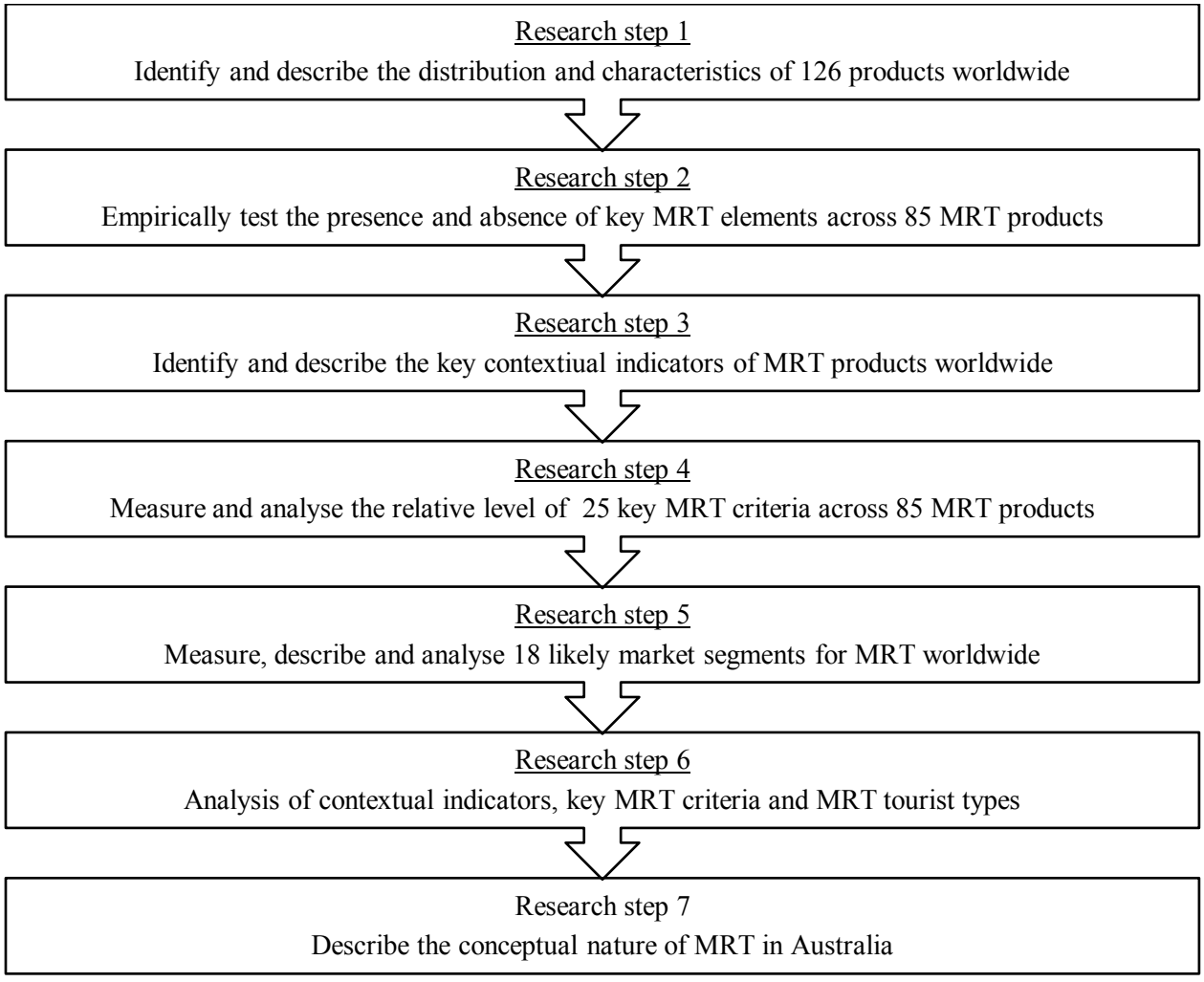


Figure 3.4: Study one: Research procedure and steps

Based on web site data, research step one is the description of many important features of 126 MRT products worldwide. These features include spatial distribution of destinations, organisational office location, type of organisation, and marine research focus (e.g. marine wildlife) of different products. Step two involves the measurement of the presence of 10 key MRT elements across 85 MRT products of those 126 product web sites. Step 3 identifies and describes the manifestation of six contextual indicators for MRT worldwide. Step four measures measuring the varying levels (i.e. 1 to 5) of 25 criteria (e.g. Table 3-17) across 85 MRT product web sites. Those 25 criteria were derived from tourism conceptual models and other knowledge that describe the 10 key elements of the proposed conceptual framework (Figure 1.1). Step five measures the likely presence or absence of 18 different market segments across those 85 products. Those market segments were identified by the review of text and photos from 85 MRT web sites and the academic literature (Clifton & Benson, 2006; Galley & Clifton, 2004; Weiler & Richins, 1995). Step 6 then uses multi-criteria analysis on the collected data to identify likely relationships amongst the 25 criteria, 18 market segments, and six contextual indicators. Lastly, step seven identifies and describes the differences between marine research tourism in Australia and elsewhere across the globe.

3.7.1. Study one, step one: Identify and describe the distribution and characteristics of MRT products worldwide

Research step one searches for, identifies, and describes the distribution and other characteristics of 35 MRT organisations and their 126 MRT products worldwide. The purpose of this step is twofold. First, from the relevant literature, a descriptive study of MRT worldwide has not occurred. Second, information gained from such a study is an informed basis to further understand MRT in Australia.

For research step one, MRT company web sites were identified by the Internet search engines, web site links, the academic literature, and stakeholder knowledge. Internet search engine phrases included "scientific expedition", "research tourism", "volunteer tourism", "conservation holiday", "marine discovery", "marine exploration", and "marine ecotourism". Organisations were selected if their products matched this thesis's adopted definition for MRT (See Chapter Two, Section 1.1). MRT product web sites were in the English language only. At the time of the search, the identified number of MRT companies and products was considered to be nearly all (if not all) MRT companies and products worldwide that are relatively well promoted on the Internet and meet this thesis's selection definition of MRT.

Selected MRT products also matched Ellis's (2003b) delimitation whereby a research tourism product can last for one or more days, is advertised publicly, takes paying tourists or paying volunteers, and operates on a commercial basis (Adapted from Ellis, 2003b). They also matched Benson's (2005) key features for a research tourism product namely they should have 1) scientific teams or individual scientists who are engaged in research pursuits; 2) the facilities (e.g. research centre) to support and enhance the opportunities for learning and education (e.g. labs, library, lecture theatre, and computer equipment); and 3) the opportunity for participants to conduct their own research with support from the scientific team or individuals.

Table 3-13: Examples of MRT products worldwide (n=52) (Source: Study one)

ID	Product name	ID	Product name
1	Deep Ocean Expeditions - Azores Undersea Volcanoes	27	The Dolphin Research Institute -Phillip Island, Australia
2	Deep Ocean Expeditions - Mid-Atlantic Hydrothermal Vents	28	Marine Wildlife Adventures - Tasmania's Soela Sea Mount
3	Coral Cay Conservation - Tobago	29	Blue Ventures - Marine Survey Expeditions, Scotland
4	Deep Ocean Expeditions - Operation Bismarck	30	Marine Wildlife Adventures - Whales Cruises, Australia
5	Cape York Turtle Rescue - Mapoon, Australia	31	The Royal Geographical Society of Queensland - Australia
6	The Undersea Explorer - Osprey Reef Shark Encounter, Australia	32	The Lakes Explorer - Explore the Gippsland Lakes, Australia
7	The Undersea Explorer - Far Northern Expedition, Australia	33	The Earthwatch Institute - Moreton Bay, Australia
8	Lizard Island Research Station - Volunteer at a Marine Research Station	34	The Earthwatch Institute - Sydney Harbour, Australia
9	Tevene'i Marine - Coral Reef Ecology Education Programs, Australia	35	Blue Ventures - Madagascar Expeditions, Madagascar
10	Tevene'i Marine - Eco Expeditions on the Great Barrier Reef, Australia	36	The Earthwatch Institute - Bahamian Reef Survey, Caribbean
11	The Oceania Project - Whale Research Expeditions, Australia	37	The Oceanic Society - Midway Turtle Tracking
12	Rodney Fox Expeditions - Great White Shark Expeditions, Australia	38	Greenforce - Caribbean Adventure, Bahamas
13	Pelican Expeditions - Blue Whale Research, Australia	39	The Oceanic Society - Bahamas Project Dolphin
14	Landscope Expeditions - Loggerhead Turtles of Dirk Hartog Island, Australia	40	The Earthwatch Institute - Tidal Forests of Kenya
15	Landscope Expeditions - Wildlife of the Montebello Islands, Australia	41	The Earthwatch Institute - Tracking Baja‘s Black Sea Turtles
16	The Shark Research Institute -Galapagos Islands, Ecuador	42	The Oceanic Society - Belize Crocodiles
17	Eye to Eye Encounters - Great Barrier Reef, Australia	43	Coral Cay Conservation - Philippines
18	Ningaloo Turtles - Western Australia	44	Greenforce - South Pacific Adventure, Fiji
19	Conservation Volunteers Australia - Broome, Australia	45	ASVO - Marine Turtles, Costa Rica
20	Biosphere Expeditions - near Broome, Australia	46	The Oceanic Society - Belize Reefs - Snorkeling
21	Bunbury Dolphin Discovery Centre - Western Australia	47	The Earthwatch Institute - Queen Conchs of Belize
22	The Earthwatch Institute - Lady Elliot Island, Great Barrier Reef, Australia	48	The Earthwatch Institute - Queen Conchs of Belize - Teen
23	Conservation Volunteers Australia - Coburg Peninsula, Turtles, Australia	49	Blue Ventures - Belize Expeditions, Belize
24	Frontier - Kenya Whale Sharks	50	The Oceanic Society - Giant Otters, Pantanal, Brazil
25	Kalinda - Great Barrier Reef Discovery, Australia	51	The Earthwatch Institute - Brazil's dolphins, Brazil
26	Marine Wildlife Adventures - Coral Sea, Australia	52	Coral Cay Conservation - Cambodia

3.7.2. **Study one, step two:** Test the presence of 10 key MRT elements across 85 MRT products

To validate the proposed conceptual framework of MRT, research step two sought to empirically test the presence and absence of the 10 key MRT elements across a representative sample of 85 MRT product web sites from across the globe. The reasons for sampling just 85 (67%) of the identified 126 MRT products was that there appeared to be significant amount of replication across the 126 MRT products and it was considered that a final sample of 85 MRT products would account for much of the underlying conceptual MRT variation. To ensure this, the guiding process for selecting MRT products is shown in Table 3-14. As a result, research step two sampled all of 35 identified MRT organisations and approximately 85 (67%) of the 126 identified MRT products. This included all of the identified 35 MRT organisations, all of the 30 Australian MRT products, and 55 (57.3%) of the 96 non-Australian MRT products.

Table 3-14: The process for selecting the sample of 85 MRT products (Source: This thesis)

ID	The MRT product web site selection process
1	Selected MRT products match this thesis's adopted definition for MRT
2	Include at least one MRT product from each identified MRT operator
3	Have a relatively higher inclusion of organisations with higher numbers of MRT products (i.e. The Earthwatch Institute)
4	Have all Australian based MRT operators
5	Include different types of products so as to increase the variety within the sample. An example of this is the RV Pelican Expeditions in Victoria, Australia where local school children and volunteers participate in coastal exploration and/or blue whale MRT)
6	All selected product web sites also needed useful and substantial information about their product and marine research programs
7	MRT products were excluded from the original sample of 126 MRT products if they were considered to be already replicated by three or more MRT products within that sample. Examples of this are 1) gap year MRT products that are commonly found in Greenforce and Frontier MRT products; and 2) many Earthwatch Institute MRT products that appear to have similar business models.

To test the proposed conceptual MRT framework (Figure1.1), research step two recorded the presence or absence of the ten key MRT elements across the selected sample of 85 MRT

products. By definition, the presence of marine tourism, ecotourism, marine research and conservation, and scientific tourism were present in these MRT products to some degree. Therefore, to complete research step one, the presence of the five remaining elements namely; wildlife tourism, volunteer tourism, educational tourism, adventure tourism, and sustainable community development across the sample were tested. The questions used to test for the presence or absence of those key MRT elements across the 85 MRT products are listed in Table 3-15. If for the majority of products, the answer to each question were yes, then the matching element can be considered to be a likely key MRT element. Hence, for that key MRT element, the proposed conceptual framework can be considered to be fully verified. Alternatively, if a certain key MRT element is not consistently present across all the 85 products then the proposed conceptual framework should be revised to include such a finding.

Table 3-15: Questions used to determine the presence or absence of key elements (Source: See source column in this table)

Element	**Question**	**Source**
Scientific tourism	Are there scientific professionals and/or active enthusiasts who pay to undertake scientific research on the tour?	Benson, 2005
Volunteer tourism	Do the participating tourists fund and/or work on research or conservation projects?	Wearing, 2003
Educational tourism	Is their active fostering and promotion of learning and education for the participants?	Ritchie, Carr & Cooper, 2003
Adventure challenge	Is there likely to be an adventure challenge for the participating tourists?	Swarbrooke et al., 2003
Wildlife tourism	Are their tourist encounters with wild (non-domesticated) animals in their natural environment?	Higginbottom, Pann, Moscardo, Davis & Muloin, 2001
Sustainable community development	Does the product directly contribute to sustainable community development at the destination?	Callanan & Thomas (2005)

3.7.3. Study one, step three : Identify and describe key contextual indicators for 85 MRT products worldwide

This thesis focuses on exploring the manifestation of a range of MRT related criteria across MRT products and market segment worldwide. However, so as to acquire new knowledge about MRT, it also sought to uncover less documented MRT criteria which may also significantly influence MRT. So, when evaluating the 85 MRT web sites, six previously unidentified (in this thesis) MRT criteria are found to have a notable affect on the character of MRT products and market segments. These criteria are 1) cost of the MRT product; 2) maximum duration of the MRT product; and 3) four _contextual indicators' described in Table 3-16. Research step three then measures and describes the variation of those MRT criteria across the sampled 85 MRT products.

The distinction between SO and LO MRT organisations was derived as a way to identify small and independent marine research tourism organisations when compared to larger and/or sophisticated (e.g. international focus) marine research tourism organisations.

Table 3-16: Four contextual indicators for this study of MRT (Source: derived from observations of 85 MRT product web sites)

ID	Contextual indicators	Description
1	Region of operation	Does the MRT product operate in the tropics or in the temperate regions of the globe?
2	Type of marine tourism operation	Does the marine tourism operation occur mostly on an island; the mainland coast; both coastal and marine; or mainly marine (e.g. Offshore and liveaboards) environments?
3	Mode of marine research	Does the marine research mainly occur using SCUBA/snorkel; a boat; coastal only; both coastal and boat; laboratory; or submarine?
4	Small organisation (SO) or larger organisation (LO)	The type of a MRT organisation is determined by whether organisation is 1) a smaller MRT organisation (i.e. SO) with one to four MRT products and no international focus or 2) a larger MRT organisation (i.e. LO) with more than four research tourism products (not only MRT products) and/or an international focus.

It is worth noting that there is some web site related limitation to obtaining cost related information. That is, the cost of many of the more volunteer minded MRT products (e.g. The Dolphin Research Institute and Lizard Island Research Station in Australia) was not explicitly

stated on the MRT product web site. For these few cases, to assist with correlation and factor analysis on the costs of these MRT products, a nominal estimate of costs per day was imputed (Hair et al., 1998) to be between 10$USD to 50$USD per day. Imputation is the process of estimating missing values based on the valid values of other variables and/or cases in the sample (Hair et al., 1998). This estimation process means that the actual costs for those products were not obtained. The study of the costs of highly volunteer minded products is outside the scope of this thesis and an opportunity for the future.

3.7.4. Study one, step four: Measure and analyse the relative level of 25 key MRT criteria across 85 MRT products

Research step three sought to measure a range of criteria that describe the 85 MRT products. At least one of these key criteria relates to each of the ten key elements of this study's proposed conceptual framework. Key MRT criteria were selected based on the researcher's assessment that they could be reliably and accurately measured via MRT product web site analysis. Overall, 20 criteria (Table 3-17 and Table 3-18) from the various tourism conceptual models were selected from the tourism models and/or descriptions outlined in Appendix 7. Additionally, 11 criteria for vacation and volunteer mindedness, marine research, marine conservation, and sustainable community development were identified from the literature as shown in Table 3-19. The outcome is 31 criteria that are intended to measure MRT.

Table 3-17: Tourism type related criteria (n= 14) to measure MRT (Source: See source column in this table)

Conceptual element	Key MRT criteria	MRT criteria abbreviation (for ease of reference)	Source
Adventure and volunteer tourism	What is the level of tourist's skill pre-requisite to participate?	Skill pre-requisite to participate	Buckley, 2000; Musso & Inglis, 1998
Adventure tourism	What is the level of mental or physical preparation required by the tourist?	Level of mental/physical preparation	Swarbrooke et al., 2003
Adventure tourism	What is the level of risk likely to be experienced by the tourist?	Level of risk for tourist	Swarbrooke et al., 2003
Adventure tourism	What is the level of adventure challenge for the tourist?	Level of adventure challenge	Swarbrooke et al., 2003
Adventure tourism	What is the level of group travel (large to small)	Level of group travel	Swarbrooke et al., 2003
Ecotourism	What is the relative ecotourism level along ecotourism spectrum	Level of ecotourism	Weaver, 2001
Educational tourism	What is the level of active fostering, promotion of learning, and education in relation to participants?	Level of educational tourism	Ritchie, Carr & Cooper, 2003
Marine tourism	What is the environment remoteness class (i.e. many human structures, human structures close by, a few human structures, evidence of some human activity, or isolated)?	Environmental remoteness class (Orams, 1999)	Orams, 1999
Marine tourism	What is the experience class (i.e. much social interaction, often contact with others, some contact, occasional contact, solitude)?	Experience class (Orams, 1999)	Orams, 1999
Marine tourism	What is the activities class (e.g. sunbathing, swimming, inshore sailing, SCUBA diving or offshore sailing)?	Activity class (Orams, 1999)	Orams, 1999
Marine tourism	What is the locations class (i.e. close to coast, intertidal zone, 1km offshore, isolated coast, or uninhabited coastal area)?	Locations class (Orams, 1999)	Orams, 1999
Marine tourism	Is SCUBA diving regularly associated with the MRT product	Level of SCUBA diving	Wilson & Garrod, 2003; Hughes, 2008
Scientific tourism	What is the level of tourist's marine research supervision by marine researchers? This is indicated by the presence of marine scientist who actively supervises the tourist‘s marine research activity.	Tourist supervision	Benson, 2005
Scientific tourism	What is the likelihood that there are skilled scientific tourists (i.e. paying marine scientist or marine research students) on the venture?	Level of skilled scientific tourism	Benson, 2005

Table 3-18: Other tourism type related criteria (n= 6) to measure MRT (Source: See source column in this table)

Conceptual MRT element	**Key MRT criteria**	**MRT criteria abbreviation (for ease of reference)**	**Source**
Volunteer tourism	What is the level of tourist's active involvement in the marine research?	Level of active involvement	Callanan &Thomas, 2005
Volunteer tourism	What level of importance does the tourist place on the destination when compared to the project?	Importance placed on the destination	Callanan &Thomas, 2005
Volunteer tourism	What levels of skills or qualifications are offered to the tourist?	Skill or qualifications offered on trip	Callanan &Thomas, 2005
Volunteer tourism	What is the maximum possible duration of the trip	Maximum duration of the trip	Callanan &Thomas, 2005
Wildlife tourism	What is the relative popularity of the main wildlife attraction and research topic?	Wildlife popularity	Swarbrooke et al., 2003
Wildlife tourism	How significant is seasonal wildlife migration on the seasonality of the MRT product?	Dependency on wildlife migration	Birtles, Valentine & Curnock, 2001

Table 3-19: Additional criteria (n=11) used to measure MRT (Source: See source column in this table)

Conceptual element	Key MRT criteria	MRT criteria abbreviation (for ease of reference)	Source
Volunteer mindedness	What is the relative level of time spent on the volunteer activity (i.e. the tourist's volunteer mindedness)?	Duration of volunteer activity	Brown & Lehto 2005
Volunteer mindedness	What is the relative hospitality level based on 1 to 5 star rating?	Level of hospitality for tourist	Derived from Brown & Lehto, 2005
Volunteer mindedness	What is the relative level of comfort?	Level of comfort for tourist	Derived from Brown & Lehto, 2005
Marine research	What is the level of research significance of the venture‘s marine research project? A high level is indicated by marine research that contributes to the marine science literature or the discovery of the marine environment such as a deep ocean expedition.	Research significance	Musso & Inglis, 1998
Marine research	What is the relative level of marine research reliability of the venture‘s marine research project? This is indicated by the presence of trained marine scientists and the relative influence of established marine science agencies.	Marine research reliability	Musso & Inglis, 1998
Marine research	What is the level of research complexity of the venture‘s marine research project? This is indicated by how well integrated a particular marine research project is into a larger scale marine science initiative and/or the number of projects being undertaken at one time on a MRT expedition.	Research complexity	Musso & Inglis, 1998
Marine research	What is the level of reliability of the tourist's research when on the venture? This is indicated by level of effort, pre-requisite skills and training undertaken by the tourist. This is independent of the quality of research from skilled scientific tourists which is considered to be relatively high.	Quality of tourist's research	Musso & Inglis, 1998; Foster-Smith & Evans, 2003
Marine conservation	What is the level of short term benefits to conservation from the marine research project?	Short term conservation benefits	Ecotourism Australia, 2009
Marine conservation	What is the longer term contribution to conservation from the marine research project?	Longer term conservation contribution	Ecotourism Australia, 2009
Sustainable community development	What is the level of sustainable interaction with the local community by the MRT tourist?	Level of local interaction	Clifton & Benson, 2006
Sustainable community development	Is there a substantial cultural interaction between the MRT tourist and a local community?	Level of cultural focus	Clifton & Benson, 2006

However, after testing the measurement the 31 criteria across the MRT web sites, only 25 MRT criteria were used in this study. This is because during the measurement process, 6 of the those criteria were found to be 1) difficult to reliably measure through web site analysis; 2) somewhat obsolete as they strongly correlate with similar yet more reliable criteria; and/or 3) not useful for this correlation analysis as they did not correlate with any other criteria (Table 3-20). Hence, to increase the reliability of the research outcomes, these 6 criteria were excluded from this study.

Table 3-20: Six MRT related criteria that were excluded from analysis and the reasons

Excluded criteria	**Reason 1**	**Reason 2**
Level of organised (group) travel	Difficult to reliably measure	
Level of mental/physical preparation	Difficult to reliably measure	Correlated well with level of adventure challenge
Level of risk for tourist	Difficult to reliably measure	Correlated well with level of adventure challenge
Research complexity	Difficult to reliably measure	Correlated well with level research significance
Level of ecotourism	Difficult to reliably measure	Can be better determined by level of conservation benefits and close interaction with local community
Importance placed on the destination	Difficult to reliably measure	

Moscardo et al.'s (2004) tourism-system can be broadly interpreted as consisting of 1) of tourism product 1) attraction; 2) benefit; or 3) concern related criteria. Therefore, to potentially link the outcomes from study one to this tourism model, the 25 selected MRT product criteria were categorised into attraction (n=17), benefit (n=6) or concern (n=2) related criteria. For this study, attraction-related criteria represent activity related characteristics that different MRT tourists will have different preferences towards. Benefit-related criteria represent important MRT product characteristics that many supply-side stakeholders are likely to seek. Concern-related criteria represent MRT product characteristics that supply-side stakeholders are likely to have an issue with. Such an approach also provides an opportunity to link study one outcomes with outcomes from studies two and three via Moscardo et al.'s tourism system.

The measurement of the 25 key MRT criteria across 85 MRT product web sites was a two phase process (Figure 3.5). In the first phase, five research assistants and the researcher independently rated the relative level of abundance (i.e. 1 is low, 3 is moderate and 5 is high) of each criteria across 42 of the 85 MRT products. The intended outcome was a calibrated dataset of MRT criteria that can be applied to effectively rate other MRT product web sites. The second phase involved the application of those calibrated MRT criteria by the researcher to rate the 25 MRT criteria across the remaining 43 of 85 MRT product web sites.

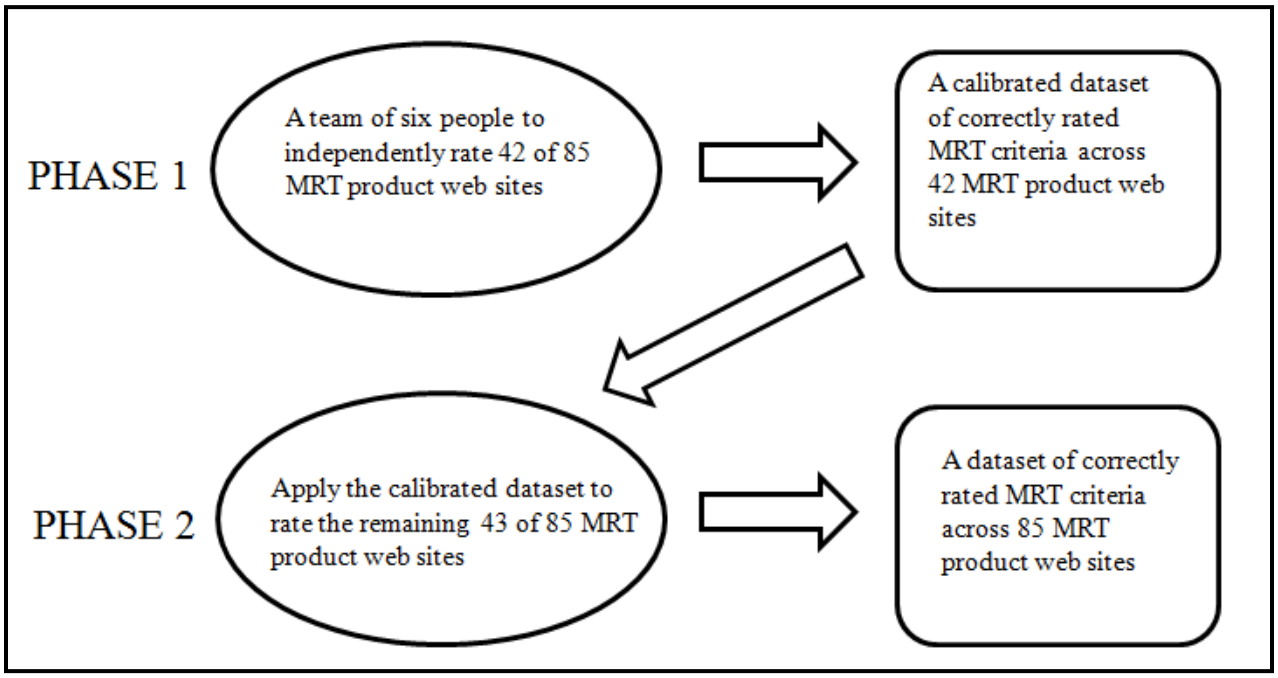


Figure 3.5: Two phases to rate (1 to 5) 25 MRT criteria across 85 MRT product web sites

There were two reasons for the first phase. First, the involvement of many people to rate and describe various MRT Criteria across a representative sample of MRT products acts to triangulate (Oppermann, 2000) and subsequently minimise subjectivity from the MRT criteria rating process. Second, the intended outcome was a calibrated dataset of MRT criteria that can be applied to other MRT product web sites. The first phase was a time intensive process and took approximately three

days for each person. Given the time intensive nature of rating web sites, the second phase acted to correctly rate the remaining 43 MRT product web sites in an effective but less resource consuming manner.

Phase-one involved two teams and was conducted over a two week period in January 2007. The first team addressed tourism related criteria and was comprised of three postgraduate tourism researchers including the researcher. The second team addressed the marine science and conservation related criteria and was comprised of three qualified (i.e. BSc) marine biologists and the researcher who has qualifications in tropical wildlife management. For both teams, each person was involved in the measurement process for twenty two hours over three days. If needed by a team member, the researcher was always available to inform them about the likely meaning of each MRT criteria.

After data collection and preparation for later statistical analysis, the researcher then cleansed the rated data by identifying and repairing outlier and no data values. Outliers occurred when one member of the teams had rated a certain criteria substantially (i.e. a value of 1 or more) higher or lower than the other team members. In these cases, the rated data was proposed and calibrated by a value of up to +/- 1 to generally match the bounds of the other rated criteria. In the few cases when no data had been entered, the researcher imputed (Hair et al., 1998) the value to be similar to the rated values from other team members.

After the data cleansing process, a final rated value for each of the 25 criteria and 85 products was calculated as an average of the rated values from each team member. An example of the rating output from this process is shown in Table 3-21. Finally, a calibrated table that shows the

average, minimum, maximum of all rated criteria across the 42 MRT product web sites was created. An example of the calibrated table is shown in Table 3-22.

Table 3-21: Example of rating (1 to 5) output from the MRT criteria rating process (Source: Chapter Four)

MRT Criteria and rating	**1 (very low), 2 (low), 3 (moderate), 4 (high) and 5 (high)**					
Product web site	**Research significance**	**Tourist supervision**	**Skill or qualifications offered**	**Adventure challenge**	**Active involvement**	**Comfort level**
1	3.9	4.7	2.5	3.5	4.3	2.0
2	4.0	4.7	2.0	3.5	2.0	4.0
3	3.8	4.5	2.0	3.5	1.0	4.0
4	3.8	4.7	3.0	2.3	4.3	3.0
5	4.3	4.7	3.5	1.5	4.5	3.3
6	2.3	4.3	1.0	2.3	3.5	3.0
7	3.6	4.3	2.5	2.8	4.0	3.0
8	3.1	4.3	1.5	2.0	3.0	3.2
9	4.9	4.7	4.0	3.5	4.5	2.0
10	2.1	5.0	4.0	3.0	4.5	3.0

Note: A value of 1 (red) is relatively low, and 5 (darker blue) is relatively high.
Note: Criteria are derived from Table 3-17 of this chapter.

Table 3-22: Example of a calibrated MRT criteria table in this study (Source: Chapter Four)

MRT criteria	**Ave**	**Max**	**Min**	**Example of max.**	**Example of min.**
Environmental remoteness level (Orams, 1999)	3.5	5.0	1.0	Travel to Dirk Hartog island off the remote Western Australian coast	University location in Bath, England
Experience level (Orams, 1999)	3.3	5.0	1.0	Track whales sharks and other sharks for nine days on a liveaboard vessel	Work closely with camp staff and participate in volleyball, football, backgammon, and chess
Level of active involvement in research	3.4	4.5	1.0	Regular SCUBA diving for ancient stone axes, whales, seals, and underwater caves	Watching great white sharks from shark cages and large boats
Level of adventure challenge	3.2	4.5	1.0	Cage diving with great white sharks	Stay overnight in the beautifully appointed heritage guesthouse with opportunity to monitor sea bird populations

Phase-two used the calibrated MRT criteria table from phase-one to correctly rate the remaining 43 MRT web sites. This phase also acted as an opportunity to review the rated criteria values from phase-one if need be, and therefore further increase the overall internal reliability of final MRT dataset. A more detailed account of this phase-one process is presented in Appendix 9.

To identify significant relationships between MRT key criteria and contextual indicators, a series of descriptive and exploratory statistical analysis (descriptive, MDBV, MANOVA, factor and correlation analysis) are undertaken. This analysis identifies how different MRT attractions, benefits and concerns may vary with different contextual indicators (e.g. region or type of MRT operation).

3.7.5. Study one, step five: Identify and analyse likely market segments for MRT worldwide

Research step five identifies, measures, and analyses 18 potential MRT market segments (Table 3-39). These MRT market segments were identified through the review of text and photos from 85 MRT web sites and the academic literature (Clifton & Benson, 2006; Coghlan, 2006; Galley & Clifton, 2004; Weiler & Richins, 1995). These market segments included conventional tourist types such as marine wildlife tourists, ecotourists, adventure tourists, educational tourists, and volunteer tourists (Table 3-39)). It also became evident during the web site review process that other MRT tourist types (e.g. SCUBA divers) are important MRT market segments (Table 3-39).

Table 3-23: 18 possible MRT market segments (i.e. MRT tourist types and characteristics) for this study (Source: study's academic literature review and observation of 85 MRT product web sites)

ID	MRT market segment	ID	MRT market segment
1	Marine wildlife tourists	10	Snorkellers only
2	Ecotourists	11	Package tour travellers (i.e. organised travel from source to destination)
3	Adventure tourists	12	Independent travellers (converse to package tour travellers)
4	Educational tourists	13	Skilled scientific scientists (i.e. paying marine scientists or marine research students)
5	Volunteer tourists	14	Older travellers (usually not gap year travellers and estimated to be about 30 years or older)
6	Natural science enthusiast	15	Families
7	Backpackers	16	Cultural tourists (i.e. a cultural attraction is part of the MRT product)
8	Gap year travellers	17	Pre-arranged accommodation or not
9	SCUBA divers	18	Liveaboard marine tourists (i.e. The MR products involves a liveaboard vessel)

The method used to measure all these market segments was to record the likely presence or absence of the 18 MRT market segments (as judged by the researcher) across 85 MRT product web sites. This web site interpretation process was similar to the interpretation of research tourism promotional material such as tourism brochures by Ellis (2003b), Coghlan (2006) and Cousins (2007). MDBV, MANOVA and factor analysis were then used to statistically describe and explore the likely relationships between MRT tourist segments and key MRT criteria.

3.7.6. Study one, step six: Analysis of contextual indicators, key MRT criteria and MRT tourist types

Using MANOVA and MDBV analysis, this step identifies the important relationships between the four contextual indicators (Table 3-16), different MRT markets (Table 3-39), and key MRT criteria (Table 3-17, Table 3-18, and Table 3-19). As with the key MRT criteria analysis from research step four, this information can be used to describe, explain and possibly predict the nature of MRT market segments and products under different contexts (e.g. region and type and MRT operation).

3.7.7. Study one, step seven: Describe the conceptual nature of MRT in Australia

Based on information acquired in earlier research steps, research step seven identifies significant statistical differences between MRT products in Australia (n= 30) and elsewhere (n= 55) across the globe, and then provides a description of the nature of MRT in Australia. Towards this, MDBV analysis is applied to determine what MRT criteria, market segment, and contextual indicators are different between Australian MRT products and other products, and what variation occurs across those Australian MRT products.

3.7.8. Limitations of study one

Study one aimed to develop an accurate picture of conceptual nature of MRT products and tourists worldwide and in Australia. However, in some or perhaps many cases, this may not be the objective reality. This is because many (if not all) MRT web sites are very likely to reflect the product image that the MRT operator wishes the potential MRT tourist to see rather than what actually occurs during that MRT experience. So, without more objective data sources (e.g. not through web sites) of MRT, a more reliable picture of exactly how MRT products, operators and tourists interact cannot be completely determined.

Notwithstanding this, it is important to highlight that even if this study‘s outcomes only reflect the MRT operator‘s intended product image, then they are still very useful. There are two reasons for this. First, such product images are in reality the images that MRT operators use to attract tourists and they therefore represent the social reality (Bryman, 2001) of the marine research tourism system. This is the social reality that many travel decisions are made from. Hence, web site

information is a useful version of reality to study. Second, it is likely that many MRT web sites will actually depict much of the objective reality of those MRT products. For example, many of the sampled web sites will 1) accurately present who are likely to be MRT tourists and what activities they may participate in; and also 2) link their marine research outcomes with established marine research projects and published academic papers.

3.8. Study two - methods and procedures

Study two acquires and compares the views of supply side key MRT stakeholders about the supply, demand and potential change for MRT products, locations and activities in Australia. A list of eight key stakeholder groups who were consulted is presented in Table 3-24. The focus of study was to further understand and compare the stakeholder group views about the present and possible future of MRT in Australia.

Table 3-24: Eight key MRT stakeholder groups who were consulted in study two (adapted from Brightsmith, 2009; Coghlan, 2008, Cuthill, 2000, Musso & Inglis, 1998)

Key stakeholder group	**Key stakeholder group**
Marine researchers	MRT operators
Marine managers	Other marine tour operators
Marine environmental conservationists	Tourism organisation
Marine educators	Postgraduate marine research students

Study two was comprised of four research steps. Step one elicited initial views of different key stakeholders groups (n=49) about MRT in Australia. Step two sought to further understand the depth and diversity of key stakeholder (n=46) views towards future MRT in Australia. Step three elicited the views of different key stakeholder groups (n=30) about new and/or potentially contestable stakeholder issues. Step four links outcomes from steps one, two and three to develop an advanced model of key stakeholder‘s views of Australian MRT.

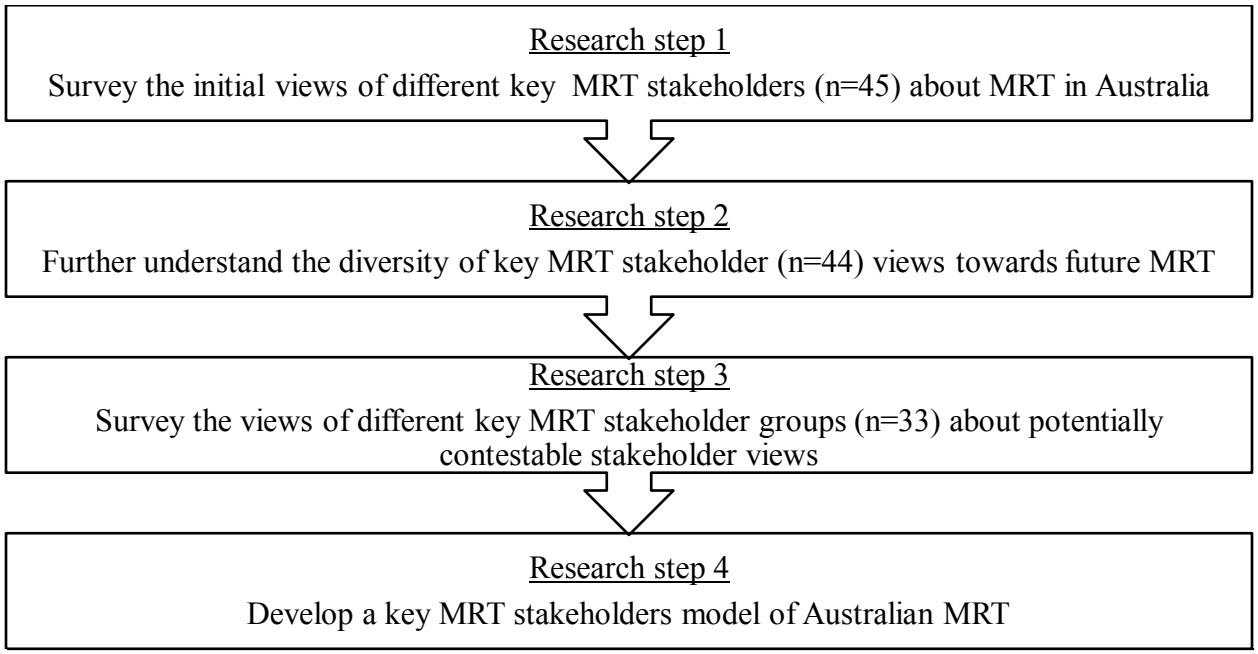


Figure 3.6: Study two: Research procedure and steps

3.8.1. Study two, step one: Acquire the initial views of key stakeholders about Australian marine research tourism

Research step one elicits the initial views of a representative set of MRT stakeholder about the supply of MRT products and activities in Australia. The intended outcome is a set of key stakeholder views about the present and possible future of MRT in Australia. Topics for investigation (Table 3-25) are identified from this thesis's literature review. An anonymous online survey (Appendix 10) for was devised to obtain key stakeholder views about these topics. Many of this survey's questions were derived through the literature review. The survey was hosted on the QuestionPro web site (QuestionPro, 2009) and undertaken between April 2007 and September 2007. The survey was intended for at least five representatives from each of the eight stakeholder groups (n=40). In the end, the survey was undertaken by 45 key stakeholders from eight stakeholder groups.

Table 3-25: Topics for key stakeholder survey number one from study two

ID	MRT stakeholder related topic
1	Driving forces, major factors, issues and constraints behind MRT
2	The benefits of MRT
3	Opportunities for MRT in Australia
3a	Who are potential MRT tourists?
3b	Suitable marine research and conservation programs, and locations
3c	Specific opportunities for the MRT industry in Australia
3d	Stakeholder benefits and involvement.
4	Stakeholder issues and different views
4a	The involvement of the marine tourism industry
4b	The role of MRT volunteers
4c	The role of marine researcher and/or manager
4d	The potential future of MRT in Australia

Selection of respondents

Potential respondents were identified through word of mouth recommendations from other stakeholders and direct contact with a range of marine tourism, research, management, conservation and education institutions in Australia. They were selected for the survey because they were seen to be well established in their respected stakeholder group and somewhat knowledgeable about MRT. Potential respondents from all Australian States and Territories, and other Countries were invited to participate. An example list of the organisations contacted is presented in Table 3-26. Personal contact (i.e. one-on-one meetings or by phone calls) by the researcher was found to be the most effective way to recruit potential respondents to complete the survey. When the researcher either phoned or visited the potential respondent, the recruitment rate was eighty percent or higher. E-mail contact without a follow up visit or phone call was ineffective (less than ten percent) in recruiting research participants.

Table 3-26: Examples of organisations contacted for the online survey of research step one in study two

ID	Name of company or institution	ID	Name of company or institution
1	Cape York Turtle Rescue, Queensland	21	Marine Education Society of Australia
2	The Earthwatch Institute, Queensland	22	Australian Marine Sciences Association
3	Lizard Island Research Station,	23	The CSIRO
4	Tevenei, Queensland	24	Australian Marine Conservation Society
5	Ningaloo Whale Shark and Dive, Western Australia	25	The Aquarium of Western Australia
6	The Oceania Project	26	University of Tasmania
7	Reef Check	27	Coral Cay Conservation
8	SV Pelican, Victoria	28	Global Vision International
9	Australian Geographic	29	Western Australian Fisheries
10	Landscope Expeditions, Western Australia	30	The Undersea Explorer
11	GBRMPA	31	Eye to Eye Marine Encounters
12	The Australian Institution of Marine Science	32	Northern Territory Tourism Commission
13	James Cook University	33	Charles Darwin University
14	Melbourne Aquarium	34	Kangaroo Island Marine Tours
15	Passions for Paradise, Queensland	35	Polperro Cruises, Victoria
16	Victorian Museum	36	Peppermint Bay Cruises, Tasmania
17	Australian Museum	37	Commonwealth Department for the Environment
18	Queensland Parks and Wildlife Service	38	Bio-search at Quicksilver cruises, Queensland
19	University of Queensland	39	Tourism Queensland
20	Pacific Marine Life Institute, Queensland	40	Ecocean, Western Australia

Survey analysis and reporting

Survey results are presented as tables, charts and descriptive text as required. In this step, to increase the reliability the analysis, the researcher enlisted the assistance of a key MRT stakeholder (i.e. a very experienced owner and operator of a Northern Queensland MRT company) to help interpret survey results and therefore add substantial depth and validity to the survey results.

Limitations

A limitation of research step one outcomes is that they represent the answers of a limited number (n=45) key stakeholders to a survey of preset questions. Such an outcome clearly cannot claim to represent most of the possible key stakeholder views (Broadly estimated to be at least several hundred) about MRT in Australia. To address this limitation and further investigate the diversity of key stakeholder views about MRT in Australia, the next research step undertook a range of semi-structured interviews with 44 MRT key stakeholders from eight key stakeholder groups.

3.8.2. Study two step two: Further understand the diversity and depth of key stakeholder views

Research step two undertakes a range of phone and in-person semi-structured interviews with a representative sample of key MRT stakeholders across Australia. A semi-structured interview process was chosen because unlike surveys, it allows for unexpected, significant and personal views and issues to be raised and discussed in more depth by the interviewee and interviewer (Bryman, 2001; Gray, 2004). Further detail about the procedure and analysis of semi-structure interviews used in this study is included as Appendix 11. When logistically possible, in-person interviews were preferred as they acted to increase trust and rapport between the interviewee and interview, and subsequently lead to greater richness of data (Jennings, 2001). Otherwise, phone interviews were chosen as they allowed contact to be made with key stakeholders in locations where the researcher could not visit due to time and money constraints (Jennings, 2001).

Research step two interviewed at least five representatives from each of the eight main stakeholder groups. The intended number of semi-structured interviewees for research step two was 40 key stakeholders. The resulting number of interviews was 44 from eight key stakeholder groups. Like research step one, potential interviewees were identified through word of mouth recommendations from other stakeholders and direct contact with a range of marine tourism operators, managers, researchers, conservationist and educators. Again, potential interviewees were selected because they were considered to be well established in their respected stakeholder group and somewhat knowledgeable about MRT. Key stakeholders from all Australian States and Territories were invited to participate in the interview process. A full but generalised (for confidentiality) list of the people interviewed is presented in Table 3-27 and Table 3-28.

Table 3-27: A generalised list of the key stakeholders interviewed in step two, study two (n=44) – part A

No.	Interviewee
1	Former executive of the Great Barrier Reef Marine Park Authority
2	Marine scientist at the Australian Institute for Marine Science
3	Owner and operators of a Melbourne based MRT company
4	Owner and operator of a Sydney of a marine discovery centre
5	Two marine managers at the Western Australia Department of Fisheries
6	Director of a marine research station in Northern Queensland
7	Marine scientist for a large marine tourism company in Northern Queensland
8	Mexican based director of global research tourism company
9	A marine tour operator from Hobart, Tasmania
10	Business Manager at the Australian Institute of Marine Science
11	Director of Marine Science, Australian Institute of Marine Science

Table 3-28: A generalised list of the key stakeholders interviewed in step two, study two (n=44) – part B

No.	Interviewee
12	Director of a marine research station in Southern Queensland
13	Curator at a large marine aquarium in Sydney, Australia
14	Director of a Dolphin volunteer and watching institute in Victoria
15	Marine educator and Founder of the Marine Education Society of Australia
16	Director of the environmental arm of a national SCUBA diving organisation
17	Director of an International Dolphin Conservation Society, South Australia
18	Board member of a global MRT company
19	Regional Manager of Queensland Parks and Wildlife Service
20	Experienced MRT guide from Thailand
21	Former President of the Australian Marine Sciences Association
22	Owner and operator of a Jervis Bay based MRT company, NSW
23	Owner and operator of a MRT company that operates across Australia
24	Pioneer of MRT in Northern Queensland
25	Manager of an Australian State Destination Management Organisation
26	Three recently graduated PhD Marine scientists with recent experience in MRT
27	Director of a National Marine Conservation NGO
28	Marketing manager for a national museum in Sydney
29	Marine scientist at the University of Tasmania
30	Marketing manager for a Western Australian research tourism company
31	Queensland Regional Manager for a global research tourism company
32	Co-Director of a marine discovery and education centre in NSW
33	Main-stream marine tour operators from northern Queensland
34	Project Officer at a marine research station in Queensland
35	CEO of national marine education society in Australia
36	Owner and operator of a Northern Queensland MRT company
37	Experienced MRT focused scientist from northern Queensland
38	PhD in marine education in Hawaii
39	Pioneer of Whale Shark MRT in Western Australia
40	Owner and operators of a Gold Coast based MRT company
41	Marine manager at a regional marine researchers station in South Australia
42	Operator of a Dolphin watching marine tour company in Victoria
43	Director of a National Marine Training Centre
44	Regional Manager of Victorian Parks and Wildlife Service

Semi-structured interview topics

As previously highlighted in Section 3.2.1, a phenomenographic approach was chosen to further understand the depth and diversity of key stakeholder views. Therefore, in accordance with phenomenographic principles, all of the stakeholder interviews began with interviewees being asked to respond to a planned question or a given situation (Bowden, 2000). Given this, all interviewees were asked to respond to the following context regarding the potential future of MRT in Australia.

> *An initial review of MRT venture web sites reveals that at least 17 organisations operate no less than 27 MRT ventures across Australia. MRT in Australia appears to be mainly comprised of small and independent businesses. The exceptions are the Earthwatch Institute and Landscope Expeditions in Western Australia. When compared to the UK and the USA, the MRT industry in Australia may be considered as relatively under developed. It can be argued that the current status of MRT in Australia is somewhat surprising because, in world terms; Australia has an advanced marine research sector, a relatively mature marine tourism industry, a large coastline and ocean region, and a wealth of marine wildlife and other natural assets. When discussing the interview questions, would you respond within the context of if and/or why MRT is underdeveloped in Australia and how could MRT be further developed across Australia?*
>
> (Source: The researcher)

While the interview outcomes were highly dependent on open discussion with the interviewees, the initial interview topics for interviewees was:

1. Discuss any significant results from the first key stakeholder survey with the interviewee;
2. What examples of MRT products across their region and elsewhere in Australia can the interviewee provide?
3. What does the interviewee find interesting and beneficial about MRT;
4. What would the interviewee view as their personal vision for MRT across Australia?
5. What would the interviewee view as possible opportunities and constraints for MRT your region and elsewhere in Australia?

The interview process

Interviews for step two were comprised of a three-phase process. The first phase was to speak with key stakeholders who were close to where the researcher is located (i.e. Cairns, Australia). This consisted of in-person interviews (n=7) of key stakeholders in Cairns (n=4) and Port Douglas (n=3) in the latter half of 2007. The second phase consisted of in-person interviews (n= 24) of key stakeholders elsewhere across Australia (Table 3-29) in the first two months of 2008. The third phase consisted of phone-based interviews (n=15) of key stakeholders across Australia (Table 3-30) during 2007 and 2008. To assist with travel for in-person interviews across Australia, a research grant of $A2300 was received from the James Cook University.

Table 3-29: Locations, distribution, and number (n=29) of in-person interviews in 2007 and 2008

City or town	**No.**	**City or town**	**No.**
Cairns, QLD	3	Port Douglas, QLD	2
Perth, WA	6	Adelaide, SA	2
Melbourne, VIC	4	Gold Coast, QLD	1
Sydney, NSW	4	Eden, NSW	1
Brisbane, QLD	3	Jervis Bay, NSW	1
Hobart, TAS	2		

Table 3-30: Locations, distribution, and number (n=15) of phone interviews in 2007 and 2008

City or town	No.	City or town	No.
Townsville, QLD	4	Mexico (Global Vision International representative)	1
Canberra, ACT	2	Mission Beach, QLD	1
Melbourne, VIC	2	Port Douglas, QLD	1
Darwin, NT	1	Port Lincoln, SA	1
Lizard Island, QLD	1	Sydney, NSW	1

The overall process for the in-person and phone semi-structured interviews was similar. For both forms of interview, a time and place for the interview was arranged that was both convenient to the interviewer and the interviewee. This was usually done by e-mail and phone. In-person interviews were usually conducted at the interviewees work office or a café close to their office, and often lasted between 1 and 2 hours. Phone interviews were done at locations that were convenient to both parties and often lasted up to 30 minutes in length.

After initial introductions and informed consent was understood and agreed, the interview was undertaken in the casual yet focused manner as is associated with semi-structured interviews. Interviews typically followed a process similar to the phenomenographic-related interview method that is described in Appendix 3. After initial questions were asked, the discussion evolved from those questions, and interview notes were written into a note pad.

Following the interviews and while the memory of the interview was still fresh, the interviewer transcribed the hand recorded notes into a computer later that day or early the next day. At this stage, the interviewer also recorded important statements from the interviewee that weren‘t written down during the interview, but later recalled by the interviewer. After this, the interviewee‘s identity, and the time and date of the interview were recorded with the transcript. To ensure

confidentiality of the interview records, the hand written notes and transcribed digital notes were kept in the lockable interviewer‘s office. These written and digital notes form the basis of step two outcomes.

Interview analysis

The goal of this interview analysis was a thematic database of key MRT stakeholder views about MRT in Australia. In accordance with phenomenographic analysis, important statements from all stakeholder interviews were selected by the researcher and combined into a database of important quotes. Statements were tagged with the interviewee‘s stakeholder group. In a three phase process, statements were assessed in terms of commonality and differences in meaning. Phase-one involved the initial classification of the majority of interview statements in terms of those categories described in Table 3-31.

Table 3-31 categories represent this study‘s building blocks towards an advanced conceptual model of stakeholder views of MRT in Australia. For example, the _conceptual framework‘ and _tourist type‘ categories link interview statements with this study‘s proposed conceptual framework (Figure 1.1) and Moscardo et al.‘s (2004) tourism-system model (Figure 1.2). The _main topic‘ was a key word or phrase that broadly captured the overall meaning of the statement. The _agenda for change‘ category was intended to link interview statements with this research step‘s phenomenographic focus on the potential of change for MRT in Australia. The contestability category was included to flag if a statement was new, important and likely to be contestable across two or more key stakeholder groups.

Table 3-31: Categories to classify interviewee statements (Source: Moscardo et al, 2004, Figure 1.1, phenomenography, and thematic analysis of interview data)

Category	Description
Key stakeholder group	What key stakeholder group does the interviewee best belong to?
Tourism-system model	What component of the Moscardo et al.'s (2004) tourism system model does the interview statement best match?
Key MRT element	What key element (e.g. Ecotourism, volunteer tourism, and marine research) is most relevant to this statement? See the proposed conceptual framework (Figure1.1)
Main topic	A word or phrase that describes the main meaning of the statement
Agenda for change	This category broadly represents the agenda for change that may be represented in the interviewee's statement
Contestability	Is the statement new and potentially contestable across stakeholder groups or not (Y/N)? To assess if these views are shared across other key stakeholder groups, statements marked –Y" were included in research step 3 of study 2.

Phase-two reviewed and then classified any hitherto unclassified statements from phase-one into an existing class or a new class. Phase-three then iteratively reviewed all interviewee statements and classes to derive a complete dataset of consistently classified interview statements. The intended outcome is a coded database about the depth and diversity of key stakeholder views about MRT in Australia. Table 3-32 illustrates an example of the intended results from this three phase classification process.

Table 3-32: An example of outcomes from the interview statement classification process (Source: Study two)

Interviewee statement	Key stakeholder group	Tourism system framework	Key MRT element	Main topic	Agenda for change	Contest-ability (Y/N)
Visitor numbers may be restricted for the benefit of the ecosystem.	Marine tour operator	Product constraint	Ecotourism	The environment	Pro environment	Y
Employment and logistics support for MRT should be drawn from the local community	Marine tour operator	Desired product characteristic	Ecotourism	Community involvement	Pro environment	N
Marine tour operators should provide proceeds, data and/or research capabilities to marine researchers.	Marine tour operator	Desired product characteristic	Research tourism	Marine research	Close relationship with marine research organisations	Y
A MRT tour must have conservation, research or other educational message that leads to increased awareness and action by the traveller	Marine tour operator	Desired product characteristic	Ecotourism	Education and interpretation	Change tourist's outlook	N

3.8.3. Study two, step three: Acquire and compare the views of key stakeholder about new, important and/or potentially contestable issues

Research steps one and two identified a range of different stakeholder views of MRT in Australia. Many of these views were considered to be new, important and/or potentially contestable across various key stakeholder groups. To determine if these new views were likely to be contestable or shared across different key stakeholder groups, research step three undertook another online and anonymous survey of key stakeholders about those views.

The online survey process

Based on the identified new, important and/or potentially contestable views, a second online survey was devised and hosted on the QuestionPro web site (QuestionPro, 2009). Sixteen survey topics (Table 3-33) and 87 survey questions were derived for that survey. The full list of survey questions is presented as Appendix 12. For each survey question, research participants are asked how well they agreed or disagreed with each statement. The exclusive choices were 1) strongly agree; 2) agreed; 3) maybe; 4) disagree; 5) strongly disagree; 6) not important to them; 7) cannot say; and 8) the statement is not clear.

Table 3-33: Survey topics for the second stakeholder survey of study two

Survey topics	
1.Environmental issues	9. Marketing concerns
2.Community involvement	10.The marine research attraction
3.Education and interpretation	11.The role of the media
4.Research quality	121.Support infrastructure
5.Key stakeholder concerns	13.A MRT guide role
6.Marine researcher involvement	14.Good business principles
7.The role of marine research in MRT	15.Proposed business aspirations
8.The MRT tourist	16.A MRT broker and trail

Note, a broker role is described as a person (s) who acts to increase the opportunities for MRT products by linking key stakeholders together (Source: Study two results)

To acquire a representative diversity of stakeholder views, this study sought to survey at least five representatives from each of the eight key stakeholder groups (i.e. 40 key stakeholders). Potential respondents were identified through previous contact with key stakeholders through research steps one and two. Potential respondents from all Australian States and Territories were invited to participate. This survey was finally undertaken by 33 key stakeholders between April 2007 and September 2007.

Research step three survey outcomes are then compared across different key stakeholder groups to derive is a set of new and important key stakeholder views about MRT in Australia that are 1) shared; 2) somewhat contested; or 3) highly contestable across two or more stakeholder groups. This information is then combined with research step one and two outcomes to generate a set of key stakeholder views about MRT in Australia that that are 1) shared; 2) somewhat contested; or 3) are highly contestable across key stakeholder groups.

3.8.4. Study two, step four: Develop a model of key stakeholder views about MRT in Australia

Using outcomes from research steps one, two and three, research step four develops a conceptual model for MRT that shows the contestability by key stakeholder groups about various key stakeholder views of Australian MRT. This conceptual model is displayed in terms of 1) Moscardo et al.'s (2004) tourism system components; 2) different key MRT elements from the proposed conceptual framework (Figure 1.1); 3) the main MRT topic; and 4) level of stakeholder contestability. A logical structure of such a model is illustrated in Figure 3.7. An advantage of this model is that it links the acquired key stakeholder views from study two with Moscardo et al.'s (2003) tourism system, and the proposed conceptual framework for MRT.

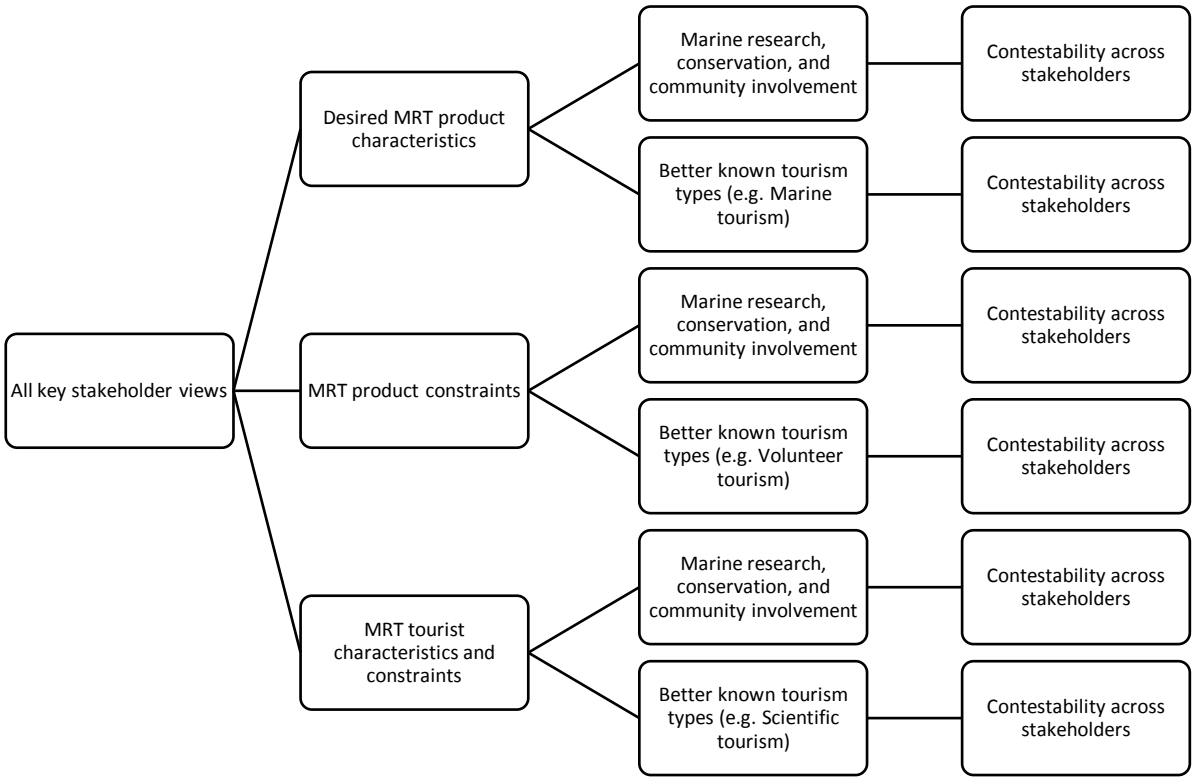


Figure 3.7: A hypothetical structure for a conceptual model of key stakeholder group views about other key stakeholders views

3.9. Study three - methods and procedures

Study three assesses the preferences of a representative sample of potential MRT tourists for different MRT products and benefits. The procedure for this study consists of six research steps (Figure 3.8). Research steps one and two are preparatory steps for research steps four, five and six which surveys 311 potential marine research tourists and then analyse that data. Research step three develops twelve one page brochures that describe twelve existing or potential Australian MRT products. Research step four develops an anonymous online survey, and then surveys 311 potential MRT tourists about their preferences for twelve different MRT products and 25 associated benefits.

Research step five applies key findings from the previous research steps to derive a conceptual model that links the preferences of different MRT tourists with different MRT products and benefits. Research step six develops twelve information tables that summarise the outstanding market segments and associated benefits for twelve MRT products.

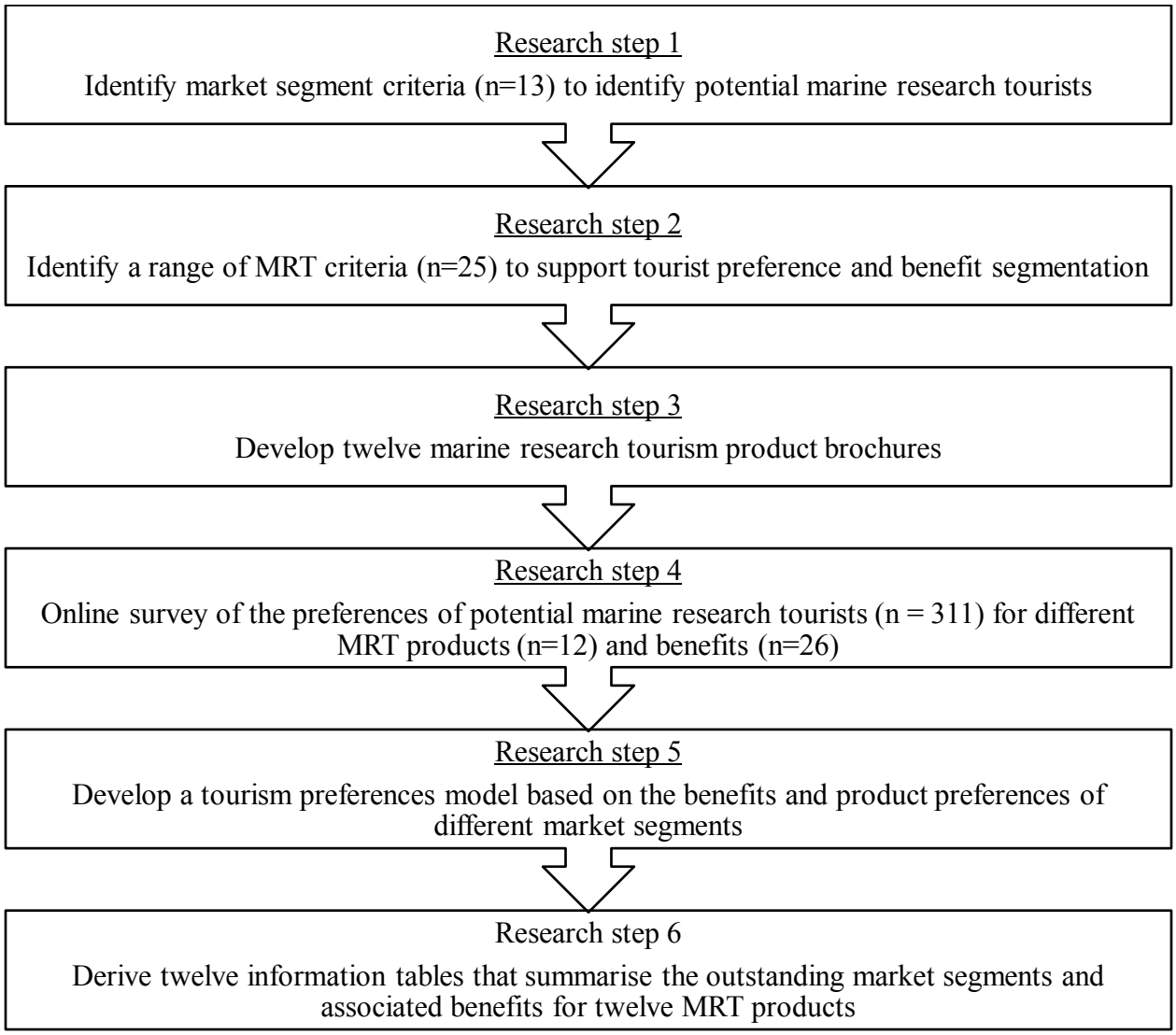


Figure 3.8: Study three: Research procedure and steps

3.9.1. Study three, step one: Identify criteria to profile potential marine research tourists

To conduct the online survey, study three required a set of suitable market segmentation criteria to suitably segment respondents. Benson (2005), Clifton and Benson (2006), Cousins (2007), and Weiler and Richins (1995) provide information about who potential MRT tourists are likely to be. A review of this literature combined with study one outcomes identifies 14 potential MRT market segments (Table 3-34) and 13 criteria for profiling MRT tourists (Table 3-35). These findings are used to design many of the questions for study three's online survey.

Table 3-34: Potential MRT market segments (n=14) (Source: Academic literature and study one)

Marine wildlife tourists	SCUBA divers	Nature enthusiasts
Adventure tourists	Volunteer tourists	Repeat MRT tourists
Marine resort tourists	Educational tourists	Trained marine researchers
Ecotourists	Gap year travelers	Marine tourism holiday makers
University marine science students	Snorkellers	

Table 3-35: MRT tourist criteria (n=13) for profiling MRT tourists (Source: Academic literature and Study one)

ID	Market segment criteria
1	Country and town of respondent
2	Gender (M/F)
3	Age group (18-30, 31-40, 41 - 50, 51 – 60, 60-70, 70+)
4	Occupation
5	Formal educational background. (High school, technical college, university)
6	How frequently does the respondent watch television nature documentaries?
7	Working past involves natural science or the environment (Y/N)
8	Frequency of work in an outdoor environment? (Y/N)
9	Supports an environmental conservation organisation (Y/N)
10	Member of a volunteer organisation (Y/N)
11	Level of whale or dolphin watching experience
12	Level of snorkelling experience
13	Level of SCUBA diving experience

3.9.2. Study three, step two: Identify key MRT benefit-related preferences

Table 3-36 and Table 3-37 show a set of 25 MRT benefit-related criteria that were used to understand the preferences of tourists for different MRT products. These criteria were derived through an assessment of the academic literature. Respondents were asked to indicate if their preferences for different key MRT benefit criteria were very important; important; somewhat important; or not very important.

Table 3-36: 25 key MRT criteria to assess tourist preferences for different products (Source: see the source column in the below table) – part A

Key MRT benefit criteria for assessing tourist preferences	**Source**
The importance of marine research programs to the marine research community	Lorimer, 2009
Learning from the marine researchers	Ritchie, Carr, & Cooper, 2003
A high level of involvement in the marine research program	Brown & Lehto, 2005; Callanan & Thomas, 2005
The high level of marine research training that you can receive	Ritchie, Carr, & Cooper, 2003
The high number of training days you can be involved with	Brightsmith et al. 2009
The high level of skill and knowledge needed to participate	Brightsmith et al. 2009
A high level of marine research education you can receive	Ritchie, Carr, & Cooper, 2003
The marine research technology or research facility that you can be involved with	Benson, 2005
The experience of the marine researchers who are undertaking the research	Derived for this research
The venture‘s high level of involvement in conservation of marine wildlife or habitat	Ecotourism, 2008; Weaver, 2001
The destination (e.g. an island, a coral reef, the southern ocean, a sailing trip, a resort, etc.)	Callanan & Thomas, 2005
The opportunity to have fun	Coghlan, 2006
The main vessel (e.g. ship or boat) that is used for travel or research (if applicable)	Discussions with stakeholders
The marine wildlife that is being researched	Discussions with stakeholders
A high level of adventure found on the venture	Swarbrooke et al., 2003
The duration of the trip (including any time on a boat)	Callanan & Thomas, 2005
The high quality of the marine researchers who are undertaking the research	Derived for this research

Table 3-37: 25 key MRT criteria to assess tourist preferences for different products (Source: see the source column in the below table) – part B

Key MRT benefit criteria for assessing tourist preferences	Source
A high level of solitude, tranquillity, and closeness to nature whilst on the venture	Orams, 1999
A high level of social interaction with others on the venture	Orams, 1999
A high level of interaction with the local people	Ecotourism, 2008; Weaver, 2001
Avoiding sun burn, cold exposure and/or sea sickness	Derived for this research
A high level of self sufficiency needed while on the venture	Orams, 1999
An opportunity to receive recognised marine research education and training	Ritchie, Carr, & Cooper, 2003
There is an offshore boating or sailing experience	Orams, 1999
The opportunity to SCUBA dive	Garrod, 2008
The opportunity to explore marine phenomena and discover new things	Ritchie, Carr, & Cooper, 2003

3.9.3. Study three, step three: Design twelve different MRT product brochures

Study three sought to further understand the preferences of a representative group of MRT tourists for a range of MRT products. There were large logistical (both time and money) issues associated with finding and then coordinating a large group of MRT tourists who each had the same first-hand experience of many different MRT products. In fact, such a survey group may be impossible to identify and then coordinate. Given this, an alternative method was needed that easily and effectively communicates MRT tourism product information to a large and widely distributed survey group.

The alternative method was to create a set of MRT product brochures that represent a range of existing MRT products. The main reason for choosing a brochure creation method was the cost effectiveness of such a method; and they can provide insight into the motivations and preferences of different tourist‘s for different destinations (Andereck, 2005; Coghlan, 2006; Goossens, 1994; Zhou, 1997). Furthermore, Ellis (2003b), Coghlan (2006) and Cousins (2007) used promotional material such as tourism brochures for their study of research tourism.

The aim of these MRT product brochures was to appeal to as many different types of MRT tourists as possible. This would increase the likelihood that survey responses were as variable and representative as possible, and therefore lead to more useful outcomes. Hence, the design of these brochures was based on the variation (i.e. presence or absence) of different MRT tourist types (e.g. Table 3-34) across the representative 85 MRT products from study one of this thesis. A benefit of this approach is that the resulting MRT product brochures can be statistically linked to the MRT tourist types and MRT criteria from study one to provide a more comprehensive view of the preferences of MRT tourists and why.

To derive these MRT product brochures, MRT tourist types across 85 MRT products in study one are classified using an AHC cluster (binary, furtherest neighbour) analysis. The result was six MRT tourist classes that underpinned the design of the subsequent MRT product brochures. A description of these six MRT tourist classes is shown in Table 3-38.

Table 3-38: Descriptions of the six classes of MRT tourists worldwide (Source: analysis of 85 MRT product web sites in Study one)

No.	Class name	Class of MRT tourist type
15	A	Independent volunteer minded backpackers, often gap year travellers, will attract skilled scientific tourists, no SCUBA, sometimes snorkelling, often have a cultural focus
14	B	Packaged, volunteer minded gap year tourists and backpackers, usually involves SCUBA diving, sometimes have a cultural focus
24	C	Independent volunteer minded tourists and backpackers, often gap year travellers, always SCUBA diving, attracts skilled scientific tourists, often involves older travellers, sometimes have a cultural focus,
9	D	Independent volunteer minded travellers, will attract families and older travellers, little or no cultural focus, and no SCUBA
13	E	Independent travellers, will attract older travellers and skilled scientific tourists, often involves liveaboard experiences, often volunteer minded, no cultural focus, and no SCUBA diving
10	F	Independent travellers, always liveaboard marine tourism, often involves SCUBA diving, will attract skilled scientific tourists and older travellers, vacation minded, can attract families, no cultural focus

Based on each of the six MRT tourist classes, two MRT brochures were designed to create twelve final MRT product brochures with key MRT criteria from study one that relate to each of

those tourist classes. A summary of the twelve MRT products are listed in Table 3-39. To illustrate the nature of these brochures, MRT product one – marine turtles brochure is shown in Figure 3.9. The complete set of twelve brochures is presented in Appendix 4.

Table 3-39: Twelve Australian MRT products and their associated MRT classes (derived from Study one results)

ID	Name of MRT product	Class	Key feature	Region
1	Work with marine turtles and indigenous rangers in remote northern Australia	A	Coastal based	Tropical
2	Volunteer and train at an Australian whale and dolphin research institute	A	Cetacean attraction	Temperate
3	Volunteer at a penguin rescue centre on the southern Australian coastline	B	Penguins and volunteering	Temperate
4	Research, education and adventure across the Whitsundays of tropical Queensland	B	Education and adventure	Tropical
5	Survey coral reefs and help assess the impacts of climate change on coral reefs	C	Reef attraction	Tropical
6	Biodiversity and habitat mapping in north Western Australia	C	Rugged trip	Tropical
7	A bottlenose dolphin education holiday on the southern Australian coastline	D	Pub accommodation	Temperate
8	Day trip to the reef with some marine research as part of the attraction	D	Day trip to reef	Tropical
9	Sail, volunteer and track blue whales in the Southern Ocean	E	Sailing vessel	Temperate
10	A continuous sailing expedition to explore and help research the oceans of Australia	E	Continuous expedition	Both tropical and temperate
11	A coral spawning research and adventure trip on a tropical coral reef	F	Liveaboard vessel	Tropical
12	A submersible research expedition to Australia‘s Bon Hommey undersea ridge	F	A submersible	Temperate

The brochure design process includes the text and photographic images from relevant MRT product web sites assessed in study one. There are two guidelines behind the design of the final twelve MRT product brochures. Both guidelines aim to maximise the geographic range of MRT destinations across Australia, and therefore increase the relevance of this research to key MRT stakeholders across Australia. The first guideline was for the final set of twelve MRT product brochures to represent an even number of temperate and tropically located MRT products in Australia. The second guideline was to locate at least one MRT product in each Australian State and the Northern Territory of Australia.

1. Marine turtles – Work with marine turtles and indigenous rangers in remote northern Australia

Cost 3 – 5 days for A$1, 275- A$2, 125 or approx. A$425 per day

Introduction

Travel to remote northern Australia and work with indigenous rangers, residents and researchers to monitor and protect turtles, and other marine life from ghost nets and feral pigs. Accommodation is new 3m x 3m insect proof canvas tents located on raised timber platforms. Each tent has two fold-out single beds. Bed linen and a bath towel are supplied. Breakfast - cereal, milk, toast and juice, Lunch - cold meat and salads, salad sandwiches, fish, Dinner - good healthy meals with an emphasis on carbohydrates to fuel the evening's activities, Snacks - dried fruit, cookies/biscuits, self-saucing pudding, fruit cake, tinned fruit, bread, fresh fruit. There are composting toilets, showers, screened dining area, bush kitchen, BBQ, reference library, DVD player & monitor for viewing research DVDs.

Marine research

This research programs aims to survey and quantify the size, structure of and trends of nesting populations, quantify nesting turtle fecundity including clutch size, clutches per season, egg morphometrics, and protect nesting sites from feral pig predation. The research project also evaluates and installs feral pig exclusion devices, identify and record ghost nets on beach, and to develop a sustainable management strategy. Everyday, you will receive full training to assist rangers with identifying nesting turtles, installing feral pig exclusion devices, and collecting and compiling data. You will assist with counting, tagging and measuring nesting turtles, counting and measuring turtle eggs, installing feral pig exclusion devices, removing ghost nets, and the operation of 4 wheel drive vehicles. Conservation and research activities will involve patrols of up to 24 kilometres of beach

Other activity

There will be close interaction Indigenous Australian Rangers and turtle researchers. There will be opportunity for some of the best fishing in Australia. There is a regular opportunity to discuss turtle research and conservation with staff at the camp site. There is no swimming as saltwater crocodiles frequent the beaches and we often see them during our activities. Our campsite has crocodile proof fencing around the boundary.

Much of the information for this page was acquired or drawn from http://www.capeyorkturtlerescue.com

Figure 3.9: MRT product 1: Work with marine turtles and indigenous rangers in remote northern Australia

Limitations of the design and use of brochures

Coghlan (2006) highlighted that there will always be reliability limitations to conclusions that are based on a research participant's interpretation of tourism promotional material such as brochures. Additionally, as identified in section 3.5, while design of these brochures is based on the MRT products studied in study one, some respondents could interpret the intended brochure messages in a differently way than intended by the researcher who designed those brochures. The consequence of these limitations is that this thesis can never claim that all respondents interpret the brochures in the same way, and this interpretation fully reflects the descriptions of MRT products on the original MRT product web sites. Notwithstanding this, all survey participants respond to the same twelve product brochures and the results reliably reflect their preferences for different MRT products and benefits.

3.9.4. Study three, step four : Survey a representative sample of potential MRT tourists

Research step four surveys a representative sample of potential MRT tourists about twelve MRT products. To achieve this, information from Table 3-34, Table 3-35, and Table 3-36 was combined to devise an online survey instrument that encompasses a wide range of MRT market segment, product and benefit criteria. The questions for this online survey form are included as Appendix 13.

From December 2007 to April 2008, a request to participate in the survey was e-mailed to at least 1800 people across Australia and elsewhere who matched the profile of potential MRT tourists (Table 3-34). This group comprised the researcher's associates and their colleagues, and a set of specific market segments namely; repeat MRT tourists, SCUBA divers, marine researchers and university students. The great majority of these associates could be broadly typified as professional working people or university students. They included many people from organisations such as the PADI Project Aware Foundation, Reef Check Australia, the Australian Marine Science Association, Flinders University, James Cook University, Melbourne University, Murdoch University, University of Queensland, the Commonwealth Scientific Industry and Research Organisation (CSIRO), and the Australian Institute of Marine Science.

Respondents were asked about their preferences for different key MRT criteria, respondents using a scale of very important; important; somewhat important; or not very important. This study sought to minimise the influence of product cost on respondent preferences because cost is clearly a major factor in determining product preferences and could overshadow the preference for other aspects of a MRT product. Thus, at the start of the survey, respondents were requested to respond as if the cost of each product would not hinder their participation.

3.9.5. Study three, step five: The preferences of different potential marine research tourists for different MRT products and benefits

This aim of this study is to further understand who are potential MRT tourists; what MRT products they are interested in; and what benefits do they seek from those products. To guide the analysis process, this study derived four topics and seven related questions (Table 3-40).

Table 3-40: Topics and questions used to identify MRT tourist preferences

ID	Topics and questions
	Topic 1 - Market segments and demographics of respondents
1	What are the marine tourism holiday preferences of respondents?
2	What are the marine tourism holiday preferences and related market segments
	Topic 2 – MRT tourists and their benefit preferences
3	What are the preferences of respondents for different MRT benefits?
4	What are the preferences of four MRT tourist classes for different MRT benefits?
	Topic 3 - A conceptual model of MRT tourist preferences and benefits
5	What is a conceptual model for MRT tourist preferences and benefits?
	Topic 4 - MRT product preferences of respondents
6	What are the overall preferences of respondents for different MRT products?
7	What are the preferences of potential MRT tourists for different MRT products in Australia and benefits?

To address these topics and questions, a benefit segmentation method was applied. Benefit segmentation is used to further understand the preferences of different groups of tourists for different benefits (Frochot & Morrison, 2000; Garrod, 2008; Murphy & Norris, 2005). An example of benefit segmentation in a marine tourism setting is Murphy and Norris (2005) who conducted benefit segmentation on survey data from 2215 tourists to the Great Barrier Reef. Their results identified four marine tourism market segments (table 3-41). Major differences amongst those four segments were attributed to the tourists' preferences for two benefits namely different levels involvement with the reef and desire for information and learning (Murphy & Norris, 2005).

Table 3-41: Four market segments on the Great Barrier Reef, Australia (Source: Murphy & Norris, 2005)

Market segment	Description
Nature family	Exhibit greater demand for a more relaxing and or social reef experience that involves their family
Nature relaxer	Exhibit greater demand for a more relaxing and or social reef experience that does not necessarily involve their family
Nature learners	Exhibit greater demand for learning and less active (e.g. pontoons and glass bottom boats) experiences
Dive learners	Exhibit greater demand for learning an more active (e.g. SCUBA) experiences

Develop a tourist preferences and benefits model

Using outcomes from the benefit segmentation process, research step five develops a MRT tourist preferences model that shows important features and processes that underpin the preferences of MRT tourists for MRT benefits. This model can be used to describe and explain the preferences of potential MRT tourists for various MRT benefits and products. To develop this model, the concept modeling and integration principles described in Section 3.6.4 of this thesis are applied.

3.9.6. Study three, step six: Derive twelve information tables that summarise the outstanding market segments and associated benefits for twelve MRT products

Research step six develops twelve information tables that summarise the outstanding market segments and associated benefits for each of the twelve MRT products. Outstanding market segments and benefits were identified if they were in the top thirty percent or bottom thirty percent of their range. The full method to identify these market segments and benefits is presented Appendix 14. To complement this Study three outcome, outstanding MRT product criteria that describe those MRT products from Study one are also identified. This can be achieved as the twelve MRT product brochures are derived from six MRT classes (Table 3-38) which in turn were

derived from Study one results. Those results describe the composition of 85 MRT products according to 26 MRT criteria. When combined, these findings represent a completion of study three of this thesis namely; a description of the preferences of potential MRT tourists for different MRT products, locations and activities in Australia. Such information is intended to further explain why certain MRT market segments may prefer certain MRT products across Australia.

3.10. Research completion summary

This following section provides a brief summary of major milestones (Table 3-42) during that period. This includes 1) when each study began and finished; 2) details of main data collection methods and number of research participants; and 3) additional milestones such as PhD ethics approval, grants received, and approved study leave.

Table 3-42: Research progress and completion summary (Source: This study) – part A

Study	**Time period**	**Details**
1 - Conceptual nature	Dec 2006 to June 2007	Web site analysis of 126 MRT web sites by 6 research participants
2 - Tourist preferences	June 2007 to June 2008	An online survey of 311 potential MRT tourists
3 - Stakeholder views	Dec 2007 to Aug 2009	Two online surveys and semi-structured interviews of approximately 70 key supply side stakeholders
4 - Integration of 3 studies	Aug 2009 to Sept 2010	Integration of outcomes from studies 1, 2 and 3
Other PhD milestones		
Ethics approval	November 2006.	
PhD confirmation seminar	December 2006.	
PhD pre-completion seminar	September 2009.	
Grants		
University grant - $2,300	January 2007.	Funds to pay research assistants in study one
University grant - $1,900	January 2008.	researcher travel across Australia to conduct semi-structured interviews in study two
Sustainable Tourism CRC Travel Grant - $2,000	October 2008.	Travel assistance to the ISTTE conference in Dublin in October 2008

Table 3-43: Research progress and completion summary (Source: This study) – part B

Study	Time period	Details
Study leave		
Paid full-time work	June to August 2007	Three months
Paid full-time work	June to July 2008	Two months
Other university approved study	March to May 2009	Three and a half months
Paid full-time work	July 2009.	One month
Paid full-time work	July 2010	One month

This thesis also generated a number of academic publications (Table 3-44). These publications include three full refereed conference papers; two working papers; and one journal article submitted in April 2009, reviewed by the Tourism in Marine Environments Journal in March 2010, and presently under review by the Authors. The three refereed conference papers are included as Appendices 15, 16, and 17. Wood and Zeppel (2008) was awarded the best paper award at the ISTTE conference in Dublin, 2008.

Table 3-44: PhD related publications

Publications
Journal submission
Wood, P and Zeppel, H. (2009). The preferences of MRT tourists. Tourism in Marine Environments, submitted in March 2009. Reviewed by Tourism in Marine Environments in March 2010. Under review for submission by Authors.
Conference papers and presentations
Wood, P. & Rumney, J. (2009). Key stakeholder views of MRT in Australia. In A. Albers & P. Myles (Eds.), Proceedings of CMT2009, the 6th International Congress on Coastal and Marine Tourism (pp.47-60). 23-26 June, Nelson Mandela Bay, South Africa. From http://www.cmt2009.com/Proceedings/content/CMT2009_A_024.pdf. (Appendix 15)
Wood, P. & Zeppel, H. (2008). The Preferences of Potential MRT tourists for Different MRT Products in Australia. In: The Future Success of Tourism: New Directions, Challenges and Opportunities. ISTTE (International Society of Travel & Tourism Educators) Conference, September 30-2 October, 2008. Clontarf Castle, Dublin, Ireland. AWARD: Best Paper (Full Refereed Paper) at ISTTE Conference 2008. (Appendix 16)
Wood, P. & Coghlan A. (2008). The conceptual nature of MRT and key stakeholder involvement in MRT. Refereed paper, in CAUTHE, Proceedings of the 18th Annual CAUTHE Conference, Richardson, S., Fredline, L., Patiar, A., and Ternel, M., (Eds.) CD-ROM, Griffith University, Gold Coast, 11-14 February. (Appendix 17)
Wood, P. (2009). Opportunities for MRT in Australia. Symposium Abstract. In A. Hergesell & J. Liburd. (Eds.), Proceedings from the first International Symposium on Volunteering and Tourism. CD-ROM, 14-18 June, James Cook University, Singapore.
Wood, P. (2007). The development of MRT in Australia: Working paper. In M. Luck et al. (Eds.), Proceedings of the 5th Coastal & Marine Tourism Congress: Balancing Marine Tourism, Development and Sustainability (pp. 430-446), 11-14 September. Auckland University of Technology, Auckland.

3.11. Summary

This chapter has outlined this thesis's research paradigms, approaches, design, stages, ethics, methods and procedures to achieve its three studies. In summary, this study was guided by a pragmatism and mixed methods research approach whereby positivistic and interpretivistic methodologies were selectively applied. Methods and procedures include 1) a rigorous rating and analysis of 85 MRT product web sites; 2) online surveys and interviews of approximately 70 supply side MRT stakeholders; and 3) an online survey of 311 potential marine research tourists. The next chapters of this thesis present and discuss the key findings from studies one, two, and three.

Chapter 4 Study one - results

A conceptual exploration of MRT products and tourists

4.1. Introduction

Based on the proposed conceptual framework for MRT (Figure 1.1), study one asks what are the key characteristics of MRT worldwide and in Australia? To achieve this, it measures, tests, explores, and describes the manifestation of that conceptual framework across a representative sample of MRT products worldwide and in Australia. This study was undertaken in seven research steps (Figure 3.4). The primary sources of data were a sample of 126 MRT product web sites; and the subsequent detailed interpretation and rating (1 to 5) of 85 MRT product web sites. Research outcomes are intended to describe the nature and distribution of MRT worldwide and in Australia; provide a conceptual insight into MRT; and provide an informed basis for studies two and three of this thesis.

4.2. Research step one - The distribution and characteristics of MRT products worldwide

Based on the thesis‘s definition and selection criteria for MRT products (described in Chapters One and Three), a review of the Internet and academic literature identified 35 MRT organisations and 126 MRT products worldwide. The organisation name, whether a MRT organisation is classified as small (SO) or large (LO), and the location of the organisation‘s main office(s) are presented in Table 4-1. The type of a MRT organisation is determined by whether

organisation is 1) a smaller MRT organisation (i.e. SO) with one to four MRT products and no international focus or 2) a larger MRT organisation (i.e. LO) with more than four research tourism products (not only MRT products) and/or an international focus. A full list of the 126 MRT products and their web addresses is included as Appendix 18.

In terms of MRT companies, Table 4-1 shows that The Earthwatch Institute is the largest MRT organisation worldwide with 21 % (n=27 products) of MRT products followed by The Oceanic Society (9%, n=11), Frontier (8%, n=10), Deep Ocean Expeditions (7%, n=9), Greenforce (5%, n=6), and Blue Ventures (4%, n=5). MRT organisations in Australia include Conservation Volunteers Australia (n=5), Marine Wildlife Adventures (n=4), Landscope Expeditions (n=2), and Cape York Turtle Rescue (n=1). In terms of organisation size, 16 of the 35 identified organisations were classified as SO organisations. Examples of these SO organisations are the Bunbury Dolphin Discovery Centre, Cape York Turtle Rescue, Eye to Eye Marine Encounters, and the Tethys Foundation. Fifteen of these sixteen SO organisations had their main office in Australia. The exception is the Tethys Institute from Italy. This indicates that Australian based MRT is mainly comprised of SO organisations.

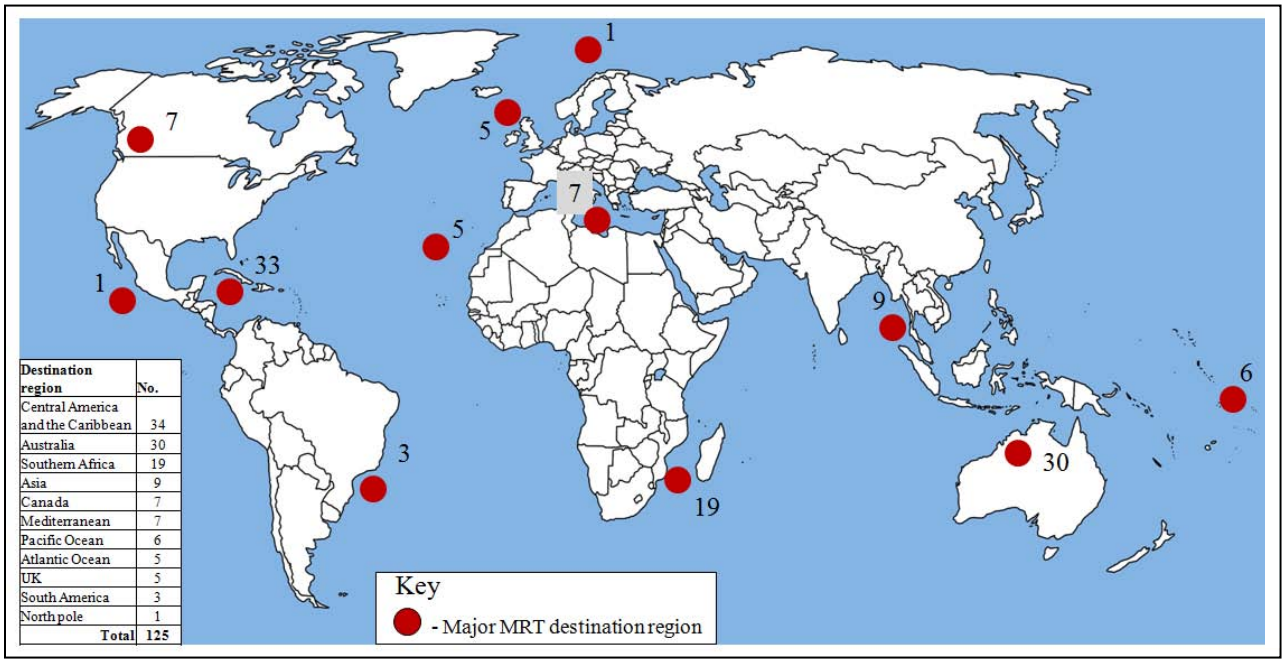
Examples of LO organisations include the Earthwatch Institute, The Oceanic Society, Blue Ventures and Greenforce. While these LO‘s operate in many countries, 47% (n=8) have their main office in the UK, 21 % (n=4) have their main office in the USA, and 16 % (n=3) have their main office in Australia. LO organisations based in Australia are Conservation Volunteer Australia (n=5 MRT products), the Whale and Dolphin Society (n=1), and the Lizard Island Research Station (n=1). The Whale and Dolphin Conservation Society is the world's most active

charity dedicated to the conservation and welfare of all whales, dolphins and porpoises (WDCS, 2010). The Lizard Island Research Station is a world-leading supplier of on-reef facilities for coral reef research and education (Australian-Museum, 2010).

Table 4-1: MRT organisations worldwide (n=35) and number (n=126) of MRT products (Source: Analysis of 126 web sites)

Organisation	Number of MRT products	Type	Main office
The Earthwatch Institute	27	LO	USA/UK
The Oceanic Society	11	LO	USA
Frontier	10	LO	UK
Deep Ocean Expeditions	9	LO	Not stated
Greenforce	6	LO	UK
Blue Ventures	5	LO	UK
Conservation Volunteers Australia	5	LO	Australia
Operation Wallacea	5	LO	UK
The Shark Research Institute	5	LO	USA
Coral Cay Conservation	5	LO	UK
Biosphere Expeditions	4	LO	UK
Global Vision International	4	LO	UK
African Conservation Experience	1	LO	UK
Asociacion de Voluntarios Para el Servicio en las Areas Protegidas (ASVO)	1	LO	Costa Rica
The Whale and Dolphin Conservation Society	1	LO	Australia
Scientific Exploration Society	1	LO	UK
Lizard Island Research Station	1	LO	Australia
The Antinea Foundation	1	LO	Switzerland
Odyssey Expeditions	1	LO	USA
Marine Wildlife Adventures	4	SO	Australia
Landscope Expeditions	2	LO	Australia
Tevene'i Marine	2	SO	Australia
The Undersea Explorer	2	SO	Australia
The Tethys Foundation	2	SO	Italy
Bunbury Dolphin Discovery Centre	1	SO	Australia
Cape York Turtle Rescue	1	SO	Australia
Eye to Eye Marine Encounters	1	SO	Australia
Kalinda MV	1	SO	Australia
Ningaloo Turtles	1	SO	Australia
Pelican Expeditions	1	SO	Australia
Rodney Fox Expeditions	1	SO	Australia
The Royal Geographical Society of Queensland	1	SO	Australia
The Oceania Project	1	SO	Australia
The Lakes Explorer	1	SO	Australia
The Dolphin Research Institute	1	SO	Australia
Total	**126**		

The overall distribution MRT products across the globe are shown in Figure 4.1. Further details about the destination region and country of MRT products are in Table 4-2. The region with the most MRT products was Central America and the Caribbean (e.g. Trinidad, Costa Rica, Bahamas, Honduras, Tobago) with 27 % (n=34) of sampled products. Following this, 24% (n=30) occurred in Australia, and 15% (n=19) occurred in Southern Africa (e.g. Madagascar, Tanzania, South Africa). Other MRT destination regions were Asia, Canada, The Mediterranean, the Pacific Ocean, the Atlantic Ocean, the United Kingdom, South America and the North Pole.



Destination region	No.
Central America and the Caribbean	34
Australia	30
Southern Africa	19
Asia	9
Canada	7
Mediterranean	7
Pacific Ocean	6
Atlantic Ocean	5
UK	5
South America	3
North pole	1
Total	125

Figure 4.1: Distribution and number of identified MRT products (n=126) worldwide (Source: Analysis of 126 web sites)

Table 4-2: Destination regions and countries of identified MRT products (n=126) worldwide (Source: Analysis of 126 web sites)

Destination region	No.	Destination country
Central America and the Caribbean	34	Belize (n=8), Bahamas (n=5), Costa Rica (n=4), Honduras (n=3), Trinidad (n=3), Baja (n=2), Ecuador (n=2), Mexico (n=2), Caribbean (n=1), Cuba (n=1), Suriname (n=1), Tobago (n=1)
Australia	30	See Section 4.8
Southern Africa	19	South Africa (n=6), Madagascar (n=4), Mozambique (n=2), Seychelles (n=2), Kenya (n=2), Tanzania (n=2), Cape Verde (n=1)
Asia	9	Cambodia (n=2), Indonesia (n=2), Malaysia (n=1), Oman and UAE (n=1), Philippines (n=2), Sri Lanka (n=1)
Canada	7	British Columbia (n=6), North West Passage (n=1)
Mediterranean	7	Egypt (n=1), Greece (n=2), Italy (n=2)
Pacific Ocean	6	Fiji (n=2), Galapagos Islands (n=1), Midway (n=2), Pacific Ocean (n=1)
Atlantic Ocean	5	Atlantic Ocean (n=4), The Azores (n=1)
United Kingdom	5	Scotland (n=4), England (n=1)
South America	3	Brazil (n=2), Uruguay (n=1)
North pole	1	Departs from Russia
Total	126	

The occurrence of main marine research focus across those MRT products is shown in Table 4-3. Tropical coral reefs and associated marine wildlife (e.g. sharks, turtles and fish) comprised 33% (n=42) of the main marine research topics. Following this, turtles accounted for 17% (n=21), whales accounted for 10% (n=13), dolphins accounted for 6% (n=8), and sharks accounted for 5% (n=7). Furthermore, 63% (n=79) of MRT products had a research focus in a tropical region, and 34% (n=43) had a research focus in a temperate region.

Table 4-3: Occurrence of marine research topic across MRT worldwide (Source: Analysis of 126 web sites)

Main marine research focus	Total	Tropical	Temperate	Other
Tropical coral reefs and associated marine wildlife (e.g. sharks, whales, turtles and fish)	42	42		
Turtles (e.g. Green, olive ridley, hawksbill and flat back)	21	18	3	
Whales (e.g. Blue, grey, humpback)	13	1	12	
Dolphins (e.g. Spinner, tuxuci, bottlenose)	8	3	5	
Sharks (e.g. Tiger, basking and hammerhead)	7	6	1	
Ship wrecks	6	1	5	
Both whales and dolphins	4	1	3	
Sea birds (e.g. crested terns, shearwaters, boodies,)	3		3	
Temperate reefs	3		3	
Deep ocean and/or undersea volcanoes	3			3
Mangroves	2	2		
Whale sharks	2	2		
Great white shark	2		2	
Penguins	2		2	
Crocodiles	1	1		
Offshore island marsupials (e.g. 'mala, mice, bandicoots') plus marine life such as turtles and dolphins	1	1		
Manatees	1	1		
Manta rays	1		1	
Open ocean/various	1		1	
Prehistoric human artefacts	1		1	
Sea Otters	1		1	
North pole science and discovery	1			1
Total	**126**	**79**	**43**	**4**

4.3. Research step two - The presence of ten key MRT elements

Research step two tests the presence of each of the ten key elements from the proposed conceptual framework for MRT (Figure 1.1) across 85 MRT products worldwide. Justification for selecting those 85 MRT products is provided in Section 3.7.2. Table 4-4 shows the names of these 85 MRT organisations; the number of their MRT products worldwide; the number and percentage of their products sampled; and the number of their products that are located in Australia. The criteria used to test these ten elements are described in Table 3-15.

Table 4-4: 34 MRT organisations and number of MRT products (n= 85) sampled for research step two (Source: Analysis of 85 web sites)

Organisation name	No. of MRT products worldwide	No. of MRT products sampled	% of MRT products worldwide	No. of Australian located MRT products
The Oceanic Society	11	8	73%	
The Earthwatch Institute	27	8	30%	3
Conservation Volunteers Australia	5	5	100%	4
Marine Wildlife Adventures	4	4	100%	4
Operation Wallacea	5	4	80%	
Greenforce	6	4	67%	
Frontier	10	4	40%	
Biosphere Expeditions	4	3	75%	1
Blue Ventures	5	3	60%	
Deep Ocean Expeditions	9	3	33%	
Landscope Expeditions	2	2	100%	2
Tevene'i Marine	2	2	100%	2
The Tethys Foundation	2	2	100%	
The Undersea Explorer	2	2	100%	2
Global Vision International	4	2	50%	
The Shark Research Institute	5	2	40%	
African Conservation Experience	1	1	100%	
Asociacion de Voluntarios Para el Servicio en las Areas Protegidas (ASVO)	1	1	100%	
Bunbury Dolphin Discovery Centre	1	1	100%	1
Cape York Turtle Rescue	1	1	100%	1
Eye to Eye Encounters	1	1	100%	1
Kalinda MV	1	1	100%	1
Lizard Island Research Station	1	1	100%	1
Ningaloo Turtles	1	1	100%	1
Odyssey Expeditions	1	1	100%	
Pelican Expeditions	1	1	100%	1
Rodney Fox Expeditions	1	1	100%	1
Scientific Exploration Society	1	1	100%	
The Antinea Foundation	1	1	100%	
The Dolphin Research Institute	1	1	100%	1
The Lakes Explorer	1	1	100%	1
The Oceania Project	1	1	100%	1
The Royal Geographical Society of Queensland	1	1	100%	1
The Whale and Dolphin Conservation Society	1	1	100%	
Total	**126**	**76**	**63%**	**30**

Results of this testing process are shown in Table 4-5 and demonstrate that nine of the ten key elements have a common presence across the sample. These were marine tourism, volunteer tourism, ecotourism, scientific tourism, wildlife tourism, educational tourism, adventure tourism, marine research, and marine conservation. Higher levels of volunteer mindedness were found to be present for eighty six percent of the products, and higher levels of vacation mindedness were found to be present for fourteen percent of the products.

The clear difference from the proposed conceptual framework and the collected data was that 1) close tourist interaction with the local community (35%); and/or 2) cultural exchange (i.e. a cultural focus) (29%) with the local community does not occur in all the sampled MRT products. Nonetheless, while these features may not always be present in MRT, it is reasonable to suggest that they are still an important feature of many MRT products. To further explore the presence of community interaction and cultural exchange, examples of 9 MRT products with close interaction and/or cultural exchange with the local community are given in Table 4-6.

Table 4-5: Presence (or absence) of ten key elements across the 85 MRT products (Source: Analysis of 85 web sites)

Key MRT element	**No. of MRT products**	**% of sample (n= 85)**
Marine tourism	85	100%
Volunteer tourism	85	100%
Ecotourism	85	100%
Skilled scientific tourism	85	100%
Educational tourism	85	100%
Wildlife tourism	85	100%
Marine research	85	100%
Marine conservation	85	100%
Adventure tourism	74	99%
Higher levels of volunteer mindedness	73	86%
Higher levels of vacation mindedness	12	14%
Close tourist involvement with local community	30	35%
Cultural focus and/or exchange	25	29%

Table 4-6: Examples of MRT tourist involvement with the local community (Source: Analysis of 85 web sites)

MRT products	**Type of community involvement and/or cultural exchange**
Cape York Turtle Rescue , Mapoon, Australia	Join a group of volunteer travellers at a turtle conservation camp in the Aboriginal community of Mapoon.
Pelican Expeditions, Blue Whale Research, Australia	Scientific or educational tourists interact with non paying volunteers from the local community to find and observe blue whales.
Conservation Volunteers Australia – Turtle Conservation, Costa Rica	Assist researchers with turtle research, interact with local people and also learn Spanish.
Blue Ventures - Madagascar Expeditions, Madagascar	Participate in coral reef surveys to prepare a local area environmental management plan. Day to day interaction with local community.
Greenforce - South Pacific Adventure, Fiji	Participate in coral reef surveys. Regular interaction with Fijian villagers, going to Sunday church, playing rugby, and cooking Fijian style.
Operation Wallacea, Indonesia	Assist with fisheries and reef management plan in cooperation with local island community. Regular interaction with local islanders.
African Conservation Experience - Dolphin and Whale Research Centre, South Africa	While assisting with whale and dolphin research, paying tourists will go into local towns to give talks about cetacean research and conservation, and to work with local school children to carry out beach cleanup activities.
ASVO, Costa Rica	The ASVO project promotes community awareness and interaction through the turtle clinic, schools and other local people. On a regular basis, volunteers will walk to the local town to buy groceries and interact with the local people.
GVI - Marine Conservation Expedition in the Seychelles	Undertake marine survey projects that contribute to official government marine management projects. Interact with locals, and visit the local towns and bars.

A review of the 85 MRT product web sites indicates that close interaction with the local community is influenced by whether a MRT product operates in an offshore environment (i.e. ‗mainly marine' in Table 4-7). For example, just fourteen percent (n=3) of the 22 ‗mainly marine' MRT products were local community focused MRT products. Those three products were the SV Pelican in Australia, the Tethys Foundation in Italy, and Operation Wallacea in Peru. For the SV Pelican, paying scientists or educational tourists often have close relations with the local conservation volunteer community in Victoria, Australia. For the Tethys Foundation, volunteer and skilled scientific tourists are likely to spend the day at sea and then return in the evening to interact with the local community. For Operation Wallacea in Peru, much of the marine research on fish, caimans, turtles, dolphins, and manatees is conducted on small boats on the Amazon River, and this is done with the support and involvement of the local Cocama Indian community.

Table 4-7 Close community interaction by type of MRT product: (Source: Analysis of 85 web sites)

Type of MRT tourism product	Close interaction	No close interaction	Total	% close interaction / Total
Mainly marine	3	19	22	14%
Coastal and marine	15	18	33	45%
Island based	2	4	6	33%
Mainland coastal	10	14	24	42%
Total	30	55	85	35%

In contrast to the 22 _mainly marine' products, forty three percent (n=27) of the other products (n=63) regularly involved the MRT tourist with the local community. This indicates that coastal based MRT products are more likely to have close interaction with the local community than offshore focused products that are well away from coastal based local communities. Examples of such coastal based MRT products are Blue Ventures in Madagascar; Global Vision International in the Seychelles; and Cape York Turtle Rescue in Australia.

4.4. Research step three - Contextual indicators of 85 MRT products worldwide

Chapter Three identifies and describes six contextual indicators that were used to measure the sampled 85 MRT products. These indicators are four geographic, scientific and business related indicators; cost per day; and maximum duration. The first four indicators are 1) region of operation (i.e. tropics or temperate zone) of MRT product; 2) type of marine tourism (i.e. island based, mainland coastal, coastal and marine, and mainly marine); 3) mode of marine research (e.g. SCUBA/snorkel, boat, coastal and boat, coastal based, laboratory and submarine); and 4) whether the MRT organisation is small (SO) or a large organisation (LO). The frequency of those four indicators across the 85 MRT products is shown in Table 4-8.

Table 4-8: The occurrence of the 85 MRT products according to four contextual indicators (Source: Analysis of 85 web sites)

Region of operation	**No.**
Tropics	53
Temperate	30
Deep ocean	2

Type of marine tourism	**No.**
Coastal and marine	33
Mainly marine	22
Mainland coastal	24
Island based	6

Mode of marine research	**No.**
SCUBA/snorkel	37
Coastal based	22
Boat	19
Coastal and boat	4
Laboratory based	1
Submarine	2

Products operated by small or large organisations	**No.**
Small organisations (SO)	20
Large organisations (LO)	65

To further demonstrate the usefulness of these contextual indicators to describe MRT, Table 4-9 shows the relationships between the _region of operation‘ with _mode of research‘ and type of MRT operation. Not surprisingly, 33 of 37 (89%) of all SCUBA and/or snorkel based research occurs in the tropics (i.e. warmer water). Conversely, in temperate regions, SCUBA and/or snorkel based marine research (n=5 of 30, 17%) occurs less. This is likely to be influenced by colder temperate waters. As a likely way to overcome the influence of these cooler waters, 23 of 32 (72%) of the MRT marine research in temperate regions is either by boat (15 of 30, 50%) or coastal (8 of 30, 27%) based.

Table 4-9 also shows that across both tropics and temperate regions, SCUBA and/or snorkel activity usually occurs in a coastal and marine setting (22 of 33, 67%) and from an island (4 of 6, 67%). However, SCUBA and/or snorkel activity is less likely to occur in a mainly marine (e.g. liveaboards) setting (6 of 22, 27%) and a _mainland coastal‘ region (9 of 24, 25%). To partially explain this, Table 4-9 shows that half (13 of 22, 60%) of the mainly marine MRT products occur in colder temperate and/or deeper waters (i.e. often unsuitable for SCUBA or

snorkeling). From further observation of those 85 web sites, 9 of the 24 (37%) ‗mainland coastal' MRT products focus on turtles, and 5 of those 24 (21%) of those products occur of the coast of temperate regions (e.g. Scotland and South Africa).

Table 4-9: Region of operation by mode of marine research and type of MRT operation (Source: Analysis of 85 web sites)

	Mainland coastal	Coastal and marine	Island based	Mainly marine	Total
Tropical regions	**15**	**26**	**3**	**9**	**53**
Boat		1		3	4
Coastal and boat		3			3
Coastal based	12	1			13
SCUBA/snorkel	3	21	3	6	33
Temperate regions	**9**	**7**	**3**	**13**	**32**
Boat	1	3		11	15
Coastal and boat		1			1
Coastal based	5	1	2		8
Laboratory based		1			1
SCUBA/snorkel	3	1	1		5
Deep					
Submarine				2	2
Total	**24**	**33**	**6**	**22**	**85**

This study found that the maximum cost per day is approximately $USD2071 for 14 days (i.e. Deep Quest expedition to a deep sea hydrothermal vent). Minimum cost per day is $20 for 90 days (i.e. Volunteer for sea turtle conservation, ASVO, Cost Rica). Maximum days are 140 days at $126 per day (i.e. Habitat mapping at Frontier Expeditions, Tanzania). Minimum days are 2 days at $USD324 per day (i.e. Analysing grey whale data in Bath, England). The average cost is $USD204 and the average maximum duration is 34 days. After excluding the Deep Quest expedition, a correlation analysis reveals a moderate to strong Pearson (r) correlation of 0.56 between average cost per day and maximum duration. Broadly, this trend indicates that as the cost per day increases, and then the maximum duration of the product decreases.

Table 4-10 shows marine research and conservation focus and mode of MRT worldwide. While web site analysis has its acknowledged limitations (Section 3.7.8), this study reports that across all the 85 MRT products, there does appear to be committed involvement by a government marine research agency and/or trained marine scientists within the research tourism organisation; and marine research and/or monitoring activities by marine scientists. To further describe the marine research activity that occurs with MRT, Table 4-10 shows the ‗main marine research focus and ‗mode of marine research' across the sampled MRT products.

Table 4-10 also shows that SCUBA or snorkel based marine research is usually focused on coral reefs (e.g. tropical and temperate reefs and reef wildlife) (31 of 37 84%), and sometimes on sharks (3 of 27, 11%). Boat based marine research often focuses on cetaceans (14 of 19, 74%), great white sharks (2 of 19, 11%), and sea birds (2 of 9, 11%). Coastal based marine research is frequently focused on marine turtles (12 of 22, 54%), dolphins (3 of 22, 17%) and an assortment of other marine wildlife such as penguins (4%), sea birds (4%), whale sharks (4%) and mangroves (4%). From this sample, coastal and boat based marine research was focused on coral reefs (n=2) and cetaceans (n=2). Submarine based marine research is focused on the deep-ocean, undersea volcanoes, and ship wrecks.

Table 4-10: Main marine research focus and the mode of marine research across 85 MRT products worldwide (Source: Analysis of 85 web sites)

	Mode of marine research						
Main marine research focus	**Coastal based**	**Coastal and boat**	**SCUBA/ snorkel**	**Boat**	**Submarine**	**Laboratory based**	**Total**
Turtles (e.g. Green, olive ridley, hawksbill and flat back)	12						12
Dolphins (e.g. Spinner, tuxuci, bottlenose)	3	1		2			6
Sea birds (e.g. crested terns, shearwaters, boodies, gannets)	1			2			3
American crocodiles	1						1
Island marsupials (e.g. 'mala, mice, bandicoots')	1						1
Mangroves	1						1
Penguins	1						1
Sea Otters	1						1
Whale shark	1						1
Tropical coral reef and associated wildlife		2	27				29
Whales and dolphins		1	1	6			8
Sharks (e.g. Tiger, basking and hammerhead)			3				3
Temperate reef			2				2
Conch shells			1				1
Manatees, reefs			1				1
Manta rays			1				1
Prehistoric human artefacts			1				1
Whales (e.g. Blue, grey, humpback)				5		1	6
Great white shark				2			2
Open ocean (i.e. reefs and whales)				1			1
Turtles. manatees, dolphins, fish				1			1
Deep ocean and undersea volcano					1		1
Deep sea ship wreck					1		1
Total	**22**	**4**	**37**	**19**	**2**	**1**	**85**

To further illustrate the type of MRT marine research that that is possible, Table 4-11 lists some examples of MRT marine research activities found across the 85 MRT products. Examples of scientific methods and technology used to undertake this marine research activity are shown in Table 4-12. The technology that is used on MRT products can range from pen and paper and water sampling to elaborate technology such as computing, Global Positioning

Systems (GPS), Geographic Information Systems (GIS) and submarines. MRT tourists can be involved with a range of marine research activities as listed in Table 4-13. MRT tourists can be involved in less active MRT activities such as watching scientists and marine wildlife. They can also be involved in more active MRT activities such as turtle tagging, coral reef survey, and GIS. Other examples of the marine research activity and related MRT tourist's marine research activity are presented in Appendix 19.

Table 4-11: Examples of MRT marine research activities across the sampled 85 MRT products (Source: Analysis of 85 web sites)

MRT marine research activity
Quantify the size and structure of nesting populations. Monitor trends in the nesting environment. Quantify nesting turtle fecundity including clutch size, clutches per season, egg morphometrics. Protect nesting sites. Incidence of feral pig predation (CYTR, 2009).
Snorkel and observe, identify individual whales, be involved in behavioural observations, GPS satellite tagging, video, documentary making (Undersea, 2007)
Process digital images of whales and compare them to catalogues to identify individuals, catalogue sonar and video sequences, enter data into a database, and perhaps subject tissue samples to mechanical tests (Biosphere, 2010)
Observing dolphins from boat or beach, taking photographs for individual identification, recording dolphin-boat and dolphin-tourist interactions, and collecting bio-acoustic and environmental data (Earthwatch, 2009)
Systematically survey the reefs to document their health and what threats they are facing. Conduct a number of ecological field measurements while snorkelling: surveying hard corals and other reef animals and plants; survey transect (Earthwatch Institute, 2009)

Table 4-12: Examples of technology used in MRT (Source: Analysis of 85 web sites)

Examples of technology		
Turtle tags	Pen and paper	Whale vocalisation recordings
Shark tags	Recording sheets	GPS receivers and transmitters
Video	Weighing	Water sampling
Cameras	Banding	Satellite tagging
SCUBA diving	Slates	DNA samples and genetic analysis
Snorkelling	Small boats	SONAR and sea bed mapping
Nets	Large research vessels	Shark cages
Bio-acoustic devices	Water sampling	Traps
Geographic Information Systems (GIS)	Submarine	Tubes for feeding injured birds
Satellite and aerial photo images	Feral pig exclusion devices	Four wheel drive vehicles
Databases	Wildlife population models	Binoculars

Table 4-13: Examples of MRT tourists‘ marine research and conservation (Source: Analysis of 85 web sites)

MRT tourist research and/or conservation activity
Assist in various aspects of data collection.
Tagging and measuring turtles
Adventure diving, watching wildlife, and scientists
Help researchers survey coral reef health
Seabird (shearwater) monitoring and habitat monitoring
Surveying dolphins from beaches and boats
Survey reef fish, record marine mammals and turtles, and examine the effects of reef dynamiting. Mangrove biodiversity assessment. Mapping work, GIS
Internship (Under-graduate & Post-graduate University Students) or Youth. assisting with pod observations, sloughed skin collection, recording GIS spatial data, water quality sampling, environmental readings
Immersed in education about the great white shark and its research

Importantly, based on the web site review, all the sampled 85 MRT products appear to have a research focus on the ecological and/or conservation aspects of marine wildlife. Furthermore, this research was always intended to assist the conservation of that marine wildlife and their habitats. Examples of marine conservation projects across the 85 MRT products include; 1) coordinate dolphin conservation across a major city harbour, 2) provide research data to international wildlife databases, 3) map, protect, and raise awareness of an island‘s ecosystem, both on land and in the water, and 4) rehabilitate seabirds including penguins, pelicans and albatross. However, this study cannot reliably report that the effective conservation measures for marine wildlife and habitat does occur for all 85 MRT. This is because of limited information about this topic and perhaps unreliable claims by MRT operators about the marine conservation outcomes on their web sites. To suitably assess this topic it is recommended that field visits to at least twenty MRT products worldwide from different MRT companies occur.

4.5. Research step four - 25 key MRT criteria across 85 MRT products

The previous research steps described the manifestation of 10 key elements across 85 MRT products. The next section of this chapter presents key outcomes from the measurement and subsequent analysis of the relative level of 25 key MRT criteria across 85 MRT products. These 25 criteria are described in Table 3-17, Table 3-18 and Table 3-19. They were measured using a 1 to 5 scale (i.e. 1 is very low, 2 is low, 3 is moderate, 4 is high, 5 is very high) across the MRT product web sites (n=85). Table 4-14 and Table 4-15 show the descriptive statistics for those measured criteria. Each table shows the mean of rated values, maximum (max), minimum (min), and standard deviation (SD) for each MRT criteria. The full descriptive statistics (e.g. Average, range, standard error, and skewness) for each of 25 criteria are presented in Appendix 20.

These tables represent an empirically based benchmark source of knowledge to understand and further rate MRT product web sites according to the relative levels of 25MRT criteria. To demonstrate the meanings of these rating values, examples of the maximum and minimum ratings of these criteria are provided. For example, in terms of level of adventure challenge criteria, the rank assigned to cage diving with great white sharks (i.e. 4.5) than staying overnight in the beautifully appointed heritage guesthouse (i.e. rated 1.5).

Table 4-14: MRT criteria benchmark table - mean, maximum, minimum and standard deviation of 16 attraction related criteria across the 85 MRT products (Source: Analysis of 85 web sites)

MRT criteria	Mean	Max	Min	SD	Example of max.	Example of min.
Environmental remoteness (Orams, 1999)	3.5	5.0	1.0	1.1	Travel to Dirk Hartog island off the remote Western Australian coastline	University location in Bath, England
Locations level (Orams, 1999)	3.5	5.0	2.0	1.1	Sail the oceans in a well resourced marine research vessel	Rehabilitation and study seabirds on the coast near a major city
Experience level (Orams, 1999)	3.3	5.0	1.0	1.2	Track whales sharks and other sharks for nine days on a liveaboard vessel	Work closely with camp staff and participate in volleyball, football, backgammon, and chess
Level of active involvement in research	3.4	4.5	1.0	1.0	Regular SCUBA diving for ancient stone axes, whales, seals, and underwater caves	Watching great white sharks from shark cages and large boats
Activity level (Orams, 1999)	3.4	5.0	1.0	1.2	Live-aboard expedition to remote coral reefs	Live on a tropical island with regular snorkelling and beach walking
Volunteer mindedness	3.3	4.7	1.0	0.8	MRT volunteers at the Lizard Island Research Station or the Tethys Institute are highly volunteer minded	Unskilled MRT tourists on comfortable liveaboard vessels (e.g. Deep Quest and Undersea Explorer) often less actively involved in the marine research and are often vacation minded MRT tourists.
Level of adventure challenge	3.2	4.5	1.0	0.8	Cage diving with great white sharks	Stay overnight in the beautifully appointed heritage guesthouse with opportunity to monitor sea bird populations
Skill or qualifications offered on trip	2.9	4.6	1.0	1.1	A sailing MRT product in the Caribbean that offers PADI scuba diving, marine biology, sailing and seamanship skills, and credit for high school courses	A MRT cruise between Sydney and Hobart in Australia where scientists study Humpback whales, however no skills or qualifications are offered to the MRT tourist
Level of comfort for tourist	2.8	4.5	1.5	0.7	Stay in a 5 star dive resort surrounded by coconut palms.	Accommodation is basic, camping with pit toilets and cold showers. Beds will be a mat and sleeping bag.
Level of SCUBA diving	2.7	5.0	1.0	1.7	Adventure SCUBA diving to the outer Great Barrier Reef	Opportunity for recreational SCUBA diving after coastal survey activity, or no SCUBA diving activity at all
Level of hospitality for tourist	2.6	4.0	1.0	0.7	At the end of the day, tourists stay in hotels and enjoy the dining at a local Italian town	Live in tents, live off the land and use survival skills
Level of scientific tourism	2.6	4.5	1.0	1.1	Experience a marine research facility on a coral island at Cayos Conchinos, Honduras	Interacting with inexperienced marine volunteers while conducting a marine research project
Skill pre-requisite to participate	2.3	4.5	1.0	1.0	Research tourism volunteers need to have a degree in science before they can participate as Interns.	No skills are required. Just a willingness to help with sea bird research and conservation
Cultural focus	2.2	5.0	1.0	1.8	Camp, fish and protect turtles with Australian indigenous people	Monitor whales and dolphins in the day and then stay in conventional accommodation at night
Max duration (days)	204	180	1	42.8	Whale, coral reef, dugong and mangrove research in Madagascar for volunteer minded tourists	Two day family research tourism product at the Bahamas
Cost per day ($USD)	34	2100	10	156.1	Witness the beauty and mystery of deep sea geysers on a submersible in the Pacific Ocean	Volunteer at the Bunbury Dolphin Centre in Bunbury, Western Australia

Table 4-15: MRT criteria benchmark table - mean, maximum, minimum and variance of benefit or concern related criteria (n=9) across the 85 MRT products (Source: Analysis of 85 web sites)

MRT criteria	Mean	Max	Min	SD	Example of max.	Example of min.
Tourist supervision	4.5	5.0	3.7	0.3	Higher levels of tourist supervision are required when the research is potentially very dangerous (e.g. Great white shark) or the a relatively untrained tourist is required to undertake rigourous survey procedures for a supervising scientist	Skilled scientific tourists at a cetacean research institute require less supervision of their marine research than many other MRT tourists
Wildlife popularity	4.3	5.0	1.5	0.9	Whales, dolphins, turtles	Island marsupials like mala and boodies
Marine research quality	3.8	5.0	1.5	0.7	A research project that seeks to understand and integrate the many components of a coral cay ecosystem	Survey of sea birds by untrained volunteers. Mostly an educational exercise.
Marine research significance	3.8	4.9	2.0	0.6	Marine observation and research of the deep ocean or and a research project that is part of integrated research into the Great Barrier Reef	An adventure diving venture for discovery purposes but apparently with no formal marine research program
Level of educational tourism	3.6	4.7	1.2	0.6	The Dolphin and Whale Centre in South Africa provides MRT tourists with knowledge and research techniques to understand cetacean biology and conservation	Enjoy an adventure diving MRT venture with little or no formal education or interpretation on offer
Longer term conservation contribution	3.5	4.5	1.7	0.6	A whale and dolphin monitoring project that has been running for two decades	An adventure diving MRT venture on the Great Barrier with little or no stated conservation outcomes
Reliability of tourist's research	3.2	4.8	1.0	0.9	Trained scientists volunteer at the Lizard Island Research Station	On a liveaboard expedition, the MRT tourist watches the scientists in action but does not assist
Dependency on wildlife migration	2.6	5.0	1.0	1.5	Pay to actively support marine researchers at a marine research station	A marine wildlife, adventure, and scientific education experience
Close local association	2.4	5.0	1.0	1.9	Regular interaction with Fijian villagers, going to Sunday church, playing rugby, and cooking Fijian style.	Live and participate in marine research on an isolated coral atoll with no local community

Table 4-14 shows the tourist supervision criterion has a relatively high mean and small standard deviation (i.e. 4.5. 0.3). This indicates that the marine research activity of MRT tourists worldwide is usually well supervised by trained marine scientists. It should be noted that this does not imply that the MRT tourists‘ research is always reliable or significant but only that it appears to be well supervised according to the relevant web site. Table 4-15 also shows that the level of wildlife popularity is relatively high mean and low standard deviation (4.3, 0.9). This indicates that much of the marine research conducted on MRT ventures is typically focused on popular marine wildlife such as whales, dolphins, turtles and coral reefs. Table 4-15 also indicates that, on average, the marine research significance (3.8, 0.6) and marine research reliability criteria are consistently high (3.8, 0.7). Table 4-14 also shows that on, average, MRT products with a cultural focus (2.2, 1.8) are not a prevalent feature across all MRT products worldwide. Likewise, close association by the MRT tourist with the local community (2.4, 1.9) is not always essential for MRT.

The maximum, mean, and standard deviation for the skilled scientific tourism is 4.5, 2.6 and 1.1 respectively. Furthermore exploration (Figure 4.2) of the underlying data shows that 28 (i.e. 9 + 15 + 4) of 85 (33%) MRT products had a rated level of skilled scientific tourism as greater than 3.5. This indicates that about approximately a third (n=28) of the sampled MRT products appear to attract professional marine scientists or marine science students. This affirms the reports by other research tourism studies (Morse, 1997; Benson, 2005; Clifton & Benson, 2006) that skilled scientific scientists are a noteworthy market for research tourism.

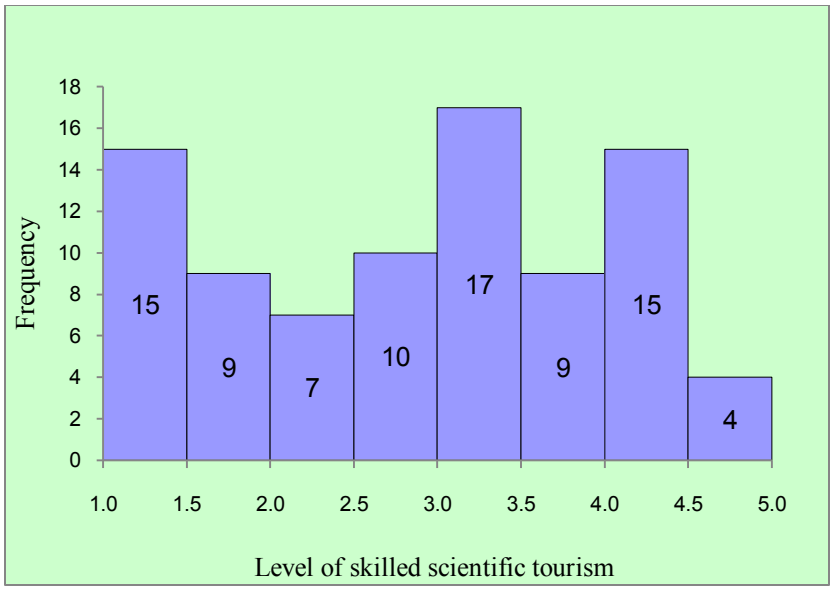


Figure 4.2: Frequency of skilled scientific tourism across 85 MRT product web sites (Source: Analysis of 85 MRT product web sites)

Table 4-15 also shows that the average level of educational tourism (3.5, 0.6), long term conservation (3.4) across the 85 MRT products is moderate to high. Similarly, Orams' (1991) four marine tourism criteria namely 1) environmental remoteness level (3.5, 1.1); 2) experience level (3.3, 1.2); 3) locations level (3.5, 1.1); and 4) activity level (3.4, 1.2) are moderately high. To assist with the subsequent analysis of these four marine tourism criteria in this chapter, Orams' (1999) spectrum of recreational marine opportunities is presented in Appendix 21.

4.5.1. Factor and correlation analysis of key MRT criteria

A combined factor and correlation analysis was undertaken on the collected 25 key MRT criteria. Results show six key factors and their associations and/or likely relationships across the sampled 85 MRT products (Table 4-18). To reflect their MRT related nature, these six factors were titled 1) locations (Orams, 1999); 2) research and conservation; 3) marine wildlife; 4)

cultural focus; 5) SCUBA diving; and 6) volunteer mindedness. Based on Table 4-18, a summary of those factors is provided in Table 4-17.

Table 4-17: Description of six key factors that underpin MRT product differences worldwide (Source: Analysis of 85 MRT product web sites worldwide)

Factor	Description
1. Locations (Orams, 1999)	Comprised of 1) Orams' (1999) four marine tourism criteria; 2) the cost per day; 3) the likely involvement of skilled scientific tourists; and 4) level of adventure challenge. Together, they have a strong influence (i.e. explained variance = 28.8%) in determining the character of MRT worldwide.
2. Research and conservation benefits	Comprised of higher levels of research significance, marine research reliability, educational tourism, longer term conservation contribution, and skill pre-requisite to participate. Explained variance is 16.9%.
3. Marine wildlife	Higher wildlife popularity and higher dependency on wildlife migration are related. Explained variance is 8.7%.
4. Cultural focus	Higher levels of cultural focus, close local association, and maximum duration of trip are related. Explained variance is 6.4%.
5. SCUBA diving	SCUBA diving and tropical regions are related. Explained variance is 5.3%
6. Volunteer mindedness	Comprised of 1) higher levels of active involvement in research; 2) volunteer mindedness; 3) Reliability of tourist's research; and 4) skill or qualifications; 5) lower levels comfort; and 6) lower levels of hospitality. Explained variance is 4.5%.

The level of tourist supervision criterion was found not to be significantly correlated with the other 25 criteria, and hence excluded from any of the derived factors. Additionally, while _marine wildlife' and _SCUBA diving' factors comprise just two criteria, they are included as key outcomes as they are clearly indicative of the nature of MRT.

Table 4-18: Factor and correlation analysis of 25 key MRT criteria across 85 MRT products (Source: Analysis of 85 web sites)

				Factor name	Location (Orams, 1999)							Research and					Marine		Cultural focus			SCUBA		Volunteer mindedness					
				Explained variance %	28.8							16.9					8.7		6.4			5.3		4.5					
Factor loading	MRT criteria type	Factor group	ID	MRT criteria ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
-0.56	Attraction	1	1	Level of scientific tourism																									
-0.64	Attraction	1	2	Level of adventure challenge	0.5*																								
-0.88	Attraction	1	3	Environmental remoteness level (Orams, 1999)	0.4*	0.6*																							
-0.85	Attraction	1	4	Experience level (Orams, 1999)	0.4*	0.4*	0.9*																						
-0.64	Attraction	1	5	Locations level (Orams, 1999)	0.4*	0.4*	0.8*	0.6*																					
-0.71	Attraction	1	6	Activity level (Orams, 1999)	0.4*	0.4*	0.7*	0.7*	0.8*																				
-0.46	Attraction	1	7	Cost per day ($USD)	0.3*	0.1	0.5*	0.6*	0.4*	0.5*																			
0.83	Benefit	2	8	Research significance	0.5*	0.3*	0.2	0.2	0.2	-0.1	0.1																		
0.81	Benefit	2	9	Marine research quality	0.5*	0.3*	0.2	0.2	0.2	0.1	0.1	0.9*																	
0.48	Benefit	2	10	Level of educational tourism	0.4*	0.2	-0.2	-0.1	-0.1	-0.1	-0.1	0.4*	0.4*																
0.81	Benefit	2	11	Longer term conservation contribution	0.4*	0.1	-0.2	-0.1	-0.2	-0.2	-0.1	0.6*	0.6*	0.5*															
0.44	Attraction	2	12	Skill pre-requisite to participate	0.6*	0.4*	0.1	0.2	0.2	0.1	-0.1	0.4*	0.4*	0.4*	0.4*														
-0.77	Attraction	3	13	Wildlife popularity	-0.1	-0.1	-0.1	-0.2	0.1	0.1	-0.1	0.3*	0.3*	0.2	0.2	-0.1													
-0.78	Concern	3	14	Dependency on wildlife migration	-0.1	0.1	0.3	0.2	0.3	0.3*	0.3*	0.2	0.2	-0.1	-0.1	0.1	0.5*												
0.85	Attraction	4	15	Cultural focus	-0.1	0.2	-0.2	-0.3*	-0.4*	-0.4*	-0.4*	0.2	0.2	0.3*	0.3*	-0.1	0.1	-0.1											
0.83	Benefit	4	16	Close local association	0.1	0.1	-0.3*	-0.4*	-0.3*	-0.4*	-0.5*	0.2	0.3	0.3*	0.3*	-0.1	0.1	-0.2	0.8*										
0.55	Attraction	4	17	Max duration (days)	-0.2	0.2	-0.4*	-0.5*	-0.3*	-0.5*	-0.6*	0.3*	0.3	0.3*	0.3	0.2	0.1	-0.3	0.5*	0.5*									
0.52	Attraction	5	18	Tropics -> temperate region	0.1	0.2	-0.2	-0.1	-0.3*	-0.2	-0.2	0.1	0.1	-0.1	0.3	0.3	-0.2	-0.4*	0.3*	0.2	0.1								
0.84	Attraction	5	19	Level of SCUBA diving	0.2	0.5*	0.3	0.1	0.3*	0.2	-0.2	0.2	0.1	0.1	0.1	0.5*	-0.2	-0.3*	0.2	0.1	0.4*	0.5*							
0.75	Attraction	6	20	Level of active involvement in research	-0.1	0.1	-0.4*	-0.4*	-0.5*	-0.5*	-0.5*	0.4*	0.4*	0.3*	0.4*	0.3*	0.2	-0.2	0.3*	0.3*	0.4*	0.3*	0.2						
-0.82	Attraction	6	21	Level of comfort for tourist	-0.2	-0.2	0.3*	0.3	0.6*	0.5*	0.5*	-0.2	-0.1	-0.3*	-0.2	-0.2	0.1	0.2	-0.6*	-0.5*	-0.4*	-0.2	-0.1	-0.6*					
-0.64	Attraction	6	22	Level of hospitality for tourist	0.2	0.1	0.4*	0.4*	0.6*	0.5*	0.6*	-0.1	-0.1	-0.3*	-0.2	-0.1	-0.1	0.3	-0.6*	-0.5*	-0.6*	-0.2	-0.1	-0.6*	0.8*				
0.74	Attraction	6	23	Volunteer mindedness	0.3*	0.1	-0.4*	-0.2	-0.5*	-0.5*	-0.4*	0.4*	0.4*	0.6*	0.6*	0.4*	0.1	-0.2	0.4*	0.5*	0.4*	0.1	0.1	0.8*	-0.7*	-0.6*			
0.78	Benefit	6	24	Reliability of tourist's research	0.2	0.2	-0.3*	-0.3*	-0.4*	-0.4*	-0.5*	0.5*	0.5*	0.5*	0.6*	0.5*	0.1	-0.1	0.4*	0.4*	0.4*	0.3*	0.3*	0.9*	-0.6*	-0.5*	0.8*		
0.43	Benefit	6	25	Skill or qualifications offered on trip	-0.1	0.2	-0.4*	-0.4*	-0.4*	-0.5*	-0.5*	0.3*	0.3*	0.4*	0.4*	0.3*	0.2	-0.2	0.5*	0.4*	0.5*	0.3*	0.3	0.7*	-0.4*	-0.5*	0.6*	0.7*	

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange.
Note 2: * shows a likely significant relationship ($p < 0.05$) between criteria
Note 3: Source for each MRT criteria is provided in Table 3-17, Table 3-18, and Table 3-19

4.5.2. Associations between MRT benefit criteria and other MRT criteria

It can be accepted that many key stakeholders (e.g. marine managers, conservationists, scientists and educators) are likely to seek increased research, conservation, and educational related benefits from a MRT product. Table 4-18 can be applied to demonstrate how those benefits may be increased by increasing or decreasing the levels of other MRT criteria. Table 4-20 shows all the benefit related MRT criteria and their key correlations with other relevant MRT criteria (Based on Table 4-18).

Table 4-20: All low, moderate and strong (e.g. orange, green and blue) correlations (i.e. r > 0.4 or r < -0.4) between benefit related MRT criteria (Based on Table 4-18)

ID	MRT criteria	Pearson correlations (r > 0.4 or r < -0.4) for various MRT criteria (e.g. ID and r value)	MRT criteria type
8	Research significance	Level of skilled scientific tourists (r = 0.4), longer term conservation (r = 0.58), Reliability of tourist's research (0.41)	Benefit
11	Longer term conservation contribution	Volunteer mindedness (r=0.54), reliability of tourist's research (0.51)	Benefit
10	Level of educational tourism	Longer term conservation (r=0.45), volunteer mindedness (r=0.55), reliability of tourist's research (r=0.42)	Benefit
24	Reliability of tourist's research	Cost per day (r=-0.41) , skill pre-requisite to participate (r=0.42), level of active involvement in the research (r=0.86), level of comfort for the tourist (-0.6) , level of hospitality (-0.49), volunteer mindedness (0.79), skills or qualifications offered (0.69)	Benefit
25	Skill or qualifications offered on trip	Activity level (Orams, 1999) (r=-0.44), cost per day (r=-0.44), cultural focus (r=.43), maximum duration (r=0.48), level of active involvement in research (r=0.69), level of hospitality (r=-0.43), volunteer mindedness (r=0.5), reliability of tourist's research 24 (0.69)	Benefit
23	Volunteer mindedness	Locations level (r=-0.41), activity level (r=-0.43), close local association with locals (0.4), level of active involvement in the research, (r=0.7), reliability of tourist‘s research (r=0.79), skills or qualification offered on the trip (r=0.5), level of comfort (r=-0.62), level of hospitality (r=-0.53),	Attraction
1	Level of skilled scientific tourists	Level of adventure challenge (r=0.4), skills required to participate (r=0.5),	Attraction
2	Level of adventure challenge	Environmental remoteness (Orams, 1999) (r=0.52), level of SCUBA diving (r=0.44)	Attraction
3	Environmental remoteness level (Orams, 1999)	Experience level (Orams, 1999), (r=0.8) locations levels (r=0.7), activity level (r=0.68), cost per day (r=0.42)	Attraction

Note: * p < 0.05 for all the shown correlations

Table 4-20 shows that research significance and quality can increase with the increased level of skilled scientific tourists. It also shows that the level of skilled scientific tourists can be increased by MRT products that have higher levels of adventure challenge. Increased adventure challenge can then be linked to increased enviromental remoteness (Orams, 1999) and the level of SCUBA diving. In turn, environmental remoteness is linked with increased tranquility and closeness to nature (Experience level), isolated coasts or oceans (Location level), off shore sailing (Activty level), and cost per day.

Similarly, Table 4-20 indicates that longer term conservation benefits are likely to be related to increased levels of volunteer mindedness and the reliability of the tourist‘s research. In turn, Table 4-20 shows that volunteer mindedness is often related to more coastal MRT products (i.e. decreased levels of locations (Orams, 1999) and activity (Orams, 1999) levels), higher levels of tourist involvement in the research, and lower levels of comfort and hospitality.

Table 4-20 also indicates that higher levels of educational outcomes from MRT are related to the higher levels of long term conservation benefits, volunteer mindedness , and reliability of tourist's research. In turn, higher levels of reliability of tourist‘s research is likley to be related to a lower cost per day, higher skills pre-requisites for the tourist, and higher levels of skills or qualification offered on the MRT trip.

To further illustrate the potential benefits of involving skilled scientific tourists in a MRT product, Table 4-21 shows that the MDBV value for marine research significance (13%); marine research reliability (11%); longer term conservation contribution (10%); and educational tourism (8%) are higher for those MRT products that attract more skilled scientific tourists. Furthermore Table 4-21, also reaffirms that skilled scientific tourists are likely to be attracted by locations level (29%), and cost per day (26%). Based on Table 4-21, the involvement of skilled scientific tourists in MRT in summarised in Table 4-22.

Table 4-21: The effect of the presence (or absence) of skilled scientific tourists on various MRT criteria (or vice-versa) (Source: Analysis of 85 web sites)

p value	Key MRT criteria	Unlikely to attract skilled scientific tourists	Likely to attract skilled scientific tourists	MDBV
0.001*	Locations level (Orams, 1999)	2.9	3.7	29%
0.000*	Skill pre-requisite to participate	1.8	2.7	26%
0.006	Cost per day ($USD)	144	239	25%
0.001*	Environmental remoteness (Orams, 1999)	2.9	3.8	21%
0.000*	Experience level (Orams, 1999)	2.9	3.8	21%
0.000*	Level of adventure challenge	2.8	3.4	19%
0.059	Level of SCUBA diving	2.2	2.9	18%
0.01	Activity level (Orams, 1999)	2.9	**3.6**	18%
0.002	Research significance	3.6	**3.9**	13%
0.006	Marine research reliability	3.6	**4**	11%
0.036	Longer term conservation contribution	3.4	**3.6**	10%
0.358	Cultural focus	2.4	2	10%
0.056	Volunteer and vacation mindedness	3.1	3.4	9%
0.096	Level of hospitality for tourist	2.4	2.7	9%
0.032	Level of educational tourism	3.4	**3.7**	8%

Note 1: For the p value column, * indicates a significant linear relationship between a MRT criteria and the presence of skilled scientific tourists
Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Table 4-22: Model about the involvement of skilled scientific tourists in MRT (based on Table 4-21)

MRT products that attract skilled scientific tourists	MRT criteria type
1. Occur in more offshore, isolated and/or uninhabited coastal areas	Attraction
2. More skill re-requisite to participate (often SCUBA diving related)	Attraction
3. Higher costs (e.g. 25%) per day	Contextual
4. Occur in higher quality environmental locations	Attraction
5. Offer more tranquil and close to nature MRT experiences	Attraction
6. Often involve higher levels of adventure challenge	Attraction
7. Often involve more SCUBA diving	Attraction
8. More likely to involve large sailing and liveaboard vessels	Attraction
9. Often result in higher research significance and quality	Benefit
10. Often lead to longer term conservation outcomes	Benefit
11. Often occur on more vacation minded MRT products	Attraction
12. Often involves higher levels of hospitality for the tourist	Attraction
13. More often associated with higher levels of educational tourism	Benefit

4.6. Research step five – Different MRT tourist types worldwide

The types of MRT tourists who participate in MRT are of central interest to this study. Research step five sampled the 85 different MRT products to identify who are the likely MRT tourist market segments. Results (Table 4-23) show a range of different MRT tourist types. All of the tourists were considered to be marine wildlife tourists, educational tourists, natural science enthusiasts, and ecotourists (with or without any sustainable community development criteria). Overall, 84 of 85 (99%) of the MRT tourists were adventure tourists. This exception is an Earthwatch Institute MRT product whereby MRT tourists spend most of their time analysing grey whale DNA and other data in a scientific laboratory in Bath, England.

Table 4-23: Type of MRT tourist segments across the 85 MRT products (Source: Analysis of 85 web sites)

Tourist segments	No.	% of 85 MRT products
Ecotourists	85	100%
Educational tourists	85	100%
Natural science enthusiasts	85	100%
Marine wildlife tourist	85	100%
Adventure tourists	84	99%
Pre-arranged accommodation	80	94%
Volunteer tourists	71	84%
Independent travellers	68	80%
Will involve skilled scientific tourists	51	60%
Backpackers	50	59%
SCUBA divers and snorkellers	46	54%
Gap year travellers	43	51%
Involves older travellers	43	51%
Cultural focus	25	29%
Package tour travellers	23	27%
Liveaboard marine tourists	20	24%
Involves families	18	21%
Snorkellers only	6	7%

In most cases (84%), MRT tourists were considered to be volunteers (Callanan & Thomas, 2005). Fifty nine percent were considered to be backpackers; sixty percent were likely to involve paying scientists and/or marine research students; and fifty one percent gap year travellers (Table 4-23). Eighty percent were independent travellers (i.e. Very little company arranged travel arrangements from source country) while twenty seven percent were considered to be package travellers (i.e. Travel arrangements from source country). Fifty four percent of MRT tourists were considered to be SCUBA divers. Fifty one percent were likely to involve older travellers, and twenty one percent of MRT products were considered to be attractive to families. Twenty nine percent of MRT tourists were likely to be involved in some form of cultural exchange with the local community. Twenty four percent of MRT tourists participated in liveaboard (i.e. one or more nights on a liveaboard boat at sea) and ninety four percent of MRT tourists appeared to have their accommodation pre-arranged for them by the MRT organisation (Table 4-23).

A combined factor and correlation analysis was undertaken on the collected MRT tourist type data. Results (Table 4-25) show three key factors and their correlations with other MRT tourist types across the sampled 85 MRT products. These three factors are termed volunteers and backpackers, skilled scientific tourists, and SCUBA divers /snorkellers. The SCUBA divers /snorkellers factor has just one criterion but is included as SCUBA diving and snorkelling are clearly important activities for MRT tourists. A brief description of those three factors and key correlations is presented in Table 4-24.

Table 4-24: Three key factors that underpin MRT market differences worldwide (Source: Analysis of 85 MRT product web sites worldwide)

Factor	Description	Explained variance
1. Volunteer tourists and backpackers	Comprised of presence of backpackers, volunteers, gap year travellers and tourists with cultural focus, and absence of families, older travellers and liveaboard travellers Together, they have a strong influence (i.e. explained variance = 33.7 %) in determining the MRT market segment difference worldwide.	33.7%
2. Skilled scientific tourists	Comprised of that the presence of skilled scientific tourists and independent travellers, and the absence of package tour travellers.	17.5%
3. SCUBA divers	The presence of SCUBA divers and snorkellers.	12.1%

4.6.1. Relationships between market segments and key MRT criteria

This study seeks to further understand the motivations of these different MRT tourist types and the benefits or concerns that they may bring to key supply-side stakeholders. Towards this, a correlation analysis was undertaken on the presence or absence of 11 types of MRT tourist (Table 4-23) and the relative levels (i.e. 1 to 5) of 25 types of MRT criteria (Table 4-14 and Table 4-15).

Table 4-25: Combined factor and correlation analysis of MRT tourist types across 85 MRT products (Source: Analysis of 85 web sites)

			Factor group	1							2			3
			Factor name	**Volunteers and backpackers**							**Skilled scientific tourists**			**SCUBA divers/ snorkel**
			Explained variance (%)	39.9							19.8			9.9
Factor loadings	**Factor group**	**ID**	**MRT criteria ID**	1	2	3	4	5	6	7	8	9	10	11
0.86	1	1	Backpackers											
0.75	1	2	Volunteers	0.6*										
0.77	1	3	Gap year travellers	0.7*	0.5*									
-0.61	1	4	Attracts families	-0.5*	-0.4*	-0.5*								
-0.78	1	5	Attracts older travellers	-0.7*	-0.5*	-0.7*	0.4*							
0.59	1	6	Cultural focus	0.5*	0.3*	0.5*	-0.2	-0.5*						
-0.77	1	7	Liveaboard travellers	-0.7*	-0.9*	-0.6*	0.3*	0.5*	-0.4*					
-0.81	2	8	Attracts skilled scientific tourists	-0.2	-0.3*	-0.4*	-0.2	0.3*	-0.2	0.4*				
0.95	2	9	Package tour travellers	0.2	0.3*	0.3*	0.3*	-0.3*	0.1	-0.4*	-0.7*			
-0.87	2	10	Independent travellers	-0.2	-0.3*	-0.4*	0.1	0.4*	-0.1	0.3*	0.7*	-0.9*		
0.91	3	11	SCUBA divers/snorkel	0.2	-0.1	0.1	-0.2	-0.1	0.1	-0.1	0.2	-0.1	-0.2	

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange.

Note 2: * shows a likely significant relationship ($p < 0.05$) between criteria

Note 3: Source for each MRT criteria is provided in Table 3-39.

Analysis of attraction related MRT criteria resulted in Table 4-26. Benefit/concern related MRT criteria resulted in Table 4-27. Table 4-26 indicates that, on average, backpackers (n=50) are usually (Pearson r=0.5) actively involved with the MRT marine research, usually (r=-0.6) associated with activities (Orams, 1999) such as swimming, snorkelling and fishing, are usually (r=-0.6) associated with near shore (Orams, 1999) locations, can (r=0.4) have a cultural focus, often (-0.4) pay less per day for their MRT experience, and have an extended MRT experience (r=0.4). Similar to backpackers, volunteer tourists (n=71) are usually (r=0.7) more actively involved with the MRT marine research, often (r=-0.6) have a more social experience (Orams, 1999), and are often found in environments (Orams, 1999) with more human structures and influences.

Gap year travellers appear to have similar attraction related traits to backpackers and volunteer tourists but are less accentuated (i.e. r value is lower for attraction MRT criteria). Family MRT tourists are usually (r=-0.6) associated with less active involvement in the marine research and more vacation mindedness. Older MRT travellers are typified by; higher levels of comfort, hospitality, vacation mindedness and cost per day, and less active involvement in the marine research, duration of experience, and cultural focus. In addition, the absence of pre-arranged accommodation (n=5) in MRT is only found in near urban areas (i.e. low environmental remoteness (Orams, 1999), higher social interaction with other (i.e. lower experience level (Orams, 2009) and where there is lower adventure challenge (Swarbrooke et al, 2003).

Table 4-26: Correlation (Pearson r) of 11 MRT tourist types with 16 attraction related MRT criteria (Source: Analysis of 85 web sites)

Factor group	1							2			3
Factor name	Backpacker and gap year travellers							Skilled scientific tourists			SCUBA divers
Explained variance (%)	33.7							17.4			12.1
Attraction MRT criteria	Attracts family	Gap year travellers	Volunt-eers	Back-packers	Attracts older travellers	Live-aboard	Cultural focus	Package MRT tourists	Attracts skilled scientists	Independ-ent travellers	SCUBA divers/ snorkel
Level of active involvement in research	-0.56 *	0.39 *	0.67 *	0.53 *	-0.4 *	-0.54 *	0.29 *	0.01	-0.11	-0.06	0.25 *
Skill pre-requisite to participate	-0.31 *	-0.07	0.05	0.08	0.01	-0.08	-0.04	-0.41 *	0.47 *	0.28 *	0.5 *
Level of skilled scientific tourism	-0.12	-0.33 *	-0.23 *	-0.14	0.19 *	0.3 *	-0.03	-0.53 *	0.7 *	0.49 *	0.14
Level of comfort for tourist	0.2	-0.25 *	-0.51 *	-0.5 *	0.39 *	0.47 *	-0.52 *	-0.15	0.09	-0.02	-0.16
Level of adventure challenge	-0.21	0.05	-0.23 *	0.14	-0.12	0.3 *	0.19	-0.36 *	0.37 *	0.2	0.35 *
Level of hospitality for tourist	0.26 *	-0.41 *	-0.43 *	-0.43 *	0.44 *	0.43 *	-0.51 *	-0.26 *	0.24	0.18	-0.11
Volunteer mindedness	-0.56 *	0.29 *	0.61 *	0.48 *	-0.4 *	-0.48 *	0.31 *	-0.11	0.18	0.1	0.12
Activity level (Orams, 1999)	0.2	-0.34 *	-0.59 *	-0.61 *	0.3 *	0.74 *	-0.36 *	-0.22 *	0.25 *	0.15	-0.07
Environmental remoteness level (Orams, 1999)	0.17	-0.37 *	-0.59 *	-0.45 *	0.34 *	0.72 *	-0.18	-0.33 *	0.35 *	0.24 *	0.03
Experience level (Orams, 1999)	0.12	-0.49 *	-0.52 *	-0.41 *	0.28 *	0.69 *	-0.28 *	-0.27 *	0.34 *	0.19	0.03
Locations level (Orams, 1999)	0.09	-0.29 *	-0.6 *	-0.56 *	0.33 *	0.7 *	-0.35 *	-0.36 *	0.4 *	0.18	0.06
Wildlife popularity	-0.03	0.17	-0.05	-0.08	0.04	0.06	0.08	-0.13	-0.06	0.07	-0.22 *
Level of SCUBA diving	-0.15	0.05	-0.14	0.05	-0.11	0.09	0.13	-0.13	0.23	-0.03	0.88 *
Cost per day ($USD)	0.2	-0.43 *	-0.5 *	-0.41 *	0.46 *	0.49 *	-0.36 *	-0.15	0.27 *	0.07	-0.12
Max duration (days)	-0.32 *	0.46 *	0.25 *	0.4 *	-0.41 *	-0.26 *	0.48 *	-0.01	-0.03	-0.11	0.25 *
Cultural focus	-0.14	0.43 *	0.29 *	0.44 *	-0.5 *	-0.36 *	1 *	0.07	-0.16	-0.06	0.08

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange.
Note 2: * shows a likely significant relationship ($p < 0.05$) between criteria

Table 4-26 also indicates that culturally focused MRT tourists are usually associated with lower levels of comfort and hospitality, costs per day, and longer MRT experiences. Liveaboard MRT tourists are usually associated with 1) less active involvement in the marine research and cultural focus, 2) more comfort, hospitality, vacation mindedness and cost per day, and 3) higher levels of Orams (1999) four marine tourism criteria (e.g. experience level). Furthermore, package MRT travellers appear to be often associated with MRT products that require less skill, attract less skilled scientific tourists, and are near urban areas, intertidal or near shore. Contrary to package MRT tourists, independent travellers are often associated with MRT products that attract more skilled scientific tourists. Perhaps not surprisingly, Table 4-26 indicates that SCUBA divers and snorkellers are moderately associated with MRT products that require more skill to participate (e.g. SCUBA training) and tropical regions where the warmer marine waters are usually more supportive of SCUBA diving and snorkelling.

Table 4-26 indicates that the presence of skilled scientific tourists (e.g. scientists) is usually associated with higher levels of pre-requisite skills, adventure challenge, and locations (Orams, 1999) that are isolated or uninhabited. This result is important as it indicates that MRT products with more adventure that travel to more remote marine locations will often attract paying scientists.

In terms of benefits or concerns to supply-side stakeholders, Table 4-27 indicates that higher levels of marine research significance is likely to be associated with the presence of skilled scientific tourists (r=0.4) and the absence of package MRT tourists (r=-0.5). Similarly, higher marine research reliability is likely to be associated with the absence of package MRT

tourists (r=-0.5). More reliable marine research by the MRT tourist is often associated with the 1) presence of volunteer tourists, gap year travellers, backpackers, and 2) the absence of with families, older travellers and lives aboard travellers. It is important to note that the reason why the reliability of marine research by families, older travellers and liveaboard travellers was rated as relatively low was not because they usually conduct low quality marine research but rather they appear to choose to a more vacation minded MRT product (Table 4-26) with less opportunities for active involvement in marine research.

Table 4-27 also indicates that skills or qualifications offered on a MRT product are usually well associated with the 1) presence of backpackers, volunteer tourists, gap year travellers, and 2) the absence of families, older travellers and liveaboard travellers. Notably, a MRT tourism product‘s longer term contribution to marine conservation appears to be well associated (r=-0.4) with MRT products that do not attract families. Possible reasons for this is that, family orientated MRT products are often associated with vacation minded (i.e. more comfortable and less volunteer minded) MRT products. Furthermore, vacation minded MRT products appear to be often associated with less quality marine research by the tourist, less education, and less skilled MRT tourists (Table 4-27).

Table 4-27: Correlation (Pearson) of 11 MRT tourist types with 8 benefit or concern related MRT criteria (Source: Analysis of 85 web sites)

Factor group	1							2			3
Factor name	Backpacker and gap year travellers							Skilled scientific tourists			SCUBA divers
Explained variance (%)	33.7							17.4			12.1
Attraction MRT criteria	Attracts family	Gap year travellers	Volunt-eers	Back-packers	Attracts older travellers	Live-aboard	Cultural focus	Package MRT tourists	Attracts skilled scientists	Independ-ent travellers	SCUBA divers/ snorkel
Research significance	-0.27 *	0.02	-0.04	0.1	-0.02	0.06	0.15	-0.47 *	0.39 *	0.27 *	0.13
Marine research quality	-0.25 *	0.09	-0.03	0.11	-0.07	0.05	0.16	-0.52 *	0.31 *	0.29 *	0.04
Longer term conservation contribution	-0.4 *	0.16	0.28 *	0.26 *	-0.11	-0.15	0.23 *	-0.31 *	0.23 *	0.15	0.05
Reliability of non-skilled tourist's research	-0.59 *	0.38 *	0.64 *	0.49 *	-0.39 *	-0.51 *	0.35 *	-0.06	0.03	-0.05	0.29 *
Skill or qualifications offered on trip	-0.52 *	0.64 *	0.51 *	0.55 *	-0.51 *	-0.5 *	0.43 *	0.03	-0.14	-0.23 *	0.25 *
Close local association	-0.2	0.39 *	0.33 *	0.37 *	-0.5 *	-0.35 *	0.71 *	-0.06	-0.05	0.06	-0.06
Dependency on wildlife migration	0.02	0.01	-0.14	-0.15	0.19	0.16	-0.09	-0.09	0.03	0.07	-0.32 *
Level of educational tourism	-0.22 *	0.19	0.21	0.14	-0.15	-0.14	0.26 *	-0.17	0.18 *	0.15	0.1

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange.
Note 2: * shows a likely significant relationship ($p < 0.05$) between criteria

When combined, these characteristics indicate that some MRT operator‘s are clearly focused on the ‗holiday‘ experience of the MRT tourist and less focused on the marine research, education and longer term conservation outcomes. Lastly, Table 4-27 indicates that MRT products that may attract older travellers and families are less likely to have close involvement by the MRT tourist with the local community. For older travellers this can be partly explained by their moderate correlation (r=0.5) with liveaboard travellers (Table 4-26) who spend most of their MRT experience in a mainly marine environment with consequent low interactions with local communities. Conversely, backpackers and gap year travellers appear to be well associated with close interactions with the local community.

4.7. Research step six - Contextual indicators, key MRT criteria and MRT tourist types

Based on the analysis of 85 MRT product web sites, the previous sections derived a knowledgebase about the variation of MRT products and tourists across the globe. The next section builds on knowledge by presenting and discussing key outcomes from the MDBV and MANOVA analysis of four contextual indicators and the main marine research focus of each MRT product.

Table 4-28: Analysis of MRT criteria, tourist type and region of MRT operation (Source: Analysis of 85 web sites)

	No.	**32**	**53**		
p value	**MRT criteria or MRT tourist type**	**Temperate**	**Tropics**	**%MDBV**	**Comment**
0.000*	Level of SCUBA diving	1.7	3.3	39%	More SCUBA diving occurs in the warmer tropic waters
0.008	Backpackers	2.6	3.8	29%	More backpacking MRT in the tropics
0.007	Cultural focus	1.5	2.6	27%	More cultural focus by MRT products in tropics
0.003*	Dependency on wildlife migration	3.2	2.2	25%	More dependency on wildlife migration in temperate waters (i.e. Less coral reefs and more cetaceans and great white sharks
0.031	Attracts older travellers	3.6	2.7	24%	Less old MRT travellers in the tropical regions. Quite possibly due to average higher levels of active involvement in marine research in tropic regions
0.068	Liveaboard travellers	2.4	1.7	17%	More liveaboard MRT in temperate regions. These products are often more vacation minded and focused on cetacean research
0.003*	Pre-arranged accom	1.6	1	16%	Occurs in where MRT products are near urban areas (i.e. low environmental remoteness (Orams, 1999) and where there is lower adventure challenge.
0.019	Level of active involvement in research	3.1	3.6	14%	More active involvement of MRT tourist in the marine research in the Tropics
0.047	Skill or qualifications offered on trip	2.6	3.1	13%	MRT in the tropics offer more skills training. Often associated with SCUBA diving.
0.02	Reliability of non-skilled tourist‘s research	2.9	3.4	13%	Higher quality research by tourist is aligned with higher activeness and skills of MRT tourist
0.055	Skill pre-requisite to participate	2.1	2.5	12%	More SCUBA activity in the tropics
0.288	Close local association	2.1	2.6	11%	More local interaction in the tropics. This is closely related to cultural focus of MRT products
0.228	Attracts family	2.1	1.7	11%	MRT products in the tropics appear to appeal less to family circumstances
0.333	Gap year travellers	2.8	3.2	11%	More MRT products that cater for gap year travellers in the tropics
0.04	Locations level (Orams, 1999)	3.8	3.2	10%	MRT products that occur in more offshore and isolated and/or uninhabited locations are more likely to occur in temperate regions

Note 1: For the p value column, * indicates a significant linear relationship between a MRT criteria and region of MRT operation
Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

4.7.1. Region of marine research tourism operation

Key associations between regions of MRT operation, key MRT criteria, and MRT tourist types are shown in Table 4-28 . This table shows that MRT products in tropical regions are closely aligned to SCUBA diving (MDBV = 39%), the presence of backpackers (29%), are more likely to have a cultural focus (27%), and often involve the MRT tourist more actively in the marine research (14%). Conversely, MRT products in temperate regions are more closely aligned with migrating marine wildlife (e.g. whales and great white sharks) (25%), attracting older travellers (24%), and liveaboard MRT products (17%). Based on Table 4-28, a model of the differences between temperate and tropical MRT products is presented in Table 4-29.

Table 4-29: Model of the differences between temperate and tropical MRT products (Based on Table 4-28)

Temperate MRT products (n=32)	**Tropical MRT products (n=53)**
1. Often depends more on seasonal migration of marine wildlife	1. Frequently more SCUBA diving and snorkelling activities
2. Attracts older travellers more often	2. Usually more backpackers and gap year travellers
3. Involves liveaboard MRT products more often	3. More MRT products with a cultural focus and closer interaction with the local community
4. Involves independent accommodation more often	4. Higher levels of MRT tourist involvement (not skilled MRT tourists) in the marine research
5. Will attracts families more often	5. Higher quality of MRT tourist's marine research
6. More likely to be located in offshore, isolated and/or uninhabited coastal areas	6. Often need higher skills to participate (such as reef survey and SCUBA skills)

4.7.2. Type of marine research tourism operation

The associations between type of MRT operation (e.g. mainly marine) and Orams' (1999) four marine tourism criteria are shown in Table 4-30. This table shows that type of marine MRT operation is closely associated (perhaps not surprisingly) with Orams' (1999) Spectrum of Marine

Recreation Opportunities. This indicates that Factor 1 (i.e. Location of the MRT product) shown in Table 4-18 is a primary driver behind the type of MRT operation. Consequently, Factor 1 related relationships shown in Table 4-18 are likely to affect the type of MRT operation and associated characteristics (i.e. MRT criteria). This is re-affirmed by results shown in Table 4-31 whereby ‗mainly marine' MRT product are associated with 1) high levels of liveaboard travellers, older travellers, families, cost per day, and dependency on wildlife migrations (often cetaceans), and 2) lower levels of backpackers, volunteer tourists and cultural focus.

Table 4-30: Orams' (1999) marine tourism model and type of MRT operation (Source: Analysis of 85 web sites)

	No.	24	33	6	22	
p value	**MRT tourist type or criteria**	**Mainland coastal**	**Coastal and marine**	**Island based**	**Mainly marine**	**MDBV**
0.000*	Locations level (Orams, 1999)	2.4	3.3	3.5	4.6	75%
0.000*	Activity level (Orams, 1999)	2.3	3.4	2.7	4.5	56%
0.000*	Environmental remoteness (Orams, 1999)	3.0	3.1	3.8	4.5	37%
0.000*	Experience level (Orams, 1999)	3.0	3.1	3.7	4.5	36%

Note 1: For the p value column, * indicates a significant linear relationship between a MRT criteria and type of MRT operation
Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Other findings include that low levels of SCUBA diving (1.9) and cost per day ($USD 155) are associated with mainland coastal MRT operations. Interesting results are that high levels of independent travel (4.8 and 4.7) are associated with mainly marine and mainland coastal and MRT products. The former could be explained as mainly independent liveaboard travellers, and the latter could be explained as independent gap year travellers. Other important results include that coastal and marine MRT products are associated with higher numbers of gap year travellers (3.9) and lower numbers of families (1.5).

Table 4-31: MRT tourist types and type of MRT operation (Source: Analysis of 85 web sites)

	No.	24	33	6	22	
p value	**MRT tourist type or criteria**	**Mainland coastal**	**Coastal and marine**	**Island based**	**Mainly marine**	**MDBV**
0.000*	Liveaboard travellers	1.0	1.4	1.0	**4.1**	77%
0.000*	Backpackers	4.2	3.7	4.3	**1.7**	65%
0.000*	Volunteer tourists	5.0	4.9	5.0	**2.6**	59%
0.003*	Gap year travellers	2.8	**3.9**	3.0	**1.9**	50%
0.007	Attracts older travellers	3.2	2.2	3.0	**4.1**	47%
0.024	Attracts skilled scientific tourists	3.0	2.9	3.7	**4.5**	38%
0.035	Temperate -> Tropics	3.5	**4.2**	3.0	**2.6**	38%
0.022	Cultural focus	2.3	2.7	2.3	**1.2**	38%
0.004*	Cost per day ($USD)	**152**	170	266	**295**	36%
0.014	Level of SCUBA diving	**1.9**	3.3	3.1	2.4	35%
0.038	Package tour travellers	2.2	2.6	2.3	**1.2**	35%
0.000*	Level of active involvement in research	3.7	3.7	3.7	**2.5**	33%
0.001*	Skill or qualifications offered on trip	3.0	3.4	3.0	**2.2**	32%
0.019	Dependency on wildlife migration	2.6	2.1	2.3	**3.4**	32%
0.008	Independent travellers	**4.7**	3.5	3.7	**4.8**	32%
0.344	Attracts family	2.0	**1.5**	1.7	2.3	20%

Note 1: For the p value column, * indicates a significant linear relationship between a MRT criteria and type of MRT operation

Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

4.7.3. Mode of marine research

Likely associations between mode of marine research and Orams‘ (1999) four marine tourism criteria are shown Table 4-32. This table shows that mode of marine research is also closely associated with Orams‘ (1999) Spectrum of Marine Recreation Opportunities. Consequently, like _type of MRT operation‘, the overall relationships associated with Factor 1 of Table 4-32 are quite likely to affect the mode and characteristics of marine research. A notable feature of Table 4-32 is that Orams‘ (1999) four marine tourism criteria for coastal based (n=21) modes are substantially higher (i.e. 0.2 or higher) than _coastal and boat‘ (n=4) modes. Such a

result may initially seem counter-intuitive, but the four ‗coastal and boat' mode MRT products occur in nearshore and/or near urban environments, and often use small boats to assist with their marine research.

Table 4-32: Orams' (1999) marine tourism model and mode of marine research (Source: Analysis of 85 web sites)

		Mode of marine research				
	No.	21	4	38	19	
p value	**MRT tourist type or criteria**	**Coastal based**	**Coastal and boat**	**SCUBA/ snorkel**	**Boat**	**MDBV**
0.000*	Locations level (Orams, 1999)	2.4	2.0	3.7	4.2	54%
0.002*	Activity level (Orams, 1999)	2.7	2.5	3.3	4.0	38%
0.003*	Environmental remoteness (Orams, 1999)	3.1	2.5	3.5	3.9	35%
0.276	Experience level (Orams, 1999)	3.2	3.0	3.4	3.9	24%

Note 1: For the p value column, * indicates a significant linear relationship between a MRT criteria and mode of marine research

4.7.4. The role of volunteer minded tourists and skilled scientific tourist in MRT

Table 4-33 indicates that stakeholder benefits like higher levels of marine research reliability, conservation and education are often associated with 1) backpackers and volunteer tourists who have useful skills (e.g. SCUBA and scientific survey) training; and 2) the presence of higher skilled scientific tourists. To explore this, important associations between mode of marine research and these stakeholder benefits are shown in Table 4-33. This indicates that backpacker and volunteer minded tourists and hence increased stakeholder benefits via volunteer minded tourism is relatively less likely (i.e. 1.8 and 3.9) to occur via boat (e.g. liveaboards) based marine research. Table 4-33 also indicates that skilled scientific tourism and hence increased stakeholder benefits are more likely to occur via boat (e.g. liveaboards) based marine

research and SCUBA diving and less likely to occur via coastal and boat (i.e. near shore and urban area) based marine research. Collectively, these results suggests that MRT products that involve backpackers, volunteer minded tourists, and skilled scientific tourists in SCUBA diving or boat marine research may be an optimum arrangement for increased stakeholder benefits.

Table 4-33: MRT criteria, tourist type and mode of marine research (Source: Analysis of 85 web sites)

		Mode of marine research				
	No.	21	4	38	19	
p value	**MRT tourist type or criteria**	**Coastal based**	**Coastal and boat**	**SCUBA/ snorkel**	**Boat**	**MDBV**
0.001*	Backpackers	4.0	4.0	3.7	**1.8**	55%
0.003*	Volunteer minded tourists	5.0	5.0	4.3	**3.9**	26%
0.196	Gap year travellers	**2.7**	**4.0**	3.4	**2.5**	38%
0.237	Marine research quality	3.6	**3.5**	3.8	3.9	15%
0.202	Level of educational tourism	3.5	**3.2**	3.6	**3.8**	19%
0.003*	Liveaboard travellers	1.4	1.0	1.7	**2.9**	47%
0.034	Level of skilled scientific tourism	2.4	**1.4**	2.7	2.8	42%
0.308	Skill or qualifications offered on trip	2.8	2.7	3.2	**2.6**	19%
0.006	Reliability of non -skilled tourist's research	3.2	3.1	3.4	3.0	12%
0.446	Research significance	3.6	3.7	3.8	3.9	8%
0.684	Longer term conservation contribution	3.6	3.6	3.5	3.6	6%

Note 1: For the p value column, * indicates a likely linear relationship between a MRT criteria and mode of marine research
Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

4.7.5. Main marine research focus, MRT criteria, and MRT tourist types

This section reports on findings that indicate likely relationships between 1) the marine research focus of different MRT products; and 2) the various MRT criteria or tourist types that underlie those products. Key findings are reported in Table 4-34. The full data that underlies this table is included as Appendix 22. As an example, Table 4-34 shows that shark related MRT

products are often associated with independent and older travellers aboard liveaboard vessels in more offshore and pristine locations. Also, whale and dolphin focused MRT products are less likely to involve SCUBA diving but are more likely to 1) offer skills or qualifications; 2) generate more reliable marine research; and 3) higher educational outcomes.

Table 4-34 also suggests that that more reliable marine research is often associated with turtle, whale and dolphin focused MRT products. Furthermore, Table 4-34 indicates that older travellers are more attracted to MRT product with sharks and sea birds. Conversely, the data suggests that older travellers are less attracted to MRT products that focus on coral reefs and turtles. This may be because, as shown in Table 4-34, coral reefs and turtle MRT involves the tourist more actively in the marine research, and have, on average, less levels of comfort for the MRT tourist. Overall, these results indicate that Table 4-34 can be used to identify 1) the existing main markets for different MRT marine research projects and; 2) possible opportunities to increase the presence of other markets in certain MRT products. For example, how can the older travellers market be increased for turtle and coral focused MRT products? Also, how can the backpacker market segment be increased for shark and sea bird focused MRT products?

Table 4-34: Significantly prevalent main research topics for different MRT criteria and tourist type criteria (Source: Analysis of 85 web sites)

No.	3	33	13	8	7	6	3	2
MRT criteria and tourist types	Sharks	Coral reefs	Turtles	Whales and dolphins	Whales	Dolphins	Sea birds	Great white shark
Independent travellers	✓		✓					
Involves liveaboard travellers	✓		×			×		
Attracts older travellers	✓	×	×				✓	
Attracts skilled scientific tourists	✓							
Regularly involves volunteer tourists	×		✓			✓		
Regularly involves backpackers	×						×	
Regularly involves gap year travellers	×						×	
Attracts package tour travellers	×							
Can attracts families								×
More SCUBA diving	✓	✓		×		×	×	×
Occurs in more offshore, isolated and/or uninhabited coastal areas	✓							
Likely to occur in tropical regions	✓	✓	✓					
Likely to occur in temperate regions							✓	✓
Likely to involve large sailing and liveaboard vessels	✓							
Likely to offer more tranquil and close to nature MRT experiences	✓							
Likely to occur in more pristine environmental locations	✓							
Can have a cultural focus	×				×	×	×	×
Close local association	×						×	×
Higher active involvement by the tourist in the marine research		✓	✓					
Skills or qualifications offered on trip		✓		✓				
Higher maximum duration (days)		✓						
More wildlife popularity			✓	✓	✓	✓		
Higher marine research reliability				✓				
Higher levels of educational tourism				✓				
Higher levels of adventure challenge								✓
Higher dependency on wildlife migration								✓

4.7.6. Type of marine research tourism organisation (LO or SO)

The frequency of type of MRT organisations (i.e. LO or SO) by region of operation, type of operation, mode of marine research worldwide are shown in Table 4-35. When compared to SO organisations, LO organisations are more likely to have more mainland coast (% MDBV = 11%), coastal and marine (18%), and island based (9%) products. In contrast SO organisations are more likely to operate _mainly marine' (38%) MRT products and undertake boat based marine research (17%) (Table 4-35).

Table 4-35: Frequency of type of MRT organisations (i.e. LO or SO) by region of operation, type of operation, mode of marine research (Source: Analysis of 85 MRT product web sites)

No. of products	65	20	% of 65	% of 20	85
Key contextual indicators	**LO**	**SO**	**% LO**	**% SO**	**% MDBV**
Region of operation					
Temperate	24	8	37%	40%	3%
Tropics	41	12	63%	60%	-3%
Type or operation					
Coastal and marine	28	5	43%	25%	-18%
Island based	6		9%	0%	-9%
Mainland coastal	20	4	31%	20%	-11%
Mainly marine	11	11	17%	55%	38%
Mode of marine research					
Boat	12	7	18%	35%	17%
Coastal and boat	4		6%	0%	-6%
Coastal based	17	4	26%	20%	-6%
Laboratory based	1		2%	0%	[2%
SCUBA/snorkel	29	9	45%	45%	0%
Submarine	2		3%	0%	[3%

Note: red are relatively low values, yellow is moderate, and blue is relatively high

The frequency type of MRT organisations (i.e. LO or SO) by marine research focus is shown in Table 4-36. This shows that SO organisations are more likely to conduct marine research that focuses on whales (8%), sea birds (8%), sharks (8%) and dolphins (5%). By contrast, LO organisations are more likely to conduct turtle (7%) and coral reef (5%) focused marine research (Table 4-36). They also conduct marine research on a variety of topics such as conch shells, crocodiles, volcanoes, mangroves and sea otters.

Table 4-36: Frequency of type of MRT organisations (i.e. LO or SO) by marine research focus (Source: Analysis of 85 MRT product web sites)

No.	65	20	% of 65	% of 20	85
Marine research focus	**LO**	**SO**	**% LO**	**% SO**	**% MDBV**
Whales	4	3	6%	15%	9%
Sea birds	1	2	2%	10%	8%
Sharks	1	2	2%	10%	8%
Turtles	11	2	17%	10%	-7%
Whales and dolphins	7	1	11%	5%	6%
Coral reef	26	7	40%	35%	-5%
Dolphins	4	2	6%	10%	4%
Great white shark	1	1	2%	5%	3%
American crocodiles	1		2%	0%	-2%
Conch shells	1		2%	0%	-2%
Deep ocean & undersea volcano	1		2%	0%	-2%
Deep sea ship wreck	1		2%	0%	-2%
Island marsupials	1		2%	0%	-2%
Mangroves	1		2%	0%	-2%
Open ocean (e.g. reef and cetaceans)	1		2%	0%	-2%
Penguins	1		2%	0%	-2%
Sea Otters	1		2%	0%	-2%
Whale shark	1		2%	0%	-2%

Note: red are relatively low values, yellow is moderate, and blue is relatively high

Associations between type of MRT organisation (i.e. LO or SO), key MRT criteria, and MRT market segments are shown in Table 4-37, Table 4-38, Table 4-39. Table 4-37 shows a likely strong relationship between Orams' (1999) four marine tourism criteria and type of MRT

organisation. For example, when compared with LO MRT products, SO MRT products are more associated with offshore powerboat and/or sailing vessels that operate in isolated, uninhabited and/or pristine locations, and offer more tranquil and close to nature experiences.

Table 4-37: Orams' (1999) MRT criteria and type of MRT organisation (Source: Analysis of 85 web sites)

	No.	20	65	
p value	**MRT tourist type or criteria**	**SO**	**LO**	**%MDBV**
0.000*	Activity level (Orams, 1999)	4.26	3.05	30%
0.007	Locations level (Orams, 1999)	4.05	3.23	21%
0.017	Environmental remoteness (Orams, 1999)	4.00	3.32	17%
0.014	Experience level (Orams, 1999)	4.00	3.32	17%

Note 1: For the p value column, *indicates a significant linear relationship between a MRT criteria and type of MRT organisation
Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Table 4-38: Key MRT criteria and type of MRT organisation (Source: Analysis of 85 web sites)

	No.	20	65	
p value	**Key MRT criteria**	**SO**	**LO**	**%MDBV**
0.008	Cultural focus	1.21	2.45	31%
0.000*	Skill or qualifications offered on trip	2.15	3.17	28%
0.001*	Level of active involvement in research	2.76	3.56	23%
0.001*	Reliability of non -skilled tourist's research	2.63	3.40	20%
0.049	Cost per day ($USD)	266	186	20%
0.144	Close local association	1.84	2.58	18%
0.124	Level of skilled scientific tourism	2.97	2.52	13%
0.022	Volunteer mindedness	2.96	3.43	13%
0.070	Level of comfort for tourist	3.06	2.71	12%
0.324	Max duration (days)	26	37	6%

Note 1: For the p value column, * indicates a significant linear relationship between a MRT criteria and type of MRT organisation
Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Table 4-39: MRT market segment and type of MRT organisation (Source: Analysis of 85 web sites)

	No.	20	65	
p value	**MRT market segment**	**SO**	**LO**	**%MDBV**
0.000*	Backpackers	1.63	3.85	55%
0.000*	Liveaboard travellers	3.53	1.48	51%
0.000*	Volunteer tourists	2.89	4.76	47%
0.000*	Gap year travellers	1.63	3.42	45%
0.005*	Attracts older travellers	4.16	2.70	37%
0.067	Package tour travellers	1.42	2.27	21%
0.059	Attracts family	2.47	1.67	20%
0.070	Independent travellers	4.79	4.03	19%

Note 1: For the p value column, * indicates a significant linear relationship between a market segment and type of MRT organisation
Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of a market segment

Based on these tables, a model (Table 4-40) can be developed that shows the key differences between LO and SO MRT products. This model represents a guide to identifying MRT characteristics in LO and SO MRT products worldwide.

Table 4-40: Model of the differences between LO and SO MRT products (Based on Table 4-37 and Table 4-38.

Products from large organisations (LO) (n=65)	**Products from small organisations (SO) (n=20)**
Are more often coastal or island based	More likely to involve mainly marine MRT with large sailing and liveaboard vessels
Far more backpacker, volunteer, gap year and cultural focused MRT products	Attracts older travellers and families more often
More likely to offer skill training and qualifications	Occur in more offshore, isolated and/or uninhabited coastal areas
More active involvement in research by the tourist	Higher cost (i.e. by 80$USD more) per day and less duration (i.e. 11 days)
More package MRT tourism products	More likely to involve independent travellers
Higher quality of tourist's marine research	Offer more tranquil and close to nature MRT experiences
More interactions with local communities	Occur in higher quality environmental locations
More volunteer minded MRT products	Attracts skilled scientific tourists more often
Are often less comfortable MRT products	Focus more frequently on whale, dolphin and shark reef marine research
Focus more frequently on turtle and coral reef marine research	More vacation minded MRT products

4.8. Research step seven – Key characteristics of Australian marine research tourism

The data collected from research step's four, five and six included all known occurrences of MRT companies (n=19) and products (n=30) in Australia. There may be other Australian based MRT companies and products but the researcher was unaware of them when data collection was finalised (i.e. February, 2010). Table 4-41 summarises those 19 Australian MRT organisations and 30 MRT products. A map of the distribution of these products is shown in Figure 4.3. This table also includes two Undersea Explorer products (i.e. product IDs 29 and 30) that stopped operating in February 2009 but are still included as they add to this study of the conceptual nature of MRT. The overall distribution of MRT products by state of operations is QLD (n= 13), WA (n=7), VIC (n=3), NSW (n=3), NT (n=2), TAS (n=1), and SA (n=1). Seventeen of the nineteen operators were private operators (either commercial or not for profit). The two government owned and operated products are Landscope Expeditions in Western Australia, and the Lizard Island Research Station in northern Queensland.

Table 4-41: MRT organisations and products in Australia (n= 30) - State of operation, cost, duration (Source: Analysis of 85 web sites)

ID	Organisation name	State of operation	Cost per day ($USD)	Max duration (days)
1	Biosphere Expeditions - near Broome	WA	227	7
2	Bunbury Dolphin Discovery Centre	WA	N/A	180
3	Cape York Turtle Rescue - Mapoon	QLD	312	6
4	Conservation Volunteers Australia - Broome	WA	175	8
5	Conservation Volunteers Australia - Coburg Peninsula	NT	90	15
6	Conservation Volunteers Australia - Coburg Peninsula, Turtles	NT	150	5
7	Conservation Volunteers Australia - Montague Island Nature Reserve	NSW	223	3
8	Dolphin Research Institute, Phillip Island	VIC	N/A	100
9	Eye to Eye Encounters. Great Barrier Reef	QLD	400	14
10	Kalinda, Great Barrier Reef Discovery	QLD	320	14
11	Lakes Explorer - Explore the Gippsland Lakes	VIC	20	1
12	Landscope Expeditions - Wildlife of the Montebello Islands	WA	550	7
13	Landscope Expeditions - Loggerhead Turtles of Dirk Hartog Island	WA	457	7
14	Lizard Island, Volunteer at a Marine Research Station	QLD	N/A	14
15	Marine Wildlife Adventure - Tasmania's Soela Sea Mount	TAS	500	10
16	Marine Wildlife adventures - Coral Sea	QLD	500	9
17	Marine Wildlife Adventures - Kimberly Adventures	WA	500	10
18	Marine Wildlife Adventures - Whales Cruises	NSW	500	5
19	Ningaloo Turtles	WA	33	35
20	Pelican Expeditions, Blue Whale Research, Australia	VIC	N/A	40
21	Rodney Fox, Great White Shark Expeditions	SA	499	6
22	Royal Geographical Society of Queensland	QLD	50	13
23	Tevene'i Marine - Coral Reef Ecology Education Programs, Australia	QLD	380	7
24	Tevene'i Marine - Eco Expeditions on the Great Barrier Reef	QLD	62	20
25	The Earthwatch Institute - Lady Elliot Island, Great Barrier Reef	QLD	328	7
26	The Earthwatch Institute - Moreton Bay	QLD	170	1
27	The Earthwatch Institute - Sydney Harbour	NSW	150	1
28	The Oceania Project - Whale Research Expeditions	QLD	270	5
29	Undersea Explorer - Far Northern Expedition, Australia	QLD	333	9
30	Undersea Explorer - Osprey Reef Shark Encounter, Australia	QLD	350	6

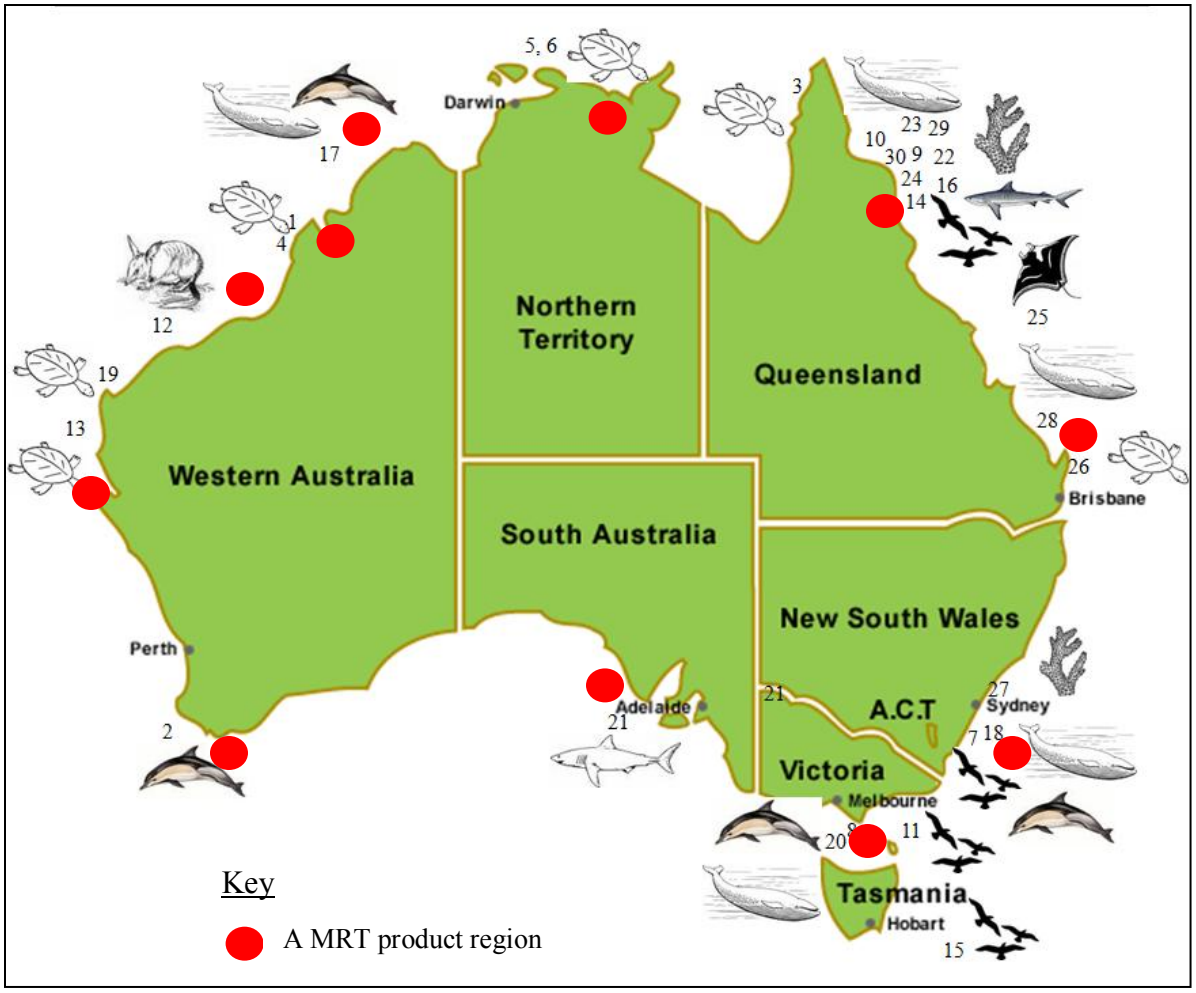


Figure 4.3: Map of MRT products across Australia. (Source: Analysis of 85 web sites)
Note: the numbers correspond to the ID number in Table 4-41.

Sixteen (80%) of the twenty MRT organisations that operate in Australia were classified as SO organisations (Table 4-42). Hence, MRT in Australian is clearly characterised by smaller MRT organisations (SO). These organisations operate 10 (33%) of the 30 identified MRT products in Australia. The 4 LO organisations that operate in Australia are the Earthwatch Institute, Conservation Volunteers Australia, Landscope Expeditions, and Biosphere Expeditions (Table 4-43).

Table 4-42: Smaller MRT organisations (SO) (n=20) and their MRT products in Australia (Source: the Internet up to April, 2010)

ID	Organisation and product	State	Marine research focus	Region
1	Eye to Eye Encounters - Great Barrier Reef, Australia	QLD	Coral reef	Tropics
2	Marine Wildlife Adventures - Coral Sea, Australia	QLD	Coral reef	Tropics
3	Kalinda - Great Barrier Reef Discovery, Australia	QLD	Coral reef	Tropics
4	Tevene'i Marine - Eco Expeditions on the Great Barrier Reef, Australia	QLD	Coral reef	Tropics
5	Lizard Island Research Station - Volunteer at a Marine Research Station	QLD	Coral reef	Tropics
6	The Royal Geographical Society of Queensland - Australia	QLD	Coral reef	Tropics
7	Tevene'i Marine - Coral Reef Ecology Education Programs, Australia	QLD	Coral reef	Tropics
8	The Dolphin Research Institute - Phillip Island, Australia	VIC	Dolphins	Temperate
9	Bunbury Dolphin Discovery Centre - Western Australia	WA	Dolphins	Temperate
10	Rodney Fox Expeditions - Great White Shark Expeditions, Australia	SA	Great white shark	Temperate
11	Marine Wildlife Adventures - Tasmania's Soela Sea Mount	TAS	Sea birds	Temperate
12	The Lakes Explorer - Explore the Gippsland Lakes, Australia	VIC	Sea birds	Temperate
13	The Undersea Explorer - Osprey Reef Shark Encounter, Australia	QLD	Sharks	Tropics
14	The Undersea Explorer - Far Northern Expedition, Australia	QLD	Sharks	Tropics
15	Cape York Turtle Rescue - Mapoon, Australia	QLD	Turtles	Tropics
16	Ningaloo Turtles - Western Australia	WA	Turtles	Tropics
17	The Oceania Project - Whale Research Expeditions, Australia	QLD	Whales	Temperate
18	Pelican Expeditions - Blue Whale Research, Australia	VIC, NSW and QLD	Whales and coral reefs	Temperate
19	Marine Wildlife Adventures - Whales Cruises, Australia	TAS	Whales	Temperate
20	Marine Wildlife Adventures - Kimberly Adventures	WA	Whales and dolphins	Tropics

Table 4-43: Larger and/or international MRT organisations (LO) and their MRT products in Australia (Source: the Internet up to April, 2010)

ID	Organisation and product	State	Marine wildlife focus	Region
1	Biosphere Expeditions - near Broome, Australia	WA	Turtles	Tropics
2	Conservation Volunteers Australia - Broome, Australia	WA	Turtles	Tropics
3	Conservation Volunteers Australia - Coburg Peninsula, Australia	NT	Turtles	Tropics
4	Conservation Volunteers Australia - Coburg Peninsula, Turtles, Australia	NT	Turtles	Tropics
5	Conservation Volunteers Australia - Montague Island Nature Reserve, Australia	NSW	Sea birds	Temperate
6	Landscope Expeditions - Loggerhead Turtles of Dirk Hartog Island, Australia	WA	Turtles	Temperate
7	Landscope Expeditions - Wildlife of the Montebello Islands, Australia	WA	Offshore island marsupials	Tropics
8	The Earthwatch Institute - Lady Elliot Island, Great Barrier Reef, Australia	QLD	Off shore island and Manta Rays	Temperate
9	The Earthwatch Institute - Moreton Bay, Australia	QLD	Turtles	Temperate
10	The Earthwatch Institute - Sydney Harbour, Australia	NSW	Temperate reef in Sydney harbour	Temperate

This study found that 15 (93%) of the 16 identified SO MRT organisations worldwide in this thesis are based in Australia. The exception being the Tethys Institute based in Italy (Table 4-5). This does not mean that MRT in Australia is not noteworthy in world terms because 30 of identified 125 MRT products worldwide occur in Australia (Table 4-2). This is twenty four percent of the world's MRT products (based on the study one sample identified over the Internet). Comparable regions are the Caribbean (n=27) and Southern Africa (n=15) (Table 4-2), however, those two regions are typified by the presence of large and/or international organisations such as The Earthwatch Institute, Frontier, and Coral Cay International. Given all this, what this means is that Australia is a hotspot for MRT globally with a very high density of SO organisations.

As Australian MRT has a prevalence of SO organisations it is to be expected that the nature of Australian MRT will be highly influenced by the characteristics that describe SO organisations as described in Section 4.7.6. However before describing the variation of

Australian MRT in any depth, There are other differences between Australian and non Australian MRT that provide additional insight into the nature of Australian MRT. Based on an examination of the collected (i.e. 126 MRT product web sites), these differences are presented in Table 4-44. Twenty six (87 %) of MRT products in Australia are operated by an Australian business. Elsewhere across the world, 41 (43%) and 40 (42%) of the MRT products are operated by USA and UK owned companies. Australian MRT products are more likely to (12%) operate in a temperate region when compared to MRT elsewhere. Finally, Table 4-44 shows that MRT elsewhere is more likely to focus on coral reefs (-11%), ship wrecks (-6%) and the deep ocean (-3%). However, compared to MRT worldwide, Australian MRT is characterised by a higher percentage of sea bird (10%) and turtle (10%) focused MRT products.

Table 4-44: Other notable differences between Australian MRT and MRT elsewhere

No. of MRT products	30	96	126	% of 30	% of 96	
	Australian MRT	**MRT elsewhere**	**Total MRT worldwide**	**% Australian MRT**	**% elsewhere**	**% MDBV**
Country of organisation						
USA	3	41	44	10%	43%	-33%
UK	1	40	41	3%	42%	-38%
Australia	26	2	28	87%	2%	85%
Region of operation						
Temperate	13	30	43	43%	31%	12%
Tropics	17	62	79	57%	65%	-8%
Not applicable (deep ocean or north pole)		4	4	0%	4%	-4%
Marine research topic						
Coral reef	7	33	40	23%	34%	-11%
Sea birds	3	0	3	10%	0%	10%
Turtles	8	12	20	27%	12.5%	14%
Ship wrecks	0	6	6	0%	6%	-6%
Deep ocean	0	3	3	0%	3%	-3%
Sharks	2	5	7	7%	5%	1%
Dolphins	2	6	8	7%	6%	0%
Whales	3	10	13	10%	10%	0%
Whales and dolphins	1	3	4	3%	3%	0%

Note: red shows relatively low values, yellow is moderate, and blue is relatively high

Given that 15 (93%) of the identified 16 SO organisations worldwide operate in Australia, the characteristics of SO companies can be investigated through a description of Australian MRT. For instance, in Australia, 11 of the 11 MRT products that operate in offshore regions are operated by SO companies (Table 4-45). Additionally, 7 of these MRT products study the marine environment from a boat, the other for products have SCUBA and/or snorkel modes of marine research. For marine research focus, one hundred percent of Australian MRT products that focus on whales and dolphins (n= 5) or sharks (n=3) are operated by SO companies (Table 4-45). Furthermore, seventy eight percent of MRT products that focus on coral reefs are operate by SO companies (Table 4-46).

Significantly, just 2 of 8 (25%) turtle focused MRT products in Australia are operated by SO companies. These two SO companies are Ningaloo Turtles and Cape York Turtle Rescue. Therefore, in contrast to the overall prevalence of SO organisations in Australian MRT, seventy five percent of Australian turtle focused MRT is operated by LO organisations. All 4 LO organisations in Australia operate turtle focused MRT products. This includes The Earthwatch Institute, Biosphere Expeditions, and two Australian based LO companies namely Conservation Volunteers Australia and Landscope Expeditions. The reasons for why this is so are likely to be related to the nature of turtle MRT products which is described later in this chapter.

Table 4-45: Type of Australian MRT products by type of operation

Type	**LO**	**SO**	**Total**	**% SO**
Coastal and marine	3	4	7	57%
Island based	2	0	2	0%
Mainland coastal	6	4	10	40%
Mainly marine	0	11	11	100%
Total	10	20	30	67%

Table 4-46: Type of Australian MRT products by marine research topic

Marine research focus	LO	SO	Total	% SO
Coral reef	2	7	9	78%
Dolphins	0	2	2	100%
Great white shark	0	1	1	100%
Island marsupials	1	0	1	0%
Sea birds	1	2	3	67%
Sharks	0	2	2	100%
Turtles	6	2	8	25%
Whales	0	3	3	100%
Whales and dolphins	0	1	1	100%
Total	10	20	30	67%

Even though Australian MRT is characterised by a high density of SO organisations, the nature of Australian MRT is not homogenous. For example, across the 30 products, 8 (27%) are turtle focused and coastally based, while 16 (53%) are liveaboard MRT products that mainly operate in an offshore environment including remote islands. Ten of these liveaboards focus on coral reef regions, and 6 of these liveaboards focus on whales, dolphins and sharks. Of the remaining 6 products, two focus on 1) dolphin volunteer tourism at coastal locations (i.e. The Dolphin Research Institute and Bunbury Dolphin Discovery Centre); 2) sea birds (i.e. The Lakes Explorer (near coastal) and Conservation Volunteers Australia at Montague Island, NSW); 3) temperate reefs in Sydney Harbour (i.e. The Earthwatch Institute); and 4) volunteering at a marine research station (i.e. Lizard Island research station.

To assess the conceptual variation across these different MRT products, the differences between the four types of Australian MRT products are shown in Table 4-47 and Table 4-48. These four products are 1) turtle and coastal based (n=8); 2) coral reef liveaboards (n=10); 3) whale, dolphin or shark liveaboards (n=6); and 4) dolphin volunteering MRT products (n=2).

Table 4-47: Conceptual variation across four main types of MRT products in Australia

No. of MRT products	10	6	8	2	
MRT Criteria	**Live aboard - coral reef region**	**Live aboard - whales, dolphins, sharks**	**Turtle MRT products**	**Dolphin volunteering**	**MDBV**
Activity level (Orams, 1999)	4.8	5.0	3.1	1.0	4.0
Close local association	1.0	1.7	2.5	5.0	4.0
Experience level (Orams, 1999)	4.6	4.8	3.1	1.0	3.8
Environmental remoteness (Orams, 1999)	4.8	4.7	3.3	1.0	3.8
Tropics (5) or temperate (1)	4.6	1.7	4.0	1.0	3.6
Level of SCUBA diving	4.6	1.0	1.4	1.0	3.6
Type or organisation	4.2	5.0	2.0	5.0	3.0
Dependency on wildlife migration	2.5	3.9	3.1	1.0	2.9
Locations level (Orams, 1999)	4.7	4.8	2.4	2.0	2.8
Skill or qualifications offered on trip	1.9	1.8	2.6	4.0	2.2
Level of adventure challenge	3.7	3.4	2.9	1.5	2.2
Level of hospitality for tourist	2.9	2.9	2.4	1.0	1.9
Level of skilled scientific tourism	3.1	3.8	2.5	2.0	1.8
Volunteer mindedness	2.6	3.2	3.4	4.2	1.5
Cultural focus	1.0	1.0	2.5	1.0	1.5
Skill pre-requisite to participate	2.8	2.0	1.3	2.0	1.5
Level of active involvement in research	2.6	2.6	3.7	4.0	1.4
Wildlife popularity	3.9	4.7	4.6	5.0	1.1
Level of comfort for tourist	3.4	3.0	2.3	3.0	1.1
Longer term conservation contribution	3.2	3.7	3.3	4.0	0.8
Reliability of tourist's research	2.5	2.8	3.2	3.0	0.7
Level of educational tourism	3.4	3.9	3.4	4.0	0.6
Marine research quality	3.7	4.0	3.5	4.0	0.6
Research significance	3.6	4.0	3.6	4.0	0.4
Tourist supervision	4.4	4.2	4.3	4.5	0.3
Cost per day ($USD)	327	380	202	10	370
Max duration (days)	11	13	11	140	130

Note: scale is 1 for relatively low (red), 3 for relatively moderate (yellow), and 5 for relatively high (blue)

Table 4-48: Variation in market segments across four main types of MRT products in Australia

No. of MRT products	10	6	8	2	
MRT market segment	**Live aboard - coral reef region**	**Live aboard - whales, dolphins, sharks**	**Turtle MRT products**	**Dolphin volunteering**	**MDBV**
Liveaboard	0.7	1.0	0.1	0.0	1.0
Pre-arranged accom	0.0	0.0	0.1	1.0	1.0
SCUBA divers/snorkel	0.9	0.0	0.1	0.0	0.9
Backpackers	0.1	0.0	0.8	0.5	0.8
Volunteers	0.4	0.3	1.0	1.0	0.7
Attracts family	0.5	0.2	0.5	0.0	0.5
Gap year travellers	0.2	0.0	0.4	0.5	0.5
Package tour travellers	0.1	0.0	0.5	0.0	0.5
Attracts older travellers	0.9	0.8	0.5	1.0	0.5
Attracts scientists	0.9	1.0	0.6	0.5	0.5
Cultural focus	0.0	0.0	0.4	0.0	0.4
Snorkel only (No SCUBA)	0.0	0.0	0.4	0.0	0.4
Independent travellers	0.9	1.0	1.0	1.0	0.1

Note: scale is 0 for a low likely presence (red), 0.5 for a moderate presence (yellow), and 1 for relatively high presence of a certain market segment (blue)

These tables and Figure 4.3 can be used to assess the conceptual nature and variation of Australian MRT. Such an assessment represents a culmination of study one's objective to further understand the conceptual nature of MRT in Australia. Given this, key traits and differences between those four types of MRT products are as follows:

- Liveaboard MRT products that focus on coral reef (n=2) are more likely to be a SO MRT organisation (4.2), cost more ($USD 327), operate in an environmentally remote region (4.8), more likely to occur in a tropical region (4.6), involve SCUBA diving (4.6), offer less marine research skills and qualifications (1.9), offer more comfort and hospitality for the tourist (3.4 and 2.9), not always focus on popular wildlife such as turtles and whales (3.9), be less dependent on wildlife migration (2.5), be more vacation minded (2.6), have higher levels of adventure challenge (3.7), and not interact with the local community while on an expedition (1.0);

- Liveaboard MRT products that focus on coral reefs are also; more likely to involve SCUBA divers (0.9), less likely to involve backpackers (0.0) and volunteers (0.4), more likely to attract older travellers (0.9) and families (0.5);

- Table 4-47 and Table 4-48 show that there are many similarities between coral reef liveaboard and liveaboard MRT products that focus on whales, dolphins are sharks (n=6). However, important differences between those types of MRT products are that whales, dolphins are sharks focused MRT products are; more likely to operate in temperate climates (1.7), not involve SCUBA diving (1.0), have closer interaction with local communities (1.7), are more dependent on marine wildlife migration (3.9), involve more charismatic marine wildlife (e.g. whales) (4.7);

- When compared to coral reef liveaboard, liveaboard MRT products that focus on whales, dolphins, and sharks are also more likely to attract skilled scientific tourists (3.8), attract more volunteer minded tourists (3.2), have higher educational outcomes (3.0), require less skills (i.e. not SCUBA) for the tourist to participate in the marine research (2.0), have less comfort for the tourist (3.0), have higher marine research significance (4.0), and higher long term conservation outcomes (3.7);

- The underlying data shows that turtle focused MRT products (n=8) in Australia are more likely to occur on coastlines and in tropical regions. In Australia, apart from the Earthwatch Institute turtle product in Moreton Bay (near Brisbane), all the other turtle products are located in remote locations across Australians north (Figure 4.3);

- Notable features of turtle focused MRT in Australia are that they; are mainly (75%) operated by LO organisations, require less skills to participate (1.3), offer more skills or qualifications (2.6), have more active involvement in marine research (3.7), have higher reliability of tourist's research (3.2), cost less than liveaboard MRT products ($USD 202), less likely to attract skilled scientific tourists (2.5), have minimal SCUBA diving (1.4), have moderate levels of comfort (2.3) and adventure challenge (2.9), more likely to attract backpackers (1.0) and volunteer tourists (0.8), and can involve close and cultural interactions with the local community (2.5);

- Dolphin volunteer research tourism (n=2) in Australia is characterised by; higher levels of volunteer mindedness (4.2), inshore marine environments (1.0). longer duration (e.g. up to 140 days), cost far less than other MRT products (i.e. a nominal $USD10 per day), higher levels of marine research significance (4.0) and conservation (4.0), lower skill pre-requisites to participate (2.0), more skills or qualifications offered on the trip (4.0), more likely to attract older travellers (1.0), less likely to attract families (0.0), and less likely to attract skilled scientific tourists.

4.9. Summary

Study one responded to the question; based on the proposed conceptual framework for MRT (Figure 1.1), what are the key characteristics of MRT worldwide and in Australia. It measured, tested, explored, and advanced that conceptual model across a representative sample of MRT products worldwide and in Australia. A summary of key results from this study are shown in Table 4-49. A full discussion of the implications of these results is found in Chapter Seven. The next chapter of this thesis presents and discusses key findings from study two.

Table 4-49: Key outcomes from study one (Source: Analysis of 126 and/or 85 MRT web sites)

ID	Key results
1	MRT is usually comprised of nine well-known tourism types and most often in coastal settings can involve closer interaction with locals and/or cultural exchange
2	A description of MRT products and tourist types worldwide and in Australia
3	Maps and description of MRT products and tourist types worldwide and in Australia
4	Identification of various contextual indicators to help describe MRT. These criteria being region of operation, type of operation, mode of operation, and organisation type
5	A description of various MRT marine research projects, topics and MRT tourist activities across the world
6	A set of benchmarked MRT criteria to measure the relative value of MRT products
7	A model about the involvement of skilled scientific tourists in MRT
8	A model of the difference between temperate and tropical MRT products
9	A model of the differences between LO and SO MRT products
10	An analysis of MRT criteria, tourist types and various contextual indicators
11	Marine research topics for different MRT criteria and market segments
12	Substantial differences between Australian MRT and MRT elsewhere
13	A description of the key characteristics of MRT in Australia

Chapter 5 Study two - results

The views of key supply-side stakeholders about MRT in Australia

5.1. Introduction

Research question two asked what are the shared and contested views of key stakeholder group‘s about the present and future of marine research tourism in Australia. To answer this, study two acquired and compared the views of approximately 70 supply-side key MRT stakeholders about present and future MRT in Australia. This chapter presents and analyses results from that study.

5.2. Research step one - results

Research step one sought the initial views of MRT stakeholder about the supply of MRT products and activities in Australia. To do this, an anonymous online survey was devised, hosted on the QuestionPro web site (QuestionPro, 2009) and undertaken between April 2007 and September 2007. Survey topics (Table 3-25) and related survey questions were derived from the stakeholder analysis in the literature review. The full list of survey questions are presented in Appendix 10. The survey was intended for at least five representatives from eight stakeholder groups (n=40). In the end, the survey was undertaken by 63 key stakeholders from the eight stakeholder groups and fully completed by 45 (71%) of key stakeholders. The numbers of respondents from each stakeholder group are shown in Table 5-2.

Table 5-1: Topics for the study 2 (Source: Academic literature and initial conversations with key stakeholders)

Topic ID	MRT stakeholder related topic
1	Driving forces, major factors, issues and constraints behind MRT
2	The likely benefits of MRT
3	Supply and demand opportunities for MRT in Australia
3a	Who are potential MRT tourists?
3b	Suitable marine research and conservation programs, and locations
3c	Product opportunities for the MRT industry in Australia
3d	Stakeholder opportunities.
4	Stakeholder issues and views about MRT in Australia
4b	The role of MRT volunteers
4a	The involvement of the marine tourism industry
4c	The role of marine researcher and/or managers, and
4d	The potential future of MRT in Australia

Table 5-2: Key stakeholder groups of online respondents

Occupation of respondent	No. that started survey	No. of full completions	% completed survey
Marine researcher	13	9	69%
A marine education society	11	9	82%
Marine tour operator	7	7	100%
An environmental conservation organisation	8	7	88%
Marine manager	9	5	56%
A tourism organisation	6	4	67%
Marine research tour operator	6	3	50%
Postgraduate marine research student	3	1	33%
Total	63	45	71%

Respondent knowledge of marine research tourism

Survey outcomes are dependent upon the knowledge of respondents about MRT. Towards understanding this, respondents were asked about their organisation‘s involvement with different MRT companies. Table 5-3 shows that respondents previously had most involvement with the Reef Check Australia (48%); The Earthwatch Institute (46%); the Undersea Explorer

(37%); and Conservation Volunteers Australia (26%). As these key stakeholders were based in Australia, it is perhaps not surprising that many respondents had less knowledge of many larger MRT organisations that operate outside Australia such as Greenforce (7%), Operation Wallacea (11%) and Frontier Expeditions (4%).

Table 5-3: Respondent involvement with different MRT organisations (n=27)

ID	MRT Organisation	% of 27
1	Reef Check, Australia	48%
2	The Earthwatch Institute, Australia and Worldwide	46%
3	Undersea Explorer, Port Douglas, Australia	37%
4	Conservation Volunteers Australia, Australia	26%
5	SV Pelican, Australia	26%
6	Cape York Turtle Rescue, Australia	20%
7	Coral Cay Conservation, Worldwide	11%
8	Greenforce, Worldwide	11%
9	GVI international, Worldwide	11%
10	The Oceanic Society, USA and Worldwide	11%
11	The Rodney Fox Shark Experience, Australia	11%
12	The Whale and Dolphin Conservation Society, Australia and Worldwide	11%
13	Biosphere Expeditions, Worldwide	9%
14	Landscope Expeditions, Australia	9%
15	The Oceania Project, Australia	9%
16	Operation Wallacea, Worldwide	7%
17	Tevene'i Marine, Australia	7%
18	The Shark Research Institute, USA and Worldwide	7%
19	Blue ventures, Worldwide	4%
20	Frontier Expeditions, Worldwide	4%
21	Odyssey expeditions, Caribbean	4%
22	Raleigh International, Worldwide	2%
23	The Scientific Exploration Society, United Kingdom	2%
24	Asociacion de Voluntarios para el Servicio en las Areas Protegidas (ASVO), Costa Rica	0%
25	The Antinea Foundation , Europe	0%
26	The African Conservation Experience, Africa	0%
27	The Tethys Research Institute, Italy	0%

Figure 5.1 shows which key stakeholder groups had most involvement with the MRT organisations in Table 5-3. Environmental conservation organisations (n=7, 50%) had most involvement (50%), marine educational societies (n=9) (34%) and marine researchers (n=.9, 32%). Marine tour operators (n=7, 11%) had least involvement with MRT.

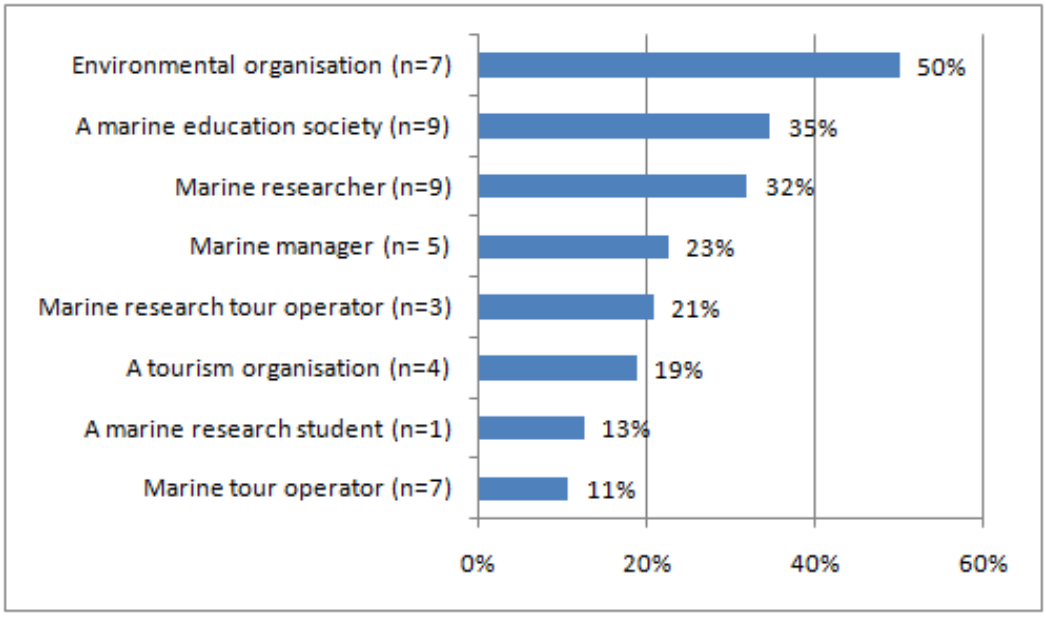


Figure 5.1: Key stakeholder group involvement with well known MRT organisations

5.2.1. Driving forces, major factors, issues and constraints

The next section presents respondents views about what driving forces, major factors, issues, and constraints are important for the future of MRT on Australia. It is reasoned that due to the expert knowledge of many respondents, such information is likely to describe much of the present status, potential and limitations for Australian MRT. Furthermore, the future of MRT in Australia will naturally depend upon what key MRT stakeholders presently perceive to be the reality of present and future Australian MRT.

The driving forces that respondents considered to be important are shown in Table 5-4. Overall, they considered an increasingly educated, active, conservation volunteer focused, environmentally responsible, marine documentary watching, and alternative tourist market to be the most likely driving force behind MRT. Additionally, an increased need for marine research, monitoring and associated funding was considered to be a possible and/or likely driving force behind MRT.

Table 5-4: Driving forces behind MRT

ID	Driving Force	Rating
1	An increasingly educated travel market who are interested in more active experiences	3.5
2	An increase in the conservation volunteering ethic within the travel market	3.4
3	An increasing desire for environmentally responsible travel within the travel market	3.3
4	An increasing desire for an alternative travel experience with the travel market	3.2
5	The effect of marine documentaries on public awareness for a marine research experience	3.0
6	A need for increased funding by marine research and management agencies	2.6
7	A greater need for marine research and monitoring of Australian marine waters	2.4
8	Marine research technology that is increasingly advanced and easier to use	2.2
9	Increasingly safe and comfortable marine tourism ventures	2.1

Note, 1 is not likely, 2 is possibly, 3 is likely, and 4 is very likely

Major factors that are likely to influence Australian MRT are shown in Table 5-5. Australia‘s marine natural wildlife and assets were identified as the most important factor. Australia‘s relatively well managed marine environment and a large coastline and ocean region were also identified as important factors. The involvement of the Australian Government, a relatively mature marine tourism industry; and insufficient knowledge about the potential future for Australian MRT was considered to be least important (i.e. somewhat important).

Table 5-5: Factors that are important to any development of MRT across Australia

Major factor	Rating
Australia has a wealth of marine wildlife and other natural marine assets	3.2
MRT experiences appear to be sought after by well educated and travelled markets	2.9
Australia has a relatively well managed marine environment	2.9
Australia has a large coastline and ocean region	2.8
Sufficiently trained and experienced volunteer tourists can effectively perform basic to advanced marine monitoring and surveys	2.7
Australia has a relatively advanced marine research sector	2.7
The involvement of Australian Federal and State Government in the sponsorship of MRT	2.5
Australia has a relatively mature marine tourism industry	2.5
There is insufficient knowledge about the potential future for MRT across Australia	2.3

Note, 1 is not important, 2 is somewhat important, 3 is important, and 4 is very important

Major issues that are likely to affect any possible expansion of Australian MRT are shown in Table 5-6. Issues that involve the marine research tourist were considered to be the most important. These were occupational health and safety, public liability insurance, keeping the tourist satisfied, and quality of the tourist's research contribution. The collaboration (or lack thereof) required between marine researchers, marine managers and marine tour operators were also viewed as important. Lowest rated issues were a shortage of suitably skilled tourists and interested marine tourism operators, however both were viewed as above somewhat important.

Table 5-6: Issues regarding any expansion of MRT across Australia

Issue	Rating
Occupational health and safety issues for volunteer tourists who are involved in marine research programs	3.3
Public liability insurance	3.3
Keeping the tourist satisfied while undertaking marine research programs	3.2
The collaboration required between marine researchers, marine managers and marine tour operators	3.1
Uncertainty as to the quality of marine research by tourists	3.0
Limited marketing and promotion of MRT ventures	2.9
A shortage of marine researchers with suitable tourism and hospitality skills	2.9
A shortage of marine researchers with suitable entrepreneurial skills	2.8
Acquiring or approving marine research permits	2.7
A shortage of interested marine tour operators	2.5
A shortage of skilled MRT tourists to undertake quality marine research	2.4

Note, 1 is not important, 2 is somewhat important, 3 is important, and 4 is very important

Major constraints to any possible expansion of MRT in Australia are listed in Table 5-7. The natural environment was considered to be the major constraint. These were 1) unsafe and uncomfortable weather and ocean conditions; and 2) the seasonality of wildlife migrations and hence wildlife marine research. The potential risk of dangerous marine wildlife; logistic issues; diesel costs; and an absence of knowledge about the MRT market, were viewed as just above _somewhat important'.

Table 5-7: Constraints for expanding MRT across Australia

Constraint	Rating
The potential risk of unsafe and uncomfortable weather and ocean conditions	3.0
Seasonality of wildlife migrations and hence wildlife marine research	2.7
The potential risk of dangerous marine wildlife to marine researchers, tourists and marine tour operators	2.5
There is a logistics related need for MRT ventures to be based near a town or other tourism centre	2.5
Increasing costs of diesel fuel and related hindrance long distance marine travel	2.5
The motivations and requirements for satisfying MRT tourists is not well known	2.4
The size and nature of the MRT market in Australia is not well known	2.4

Note: 1 is not important, 2 is somewhat important, 3 is important, and 4 is very important

5.2.2. The benefits of marine research tourism

The potential benefits of marine research tourism

Potential benefits of MRT are said to include contributions by marine researchers and tourists to marine research and management programs, and education benefits to the marine research tourists (Cuthill, 2000; Darwall & Dulvy, 1996; Ellis, 2003a, 2003b; Foster-Smith & Evans, 2003; Musso & Inglis, 1998). To affirm and expand on these identified benefits, respondents were asked about what the likely MRT benefits are to marine research or management programs.

Table 5-8 shows that respondents considered 1) increased funding and other resources for marine research (n=17); and 2) increased faster monitoring data collection and processing (n=11) as among the most likely benefits. Increased community education, awareness and stewardship of the marine environment was also viewed as a likely benefit of MRT (n=17). The tourist's potential contribution to marine research through their knowledge and worldview was also identified.

Table 5-8: Likely benefits from MRT to marine research and management programs

Likely benefit of MRT	**No.**
Increased community awareness and stewardship of research and conservation issues	17
Increased funding and other resources for marine research	17
Increased and faster monitoring, data collection and processing	11
Increased community support and subsequent capacity in marine management and research	5
Increased speed, spatial range and effectiveness of research	2
Better access to remote locations	2
Co-management and funding of resources	1
Diversity of tourist worldviews and skills that can assist the research process	1
Professional development of tourists	1
Tourists who feel they have contributed to something important like a significant marine conservation outcome	1
Improved the experience for tourists by exceeding their expectations of involvement with the marine environment and researchers	1
Not much	1

Table 5-8 also indicates that MRT may have many substantial benefits to the MRT tourist. For instance, MRT can lead to 1) increased community support for marine management and research, 2) increased marine management and research capacity; 3) the professional development of tourists; 4) exceed the marine tourist's expectations in terms of the depth of interaction with the marine environment and researchers; and 5) encourage tourists to feel that they have contributed to something important like a significant marine conservation outcome.

Potential beneficiaries of marine research tourism

Respondents were asked which key stakeholder groups could possibly benefit from MRT. Results showed that respondents considered indigenous Australian organisations, private marine researchers, dive training organisations, and government marine management and research agencies as likely beneficiaries (Figure 5.2). The listing of indigenous Australian organisations is perhaps surprising because just one of the 30 MRT Australian based ventures identified in Chapter Four of this thesis is known to regularly involve indigenous Australians (Table 4-6).

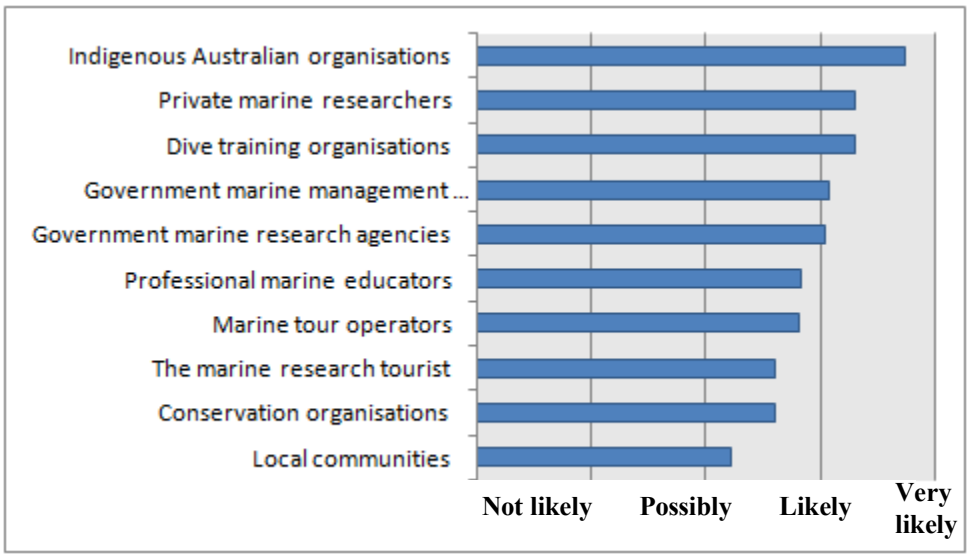


Figure 5.2: Likely and possible beneficiaries from MRT

Figure 5.2 also shows that marine tour operators and professional marine educators were considered to be ‗possible and/or likely' beneficiaries of MRT. Local communities and conservation organisations were considered to be just ‗possible' beneficiaries of MRT. Analysis of Figure 5.2's underlying data shows that those views can be traced to survey responses from marine managers (n=3/5) and marine tour operators (n=2/6). In contrast to other stakeholder

groups, they considered environmental conservation organisations, local communities, and marine educators to be ‗possible and/or not-likely' beneficiaries of MRT.

In an open text question, respondents were also asked who else could benefit from MRT in Australia. Responses included universities and technical colleges, the broader tourism industry, tourists, local businesses, schools, children, the wider public, marine wildlife and habitats, commercial fisherman, and sea food consumers. This information indicates that if MRT is developed appropriately then there may be many potential beneficiaries from MRT.

How can the benefits of marine research tourism be increased?

When asked how any benefits from MRT could be increased, survey responses were 1) marine research and management; 2) MRT product; and 3) MRT tourist related. Details are in Table 5-9. Suggestions to improve marine research or management outcomes via MRT included 1) increasing the recognition of MRT benefits by marine research and management agencies; and 2) developing coordinated lines of communication amongst potential users of the marine research from MRT. Both those suggestions are intended for marine researchers and managers to use MRT more effectively.

The top MRT product suggestions were to 1) implement a quality assured training regime for any volunteer tourists; and 2) increase funding for training and better supervision of MRT tourists. This would lead to greater reliability in data collection and processing and more satisfied tourists. The top MRT tourist related suggestions were to 1) make as many tourists as possible feel part of the research; 2) provide feedback to the tourist; and 3) increase the presence of well known marine researchers or conservationists on MRT products.

Table 5-9: How could the benefits from MRT be increased? (Source: Survey responses from study two of this study)

Respondent suggestion	Intended benefit	No. of responses
Marine research and management related		
Increased recognition of MRT benefits by marine research and management agencies	Potentially increased investment in MRT by marine research and management agencies and hence more benefits from MRT	5
Develop coordinated lines of communication amongst potential users of the marine research.	This may allow potential marine research users to use MRT more effectively.	4
MRT product related		
A quality assured training regime for any volunteer tourists. Increased funding for training and better supervision of MRT tourists.	Greater reliability in data collection and processing	6
Development of accredited MRT guides recognised by ecotourism, marine tourism and marine research authorities	Reduce the marine researcher's obligations to look after the tourist. Reduce the workload of the marine tour operator to support marine research. Supervise the tourist. Reduce OH&S and public liability issues. Improve the tourist and marine researcher experience, and hence improve MRT outcomes.	2
Special permits for access to special sites for best practice MRT operators	Increase the desirability of MRT amongst MRT operators. Improved experience for the tourist.	1
Quality insurance when actively involving tourists in marine research	Reduce liability of marine tour operators and other stakeholders if a research related accident occurs.	1
Invest in this form of tourism in a strategic manners	Further development of quality MRT products	1
MRT tourist related		
Make as many tourists as possible feel part of the research. Provide feedback to the tourist. Increase the presence of well known marine researchers or conservationists on MRT ventures.	The tourist will feel part of something and will contribute to more marine research and conservation programs	3
Seek to provide consistent and simplified marine research information to the tourist. Provide a quality hands on MRT experience to the tourist.	A potentially more satisfied, educated and aware tourist	1
Profile the demographics and motivations of MRT tourists	Assist with development of MRT products that satisfy the tourist and harness their potential contribution	1
Promote the unique research and conservation benefits of MRT to the marine tourism market	Increased demand for a MRT experience and hence increased marine research and conservation outcomes	1
Increase accessibility and reduced costs for a MRT experience	Increased demand for a MRT experience and hence increased marine research and conservation outcomes	1
A mechanism to capture the tourist's thoughts on future research directions.	A potentially more satisfied tourist, and potential suggestions to improve marine research activity	1

5.2.3. Opportunities for marine research tourism products in Australia

Several questions about the future opportunities for Australian MRT were posed. These were focused on 1) who are potential MRT tourists; and 2) what marine activities and programs are suitable for marine research tourism products.

Who are potential marine research tourists?

The first question asked what types of tourists would be interested in MRT? Respondents considered that a range of tourist types were likely or possible MRT tourists (Figure 5.3). These included; marine wildlife tourists, repeat MRT tourists, ecotourists, scientists, volunteers, SCUBA divers, and educational tourists. Respondents viewed backpackers, mass tourists, cruise ship tourists, holiday makers, package tourists, and recreational fishers as less likely to be MRT tourists. Via an open text question, respondents also suggested; school field trip groups, university students seeking a field experience, international students, marine aquarium visitors, freelance nature documentary makers, bird watchers, whale watchers, and retired scientists.

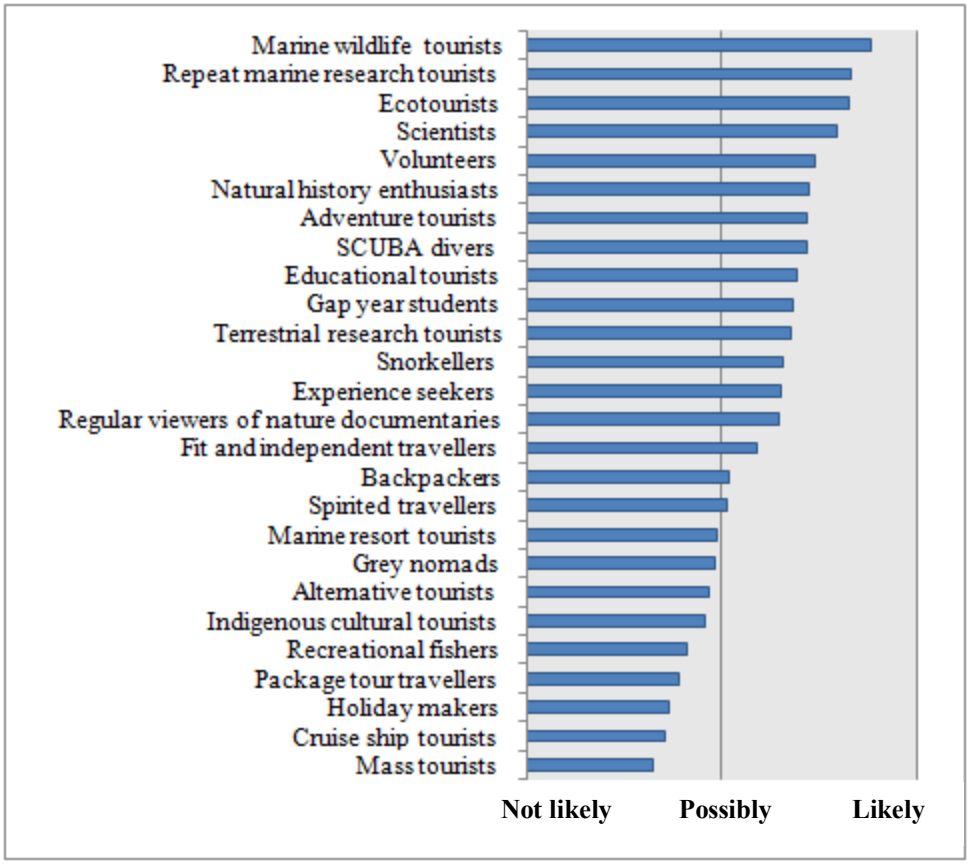


Figure 5.3: Who is likely to be a marine research tourist?

What countries would potential marine research tourists come from?

When asked what country would potential MRT tourists more likely to be from, respondents identified Australia, the United Kingdom, the United States of America, Canada, Germany and New Zealand (Figure 5.4). Visitors from India, Korea, China, Kenya, Brazil and Japan were viewed as less likely to be potential MRT tourists. Via an open text question, Singapore, Malaysia, Hong Kong, Mexico, Peru, Columbia, Chile, Argentina, Israel, Egypt, Switzerland, the Netherlands, Russia, and old Eastern bloc countries were also suggested as potential source countries for MRT tourists.

Figure 5.4: The possible source countries of potential marine research tourists

Marine research activities for marine research tourists

When asked how useful marine research interpretation is to produce a quality experience for the marine research tourist, 42 (95%) of respondents responded really useful or useful. This strongly indicates that a quality MRT experience should have informed and effective interpretation of marine research phenomena and programs. This indicates that a quality MRT experience will closely depend on tourism staffs that are very able to interpret marine research programs and the marine environment.

When asked about whether photos and video recording is a useful or very useful method for involving the marine research tourist within a marine research experience, ninety five percent of respondents considered it to be really useful or useful. This indicates that camera or video related marine research programs that can be reliably used by MRT tourist may be very useful for MRT.

Respondents were asked about what types of marine research programs would appeal to marine research tourists. Results are shown in Figure 5.5 and indicate that many marine research programs could readily appeal to marine research tourists. This includes; whales, dolphin, turtle, seals, sharks, dugongs, penguin, coral reef, sea dragon, coral reef spawning and ship wreck research programs. The research programs that respondents appear to have some ambivalence (i.e. maybe or no) towards are; ship wreck, coral spawning and sea dragon research.

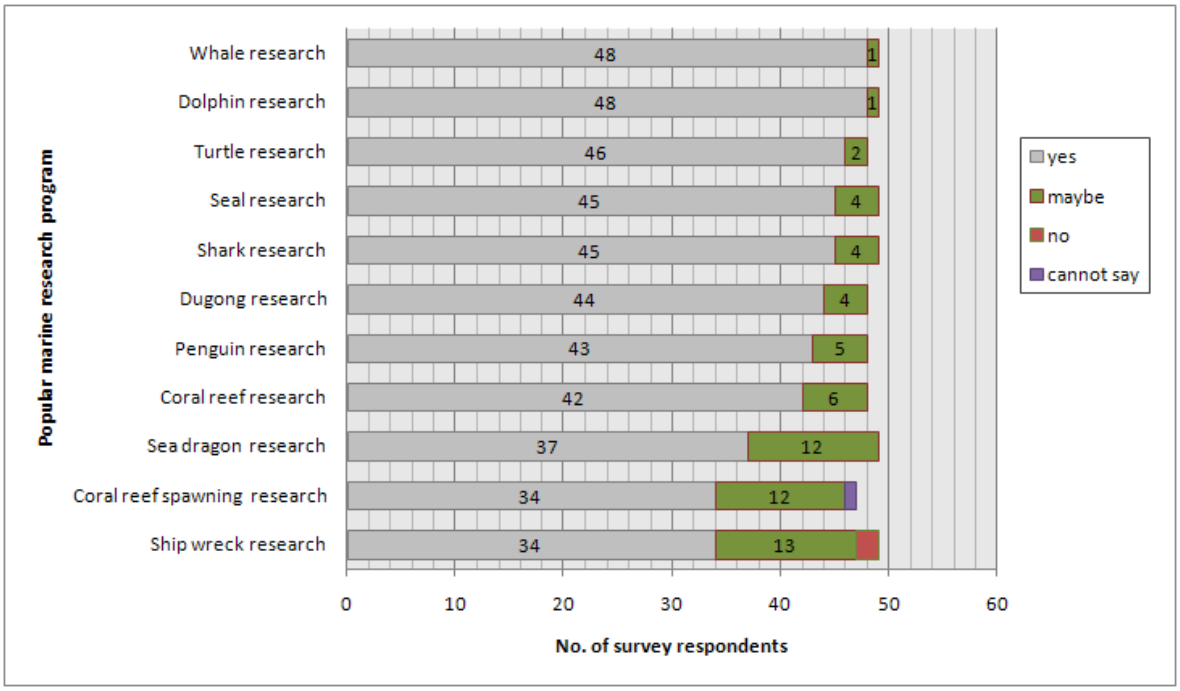


Figure 5.5: Popular marine research that could appeal to marine research tourists

Open text suggestions about specific marine research programs that may be suitable for MRT are shown in Table 5-10. Broader suggestions included research related to conservation, climate change, marine and coastal clean ups, and anything that appeals to the general public. A marine researcher commented that soft sediment communities may have a difficult time gaining similar attention as marine mammals.

Table 5-10: Marine research programs that may be suitable for Australian MRT

Marine research program	**Marine research programs**
Snorkel or scuba habitat and biodiversity surveys	Intertidal rocky reefs, sandy shores, wildlife or habitat surveys in relatively nice locations (e.g. on the banks of eastern Moreton Bay or southern Australia's rocky shores
Control of marine pests such as crown of thorns starfish counts	Fish species diversity and population counts
Mangrove and seagrass research	Crocodile counts, monitoring and research
Plankton, cephalopod, whale sharks, manta rays, and invertebrates research programs	Shore and migratory bird research

Marine research issues, programs and platforms for marine research tourism

Respondents were asked about the suitability of different marine research and conservation issues, programs and platforms (e.g. research vessel) for Australian MRT. Respondents clearly identified 1) endangered marine species and habitats; and 2) marine research issues with a conservation focus as most suitable marine research issues, (Table 5-11). Conversely, marine environmental impacts and coastal flooding impacts were considered as not ‗suitable' or ‗somewhat suitable'.

Table 5-11: Likely marine science or conservation issues that would be suitable for MRT

Type	Name	Suitability
Issue	Endangered marine species and habitats	2.9
Issue	Marine research with a conservation focus	2.9
Issue	Impacts of climate change on the marine environment	2.2
Issue	Marine fisheries programs	2.1
Issue	Lesser charismatic marine wildlife research programs	2.1
Issue	Monitoring and researching coastal estuaries	2
Issue	Researching the marine biodiversity about marine pontoons	2
Issue	Researching the impacts of marine tourism on the marine environment	2
Issue	Marine environmental impact assessments	1.8
Issue	Coastal flooding impacts	1.5

Note: 1 is not suitable, 2 is somewhat suitable, and 3 is suitable

For marine research programs, respondents clearly identified coral reef marine research programs and charismatic marine wildlife research programs as suitable for MRT (Table 5-12). Mangrove forests, marine anthropology research (e.g. indigenous heritage mapping) and studying coastal geomorphology were viewed as ‗somewhat suitable'. Island, vessel and coastal based marine research platforms were identified as the most suitable marine research platforms for MRT (Table 5-13). In comparison, deep sea marine research programs (including submersibles), underwater laboratories, and marine aquariums were considered to be ‗somewhat suitable'.

Table 5-12: Likely marine science or conservation programs that would be suitable for MRT

Type	Name	Suitability
Programs	Coral reef marine research programs	2.9
Programs	Charismatic marine wildlife research programs	2.9
Programs	Marine archaeology (e.g. ship wrecks) research programs	2.6
Programs	Watching and reporting marine bird sightings	2.5
Programs	Seasonal migration and breeding marine research programs	2.4
Programs	Monitoring and researching tidal pools	2.3
Programs	Monitoring and researching kelp forests	2.2
Programs	Monitoring and researching mangrove forests	2.2
Programs	Marine anthropology research (e.g. Indigenous heritage mapping)	1.9
Programs	Studying coastal geomorphology	1.7

Note: 1 is not suitable, 2 is somewhat suitable, and 3 is suitable

Table 5-13: Likely marine science or conservation platforms that would be suitable for MRT

Type	Name	Suitability
Platform	Island-based marine research	2.7
Platform	Vessel based marine research	2.6
Platform	Coastal based marine research	2.6
Platform	Deep sea marine research programs (including submersibles)	2.1
Platform	Underwater laboratories	2
Platform	Studying the marine environment within a marine aquarium	2

Note: 1 is not suitable, 2 is somewhat suitable, and 3 is suitable

Open text suggestions about marine research programs included 1) charismatic mega fauna focused projects or projects in attractive locations; 2) introduced pest species control programs (e.g. European Green crab, New Zealand screw shells); 3) tropical fish migration studies; 4) habitat surveys; 5) weedy sea dragon habitat studies; 6) reef check; 7) coral watch charts; 8) and sea grass inhabitants. Broader suggestions about the design of suitable MRT marine research programs included:

1. Nearly any specialty area can be made attractive to specialty interest groups if the groups are very well defined and marketed to;
2. Survey work associated with the design and establishment of marine protected areas;
3. Programs which cater to the various skill levels of the volunteer, have an outcome the volunteer can relate to, and provide hands on experiences;
4. Programs that provides rapid feedback to the participant such as turtle surveys;
5. Projects that are likely be affected by media, contemporary trends and fashions such as climate change for example, but itself can take many forms.

Marine research programs and spatial distribution for marine research tourism across Australia

When asked to provide examples of particular marine research programs in Australia that may be suitable for MRT, respondents identified twenty seven examples (Table 5-14). These results indicate a key role of charismatic marine wildlife (e.g. whales, turtles, dolphins, sharks, and coral reefs) in MRT. They also echo many of the marine program and issues shown in Table 5-11 and Table 5-12. They also point towards the likely spatial distribution of these marine programs across Australia. This distribution is broadly across Australia but with less emphasis on the Northern Territory coast, far North Western Australia, and far north Queensland (i.e. Cape York and Gulf of Carpentaria), and cold southern Australian waters (i.e. the Great Australian Bight and Tasmania). Likely reasons for this are an overall absence of larger population centres and tourism infrastructure in those regions, and/or relatively harsh coastal and ocean environments. For example, far northern environments often feature higher densities of crocodiles, lethal jelly fish, hot temperatures, and yearly monsoon and cyclone events. Similarly, Cold southern Australian waters often feature cold climates and waters, and often unprotected seas.

Respondents were asked about the role of World Heritage, marine parks or reserves as an attraction for MRT in Australia. Fifty nine percent (n=27) considered those areas to be highly influential and thirty nine percent (n=17) considered these areas to be moderately influential. This is noteworthy as Australia has a significant number of these areas such as the Great Barrier Reef Marine Park, Ningaloo Marine Park, Reef and the South East Commonwealth Marine Reserve Network (Environment-Australia, 2008). This result strongly infers that World Heritage and other marine conservation status can act as an attraction to grow MRT in Australia.

Table 5-14: Examples (n=27) of particular marine research programs in Australia that may be suitable for MRT

ID	Marine research program	Australian State
1	Researching temperate reefs and sea dragons across Australia	Australia wide
2	Coral reef, mangrove and sea grass research across Australia	Australia wide
3	Researching sea birds on the coast, islands and oceans	Australia wide
4	Aquarium research, monitoring and maintenance	Australia wide
5	Water quality testing, and monitoring of runoff into estuaries, and monitoring of outbreaks of introduced marine plant species (e.g. seaweed such as *Caleurpa taxifolia*).	Australia wide
6	Researching New South Wales' temperate waters	New South Wales
7	Sub tropical coastal waters on the Australian east coast	New South Wales and Queensland
8	Sharks, dwarf minke whales, turtles, water quality, plankton, coral reefs research in Queensland tropical waters.	Queensland
9	Crown of thorns star fish counts and water sampling, Queensland	Queensland
10	Monitoring turtle nesting	Western Australia
11	Whale researching in northern Queensland	Queensland
12	Monitoring turtle nesting at Mon Repos, Queensland	Queensland
13	Dolphin, whale, turtle and dugong researching at Moreton Bay, Queensland	Queensland
14	Minke whale researching	Queensland
15	Coral reef researching in Queensland	Queensland
16	Crocodile research and monitoring	Northern Australia
17	Turtle research and rescuing turtles from feral pig predation in north of Australia	Northern Territory
18	Whale and dolphin research at Kangaroo Island, South Australia	South Australia
19	Sea grass habitat researching with Search, Victoria	Victoria
20	Whale research in Victoria	Victoria
21	Researching temperate reefs and sea dragons in Victoria	Victoria
22	Researching marine fauna at Rottnest Island, Western Australia	Western Australia
23	Coral reef researching in Western Australia	Western Australia
24	Turtle tagging in Western Australia	Western Australia
25	Researching whale sharks, sting rays and coral reef at Ningaloo reef	Western Australia
26	Researching dolphins at Bunbury	Western Australia
27	Researching turtle nesting in Western Australia	Western Australia

The adaption of current marine tourism and marine research programs

When asked about what current marine tourism ventures could readily be adapted to include a MRT experience, respondents again reflected the role of charismatic mega fauna and habitats (Table 5-15 and Table 5-16). However, one respondent highlighted marine tourism that focuses on less popular habitats such as estuaries and inter-tidal areas. Results also highlight the present and potentially increased role of, SCUBA diving, snorkelling, live aboards, aquariums,

day cruises, intertidal-walks, other coastal based research tours, fishing boats, universities, and land research tourism for MRT. Simple activities such as undertaking bleach watch (i.e. coral bleach monitoring); coral watch (i.e. coral watch monitoring); fish counts; taking notes; temperature measurements; and data input into a computer were also highlighted. It was also suggested that Australian MRT could collaborate with marine science training at universities and land-based research tourism in Australia.

Table 5-15: Current marine tourism ventures that could readily be adapted to include a MRT experience – part A

ID	Short description	Description
1	Bleach watch, coral reefs, SCUBA and snorkelling.	Bleach Watch could be incorporated in snorkelling and diving opportunities
2	Charismatic mega fauna	All the mega charismatic fauna watching. Tourists can take notes or collect on the individuals they see.
3	Coral reefs	Reef snorkelling trips could provide training in Coral Watch on the trip out to interested people, provide colour cards to use on the reef, and provide internet access back in town for people to submit their data.
4	Coral reefs	Most visitors to coral reefs or islands could be encouraged to count and report particular species of animals, e.g. daily sightings of turtles could identify seasonal variation in habitat use.
5	Coral reefs	I think there is a lot of potential for far north QLD, already established as an international marine tourist destination. I think many tourists would enjoy monitoring coral reefs and shores especially with new coral colour (match) monitoring cards.
6	Reefs, day cruises and aquariums	GBR island resorts, day cruises and aquariums such as Underwater World
7	Dive boats, coral reefs, fishing boats	Dive tourism operations
8	Dive boats, coral reefs, fishing boats	Dive boat operations (coral reef checks) and reef cleanups. Fishing operations (fish id and counts)
10	Fishing boats	Fish creel counts from fishing boats. Recording what fish were eating from fishing boats when fish cleaned.
11	Live aboards	Any live aboard vessels
13	Live aboards, whale sharks and turtles	GBR live-aboard SCUBA dive tourism industry (but they may not be interested/ready for it at present time). WA whale shark tourism industry. Possibly some beach-based turtle watching locations (but only likely to be effective with small groups of tourists).
15	Diving and temp. measurements	Divers out on reef could take temperature reading at different depths
16	SCUBA, snorkel tours, and whales	Snorkel and SCUBA tours to the barrier reef - reef watch. Charter boat fishing. Whale watching charters
17	SCUBA, whale and dolphin watching	SCUBA diving operators, dolphin and whale watching programs
18	SCUBA, whale and dolphin watching	Dolphin and whale watching, shark diving, cruises out to the barrier reef, Ningaloo reef

Table 5-16: Current marine tourism ventures that could readily be adapted to include a MRT experience – part B

ID	Short description	Description
19	Turtles	Turtle research
21	Whale sharks, SCUBA	Whale Shark Viewing, WA - develop into whale shark research volunteer program. Recreational tourist diving on Great Barrier Reef - develop into coral reef survey program
22	Whale watching	Whale watching, in particular during migrations north and south along the WA coastline.
23	Whale watching, weedy sea dragons	Whale watching - moving towards monitoring the less common species, weedy sea dragon monitoring and habitat surveys by snorkellers.
24	Snorkelling and intertidal walks	School and universities from overseas could participate in activities such as snorkelling/intertidal walks to collect information about species diversity/distribution. An example could be estuary watch in Victoria.
25	Marine science at universities	Training students as part of university courses that are also open to the public
26	Combining MRT with land-based research tourism	There are massive possibilities including a complete terrestrial to marine tourism research package, where people get to see an overall picture of the links between the sea and land, and how the two are intertwined.

When asked to provide examples of a marine research or conservation experience that could add to an everyday marine tourism experience, respondents provided a plethora of examples (Appendix 24). Analysis of those results show that many respondents considered marine research or conservation experiences that are associated with coral reefs, whales, dolphins, turtles, sea lions, water sampling, snorkeling, photographs, population counting, birds, fish, and generally interacting with scientists. One respondent cautioned that it would be ~~–d~~difficult to develop meaningful and genuine research involvement for tourists on short duration trips and in large group sizes". When asked about guidelines that they could give to someone who is developing MRT marine research and conservation program, a number of respondents, gave suggestions likes:

1. Anything that provides a simple mechanism for tourists to get involved and actually participate in the research process is a potential marine research program for MRT;
2. Nearly any specialty area can be made attractive to specialty interest groups if the groups are very well defined and marketed to;

3. Survey work associated with the design and establishment of marine protected areas;
4. Programs which cater to the various skill levels of the volunteer, have an outcome the volunteer can relate to and provide hands on experiences;
5. Programs that provides rapid feedback to the participant such as turtle surveys;
6. Projects that are likely be affected by media, contemporary trends and fashions such as climate change for example, but itself can take many forms.

5.2.4. Stakeholder opportunities for marine research tourism in Australia

Up to this stage, many of the potential MRT market, product and activities for MRT in Australia are identified. Following this, key stakeholder opportunities to provide those products were investigated. Specifically, the potential roles of 1) volunteer tourists; 2); Australian indigenous people; 3) non-government conservation organisations; and 4) marine education societies were assessed. Results from this are outlined next.

Volunteer tourist input into MRT marine science and conservation projects

To gauge the suitability of trained volunteer tourists to work on MRT marine science and conservation projects, respondents were asked a hypothetical question. The question was –Given 2 days of appropriate training, training personnel, training methods, equipment and other necessary resources, can volunteer tourists, without prior experience, satisfactorily assist with a range of marine research activities?" To assist with reliability of results, respondents were requested to skip this question if they felt that they were not qualified to answer.

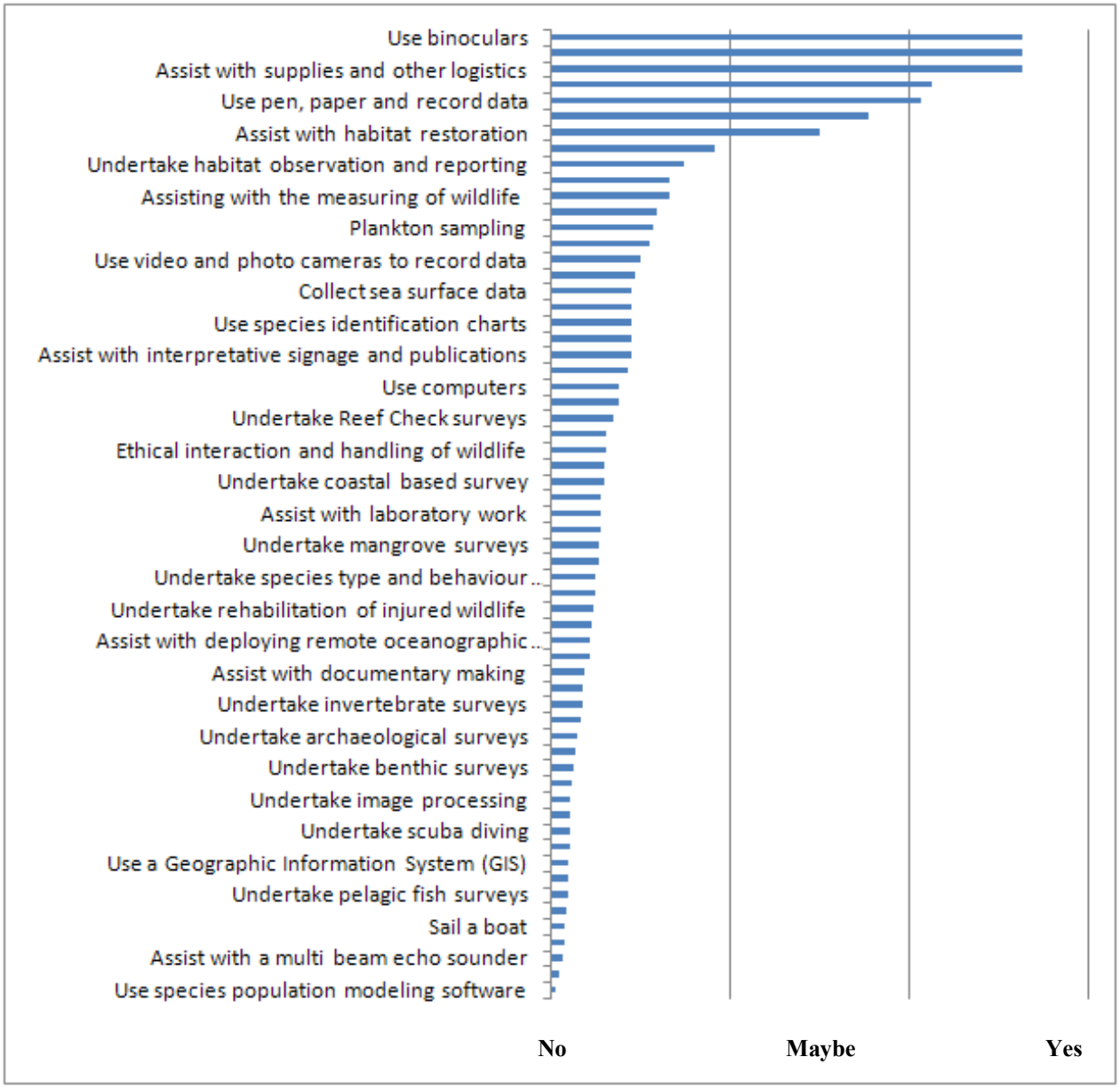


Figure 5.6: Can volunteer tourists, without prior experience, satisfactorily assist with the following activities?

Figure 5.6 results indicate that using binoculars, assisting with logistics, recording data, and habitat restoration are likely activities for those trained tourists. Activities such as using cameras, measuring wildlife, and plankton sampling were considered less likely. Using advanced research methods such as modeling software, a multibeam echo sounder, sailing a boat, and pelagic fish surveys were considered least likely. Given the expertise of many respondents, these results infer

that two days of training of an inexperienced volunteer tourist may bring a range of basic and useful skills, but will not suitably develop an advanced research capability for most marine research programs.

The role of Australian indigenous people in Australian marine research tourism

When asked about the likely roles for Australian indigenous people in Australian MRT, respondents focused on the paid involvement of Indigenous Australians to share their unique indigenous cultural and marine environmental knowledge with MRT tourists (Table 5-17). They also focused on the opportunity for Indigenous Australians to be further involved in the research and management of Australia's marine environment through MRT. Such results suggest that there is sizeable potential for future Australian MRT products that benefit Indigenous Australians and regularly employs and/or involves them in their business.

Table 5-17: Suggested likely roles of Indigenous Australians (Source: Survey outcomes from study two, step one)

Suggested role for or guidance from Indigenous Australians	**No. of suggestions**
Great and rare, knowledge and skills	9
Custodian/Advocates	7
Unique Australian experience	6
Where appropriate, MRT should benefit Australian Indigenous people	5
MRT requires consultation with Indigenous communities and TOs	5
Access to Indigenous lands may be an issue	4
Traditional knowledge for marine research	3
Partnership with scientists and/or managers	3
Guide roles for MRT	3
Cultural connections with the marine environment	3
Local knowledge	3
Training, capacity building for Indigenous Australians	3
Coastal ventures mainly and not outer the reef	1
Managing wildlife through MRT	1

The role of non-government conservation organisations in Australian marine research tourism

When asked about the likely roles for non-government conservation organisations, respondent's highlighted roles to advocate, endorse and promote MRT products. They also suggested; providing tourists, marketing services, credibility, leadership, and providing staff and guides to MRT companies. Additionally, conservation organisations could also participate in providing interpretation material, training, environmental best practice guidelines, and marine research program design. These results indicate that many respondents can foresee a coordination and service provision role for conservation groups in Australian into the future.

Table 5-18: Suggested likely roles of conservation organisations (Source: Survey outcomes from study two, step one)

Suggested role of conservation organisations	**No. of suggestions**
Advocate\endorsement\promotion\disseminate\organisers	9
Provide paying tourists from conservation groups, marketing, and add credibility to ventures	7
Provide staff and guides	4
Provide interpretation material	2
Be present and future leaders and mentors in MRT	2
Support community engagement	2
Resource stewards	2
Focus on rare, threatened, and endangered wildlife, and habitat	2
Potential benefit from MRT in terms of funding and promotion	2
Support training	1
Less constrained than government	1
Develop best practice guidelines	1
Research program design	1

The role of marine education societies in Australian marine research tourism

When asked about the likely roles for marine education societies, respondents suggested roles to advocate, endorse, and promote MRT products. They also highlighted that marine education societies could gain additional income from providing education, training, guides, scientific interpretation, and research management services to MRT companies.

Table 5-19: Suggested likely roles of marine educators (Source: Survey outcomes from study two, step one)

Suggested role of marine educators	No. of suggestions
Advocate/endorsement/promote	12
Trainers of tourists	4
Trainer of guides	3
Provide guides	3
Train students	2
Benefits to themselves	2
Providers of students	1
Provider of tourists	1
Provide science interpretation	1
Limited involvement due to lack of funding	1
Accreditation providers	1
Partner with ventures	1
Collaborate with local communities	1
Guide research management	1

5.2.5. Issues across different key stakeholder groups

The previous section identified opportunities for 1) volunteer tourists; 2); Australian indigenous people; 3) non-government conservation organisations; and 4) marine education societies to contribute to MRT in Australia. This next section presents a series of survey outcomes that reflect shared or contested views by stakeholder groups about various Australian MRT issues. These issues relate to 1) volunteer tourists, 2) the marine tourism industry; and 3) Government marine managers.

When asked how helpful can the involvement of suitably trained volunteer tourists be to marine research programs, 54 of 62 (87%) respondents responded ‗very much' (n=27) or ‗moderately' (n=27). 8 of 62 (13%) responded ‗somewhat' or ‗not very'. This ambivalence was from 4 of 9 (44%) marine managers, 3 of 13 (23%) marine researchers, and 1 of 4 (25%) tourism organisations. Such a result may imply that some marine managers and researchers may well be reticent to be involved with MRT that involves even suitably trained volunteer tourists. As stated by Brightsmith et al. (2008) and Coghlan (2008), a reason for this is that many marine researchers and managers would not see their role as tourism related and hence dealing with tourists is not their focus.

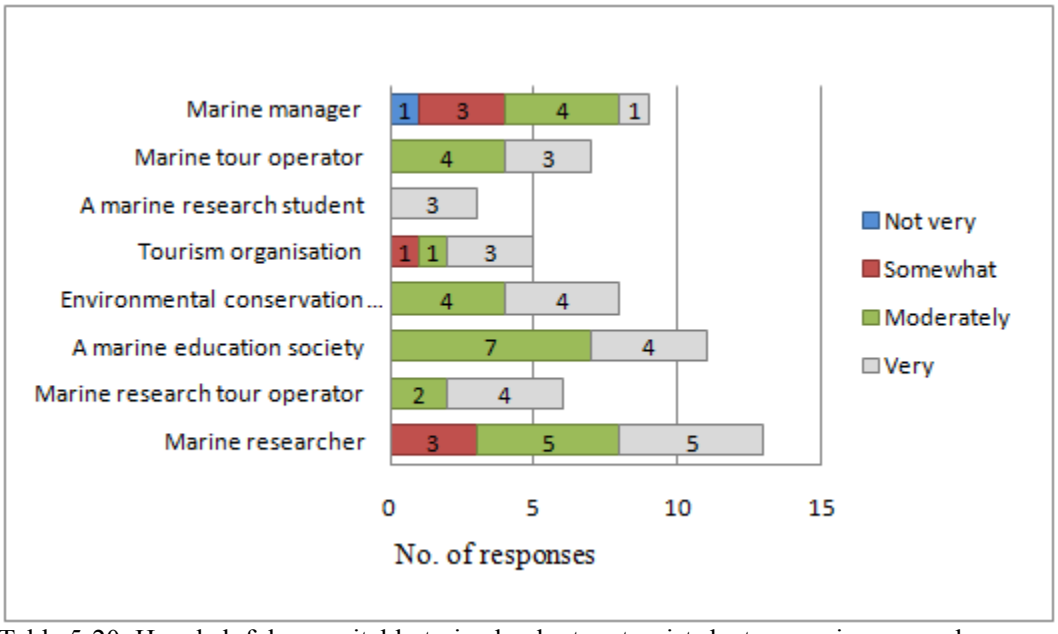


Table 5-20: How helpful can suitably trained volunteer tourists be to a marine research program (n=62)?

To follow up this proposition, respondents were asked how difficult can it be for a marine researcher who is undertaking marine research to directly supervise a volunteer tourist. Overall, there were many cautious views. For example, 41 of 60 (68%) of respondents considered volunteer supervision to be very difficult. This includes 6 of 9 (74%) of marine managers, 8 of 13 (61%) marine researchers, and 7 of 11 (63%) of marine educators. These results infer that many stakeholders including marine managers, researchers, and educators have concerns about marine researchers being directly involved in the supervision of volunteer tourists. Overall, ninety percent (54 of 60) respondents considered that it can be at least somewhat difficult for a marine researcher who is undertaking marine research to directly supervise a volunteer tourist.

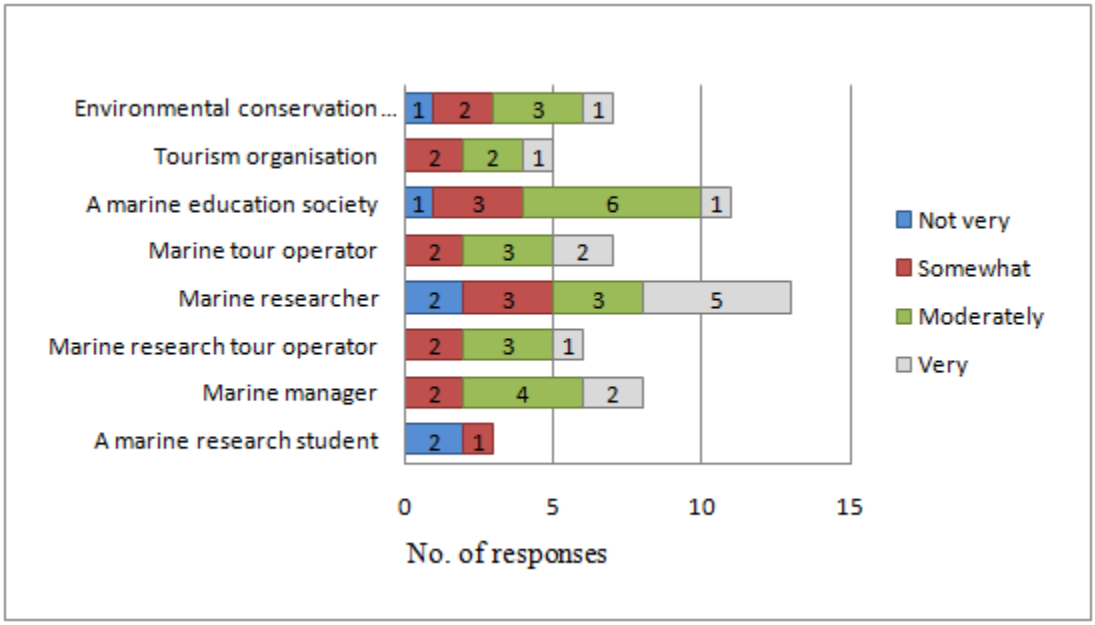


Figure 5.7: How difficult is it for a marine researcher to directly supervise a volunteer tourist (n=60)

Open text comments by two respondents highlight a range of factors that are important to supervising volunteer tourists. A marine manager stated that it ~~D~~depends a lot on the personalities involved, especially the interpersonal skills of the researchers and the tourists. It can be a very productive relationship - or it could be a total disaster. Clear and consistent and

constant communication is the key!" Furthermore, a representative of an environmental conservation organisation stated that _It depends on the complexity and whether there is an established training protocol, and the amount of time that the research tourist has available'.

Overall, such results imply that the active involvement of volunteer tourists in marine science and conservation projects can be a major hindrance to the development and operation of MRT products. For example, unless that barrier is overcome, many marine researchers and managers may be reticent to be involved in a MRT product. As indicated by Brightsmith et al. (2008), one possible approach to address this reticence is for MRT operators to use staff to undertake much of the required supervision of any volunteer tourists.

A formalised marine research tourism guide role

Following on from this, respondents were asked if there is an opportunity for a formalised MRT guide role within MRT. Such a guide could act to supervise MRT tourists and assist scientists. Figure 5.8 shows that 38 (68%) respondents responded _yes' to this question, 11(18%) responded _maybe', and 12 (19%) _could not say'. Notably, 4 of 9 (44%) marine researcher respondents responded as maybe or no. This indicates that some marine researchers may be hesitant to encourage the development of marine research programs whereby tour guides, operators and tourists are more likely to be advocates of such research.

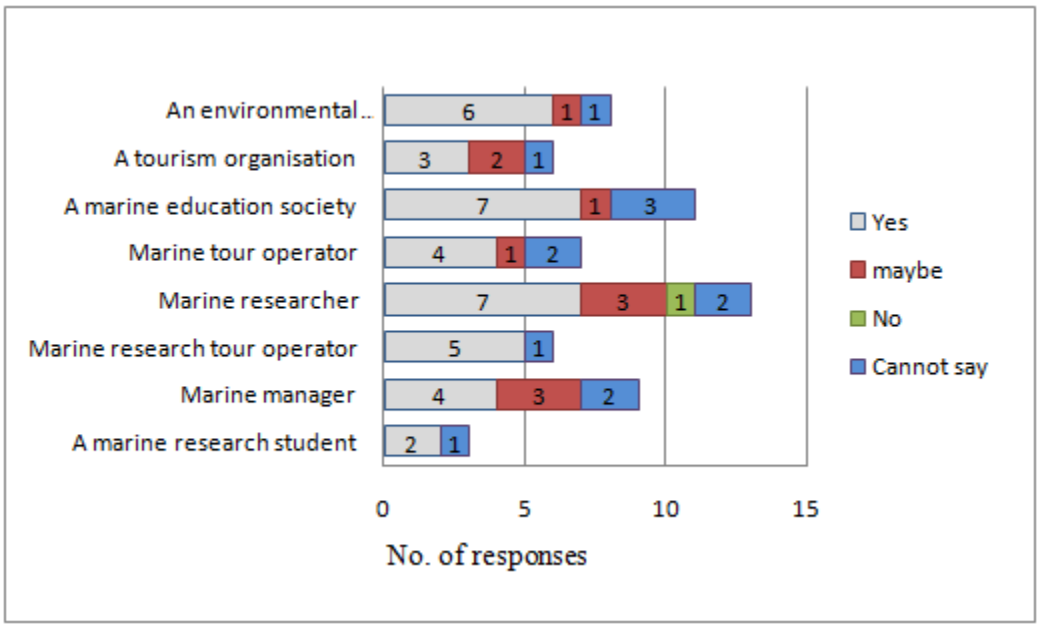


Figure 5.8: The opportunity for a formalised MRT guide role within marine research tourism (n=62)

Opportunities to formally train marine research tourists

When asked about the possible commercial opportunity to train and educate potential MRT tourists, there were a mixed range of views. Figure 5.9 shows that 25 (53%) of survey 62 respondents answered yes, and 21 (45%) responded maybe. Marine education societies (n=6, 75%) were most in favour of this proposition. Marine managers (4 of 6, 66%), marine researchers (5 of 10, 50%), representatives of environmental conservation organisation (3 of 7, 43%), tour organisation (2 of 4, 50%), and marine tour operators (2 of 5, 40%) responded as ‗maybe'. These results indicate that many key stakeholder groups would need further convincing about any proposal to commercially train potential MRT tourists to conduct marine research and conservation activities.

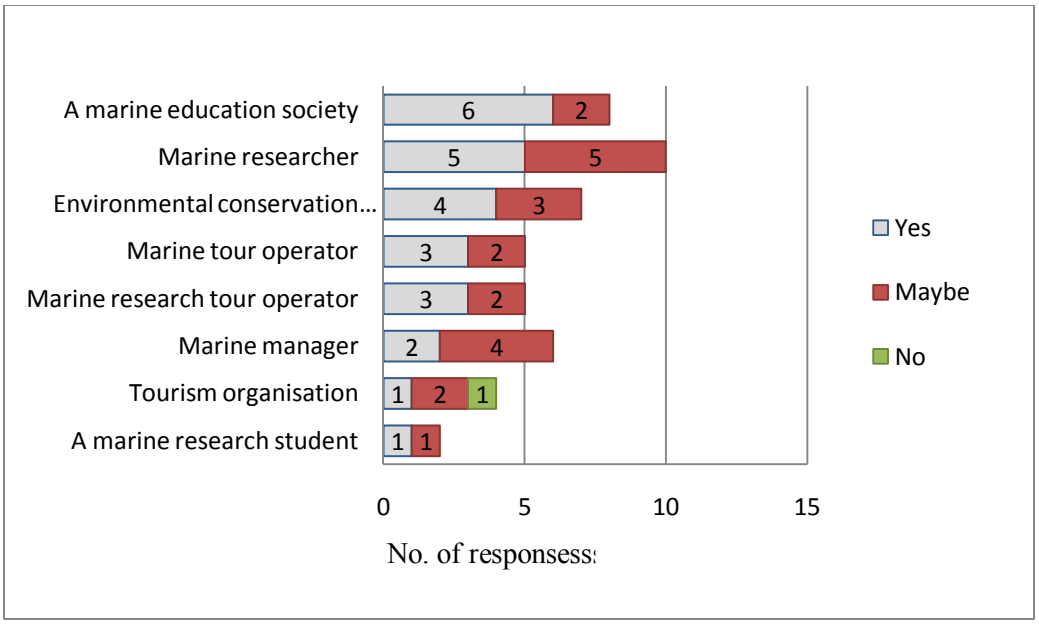


Figure 5.9: The possibility of commercial opportunity to train and educate potential MRT tourists (n=47)

Marine tourism industry involvement in marine research tourism

When asked why more than ninety five percent of Australian MRT ventures privately operated, the overall response from respondents was directed at government caution to be involved, the tourism industry's higher capability to operate tourism ventures, and business and lifestyle benefits to MRT tour operators. Full results are listed in Table 5-21 and Table 5-22. In summary, government caution was said to be due to marine research quality issues, bureaucracy, skepticism of MRT as a reliable marine research capability, and occupational health and safety issues. Such results appear to identify many of the reasons as to why government marine research and management agencies can be cautious about their potential involvement in MRT.

Table 5-21: Stakeholder comments about why there are high levels of private MRT company involvement in Australia MRT – part A

Key stakeholder	Comment
	Private industry capacity
Marine research tour operator	Private enterprises are able to access resources and make effective commercial decisions in a time frame that is commercially viable.
Marine researcher	Government agencies are not set up to operate tourism. Private industry is in a better position to respond to the demand for marine research tourism.
Tourism organisation	The ventures are run for a profit which then either goes to the company or back into more research. This is not a normal government activity.
Marine research tour operator	The world is increasingly commercial and everything needs to be financially sustainable. Given necessary regulation (i.e. interactions with wildlife), the private sector can achieve this if the project has long term sustainability and can achieve long term goals.
Environmental conservation organisation	Inherently this demonstrates that it is invariably individuals who are able to perceive a need and respond to it in terms of the overall tourism market place.
Tourism organisation	The need for flexibility in dealing with the tourists to ensure the tourists are happy is not normally found in government.
Environmental conservation organisation	Creativity on the part of marine tour operators in creating an appealing product.
Marine tour operator	Nature of the tourism industry - predominantly small, privately operated business operating for economic gain.
Environmental conservation organisation	There is less need for government researchers to use tourists when student volunteers and paid tourism staff are available.
Marine education society	The research tends to be outside government priorities.
	Government capacity
Marine education society	Government agencies are constrained by red tape and bureaucracy, issues with insurances etc. that restrict their ability to work with community at this level.
Marine research tour operator	Because the government cannot think outside the box. Government relies on simplistic models of management and not a culture of cooperation. The idea of partners in conservation is too messy for a government body with occupational health and safety, and audit management by numbers.
Environmental conservation organisation	Government marine research agencies do not currently perceive a need to involve research tourists and are inherently sceptical of the value of their participation.
Environmental conservation organisation	Because they are economically based investment decisions which governments struggle to make in an opportunistic way.
Marine tour operator	Government does not like to fund organisations that can make a dollar (i.e. have income), this is not a good criteria.

Table 5-22: Stakeholder comments about why there are high levels of private MRT company involvement in Australia MRT - part B

Marine research tour operator	The government management agencies are afraid of the unpredictability of tourists and the public in general.
Environmental conservation organisation	Government health and safety regulations.
Marine research tour operator	There are few (if any) public/government funding opportunities for such activities.
	Marine research quality
Marine manager	Governments will want to be associated with peer reviewed publications. Peer-reviewed publications need to be high quality. There is a perception that data collection and/or analyses done by volunteers are not as rigorous as trained technicians.
Marine researcher	Government does not support it. It is perceived as 'soft science'.
Marine researcher	Some would likely be conducting bogus research and using the marketing tactic for profiteering. To sort the wheat from the chaff, look for; 1. Government management agency-issued research permits (with appropriate scientific and ethical evaluation and formal reporting requirements) 2. Affiliations with legitimate research institutions (e.g. University or government agency) 3. Publications.
Marine education society	A long-standing belief by many researchers that volunteers cannot be trained adequately to provide meaningful assistance, yet private operators have recognised and addressed this issue.
	Benefits to MRT operators
Marine researcher	Private motives for support such as marketing or just feel good
Marine tour operator	Great and rewarding business opportunity for individuals.
Marine education society	Initial individual passionate people who have started an organisation towards achieving a goal in the area of their interest. I.e. people have started these ventures because of their passion for it, realised that the way to get assistance in funding is by having paying tourists assisting, which lifts the burdens of needing to find large grants.
Tourism organisation	Believe that research tourism is driven more by conservationists than by government, as their environmental focus is stronger and they are smart at enlisting celebrity endorsers, media and local community support.
	Advice
Environmental conservation organisation	The potential for MRT in Australia is high but under utilised. It is important to link private ventures into government agencies in a form of partnership to ensure that the information collected is validated and can be incorporated into management. The relationship may be direct or indirect through a relationship with a scientific institution/scientist that is linked into the agencies. Collecting scientific information for information sake is not appropriate in our view if better designed programs can ensure the information is used to protect and conserve marine species and habitats, which we would think most research tourists would expect they would be contributing to.

When asked can MRT successfully diversify marine tourism in Australia, of 25 of 39 (64%) key stakeholder groups stated ‗yes' and 14 of 39 (36%) stated ‗maybe' (Figure 5.10). 8 respondents stated that they ‗could not say'. Such a result indicates that, depending on commercial viability, there is an opportunity for an MRT to diversity marine tourism in Australia.

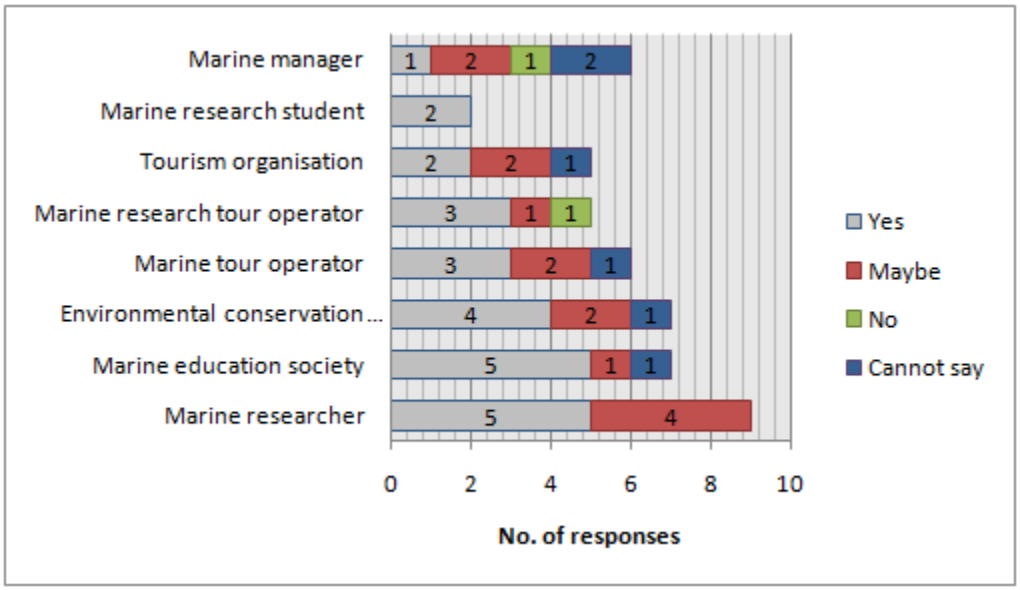


Figure 5.10: Can MRT be used to successfully diversify marine tourism in Australia? (n= 45)

When asked if a MRT experience can improve the commercial viability of marine tourism, 30 of 43 (69%) key stakeholders had positive responses (i.e. likely or very likely) to this question (Figure 5.11). Perhaps not surprisingly, 5 out of 5 MRT operators considered that a MRT experience as, likely or very likely, to improve the commercial viability of a marine tourism product. Tourism organisations also had positive view (i.e. 3 likely and 1 possibly) about this question, and this may indicate an inclination of tourism organisations to favour diversification and product development where possible. 11 of 12 (91%) marine education societies, environmental conservation organisations, and marine research students also had favourable views (very likely or likely) towards this question. This indicates that an overall stakeholder enthusiasm for future MRT in Australia and their potential involvement.

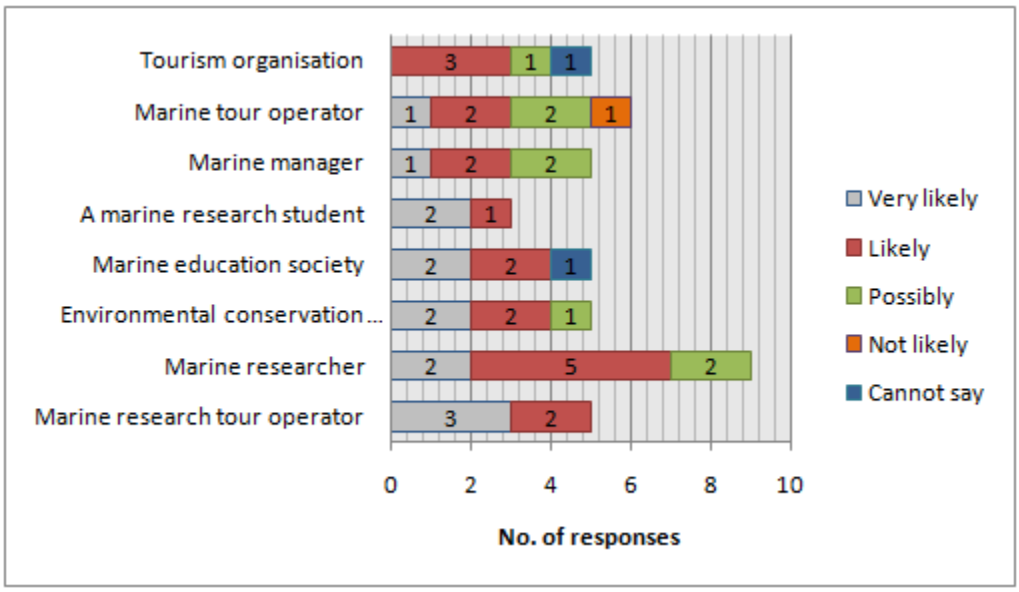


Figure 5.11: Possibility of MRT improving the commercial viability of marine tourism (n=45)

Conversely, marine tour operators had mixed views with 3 of 6 (50%) favourable views (i.e. very likely or likely) and 3 (50%) not favourable views (i.e. possibly or not likely). This indicates that some marine tour operators are sceptical about the commercial viability of including a MRT experience in their marine tour. Furthermore, 2 of 5 (40%) marine managers and 2 of 9 (22 %) marine researchers also had mixed views (i.e. possibly). This may indicate their reticence to have a service role that commodifies marine research as an MRT attraction.

When asked if MRT can be used in Australia to effectively compete with international marine tourism attractions, 28 of 41 (68%) of respondents stated _yes', 14 of 41 (34%) stated _maybe' and 5 of 46 (11%) stated _cannot say' (Figure 5.12). This indicates that there is an opportunity for Australian tourism product developers (e.g. tourism operators and marketing organisations) to actively support the development of MRT products in Australia and subsequently increase the international competiveness of the Australian marine tourism industry.

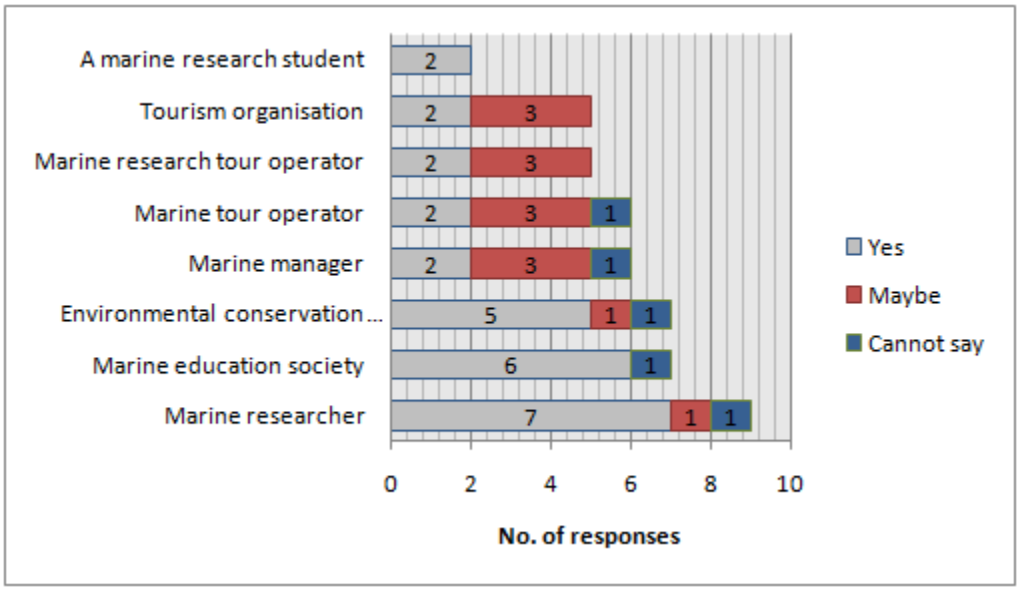


Figure 5.12: Can MRT be used to effectively compete with international marine tourism attractions? (n=46)

Government involvement in marine research tourism

Questions regarding government in Australian MRT focused on 1) the roles of Government marine management and researcher agencies; 2) the role of peer reviewed research publications, and 3) the role of popular marine science in government marine research or management priorities. When asked how important is the involvement of government marine research agencies in MRT, 16 of the 35 (46%) respondents believed that government marine research agency involvement in MRT is important and essential (Figure 5.13). Similarly, 19 of 35 (54%) believed that government marine research agency involvement in MRT is important but not essential. These results indicate that some stakeholders (including marine researchers and managers) could support MRT without the immediate involvement of marine research authorities. 7 of a total 42 (17%) respondents _could not say‘.

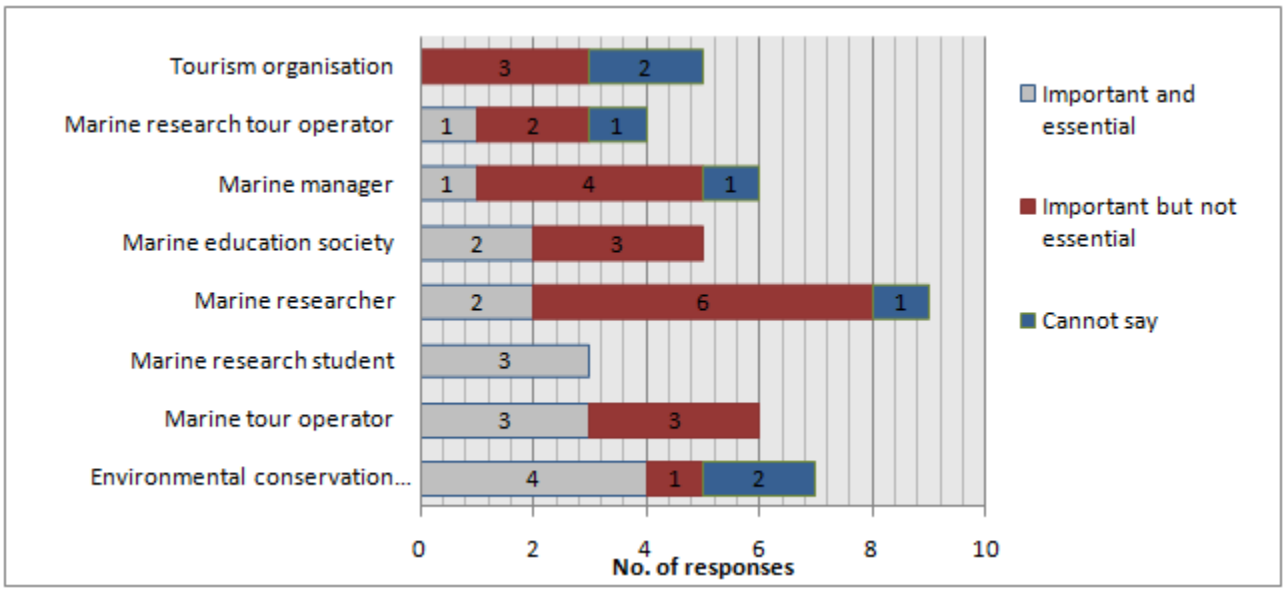


Figure 5.13: Importance of the involvement of government marine research agencies (n=42)

When asked how important the involvement of government marine management agencies in MRT is across Australia, 19 of 35 (54%) of respondents believed that government marine management agency involvement in MRT is important and essential (Figure 5.14). Similarly, 14 of 35 (40%) respondents believed that government marine management agency involvement in MRT is important but not essential. 3 of 35 (8%) stated ‗not important'. These results indicate that, from a stakeholder point of view (including some marine researchers and managers) it may be acceptable for many MRT products in Australia to operate outside the direct patronage (excluding permits) of Government marine management Agencies. Thus, it is possible that they may be able to pursue their marine conservation, research and education goals in an independent manner to Government marine management priorities if they chose to. Whether Australian Government marine agencies would support this independent research capability is are not clear and it is suggested that more information is needed to verify such an assertion.

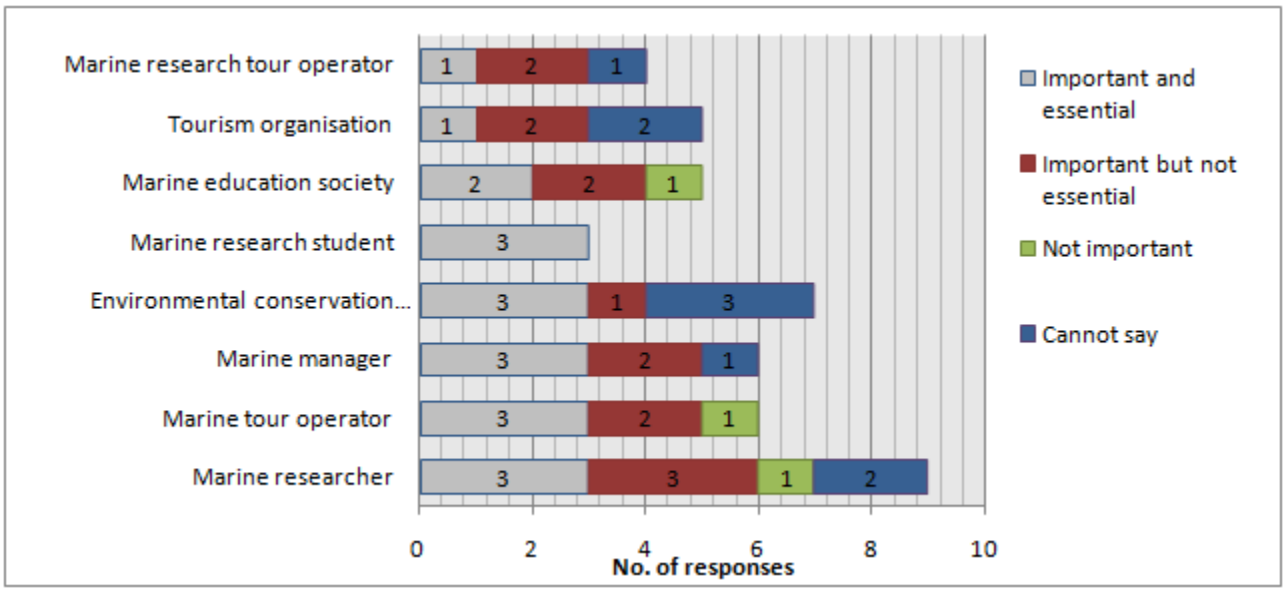


Figure 5.14: Importance of the involvement of government marine management agencies (n=44)

Notably, 9 of 44 (20%) respondents could not answer this question. They were from key stakeholder groups such as tourism organisations, environmental conservation organisations and marine researchers. It is possible this reticence is due to 1) a respect for the jurisdiction and independence of marine management agencies; or 2) self acknowledgement by the respondents that they do not have the enough knowledge to satisfactorily respond. However, without further information on that topic, this is speculation only.

Academic publications and marine research tourism

When asked how important are academic publications and conference presentations to a MRT venture, 40 of 44 (91%) respondents considered that academic publications and conference presentations are important and/or essential (Figure 5.15). The exceptions were a marine tour operator, a MRT operator, a marine manager, and a marine researcher. A possible explanation is that these respondents believe that MRT can plausibly operate outside of the marine research peer

review process. Such an occurrence could appeal to some MRT operators as they would have fewer publishing obligations while possibly still attracting a suitable market and delivering conservation outcomes. However there are potential benefits to MRT operators from producing academic publications from MRT. For example, in an open text comment, a MRT operator commented that academic publications are important for 1) longer term credibility of the MRT product; 2) attracting scientists to participate; 3) involving conservation groups, and 3) possibly gaining government funding. For this question, 5 of 49 survey responds _could not say'.

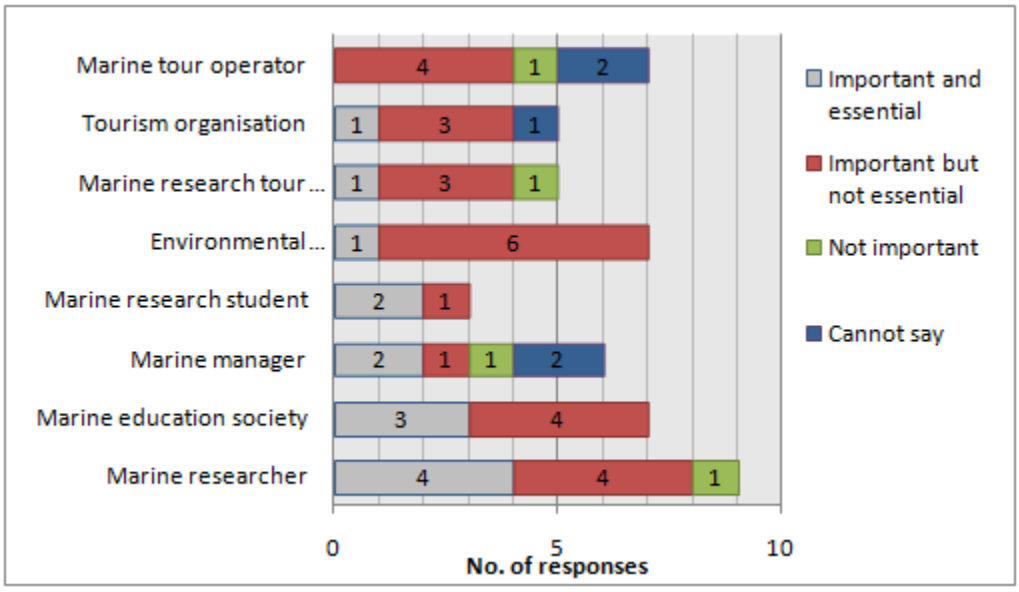


Figure 5.15: The importance of academic publications to MRT (n=49)

When asked if academic publications and conference presentations can increase government involvement in MRT, 28 of 44 (64%) respondents stated _yes' and 13 of 44 (30%) respondents said _maybe' (Figure 5.16). 3 of 47 survey responds _could not say'. Those (3 of 44) that said no to this proposal were a marine researcher (n=2) and marine researcher (n=1). While those latter numbers are limited (n=3), they may again indicate a reticence by some marine managers and marine researchers to recognise and fund MRT.

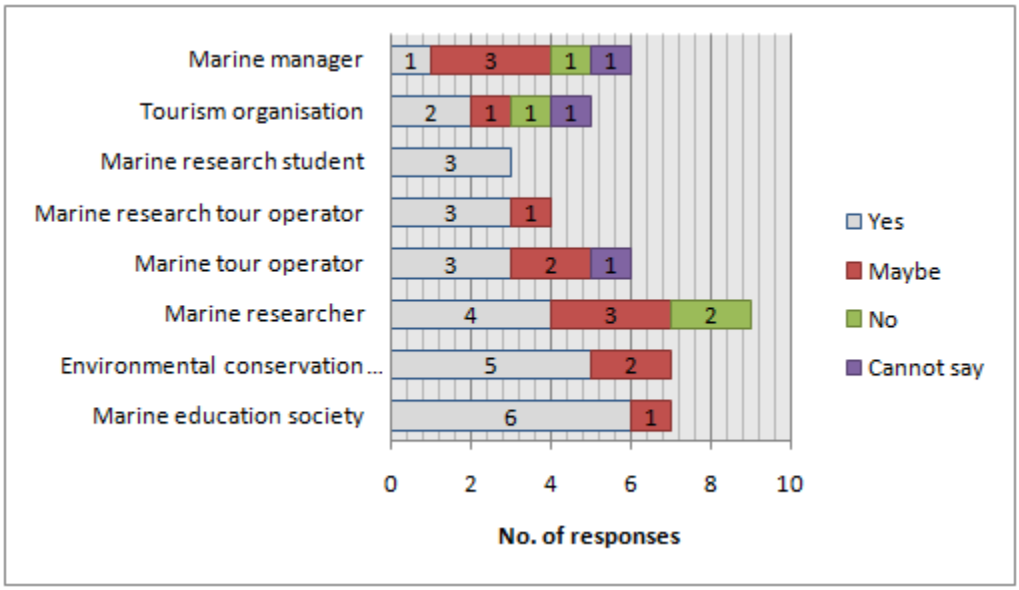


Figure 5.16: Academic publications and a possible increase in government involvement (n=47)

Government marine research priorities and marine research tourism

When asked if marine research programs on MRT venture's research programs should always be relevant to government marine research or management priorities, there were mixed views. For example, 12 of 44 (26%) respondents said _yes', 17 of 44 (39%) said _maybe', 15 of 44 (35%) said _no', and 4 of a total 48 said _cannot say' (Figure 5.17).

Just 1 of 8 (13%) of marine researchers and 1 of 6 (17%) marine managers considered marine research program relevance to be compulsory. These results clearly indicate that many marine researchers and managers do not believe that marine research programs on MRT ventures programs should always be relevant to government priorities. Conversely, 3 of 7 (42%) of conservation organisations considered marine research program relevance to be compulsory. This could indicate that some environmental conservation organisations have an interest in contributing and maybe influencing government marine research and management programs

through MRT. However, this is speculation and more information would be needed to verify if this is the case and what the implications for the future of MRT in Australia may be.

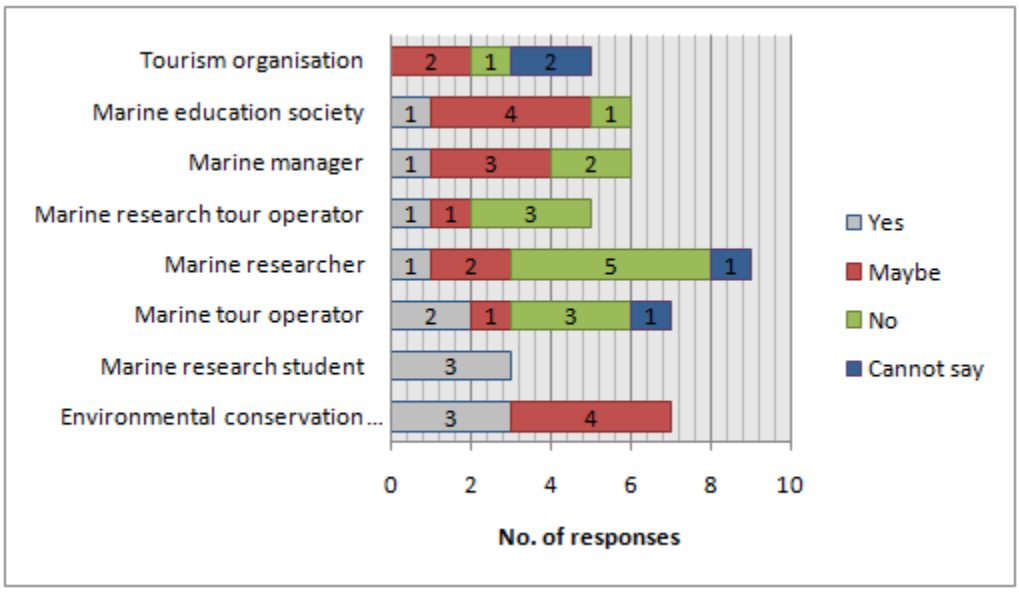


Figure 5.17: Relevance to government marine research or management priorities (n=48)

Popular marine science and marine research tourism

When asked if MRT ventures can involve popular marine science (e.g. whale, turtle and shark research) that does not address current government marine research or management priorities, 9 of 42 (21%) respondents said _yes‘, 18 of 42 (43%) said _maybe‘, 15 of 42 (36%) said _no‘, and 7 of a total 49 said _cannot say‘ (Figure 5.18).That is, there were also mixed views from respondents on this topic. Those that said _yes‘ were environmental conservationists (3), marine educators (3), marine researchers (2) and a marine tour operator (1). Those that said no were from environmental conservationists (3), marine educators (2), marine researchers (4), marine managers (3), tourism organisations (2) and a MRT operator (1). This indicates a broad level of disagreement amongst Australian MRT stakeholders about this topic. It‘s possible that

much of this disagreement is due to a shared concern that popular science focused MRT research seem like a wasted effort as it may not contribute to ‗more important' research priorities that are involve less ‗popular' marine science programs.

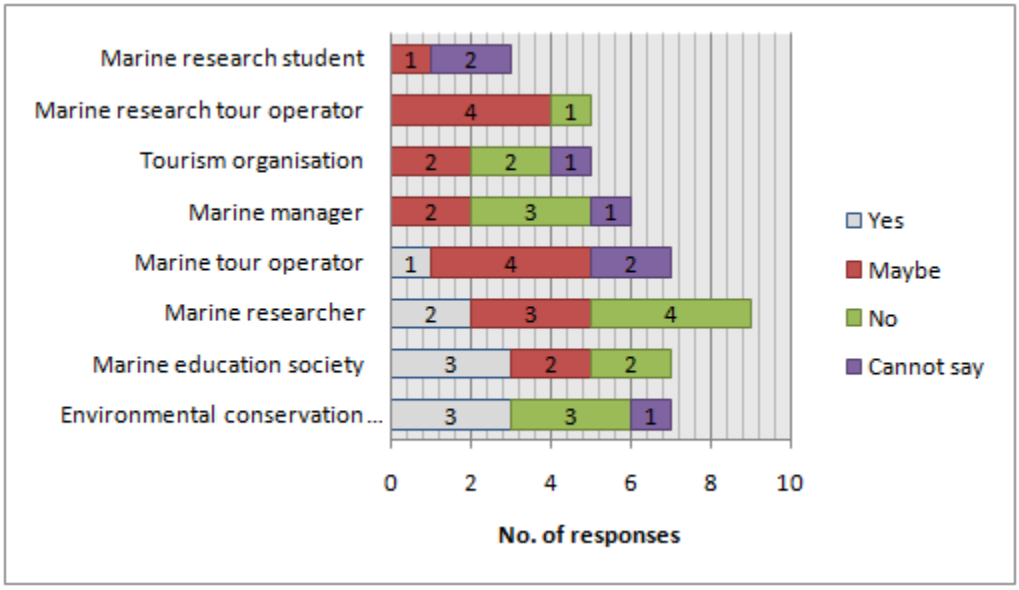


Figure 5.18: Popular marine science and current government marine research or management priorities (n=49)

The involvement of all stakeholders in Australian marine research tourism

Lastly, after all other survey questions, two final questions were posed to gauge the potential support of each stakeholder group for any collaborative development of Australia MRT into the future. The first question asked is the needs of the marine researcher, manager, tour operator, and marine tourist should all be satisfied for a successful MRT product to occur (Figure 5.19). The second question asked if all key stakeholder groups though that MRT could be ‗notably' expanded across Australia (Figure 5.20). The definition of notable was left up to the respondent, it is argued that an affirmative reply (i.e. yes) to that question indicates that a respondent has a positive view about the feasibility of expanded MRT in Australia.

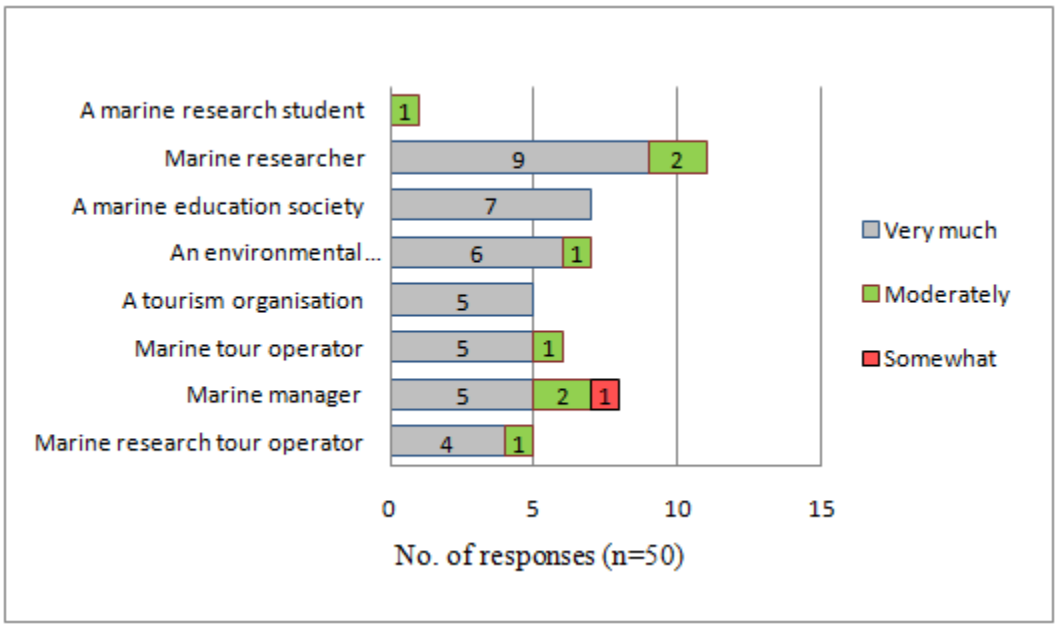


Figure 5.19: Need to satisfy the needs of the marine researcher, the marine manager, the marine tour operator, and the marine tourist (n=50)

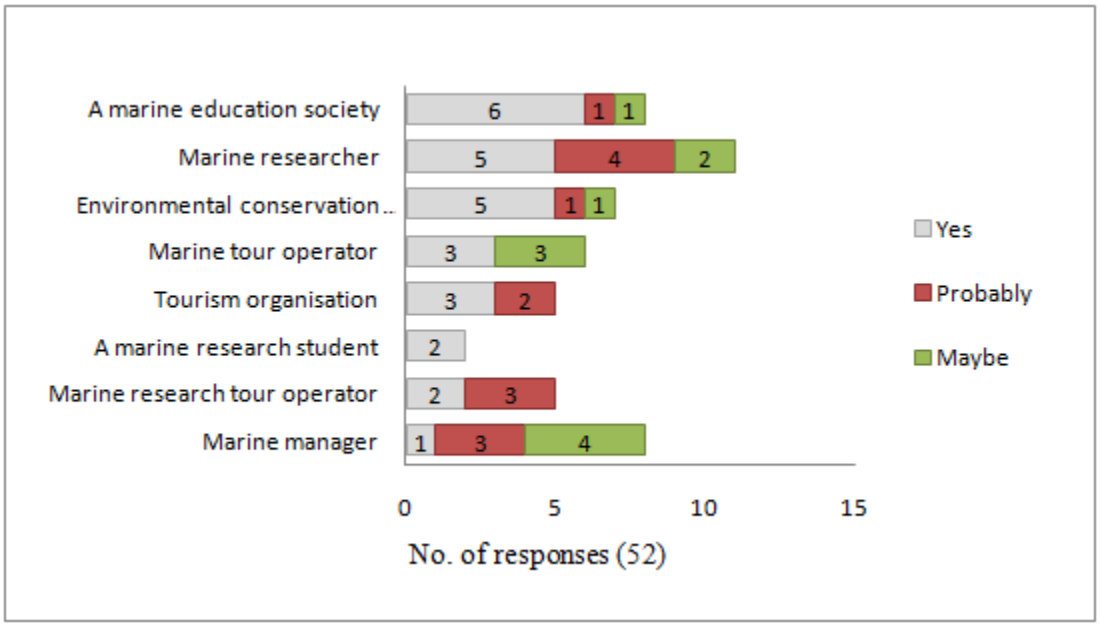


Figure 5.20: Can MRT be notably expanded across Australia?

These results indicate that that many key stakeholder groups would be supportive of collaborative MRT and expanding MRT in Australia. However, results shown in Figure 5.20 also indicate that some marine managers, researchers and tour operators would have their doubts

about MRT notably expanding across Australia. As previously identified in this chapter, these doubts are likely to be related to factors surrounding 1) the perceived role of MRT by Australian government marine research and management agencies; and 2) the perceived financial viability of an increased number and type of MRT operations in Australia.

5.2.6. Shared or contestable views of different key stakeholder issues

The above section described the various key stakeholder group views across different key stakeholder issues. Based on this information, a list of the contestable (n=7) and shared issues (n=8) across two or more key stakeholder groups is presented in Table 5-23 and Table 5-24. To link them with Moscardo et al.'s (2004) tourism system and for later use in this chapter, these statements are presented in terms of desired product characteristic or product constraint.

Table 5-23: Shared or contested views by stakeholder groups about various Australian MRT issues (n=15) – part A

ID	Step one survey question	Contest-able
	Desired product characteristic	
27	Volunteer tourists care said to be helpful to marine research programs. How helpful can the involvement of suitably trained volunteer tourists be to marine research programs? (Mixed views)	Highly
37	Can marine research tourism be used to successfully diversify marine tourism in Australia? (Mixed views)	Somewhat
36	Can the development of marine research tourism across Australia be used to effectively compete with overseas marine tourism attractions? (Mixed views)	Somewhat
44	Is there is a potential commercial opportunity to train and educate prospective marine research tourists? (Mixed views)	Somewhat
146	Can the commercial viability of existing marine tourism operators be improved by introducing one or more marine research tourism experiences? (Answer is yes)	Shared
115	Is there an opportunity for a marine research tourism guide role within a marine research tourism venture? (yes)	Shared
199	How important are academic publications and conference presentations to a marine research tourism venture? (Important and/or essential)	Shared

Table 5-24: Shared or contested views by stakeholder groups about various Australian MRT issues (n=15) – part B

ID	Step one survey question	Contest-able
	Desired product characteristic	
201	In the future, how important will the involvement of Government marine research agencies in marine research tourism across Australia be? (Important and/or essential)	Shared
200	In the future, how important will the involvement of Government marine management agencies in marine research tourism across Australia be? (Important and/or essential)	Shared
135	It is proposed that a successful marine research tourism venture should satisfy the needs of the marine researcher, the marine manager, the marine tour operator, and the marine tourist. Please indicate how much you agree with this statement? (yes)	Shared
147	Can MRT be notably expanded across Australia? (yes)	Shared
	Product constraint	
26	How difficult can it be for a marine researcher who is undertaking marine research to directly supervise a volunteer tourist? (Mixed views)	Highly
16	Can popular marine science in MRT restrict any Government involvement in marine research tourism? (Mixed views)	Highly
22	Do you believe that marine research programs on marine research tourism tours should always be pertinent to Government marine research or management priorities? (Mixed views)	Highly
166	Can increased academic publications or conference presentations from marine research tourism ventures be an incentive for Governments to be further involved in marine research tourism ventures? (yes)	Shared

5.2.7. New, important and potentially contestable views about MRT in Australia

Finally, respondents had the opportunity to provide open text comments on many survey questions. As identified by the researcher, their comments generated 12 new, important and/or potentially contestable stakeholder views about Australian MRT (Table 5-25). Those views broadly focus on 1) the possible roles of Indigenous Australians; 2) the experience of the MRT tourist; and 3) the involvement of the marine research community. To test if these views are shared or contestable across one of more key stakeholder groups they were selected for research step three in this chapter. This research step surveyed eight key stakeholder groups about the possible contestability of key stakeholder views about MRT in Australia.

Table 5-25: New, important and/or potentially contestable statements (n=12) identified from research step one

Key stakeholder group	Open text statements from survey	Key MRT element
	Desired product characteristic	
Conservation organisation	When possible, it is important that marine research tourism in Australia actively engage with indigenous Australians in the development of Indigenous focused marine research tourism businesses	Community
MRT operator	A possible marine research tourism venture with great potential is a complete terrestrial to marine tourism research package, where people get to see an overall picture of the links between the sea and land, and how the two are intertwined.	Ecotourism
Marine researcher	To expand marine research tourism in Australia, there would need to be a peer review system by the scientific community, of the research undertaken, the data collected, occupational health and safety, and education standards.	Marine research
Marine manager	When on marine research tourism ventures, marine researchers should seek to recognise that it is a privilege to have people pay to be involved with them and to support their research.	Marine research
Marine manager	Hence, marine researchers should recognise this important role of tourists by always treating them in a professional manner, communicating effectively and frequently, providing quality information about the marine research project, and thanking them for their contributions.	Marine research
Conservation organisation	For a marine research tourism venture, there needs to be a method to capture, assess and use the tourists' own thoughts on future research directions and what they believe the key issues are for conservation.	Scientific tourism
Conservation organisation	Where possible, marine research tourism in Australia should seek to _open the doors‘ to the lay person and always make them feel welcome.	Scientific tourism
	Product constraint	
MRT operator	A potential major barrier to developing marine research tourism in Australia is lower cost marine research tourism opportunities for tourists in other regions of the world.	General tourism
Marine manager	Australia marine research tourism needs to protect its reputation. If marine research tourists go home and say the diving was OK, the food and the company were OK, but they were 'spare wheels' as far as the project was concerned, neither they nor their friends will be back for a repeat experience. They will just go diving instead or join a marine	MRT
Marine researcher	The diversion of Government funds from pure research to research tourism will divide the academic and the tourism industry and this will reduce the possibility of collaboration between marine researchers and marine research tourism industry.	Marine research
	Tourist characteristic or constraint	
Marine researcher	Without a clear link to a conservation goal, many marine biological studies will not appeal to tourists.	Marine conservation
Marine researcher	The 'I always wanted to be a marine biologist' dream of many people is an important driver for marine research tourism. Marine research tourism should tap into that market.	Scientific tourism

5.3. Research step two - results

Research step one provided a set of stakeholder views about the potential for different MRT products, destinations and activities in Australia. It also generated an initial set of key stakeholder views about Australian MRT that are shared and contested across different key stakeholder groups. To further understand the diversity and contestability of key stakeholder views about Australian MRT, research step two undertook a series of semi-structured interviews with 44 key stakeholders from eight key stakeholder groups. The number of interview statements, key stakeholders, and type of interview contact for each key stakeholder group are presented in Table 5-26. The interview process resulted in 581 interview statements and/or facts, and from these statements, 205 relevant interview statements were identified by the researcher as relevant outcomes to this study of present and future MRT in Australia.

Table 5-26 Number of interview statements by key stakeholder group, and type of interview contact

Key stakeholder group	No. of key stakeholders	No. of interview statements	In person, 2007	In person, 2008	Phone discussions
MRT operator	13	115	42	38	35
Marine educator	6	21		18	3
Marine researcher	7	19		6	13
Marine tour operator	7	17	1	14	2
Marine manager	7	15	10	4	1
Marine conservation organisation	3	13	1	12	
Tourism destination manager	1	3			3
SCUBA diving organisation	1	2			2
Total	**44**	**205**	**54**	**92**	**59**

As described in Chapter Three, these 205 statements were classified according to their key stakeholder group and the five categories shown in Table 3-31. The full set of interview statements are listed in Appendix 25. The frequency of each category and related stakeholder group are presented in Appendix 26. Table 5-27 shows the frequency of different tourism-system components (Moscardo et al., 2004) across the 10 key MRT elements in Figure 1.1). This indicates that Moscardo et al.'s (2004) tourism-system and this thesis's proposed conceptual framework are linked through the interviewee's statements. The next section presents and discusses important key stakeholder views from these interviews. The first stakeholder group discussed is marine managers.

Table 5-27: Tourism system components (Moscardo et al., 2004) by key MRT element

Key MRT element	**Tourism system component**			
Intended benefit	**Desired product characteristic**	**Product constraint**	**Tourist characteristic**	**Total**
Marine research or management	32	20		52
Environmental conservation	10	5	3	18
Community benefits	6			6
Tourism type	**Desired product characteristic**	**Product constraint**	**Tourist characteristic**	
Adventure tourism			1	1
Alternative tourism			1	1
Ecotourism tourism	11	4	2	17
Education tourism	14	4	1	19
General tourism	2			2
Marine tourism	5	1	1	7
MRT tourism	34	19	3	56
Scientific tourism	7	4	4	15
Volunteer tourism		2	1	3
Wildlife tourism	3	2	3	8
Total	**124**	**61**	**20**	**205**

5.3.1. Marine managers

Marine managers (n=7) provided 15 important interview statements. These are fully listed in Appendix 25. In terms of desired product constraints, a regional marine manager of Queensland's (QLD) Parks and Wildlife Service (i.e. a State agency) highlighted the role of scientific research permits for marine research in MRT. For example, Great Barrier Reef Marine Park Authority (GBRMPA) permits guidelines state that the marine research can be 1) full research and needs a research permit; or 2) limited research when no research permit is needed. A consequence of this is that some limited research may well be for private purposes (i.e. not shared with research agency or published), and marine management agencies need not provide a research permit.

In terms of desired product characteristics, results suggest that if MRT operators are granted research permits to restricted marine areas (e.g. green and pink zones on the Great Barrier Reef), then marine managers are likely to set high standards for MRT. For instance, the QLD regional manager suggested that to gain permits for such research, a MRT operator would need to 1) demonstrate that their marine research is high quality and useable; 2) publish and/or share their marine research outcomes with marine research agencies; and 3) have a low or no ecological foot print operation. The same marine manager also stated ~~–if~~ these conditions were met, not only could access to restricted areas be permitted by MRT operators but they should be recognised by a higher level of ecotourism accreditation (e.g. NEAP, 2010) than presently exists".

A regional manager of Victoria Parks (i.e. a State agency) stated that ~~–T~~here is a need for real research and real data quality and analysis from MRT ventures. Similarly, the QLD regional

manager stated that –in most cases (except with highly trained tourists and marine tour operators), marine researchers will be essential for coordinating and quality assuring the research, monitoring and survey activity". However, the Victorian regional manager stated that –public education, awareness and other benefits are also significant outcomes for MRT". Supporting this, the QLD regional marine manager also stated that –it is conceivable, that some limited research tour operations may not have an emphasis on research output but rather concentrate on satisfying needs of tourist and the MRT operator".

Human resources for the marine researcher role of a MRT product were raised. The QLD regional marine manager also stated that –due to funding constraints of Government marine management and research agencies, MRT cannot expect a great deal of financial resources from those agencies". He suggested that –human resources for extra marine researchers on MRT ventures may often need to come from the private market and many MRT operators need to adapt to this circumstance".

In terms of possible MRT tourist characteristics, a Director of a Federal Government Marine Management Program stated that the –likely negative impacts from climate change will play a significant role in increased consumer demand for MRT". A Western Australian marine manager stated that –people are interested in anything new even if they do not know what they can do". This implies that new MRT products (e.g. expeditions to new and remote locations) and marine research topics (e.g. rare and novel wildlife) may well increase demand for MRT. A Director of a National Marine Management Network raised the notion of a MRT _trail' across Australia that is linked with museums, zoos, aquaria, and marine discovery centres. The notion

of a MRT trail is also raised later in this chapter by other key stakeholder groups such as MRT operators and a marine educator. Finally, as an overarching desired product characteristic, a former CEO of the ARC Centre of Excellence for Coral Reef Studies in Australia, highlighted that "data from marine programs from MRT ventures needs to be converted into knowledge, wisdom and understanding".

5.3.2. Marine researchers

Marine researchers (n=7) provided 9 interview statements. These are fully listed in Appendix 25. In terms of desired product characteristics, interview outcomes show that marine researchers have a clear focus on reliable, useful and effectively disseminated marine research outcomes from MRT products. For example, a Director of a marine research branch at the Australian Institute of Marine Science (AIMS) stated that:

1. MRT must contribute data of uncompromised quality to the research project;
2. There needs to be useful data and effective links with researchers;
3. MRT must be strongly supported by the researcher's host organisations in terms of logistics and requirements for occupational health, safety and environment;
4. A MRT venture should add to the prestige and scientific reputation of the project among scientific peers of the researcher;
5. MRT must broaden the network of the general public who are empathetic with marine research;
6. MRT should provide the tourist with a challenging and rewarding experience.

A marine scientist at the University of Tasmania stated that –MRT should support more marine parks around Australia as this is desirable for the conservation of Australia‘s marine environment”. He also identified opportunities for MRT products namely 1) marine bird watching around Tasmania; 2) using satellite tagging, ultra sonic tagging and conventional observation methods; and 3) remotely operated vehicles, drop cameras and global positioning systems. He expressed that –with appropriate training and supervision, MRT tourists may also have the opportunity to use these technologies”. Finally, this scientist remarked that because of 1) the proximity of Australia‘s major city centres and research facilities; and 2) the quality, diverse and interesting marine environments, it is somewhat surprising that there are not more MRT ventures in Australia‘s temperate waters”. To partly explain this, a marine researcher from the Flinders University stated that; 1) –Much of the coastline off southern Australia is cliff like, quite inaccessible and unsafe; and 2) Seasonality and wave conditions also play a part in safe access to those coastal areas”.

In terms of possible MRT tourist constraints, a director of an Australian marine research station stated that –Asking a general tourist to be actively involved in advanced marine research is like asking an airplane passenger to be a steward or even a pilot”. He also stated –that professional marine research work can be repetitive and hard work” and is therefore not suitable for the active involvement of vacation minded MRT tourists. Another leading marine researcher at AIMS stated that 1) –Most professional researchers do not want tourists watching them while they work”. An assistant at a marine research station stated that –marine research facilities are not enthusiastic about general tourists watching some of the more intrusive marine research procedures such as; handling wildlife”. Finally, a research development manager at AIMS stated

that –organising all of the marine research, conservation and tour operation aspects of a MRT product requires a relatively highly skilled person".

5.3.3. Marine conservation organisations

Marine conservation organisations (n=7) provided 13 interview statements (Appendix 25). Interview outcomes were mostly (11 of 13 statements) provided by a Director of a peak marine conservation group in Australia. As such, this section is particularly revealing about their views about MRT and its potential in Australia. However, if their views are accepted as fairly representative of other marine conservation stakeholders in Australia, then interview outcomes indicate a likely positive view by marine conservation groups towards Australian MRT.

To begin, the peak marine conservation group director stated that –as pristine quality of marine areas decrease across the world, there will likely be an increased demand for MRT funded marine science and conservation benefits by marine managers, marine researchers, marine conservation agencies". He also remarked that –due to the negative effects of climate change, the public's increased awareness and concern for the marine environment will be a major driver for demand for MRT". Due to these driving forces, he also viewed MRT as a commercially viable way to diversify marine tourism in Australia.

In terms of desired product characteristics, a spokesperson from a Hawaiian marine conservation group highlighted that –it is necessary to involve Australian indigenous people with the direction, development and operation of Australian MRT". Complementing this view, the marine conservation group director saw MRT as being a low environmental impact tourism product that aims for increased public awareness and research/monitoring benefits to marine

researchers, managers and conservationists. For increased benefits to tourists, he suggested that –MRT can be devised as an opportunity for the tourist to be inspired and train to become a marine researcher, manager, or conservationist". He also saw MRT as a way to develop a higher level ecotourism certification than existing advanced ecotourism accreditations (NEAP, 2010). This higher level of ecotourism certification would be obtained when there are increased benefits to marine researchers, managers, conservation and tourists. Finally, he suggested that a MRT guide role could be developed to effectively deliver such benefits to those stakeholders. He likened such a role to a privatised marine ranger role. Such a view is similar to the conclusions about this topic by Brightsmith et al. (2008) and Coghlan (2008).

In terms of product constraints, there were some cautionary comments from the interviewees about the nature and possible future of MRT. A third conservation group representative (i.e. a director of a world whale and dolphin foundation) remarked that –many scientists are sceptical about the quality and use of volunteer collected data". However, the main conservation group director did remark that quality research outcomes may not be essential as MRT research outcomes can be poor but can have a quality educational outcome and this can be acceptable. He also highlighted some major barriers to MRT as he perceived them. The first barrier was that –some Government departments behave as if they are not in favour of marine conservation and sometimes do not share marine research data with marine conservation projects". The second barrier was that –some sizeable public demographics in Australia behave as if they are not in favour of marine conservation". When stating this, he was referring to a perceived intensive and degrading use of a major Australian harbour's marine wildlife and habitat by recreational fishers, boat owners, and mass tourists.

5.3.4. Marine educators

Marine educators (n=6) provided 21 interview statements (Appendix 25). Overall, interview results suggest that marine educators see MRT as an opportunity to further educate the public about the marine discovery and science, and subsequently assist with conservation, use, management and stewardship of the marine environment. They also provided insight into the nature of, issues and opportunities for a MRT industry in Australia. For instance, a representative of a large natural sciences museum remarked that ~~–t~~heir deep sea marine exhibits are a very popular and fascinating topic for the public". She also forecasted that ~~–c~~limate change and its impact is becoming an interesting research topic for potential MRT tourists."

The Director of a national marine education society believed there should be ongoing and increasing tourist participation in MRT. She stated that ~~–O~~ne of the core elements of sustainable MRT is that the marine research and tourism industry takes into account the latest approaches to environmental education". A former director of that national marine education society advocated that ~~–t~~he communication of Government marine research outcomes should form ten percent of the budget for all marine research programs". In this context, it was stated that MRT could play a role in government marine research education programs.

Marine educators had a range of insights regarding marine education. For instance, an owner of privately funded marine discovery centre in NSW stated that ~~–t~~here is no more effective interpretation device than a live human being". A Director of a State sponsored marine education centre stated that ~~–M~~RT should aim to interpret the science that underpins marine management". The head curator at a large scale marine aquarium in NSW stated that ~~–w~~ith notable exceptions, often marine researchers do not make good communicators to the public or

marine tour guides". Notwithstanding this, the former director of a national marine education society stated that –marine researchers and marine tour operators can both play an important role in communicating the marine research experience and story to the tourist".

Marine educators also had a range of views about the role of MRT in marine research, and how MRT can assist scientific research and conservation of the marine environment. For instance, the head curator of a large marine aquarium stated that –supporting MRT should become a mandated project area for Government marine research and management programs". A Director of a State sponsored marine education centre stated that –MRT can support management of marine parks by providing marine research and monitoring information to key stakeholders such as marine managers, marine managers, and marine conservation groups." The Director of the national marine education society emphasised that –environmental education for sustainability involves a vision and a mission of personal and social change". Demonstrating such a mission, an owner of a privately funded marine discovery centre in NSW remarked that –MRT should seek to change the way people look and feel about the marine environment".

Marine educators saw an important relationship between marine discovery centres and MRT. The owner of the privately funded marine discovery centre in NSW remarked that –when compared to ocean based MRT vessels, land-based marine discovery centres are a lower cost way to bring the wonders of marine research and the environment to the public". The former director of a national marine education society stated that –marine discovery centres can educate and train people for both the supply of and demand of MRT products". He also stated that there could be –publicly funded marine discovery centres that are funded by tourism, philanthropy,

marine research program funds, volunteer contributions, and information services such as marine interpretation" he said. He also stated that "future MRT in Australia could result in a broad network of MRT products, discovery centres, community groups, conservation agencies, and marine research and management agencies". As part of this, he suggested that "MRT stakeholders should seek to develop a MRT 'trail' across Australia that promotes and links an organised network of different MRT attractions and products".

Finally, the head curator of a large marine aquarium in NSW identified an approach to MRT that can remove some of the identified tension between providing services to tourists and supporting the needs of marine researchers. He suggested that "many MRT ventures can take a low interference approach, whereby MRT tourists have limited interaction with a marine research facility or people, but the marine research facility provides and authentic setting for the MRT attraction, and also can provide some expertise or resources". Such a role would require additional endeavour by the MRT operator and staff to deliver an authentic marine research experience. The privatised marine ranger role that was identified in Section 5.3.3 by the peak marine conservation group director could potentially assist with that endeavour.

5.3.5. Marine tour operators

Marine tour operators (n=7) provided 18 interview statements (Appendix 25). Four marine tour operators were from main-stream marine tour operators from northern Queensland. Two operators were from whale and dolphin watching ventures in Jervis Bay, New South Wales. One operator was from a dolphin watching venture in Port Phillip Bay, Victoria, and another was from a marine wildlife tour company in Hobart, Tasmania. Six of the eight interviewed marine

tour operators were clear advocates for marine research tourism and could see its potential within their company. For example, one of the Jervis Bay operators is actively involved in collecting whale and dolphin scientific data and sharing that information with interested guests. Similarly, the Port Phillip Bay operator expressed a desire to involve customers in the conservation and research of Port Phillip Bay's dolphin population where possible. The Tasmanian operator already used underwater cameras to bring the cold depths of the Tasmanian's d'Entrecasteaux Channel to life for their customers. Other statements that capture some of this level of support for MRT are presented in Table 5-28.

Table 5-28: Supportive statements about MRT by marine tourism operators

Interview statement	**Interviewee**
Employment and logistics support for MRT should be drawn from the local community	Tasmanian marine tourism operator
A MRT tour must have conservation, research or other educational message that leads to increased awareness and action by the traveller	Tasmanian marine tourism operator
MRT can encourage critical thinking skills by its tourists.	Jervis Bay whale and dolphin operator
MRT can contribute to making a marine park a far more economically sound alternative to a local fishing industry.	Jervis Bay whale and dolphin operator
Marine tour operators should provide proceeds, data and/or research capabilities to marine researchers.	Tasmanian marine tourism operator

Caution by marine tourism operators about any expansion into MRT in Australia was usually because they had concerns about the market potential for MRT and economic viability of MRT. For example, a marine tour operator from Port Douglas was recorded as saying "Fundamentally, the development and ongoing operation of a MRT product depends on suitable benefits to the MRT venture operators" and "The greater good factors such as public awareness, benefits to marine research and conservation are important but a secondary factor to economic viability". As well as financial viability, the Tasmanian tour operator highlighted that seasonality plays a central role in MRT. For example, "cold and stormy winter condition in Tasmania will

limit accessibility to MRT destinations and also act to deter tourists from participating". Conversely, warmer oceans and weather, and placid ocean conditions will allow for 1) greater access to a wider array of MRT destinations; and 2) increase tourist interest in the MRT product. However, this is not to say that Tasmanian waters are unsuitable for MRT during the winter months, as during one of this study's interview's, a marine researcher from the University of Tasmania highlighted that many bays across Tasmania's coast do act as relatively comfortable wave and wind shelters for marine research vessels during the colder months.

Interview statements from MRT operators indicate that marine tour operators and marine researchers do have conflicting perceptions of their roles. For example, a dolphin watching operator from Port Phillip Bay reported that ~~–m~~arine researchers were often reluctant to involve the paying tourists in their research activity. They also had strict guidelines regarding the distance that the marine tour operator could get to dolphin pods." Both these marine research focused requirements were at odds with the tour operator's needs to provide an MRT experience that has closer interaction with the scientist (i.e. part of the attraction) and the dolphins. Echoing those views, two tour operators from Northern Queensland stated that ~~–o~~n MRT expeditions, marine researchers have been known to be disorganised, self interested, not interact well with tourists, and/or not collaborate well with marine tour operators". Towards ensuring the marine researcher's commitment and services to a MRT product, the Port Phillip Bay marine tour operator stated that ~~–W~~hen appropriate, there should be contractual agreements between the marine tourism operator and marine researcher that outline the roles and commitments of both key stakeholders". ~~–S~~uch agreements would also seek to re-assure the marine researcher that the tour operator understood their needs and were committed to meeting them".

The Port Phillip Bay marine tour operator was also an advocate of a broker role across the Australian MRT sector. This broker role would act to increase the opportunities for MRT products by linking key stakeholders together, facilitating cooperation amongst them, resolving their issues as much as possible, and possibly providing logistical support. Furthermore, this tour operator envisaged a MRT trail across Australia. This trail idea was similar to the MRT trail advocated by the former director of a national marine education society in section 5.3.4 of this chapter. The Port Phillip Bay marine tour operator suggested that a MRT trail could be facilitated by a national body (comprised of Federal, State and Local bodies). In turn, this national body would support a number of cooperating yet competing MRT broker organisations, which in turn support individual MRT business who operate across that trail. Clearly, such a proposal is quite visionary and would require a great deal of key stakeholder involvement, planning and resources. However, as highlighted by this marine tour operator, there are many marine research, management, conservation, education and tourism benefits associated with MRT, so perhaps investment in a MRT trail across Australia would be reasonable investment by government, the private sector and/or the NGO sector.

While commercial viability is very important to marine tour operators, the need for quality marine conservation outcomes by MRT was identified by some of these interviewees. For example, the Tasmanian marine tour operator suggested a set of possible ecotourism related conditions for MRT. These were; 1) that MRT must have minimal impact on ecosystems, 2) MRT products must seek to minimise the negative impacts of bringing large number of people (i.e. tourists) to any area, and 3) marine tourism visitor numbers may be restricted for the benefit of the ecosystem. In keeping with this conservation ethic, a whale and dolphin watching operator from NSW suggested that ~~–w~~within the previous ten years, tourists have become increasingly

focused on environmental conservation and discovery and, in turn, this focus is driving an increasing demand for marine ecotourism including MRT".

Marine research and conservation can therefore be viewed as an important attraction of marine ecotourism and MRT. However, a whale and dolphin watching operator from NSW cautioned that "MRT should always clearly explain the MRT product's marine research and conservation to the tourist". "That is, there is no point in baffling the tourist with unnecessary information". This marine tourism operator statement reaffirms the important role of skilled marine science and conservation interpreters in the MRT sector.

5.3.6. SCUBA diving organisation

Complementing the marine tour operator interviews, a phone interview was conducted with the Director of the Conservation Program of a large SCUBA training company in Australia. Perhaps not surprisingly, this SCUBA diving advocate saw an important role for the SCUBA diving community in any expansion of MRT across Australia. This was in terms of 1) providing trained and informed SCUBA divers to be MRT tourists; and 2) the provision of MRT infrastructure and services. That is to say, within the SCUBA diving fraternity there are potential MRT guides, SCUBA staff, and tour operators for MRT products. She stated that "due to their knowledge of the marine realm, science and destination, many of these people could operate and/or contribute to the growth of MRT products". Also, "while doing this, they can provide the necessary marine environmental stewardship, marine vessels, logistics support, industry networks, interpretation, SCUBA facilities and equipment for a MRT product". The fact that

–many SCUBA instructors have marine research and training skills, and they could train people to recognise and respect species, and habitats" was also emphasised.

Supplementing the marine tour operators and SCUBA training organisation views, the views of a Tourism Development Manager of an Australian State's Tourism Management Organisation were also obtained. This individual was quite adamant that MRT across Australia should be both economically and environmentally viable. For instance, he stated that –MRT should be based on sound assessments of market/consumer demand including an examination of affordability and perceived value for money –. He also remarked that a –MRT should aim to be financially self-sustaining over the longer term and have minimal (or no) ongoing financial support from Governments".

These statements indicate that he believed that any MRT growth in Australia should be mainly determined by market forces but there may be a short term (i.e. not ongoing) role by Australian Government agencies to invest and grow Australian MRT. His likely reasoning for this was that the known research, conservation and educational benefits from MRT are likely to be a reason for Government to support MRT growth in Australia. Finally, while focused on economic viability, he did advocate a conservation and cultural focus for MRT by stating that –MRT should be culturally and environmentally sensitive with a minimal carbon footprint".

5.3.7. Marine research tourism operators

Interviews with 13 MRT operators resulted in 115 interview statements (Appendix 27). As a prelude to this review of MRT operator views, it is worthy to note that this study found that many interviewees were former marine managers, researchers, conservationists and/or educators. Given this, many of their views and concerns relating to MRT may often be reflective of the views of those other stakeholder groups. However, many of their views should be considered to be quite unique to the MRT sector because 1) these MRT operators will often have a deeper knowledge of the MRT sector than many other stakeholder groups; and 2) to operate a MRT venture, they will often need to understand and meet the needs of those other key stakeholder groups, whereas this is not necessarily the main function of other stakeholder groups. These 115 MRT operator statements are presented and discussed in order of the main topic category (Table 3-31).

Table 5-29: Frequency of 115 MRT interview statements by main topic (n = 16)

ID	Main topic	No. of statements
1	Local community involvement	4
2	Marine conservation concerns	8
3	Education and interpretation	10
4	Marine research quality	12
5	Marine researcher involvement	5
6	The MRT attraction	13
7	The MRT attraction - marine research stations	5
8	The role of marine research in MRT	8
9	The MRT tourist	6
10	A MRT guide role	3
11	MRT marketing concerns	4
12	Proposed business aspirations	6
13	Good business principles	9
14	Support infrastructure	5
15	MRT broker concept	2
16	Key stakeholder concerns	15
	Total	**115**

Local community involvement

Three different MRT operators provided four interview statements about local community involvement (Table 5-30). One of these MRT operators was Director of a marine discovery and tourism centre in New South Wales (n=2 statements). Another was a Board Member of a well known multinational marine research tourism organisation. The third was the founder of a whale shark MRT business in Western Australia. Overall, these statements aspire for a better local community that is assisted by MRT. To assess if such aspirations are shared across all of the eight key stakeholder groups, one of those four statements was selected as a survey question for research step three. A –Y" value in the _contestable' field of Table 5-30 shows the interview statement that was selected for research step three.

Table 5-30: MRT operator (n=4) statements about community involvement (n=4)

Interview statement	Tourism system framework	Key MRT element	Agenda for change	Contest-ability (Y/N)
MRT must have widespread and ongoing community involvement. Networking and mutual benefits will ensure an active, creative and developing MRT venture	Desired product characteristic	Community	Pro community	N
MRT can be used to rebuild and diversify regional communities	Desired product characteristic	Community	Pro community	N
MRT can act as a catalyst for regional development through the diversification of tourism, new tourism ventures, investment in local marine research, the benefit of localised marine research, and the involvement of skilled marine research people within the local community.	Desired product characteristic	Community	Business approach	N
Marine research tourism in Australia should aim to link, learn from and support marine research tourism in developed and less developed countries across the World.	Desired product characteristic	Community	Pro MRT Industry	Y

Marine conservation concerns

Four different MRT operators provided eight interview statements that are related to achieving marine conservation through MRT (Appendix 27). Two of these operators were regularly involved in coral reef MRT expeditions in Northern Queensland (n=5 statements), one was Director of a marine discovery and tourism centre in New South Wales (n=2), and one was the Director of a dolphin watching and volunteer MRT organisation in Victoria (n=1). These eight interview statements suggest that MRT operators are likely to be advocates of marine conservation and they view MRT as an approach to achieve marine conservation and scientific outcomes. For example, one of North Queensland MRT operators remarked that ―MRT should always act to promote and create the most environmentally responsible tourism with low impact on ecosystems". Second, they often view MRT as a way to earn revenue to increase marine education, awareness and subsequent marine stewardship and conservation. For example, MRT was described as a business model to ―cash in on conservation and earn from the marine environment". To assess if such aspirations are shared across all of the eight key stakeholder groups, four of those eight statements were selected as survey questions for research step three. For reference, a ―Y" value in the ‗contestable' field of Appendix 27 shows the interview statements that were selected for research step three.

Education and interpretation

Five different MRT operators provided ten interview statements about education and/or interpretation‘ (Appendix 27). These individuals were 1) the Marketing Manager for a Government owned MRT organisation (n=2 statements); 2) a Board Member of a well known multinational marine research tourism organisation (n=1); 3) a Director of a dolphin volunteer organisation in Victoria (n=5); 4) a resident scientist for coral reef MRT expeditions in Northern Queensland (n=1); and 5) a co-owner of a marine education and tourism operator on the Gold Coast, Queensland (n=1).

Four statements were considered to be MRT product constraints. Overall, they caution that many marine ecotourism products exhibit environmentally unsuitable messages and behaviour to the tourist. One statement explicitly advises that ~~–e~~ommunicating a scientific program to a tourist requires care and interpretative skill". Another statement appears to lament the lack of training that MRT staffs have to effectively communicate and involve the tourist within the MRT experience. Five statements focused on increasing the quality and reach of marine interpretation to tourists through high levels of interpretative competence. To this end, the Director of the Dolphin volunteer organisation in Victoria expressed that ~~–th~~e MRT interpretative experience should be like a good story that 1) involves the tourist in the marine research; 2) enhances the MRT tourist experience; and 3) adds to the MRT attraction".

Marine research quality

Six different MRT operators (Table 5-31) provided twelve interview statements that were concerns about marine research quality (Appendix 27). Two of these statements had significant views about marine research quality, issues and significance. For example, the board member of a well known MRT company stated that ~~–~~MRT ventures should; address relevant research priorities in Australia/the region, contribute to peer-reviewed scientific literature; have appropriate ethical standards suitable for tourism (e.g. non-lethal research)". He also stated that

> *To be credible as "research" tourism, operators must ensure that the research they are conducting fits the following criteria; 1) data that can be relied upon, 2) the data that is actually needed; 3) the data is used; 4) there is a credible result; and 5) the venture engages with, and benefits the local community. If all 5 criteria above have been met, then we should be able to point to a real result from the tourism venture. Tourists will be able to see exactly what they have contributed. If there is no result what has been the point? When MRT operators can meet all these criteria, we will have a tourism research industry worth its name. Until that time many so-called research ventures will continue to be nothing more than glorified holiday packages jumping on the "eco" bandwagon, conning their customers and devaluing the efforts of genuine research ventures.*

Table 5-31: MRT operators (n=6) who made statements about marine research quality in MRT (n=12)

MRT operator interviewee	**Number of statements**
Owner of a well known MRT company in Northern Queensland	3
Board Member of a well known multinational marine research tourism organisation	3
Co-owner of a marine education and tourism operator on the Gold Coast, Queensland	3
Owner of a MRT company that operates across Australia	2
Marketing manager for a Government owned MRT organisation	1
Director of a dolphin volunteer organisation in Victoria	1

In terms of potential benefits from MRT, the Northern Queensland MRT operator had the view that many marine research projects were often more viable and possible due to MRT. He said that ~~–~~MRT can provide regular access to a marine research area, more research vessels, and

hence provide ongoing data collection that leads to more reliable and complete research findings". Complementing this, the marketing manager for a Government owned MRT organisation stated that ~~"a~~ MRT venture should be seen by participating organisations as a highly desirable, legitimate and cost-effective aspect of research operation". Overall all, this was the view of most MRT operators; however they were sometimes frustrated that the marine research track record of MRT sector was not better recognised and accepted in Australia's marine research and management communities. For example, the Gold Coast MRT operator stated that ~~"th~~e research community needs to recognise the value of long term data and observations from MRT" and ~~"s~~ections of the research community still do not recognise the value of data obtained from volunteers with limited training".

However, the Dolphin watching operator from Victoria commented that MRT operators can gain government support by ~~"b~~eing clear about what they are trying to achieve, and they need to have clear, honest and achievable scientific goals". Similarly, the Board Member said that ~~"th~~e MRT industry will gain due recognition if their quality of the data and scientific process is ensured". Furthermore, the North Queensland MRT operator stated that ~~"m~~arine researchers must share the results of MRT research projects with stakeholders" so that the quality of marine research outcomes is further recognised by the marine research sector.

Marine researcher involvement in marine research tourism

Two different MRT operators provided five interview statements that were concerns about marine researcher involvement (Appendix 27). One was a well known North Queensland MRT operator (n=2 statements), and the other was the North Australian regional director of a very large global MRT company (n=3). All statements were considered to be MRT specific and product constraints. They focused on 1) a closer relationship between MRT and marine research organisations; 2) the role of marine researchers in a MRT product; and 3) issues about attracting skilled marine researchers to MRT. It is worth noting that, these statement highlight that willing and skilled marine researchers are usually very important to MRT, but attracting them and satisfying their needs is a critical issue for MRT in Australia. To illustrate this, the regional director of a large MRT Company stated that marine researcher's overall unwillingness to engage in Australian MRT is due to;

> *The perceived lack of credos for MRT in marine science community, and the lack of financial returns to the researcher, the likely unavailability of the many professional researchers to participate in periodic MRT ventures, occupational health and safety issues, and handling tourists.*

The role of marine research in marine research tourism

Six different MRT operators (Table 5-32) provided eight interview statements about the role of marine researchers in MRT (Appendix 27). All these statements were MRT specific, seven were desired product characteristics of MRT, and one was considered to be a product constraint. The product constraint was stated as _for commercial reasons, some MRT ventures

may choose to have an emphasis on satisfying the needs of tourist rather than an emphasis on research outcomes‘. This statement was considered likely to be somewhat contestable to marine researchers and/or managers as it advocates a possibility of diminished but acceptable marine research and conservation outcomes from MRT. To assess if such a view is shared across all of the eight key stakeholder groups, four of those eight statements were selected as survey questions for research step three.

Table 5-32: MRT operators (n=6) who made statements about _The role of marine research in MRT‘ (n=8)

MRT operator interviewee	Number of statements
North Australian regional director of a very large global MRT company	2
Recently graduated PhD marine scientists in Western Australia who have participated in MRT	2
Director of a dolphin volunteer organisation in Victoria	1
Owner of a well known MRT company in Northern Queensland	1
Co-owner of a marine education and tourism operator on the Gold Coast, Queensland	1
Marketing manager for a Government owned MRT organisation	1

It is worth noting that there are some elaborate ideas in this topic. For example, the regional director of a very large global MRT company had aspirations that _A MRT venture should be viewed as a reliable and viable marine research platform for marine researchers and managers‘. This person also highlighted that many geographically overlapping marine research projects may be a viable reason for initiating and operating a MRT venture. The Gold Coast MRT operator saw the opportunity for the costs of MRT tourism to be offset by a contribution from the marine research and/or management sector. Additionally, the recently graduated PhD students spoke of how marine technology could be applied to readily enhance the MRT tourist experience as well as collect quality marine research data. They spoke of 1) increasing the tourist's _situational awareness‘ of the marine research phenomena; 2) setting the MRT scene through that situational awareness and technology; 3) and _edu-tainment‘ the MRT tourist

through marine technology and enhanced awareness. They also advocated the increased use of remote sensing (both acoustic and light) technology to humanely sample marine wildlife and habits and to increase the MRT tourist's situational awareness.

The marine research attraction

Five interviewees (Table 5-33) made thirteen statements about marine research being a central part of the MRT attraction (Appendix 27). The Director of the dolphin volunteer centre stated that "marine researchers can be part of the marine research attraction". Further to this, he stated that "well respected marine researchers can be a marketing advantage for a MRT product". The north Queensland MRT operator also echoed these thoughts and also stated that the "marine research environment is also a central part of the MRT attraction". He went on further to say that 1) "MRT operators should promote marine wildlife and environment as 'celebrity' marine wildlife and environment; and 2) they should promote their crew (e.g. resident marine biologists) as 'legends' in marine research. "This is partly what the MRT tourist has travelled to see" he stated. To assess if this view is shared or contested across other key stakeholders, it was include in research step three.

Table 5-33: MRT operators (n=5) who made statements regarding "the marine research attraction" (n=13)

MRT operator interviewee	Number of statements
Owner of a well known MRT company in Northern Queensland	5
Director of a dolphin volunteer organisation in Victoria	2
A resident scientist for coral reef MRT expedition in Northern Queensland	2
Marketing manager for a Government owned MRT organisation	1
Recently graduated PhD marine scientists in Western Australia who have participated in MRT	1

Indicating what the expectations of many MRT tourists may be, the north Queensland MRT operator stated that –These days, many prospective MRT tourists have Discovery Channel expectations and to satisfy these tourists, they should receive an experience that satisfies those expectations". He also provided a very significant statement about the possible linkage between media and the growth of MRT.

> *MRT should understand that the use of documentaries, articles and other messages acts to create a perpetual cycle of tourist demand for MRT experiences. The combinations of media and MRT act to assist in changing public awareness and values towards marine research, conservation and management. This in turn acts to affect Government policy and action with regard to marine research, conservation and management.*

While this statement may appear to be self-evident to those in media management and/or marine tourism marketing, it was included for testing in research step three by other MRT stakeholders. This is because if most other stakeholders in step three agree with it, then it could be readily argued that the present and future media is a key driver to increase MRT growth across Australia. Lastly, the marketing manager of a Government MRT organisations suggested that –to develop MRT ventures that are focused on lesser charismatic wildlife and habitats, MRT should attract more knowledgeable and educated travellers". His example of this is a proven MRT product that involves mainly older and educated travellers in the census of small coastal fauna on a remote offshore island product in Western Australia.

Marine research stations as a marine research tourism attraction

Two different MRT operators provided five interview statements about the existing and/or potential role of marine research stations as a MRT attraction in Australia (Appendix 27). This is important to MRT because Chapter Four of this thesis reports a number of MRT products that occur at or near a marine research station (e.g. Lady Elliot Island, Great Barrier Reef, Australia, and Cochino Pequeno, Cayos Cochinos, Honduras). Additionally, the Australian Government has a number of marine research stations (e.g. four marine research stations on the Great Barrier Reef) that presently (e.g. Lizard Island Research Station) or potentially could have some involvement in marine research tourism.

The first interviewee was a director of a marine research station. She expressed that ~~t~~the station's marine research programs were indeed a popular attraction for the general public and that her marine research station could benefit from harnessing that demand for their programs". The Second interview was a recently graduated PhD marine researcher who posed three levels of possible involvement with marine research stations in MRT. Briefly, these were 1) an authentic marine research backdrop for MRT; 2) Logistical support for MRT products; and 3) an actual venue for MRT providing the MRT does not interfere with the station's marine research programs. To assess if such views are shared across all key stakeholder groups, all five statements were selected for research step three.

The marine research tourist

Five MRT operators (Table 5-34) provided six statements (Appendix 27) that were about the nature or the intended experience of the MRT tourist. Three of these statements were about the selection of suitable MRT tourists for different MRT products. For example, the owner of the marine volunteer vessel in Victoria suggested that ‗For sophisticated marine research programs, the most suitable MRT tourists are ―documentary makers, scientists and marine managers". Similarly, the regional director of a global MRT company remarked that ―whether MRT venture has active or passive tourists will often depend on; the research tasks (e.g. simple tasks undertaken by many tourists compared with difficult tasks undertaken by a few), marine tourism operator preferences, and the tourist's, preferences, skills and abilities". Furthermore, the owner of a MRT company that operates across Australia stated that ―much marine research is too complicated for the public and to counter this, it is recommended that many MRT ventures undertake more popular and discovery orientated marine research programs". To test if such views are shared across other MRT operators and other stakeholder groups, all these three statements were selected for study three.

In terms of desired experiences for the MRT tourist, the Director of a marine discovery and tourism centre in New South Wales highlighted that ―MRT should improve the tourist's knowledge, understanding and stewardship of the marine environment" and ―MRT must provide a satisfying experience for the tourists". The owner of the MRT company in Northern Queensland went further and highlighted that from his experience, a MRT experience can provide a ‗religious' type experience to the MRT tourist that causes them to become marine environmental stewards, and in many cases, they may later train to become a marine management or research professional.

Table 5-34: MRT operators who made statements regarding ‗the MRT tourist' (n=5)

MRT operator interviewee	Number of statements
Director of a marine discovery and tourism centre in New South Wales	2
Owner of a well known MRT company in Northern Queensland	1
Owner of a MRT company that operates across Australia	1
North Australian regional director of a very large global MRT company	1
Owner of a marine volunteer and expedition vessel in Victoria	1

A marine research tourism guide role

Brightsmith, et al. (2008) and Coghlan (2008) both highlighted the importance of a research tourism guide role to facilitate a satisfactory experience for scientists and tourists. Three MRT operators also provided four statements about this topic. One interviewee was the owner of the northern Queensland MRT company, one was the Director of dolphin watching and volunteer centre in Victoria, and the other was an experienced MRT guide from Thailand. The Director of the dolphin watch centre expressed that ―a MRT guide role should act as a buffer that ensures that both the needs of marine researchers and MRT tourists are understood and met." The MRT guide from Thailand suggested that ―MRT guides can come from the ranks of deck hands on fishing trawlers". The MRT operator from Northern Queensland stated that many existing MRT guides are interested in a career in marine research and a formalised MRT guide career path could assist this aspiration". He also stated that ―the MRT guide could also inspire suitable receptive MRT tourists into a career in the marine management or ecotourism sector". ―To assess if these views are shared across other stakeholders three of these four statements were selected for research step three.

Marine research tourism marketing concerns

Three different MRT operators (Table 5-34) provided four interview statements concerning the marketing of MRT (Appendix 27). Three of these statements expressed concerns that some MRT ventures have unbelievable marketing with regard to their marine research and conservation outcomes. For example, the resident scientist of a MRT program stated that ~~"~~MRT operators do not manage the expectations of customers about such poor marine science or conservation outcomes". The MRT operator in North Queensland also lamented that ~~"~~the current reef tourism industry doesn't seem to reflect that MRT may be a marketing advantage for the marine ecotourism sector". For this study, these views were considered to be quite possibly true in some cases, and were therefore not selected for research step three.

Table 5-35: MRT operators (n=3) who made statements regarding _MRT marketing concerns' (n=4)

MRT operator interviewee	**Number of statements**
Director of a dolphin volunteer organisation in Victoria	2
Owner of a well known MRT company in Northern Queensland	1
A resident scientist for coral reef MRT expedition in Northern Queensland	1

Business aspirations for Australian marine research tourism

Three MRT operators (Table 5-36) provided six interview statements (Table 5-37) about their business aspirations for Australian MRT. Seven of these statements were MRT product characteristics and two were considered to be MRT product constraints. As most of these statements were aspirational and perhaps not shared across key stakeholder groups, four of them were selected for research step three of this study.

Table 5-36: MRT operators (n=3) who made statements regarding ‗good business principles' (n=6)

MRT operator interviewee	Number of statements
Owner of a well known MRT company in Northern Queensland	4
Pioneer of the Whale Shark MRT sector in Western Australia	2
Director of a dolphin watch and volunteer organisation in Victoria	1

Table 5-37: MRT operator (n=3) statements classified as ‗good business principles' (n=6)

Interview statement	Tourism system framework	Key MRT element	Agenda for change	Contest-ability (Y/N)
To expand marine research tourism in Australia and ensure desired quality, there would need to be a rigorous tender process that only grants operational licenses to quality assured marine research tourism operations.	Desired product characteristic	MRT	Pro MRT Industry	Y
The Undersea Explorer is often recognised as a good business model for marine research tourism. Is it reasonably to enquire why similar ventures have not been developed elsewhere, and also, how can similar ventures be developed elsewhere?	Product constraint	MRT	Pro MRT Industry	Y
MRT should be expanded to all areas of and Australia and worldwide.	Desired product characteristic	MRT	Pro MRT Industry	N
MRT can diversify marine tour operations and assist with competing against lower cost and less regulated marine tourism	Desired product characteristic	MRT	Pro MRT Industry	N
To expand marine research tourism in Australia, there should be a memorandum of understanding of roles and commitments between key stakeholders.	Desired product characteristic	MRT	Business approach	Y
Where possible, marine research tourism vessels should at least provide free space for marine researchers.	Desired product characteristic	MRT	Business approach	Y

Good business principles for marine research tourism

Four different MRT operators (Table 5-38) provided eight interview statements that relate to likely good business principles for developing MRT in Australia (Appendix 27). The Director of the dolphin volunteer centre informed that ―marine discovery centres (e.g. a MRT product) can be profitable through research programs, tourism, volunteer programmes, selling souvenirs, and information services". This statement is important as an experienced MRT operator has demonstrated that MRT and marine discovery products can be commercially viable.

Notably, his MRT product involved popular charismatic dolphins and is located within three hours drive of a large Australian capital city. This indicates that popularity of marine research attraction and vicinity to a source market are likely to be important factors for a commercially viable MRT product.

Table 5-38: MRT operators (n=4) who made statements regarding ‗good business principles' (n=8)

MRT operator interviewee	Number of statements
Owner of a well known MRT company in Northern Queensland	3
A resident scientist for coral reef MRT expedition in Northern Queensland	2
Mexican regional director of a relatively large global MRT company	2
Director of a dolphin watch and volunteer organisation in Victoria	1

An overarching business principle was expressed by a Mexican based Regional Director of a large global MRT. He recommended that there is a need to professionalise the MRT industry as this could address many of the stakeholder issues. Specifically he suggested 1) ensuring marine research, conservation and educational outcomes; 2) attracting and satisfying MRT tourists; and 3) formalising the development of a MRT guide role that understands and addresses all key stakeholder needs. As further insight into a viable business model for MRT, he also recommended that MRT products should seek to integrate their MRT products with other forms of tourism such as package holidays, adventure travel, and responsible tourism.

Another useful business principle provided by the North Queensland MRT operator was that long term permits for access and marine research is essential for a stable MRT product. Furthermore, interviewees provided four other ‗good business principle' statements for MRT (Table 5-39). Such principles can act as a guide for MRT stakeholders to manage and develop MRT products.

Table 5-39: Four other MRT operator statements classified as ‗good business principles'

Interview statement	Key MRT element	Tourism system framework
The marine tour operator should be empowered so they are able to undertake the high quality marine research support, interpretation and hospitality tasks that are required for a MRT venture.	MRT	Product characteristic
MRT should always adhere to quadruple (social, cultural, economic and environmental) bottom line sustainability principles	Ecotourism	Product characteristic
There is a need to integrate and expand into other tourism packages such as package holidays, adventure travel, responsible holidays and more	General tourism	Product characteristic
Very few operators would be willing to change their existing product/itineraries to incorporate a research focus unless their business benefited from it somehow (i.e. financially).	General tourism	Product constraint

Support infrastructure for marine research tourism

Two MRT operators provided five interview statements that relate to support infrastructure for MRT in Australia (Appendix 27). All of these statements were classified as desired product characteristics. Three statements were by the owner of the northern Queensland MRT company. His first statement was that ―MRT should have the opportunity to appropriately utilise existing and underused marine research equipment (from research agencies) in a regular and more efficient way" and is indicative of the north Queensland MRT operator's desire to be more closely embedded with and supported by the region's marine research community. The second statement was that ―when appropriate, MRT should have strong supporting links with non government conservation organisations such as the Australian Marine Conservation Society and the World Wildlife Fund". He also recommended that ―many marine and coastal volunteer programs can be an important part of the MRT infrastructure and services in Australia".

The other two statements were from the Director of the marine discovery centre in NSW. She strongly advocated 1) the increased involvement of universities with Australian MRT; and 2) an increased role for marine education societies to provide organisational and information

services to MRT. As these statements involve the participation of other stakeholder groups, four of these five support infrastructure statements were selected for research step three.

A marine research tourism broker concept

In earlier results (Section 5.3.5), the Port Phillip Bay marine tour operator was an advocate of a MRT broker role across the Australian MRT sector. In brief, such a role would act to link and support key MRT stakeholders towards increased opportunities for MRT products in Australia. Two MRT operator stakeholders also expressed views on this topic. These MRT operators were marine scientists in Western Australia who have participated in MRT, and a pioneer of MRT in Northern Queensland. The WA marine scientists suggested that MRT ventures and marine researchers should work collaboratively to obtain research grants that can be used to fund MRT ventures. The pioneer of MRT suggested that a MRT broker would act to support the interests of all key stakeholders, identify research attractions, destinations, and facilitate permits, certification and training. Both these viewpoints were selected to verify if they were shared across other MRT operators and other stakeholder groups.

Key stakeholder concerns

Six different MRT operators (Table 5-40) provided fifteen interview statements that were classified as key stakeholder concerns (Appendix 27). For this study, stakeholder concerns are defined as concerns that are likely to be contested by one or more stakeholder groups. Only one of these statements was classified as a desired product characteristic. This was that ~~–~~"MRT must be conducted in a moral, honest and professional manner that is mutually beneficial to operators, researchers and the environment". This holistic advice can be seen as a suitable approach to

towards resolving the other twelve stakeholder concerns which were broadly classified as _product constraints".

Table 5-40: MRT operators (n=6) who made statements regarding _key stakeholder concerns' (n=15)

MRT operator interviewee	Number of statements
Director of a dolphin volunteer organisation in Victoria	8
Owner of a well known MRT company in Northern Queensland	6
Co-owner of a marine education and tourism operator on the Gold Coast, Queensland	3
A pioneer of MRT in northern Queensland	1
A resident scientist for coral reef MRT expedition in Northern Queensland	1

When combined, research steps one and two identified 232 key stakeholder views about the opportunities and issues for MRT in Australia (Table 5-42). Table 5-42 shows that 128 (i.e. 120 + 8) statement from research steps one and two were considered to be shared across all key stakeholder groups. It also shows 17 (i.e. 7 and 10) stakeholder views from research step's one and two were considered to be already contestable across two or more key stakeholder groups. Those 17 contestable views are listed in Appendix 28. Additionally, 87 (i.e. 12 + 75) views from research step's one and two that were considered by the researcher as potentially contestable (Table 5-42) across two or more key stakeholder groups. Those 87 potentially contestable views from research step two are listed in Appendix 29.

Table 5-41: A summary of MRT operator statements (n=6) described as ‗key stakeholder concerns' (n=15)

Key stakeholder group	Summary statements
MRT operators	Research for many MRT ventures is still focused on short term specific question based studies instead of ensuring the lack of long term whole of ecosystem information is reversed.
Marine researchers	The value of MRT in both revenue and operational advantages has not been recognised by key sectors of the marine tourism industry. If MRT is not officially considered as important by marine research and/or management agencies, then the advancement of MRT is limited. They are limited by their culture and psychology. Governing agencies are unable to differentiate between scientific research and non-invasive observational research employed in basic MRT when determining permit requirements.
Marine managers	The value of MRT in both revenue and operational advantages has not been recognised by key sectors of the marine tourism industry. If MRT is not officially considered as important by marine research and/or management agencies, then the advancement of MRT is limited. Marine managers should become clearer about their research questions and what data needs collecting. Governing agencies are unable to differentiate between scientific research and non-invasive observational research employed in basic MRT when determining permit requirements. Australian government marine management and research organises often act to hinder rather than helps this industry Often the above hindrance is due to an institutional prejudice against MRT. They are limited by their culture and psychology.
Marine tour operators	Sometimes, marine tourism operators have different priorities to a marine researcher. They are limited by their culture and psychology. Many marine tour operators state that they support marine research, but this is a misrepresentation, there is an absence of a real research program with real research outcomes. Many marine tour operators are unaware of the requirements to carry out quality marine research.
Marine tourists	Many potential MRT tourists are unaware of the hard work that is often associated with active participation with a marine research program. MRT tourists should not be associated with marine research that requires a high level of ethical clearance (e.g. biopsies, DNA tagging, etc).

Table 5-42: Summary of key stakeholder views about MRT from research steps 1 and 2

	No. of shared or contestable views						
Key stakeholder group	Shared from step 1	Shared from step 2	Contest-able from step 1	Contest-able from step 2	Potentially contestable from step 1	Potentially contestable from step 2	**Total**
MRT operator	0	61	0	6	2	48	117
Marine researcher	0	14	0	1	4	4	23
Marine educator	0	17	0	0	0	4	21
Marine manager	0	6	0	1	3	8	18
Marine tour operator	0	11	0	1	0	5	17
Conservation organisation	0	6	0	2	3	5	16
Unknown	8	0	7	0	0	0	15
Tourism destination manager	0	2	0	0	0	1	3
SCUBA diving organisation	0	2	0	0	0	0	2
Total	**8**	**120**	**7**	**10**	**12**	**75**	**232**

5.4. Research step three - results

Research step three sought to test if those 87 potentially contestable views are likely to be contestable or shared across eight key stakeholder groups. To achieve this, an anonymous online survey was devised and undertaken between August 2008 and October 2008 by 33 key stakeholders (Table 5-43). Survey questions (Appendix 12) were derived from each of the 87 key stakeholder views identified as potentially contestable. For each survey question, research participants were asked how well they agreed or disagreed with each statement. The exclusive choices were 1) strongly agree; 2) agreed; 3) maybe; 4) disagree; 5) strongly disagree; 6) not important to them; 7) cannot say; and 8) the statement is not clear.

Table 5-43: Key stakeholder groups of research step three respondents

Key stakeholder group	**Number**
Marine researcher	6
Marine tour operator	6
Marine conservation organisation	6
Marine research tour operator	4
Marine educator	3
Tourism destination organisation	3
Postgraduate marine research student	3
Marine manager	2
Total	33

The intended number of respondents was 40 people from eight key stakeholder groups (i.e. five people per group). As it turned out, the final number of respondents (n=33) was limited by a shortage of key stakeholder who were sufficiently involved in study two and had the time to complete it. However, this survey sample of 33 key stakeholders from eight key stakeholder groups is suitable for this research because it survey outcomes will still indicate if a certain stakeholder view is shared or contested across two or more stakeholder groups. For example, if

twenty percent of stakeholders from three key stakeholder groups disagree with a certain view that that indicates that that stakeholder view is contestable across different key stakeholder groups. Similarly, if one hundred percent of a certain stakeholder group disagrees with a certain stakeholder view, then it could be readily reasoned that many key stakeholders from the outside population of that stakeholder group would also disagree with that view.

Nonetheless, a sample of 33 key stakeholders is clearly limited if seeking to claim that a certain survey percentage of a stakeholder group's disagreement about a certain stakeholder view is representative of the full population of that key stakeholder group. For example, depending on the issue, if fifty percent of marine researchers (n=3) disagree with a certain stakeholder view, then claiming fifty percent of all marine researchers in the complete population of Australian marine researchers disagree with that view is clearly not justifiable. At most, it can be said that some marine researchers in that population may disagree with that stakeholder view. To further interpret which key stakeholders disagree with certain contested issues (and perhaps why), this study recommend s that the contestability of those issues be tested by surveying 64 or more key stakeholders from eight key stakeholder groups (i.e. 8 participants per stakeholder group).

In terms of survey outcomes, the number of survey statements that _shared' _somewhat contestable' or _highly contestable' across two or more key stakeholder groups are summarised in Table 5-44. For this study, a highly contestable view was identified if ten percent or more of the 33 survey responses were _strongly disagree' or _disagree'. Somewhat contestable views were identified if thirty percent or more of the survey responses were _maybe'. Shared views were identified if they were not _highly contestable' or _somewhat contestable'. That is, shared views

were determined if less than thirty percent of survey responses were ‗maybe' and less than ten percent of survey responses were ‗strongly disagree' or ‗disagree'.

Table 5-44: The number of research step three survey statements that were considered to be highly contestable, somewhat contestable, or shared across two or more key stakeholder groups

Key stakeholder group	Shared	Somewhat contestable	Highly contestable	Total
Conservation organisation	3	3	2	8
Marine educator	3		1	4
Marine manager	9	1	1	11
Marine researcher	3	1	4	8
Marine tour operator	1	2	2	5
MRT operator	30	6	14	50
Tourism destination manager	1			1
Total	**51**	**12**	**24**	**87**

5.4.1. Shared key stakeholder views

As acknowledged above, this thesis is focused on the conceptual nature of MRT. As such the specifics and implications of the collected stakeholder views for Australian MRT are not evaluated in great detail. However, before focusing on those stakeholder views that are potentially contestable, the top 10 most shared (n=51) key stakeholder views from research step three are presented in Table 5-45. These shared views are presented so as to indicate the type of MRT topics that have common agreement across various key stakeholder groups. Such views could be used as basis for key stakeholder collaboration towards MRT development.

Table 5-45: The top 10 most shared key stakeholder views from research step three – part A

ID	Stakeholder group	Survey statement	Tourism system framework	Key MRT element
75	MRT operator	Marine research tourism should always act to promote and create the most environmentally responsible tourism.	Desired product characteristic	Ecotourism
82	MRT operator	This combination of media and marine research tourism can act to assist in changing public awareness and increasing the public's interest in marine research, conservation and management.	Desired product characteristic	Ecotourism
87	MRT operator	The marine research program of any marine research tourism venture should always seek to effectively analyse, develop and communicate the resulting knowledge to marine researchers, tourists and other key stakeholders.	Desired product characteristic	Education
197	Marine manager	Hence, marine researchers should recognise this important role of tourists by always treating them in a professional manner, communicating effectively and frequently, providing quality information about the marine research project, and thanking them for their contributions.	Desired product characteristic	Research
201	N/A	In the future, the involvement of Government marine research agencies in marine research tourism across Australia is important and or essential.	Desired product characteristic	Research
216	Marine researcher	All marine research tourism ventures need to have clear, honest and achievable scientific goals.	Desired product characteristic	Scientific tourism
215	Marine manager	To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that their marine research is high quality.	Desired product characteristic	Scientific tourism
221	Conservation organisation	Where possible, marine research tourism in Australia should seek to _open the doors' to the lay person and always make them feel welcome.	Desired product characteristic	Scientific tourism
176	Marine manager	In most cases (except with highly trained tourists and marine tour operators), marine researchers are essential for coordinating and quality assuring the research, monitoring and survey activity	Product constraint	Marine research
170	MRT operator	The willingness of many marine researchers to participate in marine research tourism will be dependent on their recognition and acceptance of the benefits of marine research tourism.	Product constraint	Marine research
51	MRT operator	Marine research tourism in Australia should aim to link, learn from and support marine research tourism in developed and less developed countries across the World.	Desired product characteristic	Community involvement

5.4.2. Contested key stakeholder views identified as highly contestable

In summary, research step three identified 36 key stakeholder views that were considered to be significantly (n=24) or somewhat contestable (n=12) across two or more stakeholder groups. Also, research step one identified 7 key stakeholder views that were considered to be highly contestable (n=4) and somewhat contestable (n-3) (Table 5-23). The aggregated number of significantly or somewhat contestable views is 44. Those 44 key contestable views are listed in Table 5-46to Table 5-55 below. They are presented according to the key stakeholder group who provided the view and the different key stakeholder groups who contest those views.

Table 5-46: Key stakeholder views (n=7) that were identified as ‗desired MRT product characteristics and ‗highly contestable‘

ID	Key stakeholder group	Survey question	% AGREE	% MAYBE	% DIS-AGREE
24	Marine tour operator	These days, many prospective marine research tourists have Discovery Channel expectations. To satisfy these tourists, they should receive an experience that meets those expectations.	28%	22%	50%
19	Marine researcher	To expand marine research tourism in Australia, there would need to be a peer review system by the scientific community, of the research undertaken, the data collected, occupational health and safety, and education standards.	55%	23%	23%
8	MRT operator	To expand marine research tourism in Australia and ensure desired quality, there would need to be a rigorous tender process that only grants operational licenses to quality assured marine research tourism operations.	55%	24%	21%
7	Marine educator	Given Australia's sizable coastal and ocean territory, and relatively well developed marine research and tourism sectors; it is somewhat surprising that marine research tourism industry is not well developed in Australia.	52%	29%	19%
2	Conservation organisation	To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that they have advanced NEAP Eco Certification (i.e. advanced ecotourism accreditation).	63%	20%	17%
21	MRT operator	Without interference in their marine research program, some marine research stations could become suitable marine research tourism destinations.	55%	33%	12%
6	Marine tour operator	Development of such a trail could be facilitated by a national organisation (comprised of representatives from Federal, State and Local organisations) that supports a number of marine research tourism broker organisations, which in turn support individual marine research tourism business.	43%	46%	11%
5	MRT operator	When appropriate, to expand marine research tourism in Australia, there should be contractual agreements between stakeholders that that outlines the roles and commitments of stakeholders.	48%	41%	10%

Note: Blue cells are relatively high values, yellow and orange cells are moderate values, and red cells are low values

Table 5-47: Key stakeholder groups who contested the those views (n=7) listed in the above table

No.	6	3	2	4	6	6	3	3
ID	**Conservation organisation**	**Marine educator**	**Marine manager**	**MRT tour operator**	**Marine researcher**	**Marine tour operator**	**Postgraduate marine research student**	**Tourism organisation**
24	50%	0%	50%	50%	67%	33%	100%	67%
19	50%	0%	50%	50%	17%	0%	33%	0%
8	25%	0%	100%	25%	17%	0%	67%	0%
7	25%	0%	0%	25%	17%	17%	33%	33%
2	0%	67%	0%	25%	0%	33%	0%	0%
21	0%	0%	50%	0%	33%	0%	33%	0%
6	25%	0%	0%	25%	0%	0%	33%	0%
5	25%	0%	50%	0%	17%	0%	0%	0%

Note 1: Blue cells are relatively high values, yellow and orange cells are moderate values, and red cells are low values
Note 2: ID values are the same ID values for the above table and link the survey question with this table‘s content

Table 5-48: Key stakeholder views (n=14) that were identified as ‗MRT product constraints' and ‗highly contestable'

ID	Stakeholder group	Survey question	% AGREE	% MAYBE	% DIS-AGREE
3	Conservation organisation	It is satisfactory for some marine research tourism ventures to have quality educational outcomes but relatively poor marine research outcomes.	45%	15%	39%
4	MRT operator	A potential major barrier to developing marine research tourism in Australia is lower cost marine research tourism opportunities for tourists in other regions of the world.	41%	41%	19%
9	Marine researcher	It is somewhat surprising that there are not more marine research tourism ventures in Australia's southern temperate waters.	21%	43%	36%
15	Marine researcher	The diversion of Government funds from pure research to research tourism will divide the academic and the tourism industry and this will reduce the possibility of collaboration between marine researchers and marine research tourism industry.	21%	50%	29%
12	MRT operator	Supporting marine research tourism should become a mandated project area for government marine research and management programs.	50%	23%	27%
20	MRT operator	Until research from marine research tourism generates reliable and peer reviewed research, many so-called marine research tourism ventures will continue to be nothing more than glorified holiday packages jumping on the ―eco" bandwagon, conning their customers and devaluing the efforts of genuine marine research tourism ventures.	50%	23%	27%
10	MRT operator	A limiting factor for marine research tourism is the culture and psychology of key stakeholders such as marine managers, marine researchers and marine tour operators.	57%	21%	21%
14	MRT operator	Often the above hindrance by Australian government marine management and research organisations is due to an institutional prejudice against marine research tourism.	32%	53%	16%
11	MRT operator	Australian government marine management and research organisations often act to hinder rather than help the marine research tourism industry.	40%	45%	15%
13	MRT operator	So that marine research tourism can assist marine management agencies, those agencies should become clearer about their research questions and what data needs collecting.	69%	19%	13%
17	Marine manager	Due to government funding constraints, one can assume that suitable financial or human resources for marine research tourism will not be available from existing Government marine research and management agencies.	73%	15%	12%
23	MRT operator	Willing, skilled and available marine researchers can be considered as among the rarest essential commodities for marine research tourism.	68%	21%	11%
18	MRT operator	Hence, the development of marine research tourism in Australia will be limited by the availability of willing and skilled marine researchers.	79%	11%	11%

Note: Blue cells are relatively high values, yellow and orange cells are moderate values, and red cells are low values

Table 5-49: Key stakeholder groups who contested the views (n=14) listed in the above table

No.	6	3	2	4	6	6	3	3
ID	Conservation organisation	Marine educator	Marine manager	MRT tour operator	Marine researcher	Marine tour operator	Postgraduate marine research student	Tourism organisation
3	75%	33%	0%	25%	33%	33%	67%	33%
4	0%	33%	0%	0%	17%	0%	33%	33%
9	50%	33%	0%	50%	17%	33%	33%	33%
15	25%	0%	50%	75%	0%	17%	33%	0%
12	50%	33%	0%	25%	33%	0%	33%	33%
20	25%	33%	0%	25%	33%	33%	0%	33%
10	50%	0%	50%	0%	17%	17%	33%	0%
14	0%	33%	0%	25%	0%	0%	33%	0%
11	0%	33%	0%	25%	0%	0%	33%	0%
13	0%	0%	0%	25%	17%	0%	67%	0%
17	0%	0%	0%	25%	17%	0%	33%	0%
23	0%	0%	0%	50%	0%	0%	33%	0%
18	25%	33%	0%	25%	0%	0%	0%	0%

Note 1: Blue cells are relatively high values, yellow and orange cells are moderate values, and red cells are low values
Note 2: ID values are the same ID values for the above table and link the survey question with this table‘s content

Table 5-50: Key stakeholder views (n=14) that were identified as ‗MRT tourist characteristics' and ‗highly contestable'

ID	Stakeholder group	Survey question	% AGREE	% MAYBE	% DIS-AGREE
1	Marine researcher	Without a clear link to a conservation goal, many marine biological studies will not appeal to tourists.	29%	52%	19%
25	MRT operator	In many cases, marine research is too complicated for the general public. To counter this, it is recommended that marine research tourism ventures undertake more popular and discovery - orientated marine research programs.	27%	42%	30%
28	MRT operator	Unless volunteers are needed, marine research that can be undertaken on marine research tourism ventures could also be done on normal marine tour ventures, by scientists and crew, and without the active involvement of tourists.	60%	23%	17%

Note: Blue cells are relatively high values, yellow and orange cells are moderate values, and red cells are low values

Table 5-51: Key stakeholder groups who contested the views (n=14) listed in the above table

No.	6	3	2	4	6	6	3	3
ID	Conservation organisation	Marine educator	Marine manager	MRT tour operator	Marine researcher	Marine tour operator	Postgraduate marine research student	Tourism organisation
1	25%	0%	0%	0%	33%	17%	33%	33%
25	50%	67%	50%	75%	0%	0%	33%	0%
28	0%	0%	0%	0%	17%	50%	33%	0%

Note 1: Blue cells are relatively high values, yellow and orange cells are moderate values, and red cells are low values
Note 2: ID values are the same ID values for the above table and link the survey question with this table's content

Table 5-52: Key stakeholder views (n=10) that were identified as ‗desired MRT product characteristics and ‗somewhat contestable‘

ID	Stakeholder group	Survey question	% AGREE	% MAYBE	% DIS-AGREE
29	Marine tour operator	Marine research tourism across Australia should have widespread and ongoing community involvement.	61%	36%	3%
30	Conservation organisation	When possible, it is important that marine research tourism in Australia actively engage with indigenous Australians in the development of Indigenous focused marine research tourism businesses	68%	32%	0%
31	MRT operator	A possible marine research tourism venture with great potential is a complete terrestrial to marine tourism research package, where people get to see an overall picture of the links between the sea and land, and how the two are intertwined.	55%	39%	6%
34	Marine tour operator	There is an opportunity for a number of collaborating yet competing marine research tourism broker roles across Australia. Such broker roles would act to support the interests of all key stakeholders by undertaking tasks such as the identification and development of marine research tourism, and facilitate permits, certification and training.	32%	60%	8%
38	MRT operator	Marine research tourism should seek to develop a marine research tourism trail across Australia. This trail could consist of an organised network of different marine research tourism ventures and attractions across Australia.	50%	43%	7%
32	Conservation organisation	A marine research tourism guide's formal career path could progress to a marine tour operator, marine manager, marine researcher or similar role. A marine research tourism guide role is envisioned to be a paid role that ensures that the many needs of marine researchers, managers, tour operators and tourists are met.	35%	58%	6%
42	Marine researcher	In the future, a marine research tourism venture should add to the prestige and scientific reputation of the project among scientific peers of the researcher.	66%	31%	3%
41	MRT operator	A marine research tourism venture should be seen by marine research and management organisations as a highly desirable, reliable and cost-effective aspect of research operation.	65%	32%	3%
40	MRT operator	Without interference in their marine research program, marine research stations could provide an authentic marine research backdrop for marine research tourism ventures to operate near.	66%	34%	0%
43	Conservation organisation	For a marine research tourism venture, there needs to be a method to capture, assess and use the tourists' own thoughts on future research directions and what they believe the key issues are for conservation.	48%	42%	9%

Note: Blue cells are relatively high values, yellow and orange cells are moderate values, and red cells are low values

Table 5-53: Key stakeholder groups who stated _maybe‘ of _did not agree‘ about the views (n=11) listed in the above table

No.	6	3	2	4	6	6	3	3
ID	**Conservation organisation**	**Marine educator**	**Marine manager**	**MRT tour operator**	**Marine researcher**	**Marine tour operator**	**Postgraduate marine research student**	**Tourism organisation**
29	50%	0%	100%	50%	50%	17%	33%	33%
30	50.0%	33.3%	0.0%	50.0%	0.0%	33.3%	0.0%	66.7%
31	25%	0%	75%	59%	50%	66%	25%	0%
34	75%	33%	50%	75%	33%	50%	33%	67%
38	100%	33%	50%	25%	33%	33%	33%	67%
32	100%	33%	100%	25%	50%	50%	100%	67%
42	0%	0%	100%	25%	50%	33%	25%	0%
41	75%	0%	50%	0%	17%	17%	0%	33%
40	50%	33%	50%	0%	67%	0%	67%	33%
43	100%	0%	100%	50%	17%	67%	100%	33%

Note 1: Blue cells are relatively high values, yellow and orange cells are moderate values, and red cells are low values
Note 2: ID values are the same ID values for the above table and link the survey question with this table‘s content

Table 5-54: Key stakeholder views (n=2) that were identified as ‗MRT product constraints and ‗somewhat contestable‘

ID	Stakeholder group	Survey question	% AGREE	% MAYBE	% DIS-AGREE
35	MRT operator	The Undersea Explorer is often recognised as a good business model for marine research tourism. Is it reasonably to enquire why similar ventures have not been developed elsewhere, and also, how can similar ventures be developed elsewhere?	58%	35%	8%
39	Marine manager	In many cases, resources for employment of extra marine researchers on marine research tourism ventures will need to come from the private market.	59%	38%	3%

Note: Blue cells are relatively high values, yellow and orange cells are moderate values, and red cells are low values

Table 5-55: Key stakeholder groups who stated ‗maybe‘ or ‗did not agree‘ about the views (n=2) listed in the above table.

No.	6	3	2	4	6	6	3	3
ID	Conservation organisation	Marine educator	Marine manager	MRT tour operator	Marine researcher	Marine tour operator	Postgraduate marine research student	Tourism organisation
35	75%	0%	100%	0%	67%	17%	33%	0%
39	0%	33%	100%	25%	67%	33%	67%	33%

Note 1: Blue cells are relatively high values, yellow and orange cells are moderate values, and red cells are low values
Note 2: ID values are the same ID values for the above table and link the survey question with this table‘s content

Additional to the above findings about the contested views of key stakeholders, this survey generated a number of open text comments from survey participants. These were response to various survey questions and are presented in Appendix 30. They represent an interesting commentary on the various issues that may be contestable for various MRT key stakeholders. As needed, some of these comments are used in the next sections and chapters to add further depth to and/or to highlight a particular discussion point. However, as the focus of this thesis is the conceptual nature of MRT, they are not discussed or analysed in this chapter. Further study is recommended to evaluate the possible implications of those open text comments for Australian MRT.

Finally, there were a number of survey statements that were considered to be ‗not clear' by respondents and these are listed Appendix 31. Also, there were other survey statements whereby for unknown reasons, the respondent could not comment on a specific statement. For reference, these ‗not clear' and ‗cannot say' statements are listed in Appendix 31.

5.5. Research step four - results

Research step's one, two and three identified 232 key stakeholder views that are considered to be shared (n=188), somewhat contestable (n=16), or highly contestable views (n=26) across two or more key stakeholder groups (Appendix 33). These views were also categorised according to the key stakeholder groups (n=8) who provided the view, key MRT elements (n=13), three tourism-system components (Moscardo et al, 2004) (n=3), MRT main topics (n=16), and ‗agenda for change' topics (n=16) (Table 3-31). Research step four uses this information to derive a new conceptual model of key stakeholder's views of MRT in Australia.

To derive this model, all 232 key stakeholder views from steps 1, 2 and 3 in this study were first classified according to the 10 key MRT elements shown in Figure 1.1). These are three intended MRT benefits (e.g. marine research and conservation); and 2) seven well-known tourism types (e.g. marine tourism and volunteer tourism). The occurrence of all 232 stakeholder views across those key MRT elements and MRT tourism-system components is shown in Table 5-56. For example the marine research element received 62 stakeholder statements. Furthermore, 38 statements were classified as desired product constraints and 24 were classified as product constraints. Similarly, the marine research tourism element received 63 statements that are comprised of 40 desired product characteristics and 20 product constraints.

Table 5-56: Occurrence of all stakeholder views (n=232) across 13 key MRT element and 3 MRT tourism-system components

Key MRT element	Total	Desired product characteristic	Product constraint	Tourist characteristic
Intended benefits				
Marine research	62	38	24	0
Marine conservation	19	10	5	4
Community involvement	7	7	0	0
Tourism types				
Marine research tourism	63	40	20	3
Educational tourism	19	14	4	1
Ecotourism	18	12	4	2
Scientific tourism	18	9	4	5
Wildlife tourism	8	3	2	3
Marine tourism	7	5	1	1
Volunteer tourism	6	2	3	1
General tourism	3	2	1	0
Adventure tourism	1	0	0	1
Alternative tourism	1	0	0	1
Total	**232**	**142**	**68**	**22**

Note: Blue cells are relatively high numbers of stakeholder views, yellow, orange and green cells are moderate numbers, and red cells are low numbers

Note 2: When compared to the proposed conceptual framework of MRT (Figure 1.1) two additional tourism types were identified in the acquired stakeholder views namely general tourism (n=3) and alternative tourism (n=1). These are included to indicate that those MRT elements are also present in this analysis.

In this study, the contestability of a view indicates if that view is shared or contested across two are more key stakeholder groups. The contestability of this study's 232 key stakeholder views across those MRT elements and tourism-system components is shown in brackets in Table 5-57. This table shows that 17 (27%) of the 62 total marine research related views were considered to be contestable. In terms of desired product characteristic 5 (13%) of 38 views are contestable. In terms of product constraint 12 (50%) of 24 views are contestable. Similarly, Table 5-57 shows that12 (19%) of 63 views that were specific to marine research tourism are contestable. Other contestable key MRT elements include; volunteer tourism (66%), community involvement (28%) and scientific tourism (22%).

Table 5-57: Percentage of contestable stakeholder views (n=44) across 13 key MRT elements and 3 tourism-system components

Key MRT element	Desired product characteristic	Product constraint	Tourist characteristic	Total
Intended benefits				
Marine research	5/38 (13%)	12/24 (50%)		17/62 (27%)
Community involvement	2/7 (28%)			2/7 (28%)
Marine conservation	0/10 (0%)	0/5 (0%)	1/4 (25%)	1/19 (5%)
Tourism types				
Volunteer tourism	2/2 (100%)	1/3 (33%)	1/1 (100%)	4/6 (66%)
General tourism	0/2 (0%)	1/1 (100%)		1/3 (33%)
Scientific tourism	2/9 (22%)	1/4 (25%)	1/5 (20%)	4/18 (22%)
Marine research tourism	9/40 (22%)	3/20 (15%)	0/3 (0%)	12/63 (19%)
Ecotourism	2/12 (16%)	0/4 (0%)	0/2 (0%)	2/18 (11%)
Educational tourism	0/14 (0%)	1/4 (25%)	0/1 (0%)	1/19 (5%)
Adventure tourism			0/1 (0%)	0/1 (0%)
Alternative tourism			0/1 (0%)	0/1 (0%)
Marine tourism	0/5 (0%)	0/1 (0%)	0/1 (0%)	0/7 (0%)
Wildlife tourism	0/3 (0%)	0/2 (0%)	0/3 (0%)	0/8 (0%)
Contestable/all (%)	22/142 (15%)	19/68 (27%)	3/22 (13%)	44/232 (18%)

Note: Blue cells indicate shared views, yellow and orange cells are moderately contestable views, and red cells are contestable views of key stakeholders

Using this information, a new tourism-system of key stakeholder's views of MRT in Australia can be derived (Figure 5.21). This system is based on Moscardo et al.'s (2004) supply and demand tourism-system and shows eight tourism system components that are likely to contribute to changes in MRT across Australia. Significantly, when compared to Moscardo et al.'s (2004) tourism system model, this new tourism system has two new components. They are 1) desired research, conservation and community involvement characteristics (Component 8); and 2) research, conservation and community involvement constraints (Component 7). That is, in terms of Moscardo et al.'s (2004) tourism-system, 1) MRT activity preferences; and 2) the choice of MRT locations and activities are also dependent upon those two factors. That is, MRT is not only dependent on tourism product opportunities and issues but also clearly dependent on various marine research, conservation, and community involvement characteristics and constraints.

For each of the eight components (Figure 5.21), the number of key stakeholder statements is shown, and the % of those statements that are considered contestable is also shown. This indicates what system components are most (and least) important to this study's key stakeholders and what percent of those components are contested across two or more stakeholder groups. For example, components one (n=87) and seven (n=55) of Figure 5.21 have the highest number of statements, and this indicates that 1) desired MRT characteristics; and 2) marine research, conservation, and community constraints are most important to key stakeholder groups. Similarly, component eight (n=29) has the highest percentage (41%) of contested statements, and this indicates that desired marine research, conservation, and/or community characteristics by key supply-side stakeholders are the most contested aspect of MRT in Australia.

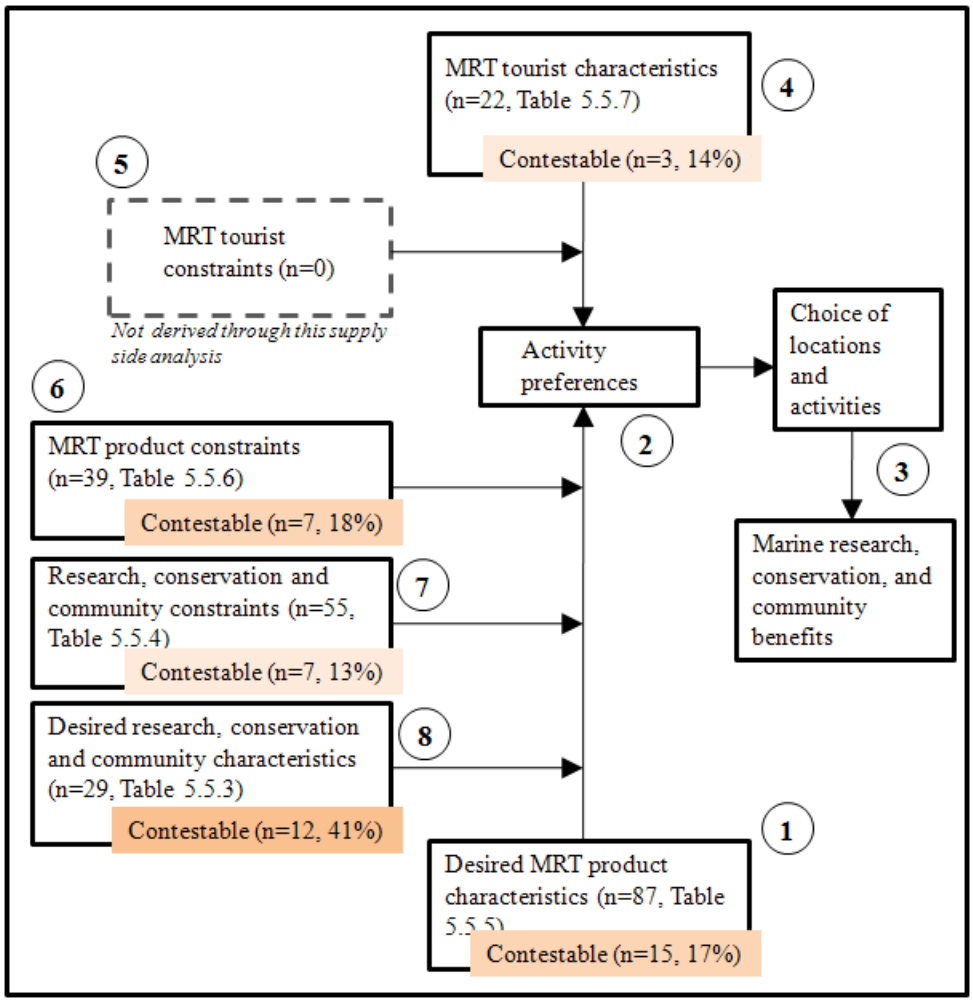


Figure 5.21: A conceptual model of key supply-side stakeholder's views of MRT in Australia

To complement this new MRT system model, Table 5-58 to Table 5-62 show the occurrence and contestability of stakeholder views that are associated with four categories namely; relevant tourism system components, key MRT elements, main topic, and agenda for change. They act as reference to quickly assess the conceptual and contested nature of MRT in Australia from the viewpoints of approximately 70 key stakeholders. In these tables, the occurrence of stakeholder views for each category are displayed using red (low numbers), orange (moderate) to blue (high numbers) arrows. The percentage of contestable views for each category is displayed using a green (shared view), orange (somewhat contestable) and red (contestable) traffic lights.

For example, Table 5-58 adds insight into the conceptual nature of component eight. That is, component eight is comprised of key stakeholder views about marine research (n=38), marine conservation (n=10), and community involvement in MRT (n=7), research quality (n=17), and the role of MRT in marine research (n=13). A majority of these views were provided by MRT operators, marine researchers, and marine managers. Thirty three percent of marine tour operator views, thirty three percent of conservation organisation views and twenty nine percent of marine researcher views were considered to be contestable. Additionally, twenty nine percent of the key stakeholder views about community involvement in MRT (n=7) were considered to be contestable across two or more key stakeholder groups. While not expanded upon in this chapter, Table 5-59, Table 5-60, Table 5-61, Table 5-62 also provide further similar insight into the conceptual nature of MRT in Australia.

Table 5-58: Component 8 - Desired marine research, marine conservation, and community involvement characteristics (n=55)

Intended benefits	All statements	Contestable statements	% contestable statements
Marine research	38	5	13%
Marine conservation	10	0	0%
Community involvement	7	2	29%
Total	55	7	13%

Key stakeholder group	All statements	Contestable statements	% contestable statements
MRT operator	29	3	10%
Marine researcher	7	2	29%
Marine manager	6	0	0%
Conservation organisation	3	1	33%
Marine educator	3	0	0%
Marine tour operator	3	1	33%
N/A	3	0	0%
Tourism destination manager	1	0	0%
Total	55	7	13%

Main MRT topic	All statements	Contestable statements	% contestable statements
Research quality	17	0	0%
The role of marine research in MRT	13	2	15%
Community involvement	7	2	29%
The environment	5	0	0%
The MRT attraction - marine research stations	4	2	50%
The MRT tourist	3	0	0%
Good business principles	2	0	0%
Business aspirations	2	1	50%
Support infrastructure	2	0	0%
Key stakeholder concerns	0	0	N/A
Marine researcher involvement	0	0	N/A
Marketing concerns	0	0	N/A
MRT broker concept	0	0	N/A
The MRT attraction	0	0	N/A
Total	55	7	13%

Agenda for change	All statements	Contestable statements	% contestable statements
Pro MRT Industry	13	2	15%
Quality marine research	11	0	0%
Business approach	5	0	0%
Close relationship with marine research organisations	5	0	0%
Marine research	5	1	20%
Growth	4	2	50%
Pro environment	4	0	0%
Pro community	3	1	33%
Proactive involvement of Australian indigenous peoples	2	1	50%
Quality tourist experience	2	0	0%
Role of environmental attractions	1	0	0%
Pro marine tour operator	0	0	N/A
Total	55	7	13%

Table 5-59: Component 7 - Marine research, conservation and community involvement constraints (n=29)

Intended benefits	All statements	Contestable statements	% contestable statements
Marine research	24	12	50%
Marine conservation	5	0	0%
Community involvement	0	0	N/A
Total	29	12	41%

Key stakeholder group	All statements	Contestable statements	% contestable statements
MRT operator	13	7	54%
Marine manager	6	2	33%
Conservation organisation	3	0	0%
N/A	3	2	67%
Marine researcher	2	1	50%
Marine tour operator	2	0	0%
Marine educator	0	0	N/A
Tourism destination manager	0	0	N/A
Total	29	12	41%

Main MRT topic	All statements	Contestable statements	% contestable statements
Key stakeholder concerns	14	7	50%
Marine researcher involvement	4	3	75%
Research quality	3	1	33%
The role of marine research in MRT	3	1	33%
The environment	2	0	0%
Marketing concerns	1	0	0%
MRT broker concept	1	0	0%
Business aspirations	1	0	0%
Community involvement	0	0	N/A
Good business principles	0	0	N/A
Support infrastructure	0	0	N/A
The MRT attraction	0	0	N/A
The MRT attraction - marine research stations	0	0	N/A
The MRT tourist	0	0	N/A
Total	29	12	41%

Agenda for change	All statements	Contestable statements	% contestable statements
Pro MRT Industry	12	6	50%
Pro environment	5	0	0%
Close relationship with marine research organisations	4	2	50%
Business approach	3	1	33%
Quality marine research	2	1	50%
Marine research	1	1	100%
Pro marine tour operator	1	0	0%
Role of environmental attractions	1	1	100%
Growth	0	0	N/A
Pro community	0	0	N/A
Proactive involvement of Australian indigenous peoples	0	0	N/A
Quality tourist experience	0	0	N/A
Total	29	12	41%

Table 5-60: Component 1 - Desired MRT product characteristics (n=87)

Better known tourism types	All statements	Contestable statements	% contestable statements
Marine research tourism	40	9	23%
Educational tourism	14	0	0%
Ecotourism	12	2	17%
Scientific tourism	9	2	22%
Marine tourism	5	0	0%
Wildlife tourism	3	0	0%
General tourism	2	0	0%
Volunteer tourism	2	2	100%
Adventure tourism	0	0	N/A
Alternative tourism	0	0	N/A
Total	87	15	17%

Key stakeholder group	All statements	Contestable statements	% contestable statements
MRT operator	36	4	11%
Marine educator	17	1	6%
Conservation organisation	8	3	38%
N/A	8	4	50%
Marine tour operator	7	3	43%
Marine researcher	5	0	0%
Marine manager	2	0	0%
SCUBA diving organisation	2	0	0%
Tourism destination manager	2	0	0%
Total	87	15	17%

Main MRT topic	All statements	Contestable statements	% contestable statements
Proposed business aspirations	14	7	50%
Education and Interpretation	13	0	0%
Support infrastructure	11	1	9%
Good business principles	10	0	0%
The environment	8	0	0%
A MRT guide role	7	2	29%
MRT broker concept	7	3	43%
The MRT attraction	4	0	0%
Research quality	3	2	67%
The MRT tourist	3	0	0%
The role of marine research in	3	0	0%
Key stakeholder concerns	2	0	0%
The MRT attraction - marine research stations	1	0	0%
The role of the media	1	0	0%
Marine researcher involvement	0	0	N/A
Marketing concerns	0	0	N/A
Total	87	15	17%

Agenda for change	All statements	Contestable statements	% contestable statements
Pro MRT Industry	24	7	29%
Business approach	18	3	17%
Pro environment	9	1	11%
Quality tourist experience	9	0	0%
Growth	7	1	14%
Role of MRT staff	5	1	20%
Change tourist's outlook	3	0	0%
Role of documentaries and other	3	0	0%
Close relationship with marine research organisations	2	0	0%
Marine research	2	0	0%
Quality marine research	2	2	100%
Ethics	1	0	0%
Pro community	1	0	0%
Role of environmental attractions	1	0	0%
Total	87	15	17%

Table 5-61: Component 6 - MRT product constraints (n=39)

Better known tourism types	All statements	Contestable statements	% contestable statements
Marine research tourism	20	3	15%
Ecotourism	4	0	0%
Educational tourism	4	1	25%
Scientific tourism	4	1	25%
Volunteer tourism	3	1	33%
Wildlife tourism	2	0	0%
General tourism	1	1	100%
Marine tourism	1	0	0%
Adventure tourism	0	0	N/A
Alternative tourism	0	0	N/A
Total	39	7	18%

Key stakeholder group	All statements	Contestable statements	% contestable statements
MRT operator	24	4	17%
Marine researcher	6	1	17%
Marine tour operator	4	0	0%
Marine manager	3	0	0%
Conservation organisation	1	1	100%
N/A	1	1	100%
Marine educator	0	0	N/A
SCUBA diving organisation	0	0	N/A
Tourism destination manager	0	0	N/A
Total	39	7	18%

Main MRT topic	All statements	Contestable statements	% contestable statements
Key stakeholder concerns	14	2	14%
Education and Interpretation	6	1	17%
Good business principles	5	0	0%
Marine researcher involvement	3	2	67%
Marketing concerns	3	0	0%
Proposed business aspirations	2	1	50%
The MRT attraction	2	0	0%
A MRT guide role	1	0	0%
Research quality	1	0	0%
The environment	1	1	100%
The role of marine research in MRT	1	0	0%
MRT broker concept	0	0	N/A
Support infrastructure	0	0	N/A
The MRT attraction - marine research stations	0	0	N/A
The MRT tourist	0	0	N/A
The role of the media	0	0	N/A
Total	39	7	18%

Agenda for change	All statements	Contestable statements	% contestable statements
Pro MRT Industry	16	5	31%
Marine research	6	0	0%
Business approach	4	0	0%
Close relationship with marine research organisations	3	0	0%
Quality marine research	3	0	0%
Quality tourist experience	3	0	0%
Pro environment	2	0	0%
Role of MRT staff	2	2	100%
Change tourist's outlook	0	0	N/A
Ethics	0	0	N/A
Growth	0	0	N/A
Pro community	0	0	N/A
Role of documentaries and other media	0	0	N/A
Role of environmental attractions	0	0	N/A
Total	39	7	18%

Table 5-62: Component 5 - MRT tourist characteristics (n=22)

MRT elements (both intended benefits and tourism types)	All statements	Contestable statements	% contestable statements
Scientfic tourism	5	1	20%
Conservation	4	1	25%
Marine research tourism	3	0	0%
Wildlife tourism	3	0	0%
Ecotourism	2	0	0%
Adventure tourism	1	0	0%
Alternative tourism	1	0	0%
Educational tourism	1	0	0%
Marine tourism	1	0	0%
Volunteer tourism	1	1	100%
Total	22	3	14%

Key stakeholder group	All statements	Contestable statements	% contestable statements
MRT operator	14	2	14%
Marine researcher	3	0	0%
Marine educator	2	0	0%
Conservation organisation	1	0	0%
Marine tour operator	1	0	0%
Total	21	2	10%

Main MRT topic	All statements	Contestable statements	% contestable statements
The MRT attraction	13	0	0%
The MRT tourist	8	2	25%
Education and Interpretation	1	0	0%
Total	22	2	9%

Agenda for change	All statements	Contestable statements	% contestable statements
Pro MRT Industry	12	2	17%
Quality tourist experience	4	1	25%
Change tourist's outlook	2	0	0%
Role of MRT staff	2	0	0%
Business approach	1	0	0%
Role of environmental attractions	1	0	0%
Total	22	3	14%

5.6. Summary

Study two responded to the question, what are the shared and contested views of supply-side stakeholder groups about the present and future of marine research tourism in Australia? Specifically, study two identified a range of existing and potential MRT destinations, products and activities across Australia. Through two online surveys and semi-structured interviews of approximately 70 key stakeholders from 8 key stakeholder groups, it then derived a database of 232 key stakeholder groups about operation, management and development of MRT products and activities in Australia. This database was subsequently applied to develop a new conceptual model of key supply-side stakeholder views about Australian MRT.

Study two focused on supply side of MRT in Australia. However, this thesis also focuses on the demand side of Australian MRT. To achieve this, study three of this thesis researches and describes the preferences of 311 potential marine research tourism tourists for 12 different marine research tourism products, locations and activities in Australia. This study is in response to the calls by Ellis (2003b), Brown and Lehto (2005), and Coghlan (2007) for further study into the preferences of potential research tourists for different research tourism products. The next chapter of this thesis presents and discusses key findings from study three.

Chapter 6 Study three - results

Marine research tourist preferences

6.1. Introduction

Study three asks what are the preferences of potential marine research tourism tourists for twelve marine research tourism products in Australia and why. To address this question, this study created twelve Australian MRT product brochures and surveys the preferences of potential MRT tourists for those products and twenty five associated benefits. This chapter presents and analyses key results from this study.

6.2. Design twelve marine research tourism product brochures

To act as a representative set of product images and important stimulus for respondents, study three created twelve MRT product brochures. There were two design principles for the creation of these brochures. First, they should reflect the diverse range of Australian MRT products that are likely to appeal to a broad range of MRT tourist types. Second, to indicate the potential future for MRT in Australia, the MRT products either exist or could potentially exist in Australia. To create these brochures, six distinct classes of MRT tourist (Table 3-38) were derived from the MRT tourist type data from Study two. Subsequently, each of the classes was used to derive two MRT product brochures. The outcome was twelve MRT product brochures that are intended represent a broad range of existing and potential Australian MRT products.

The composition (Table 3-38, Table 6-1 and Table 6-2) of these six MRT classes may play a role in explaining why different MRT tourists prefer different MRT products and benefits. In terms of MRT attraction related criteria from Chapter Four, the relative level of SCUBA diving (93%), close association with the local community (71%), and Orams' (1999) location criteria (63%) have the most influence (i.e. %MDBV) across the six MRT tourist classes (Table 6-21). In terms of MRT benefit or concern related criteria from chapter four, the quality of tourist's research (50%), and skills or qualifications offered on MRT product (49%) appear to have the most influence across the six MRT tourist classes (Table 6-2)).

Table 6-1: Six MRT product classes and related attraction MRT criteria (Source: analysis of Study one results)

		MRT tourist class						
Factor group	**Key MRT criteria**	**A**	**B**	**C**	**D**	**E**	**F**	**MDBV**
1	Level of SCUBA diving	1.1	3.1	4.0	1.2	1.1	4.8	93%
4	Close local association	3.9	2.1	2.8	1.4	1.9	1.0	71%
1	Locations level (Orams, 1999)	2.5	2.9	3.2	2.8	4.5	5.0	63%
1	Environmental remoteness (Orams, 1999)	3.1	2.9	3.2	2.7	4.3	5.0	58%
4	Cultural focus	3.3	2.4	2.7	1.4	1.3	1.0	57%
1	Activity level (Orams, 1999)	2.6	2.9	2.8	2.8	4.5	4.9	56%
1	Experience level (Orams, 1999)	3.2	3.0	3.2	2.7	4.2	4.9	56%
5	Level of skilled scientific tourism	2.4	1.5	3.3	1.6	3.4	3.0	54%
2	Skill pre-requisite to participate	1.8	1.9	3.3	1.5	2.0	2.5	50%
1	Level of adventure challenge	2.9	3.0	3.6	2.0	3.3	3.7	48%
6	Level of active involvement in research	3.6	3.7	4.0	3.0	2.8	2.3	48%
6	Volunteer mindedness	3.7	3.3	3.9	2.7	3.0	2.4	43%
6	Level of comfort for tourist	2.6	2.7	2.3	2.8	3.2	3.6	42%
6	Level of hospitality for tourist	2.4	2.2	2.4	2.9	2.9	3.2	34%
1	Cost per day ($USD)	154	153	152	211	340	372	30%
4	Max duration (days)	37	52	51	4	19	17	27%
3	Wildlife popularity	4.5	4.2	4.0	4.2	4.6	4.2	18%

Note 1: A value of 1.0 indicates a lower level of key MRT criterion in a particular MRT product and value of 5.0 (i.e. blue) indicates a higher level. The colours indicate the relative values of each criterion (i.e. relative low is red and relatively high is blue).
Note 2: ** indicates that

Table 6-2: Six MRT product classes and related MRT benefit or concern related criteria (Source: analysis of Study one results)

		MRT tourist class						
factor group	**Key MRT criteria**	**A**	**B**	**C**	**D**	**E**	**F**	**MDBV**
6	Quality of tourist's research	3.3	3.4	4.0	2.7	2.7	2.2	50%
6	Skill or qualifications offered on trip	3.2	3.6	3.5	2.0	2.5	1.8	49%
2	Longer term conservation contribution	3.6	3.4	3.9	2.9	3.6	3.2	37%
2	Marine research quality	4.0	3.4	4.1	3.1	4.1	3.6	35%
2	Research significance	3.8	3.5	4.1	3.2	4.0	3.7	32%
2	Level of educational tourism	3.6	3.5	3.9	3.2	3.8	3.2	22%
3	Dependency on wildlife migration	2.8	2.4	2.0	2.8	3.3	3.0	32%
7	Tourist supervision	4.4	4.6	4.6	4.2	4.4	4.4	11%

Note: A value of 1.0 indicates a lower level of key MRT criterion in a particular MRT product and value of 5.0 (i.e. blue) indicates a higher level. The colours indicate the relative values of each criterion (i.e. relative low is red and relatively high is blue).

The twelve MRT product brochures that were created from these six MRT classes are summarised in Table 1-4. These brochures are central to this study but due of their file size; they are attached as Appendix 4. To complement this brochure information, the possible geographic locations in Australia for each of the twelve MRT products are shown in Figure 6.1.

Table 6-3: Twelve Australian MRT products and their associated classes (Source: analysis of Study one results)

ID	**Name of MRT product**	**Key feature**	**MRT Class**
1	Work with marine turtles and indigenous rangers in northern Australia	Coastal based	A
2	Volunteer and train at an Australian whale and dolphin research institute	Cetaceans	A
3	Volunteer at a penguin rescue centre on the southern Australian coastline	Penguins	B
4	Research, education and adventure across the Whitsundays of tropical Queensland	Education and adventure	B
5	Survey coral reefs and assess the impacts of climate change on coral reefs	Reef attraction	C
6	Biodiversity and habitat mapping in north Western Australia	Rugged trip	C
7	A bottlenose dolphin education holiday on the southern Australian coastline	Pub accom.	D
8	Day trip to the reef with some marine research as part of the attraction	Day trip	D
9	Sail, volunteer and track blue whales in the Southern Ocean	Sailing vessel	E
10	A continuous sailing expedition to explore and research Australia‘s oceans	Continuous expedition	E
11	A coral spawning research and adventure trip on a tropical coral reef	Live-aboard	F
12	A submersible research expedition to Australia‘s Bon Hommey ridge	A submersible	F

Figure 6.1: Possible locations in Australia for the twelve MRT products. Identification numbers (ID) are shown in Table 1-4. (Source: analysis of Study one results)

6.3. Market segments and demographics of respondents

By September 2008, 311 people completed the online survey of study three. The age, gender, education and nationality demographic breakdown of these respondents is presented in Table 6-4. There were 199 Australian and 109 international respondents from 44 countries (See Appendix 33). International respondents were from North America (n = 42), Central and South America (n = 16), SE Asia (n = 16), Europe (n = 22), and South Pacific, Africa and China (n = 13)

(Table 6-5). A majority of respondents' identified as ‗professional' (n=91), post graduate marine research students (n=41), self employed (n=32), non marine science students (n=32), marine scientists (n=22), and undergraduate marine science students (n=22) (Table 6-6). Overall, 123 of 311 (40%) respondents indentified as having a marine science related occupation.

Demographic distribution of respondents

Table 6-4: Age, gender, education and nationality demographics of respondents (n=311) (Source: analysis of survey results)

	Gender		Education			Nationality	
Age	**F**	**M**	**High School**	**Technical college**	**University**	**Australian**	**International**
18 – 30	62	33	2	1	93	67	29
31 – 40	39	43	5	6	71	49	33
41 – 50	32	42	9	6	59	46	28
51 – 60	17	33	7	7	36	34	16
61 -70	2	5	1	1	4	3	3
Total	152	156	24	21	263	199	109
Not stated	3		1	0	2	1	2

Table 6-5: Respondents by region (Source: analysis of survey results)

Region	**No.**
Australia	200
Central and South America	16
Europe	22
North America	42
Not stated	2
Other (e.g. South Pacific, Africa, China, Middle East)	13
SE Asia	16
Grand Total	311

Table 6-6: Respondents by occupation (Source: analysis of survey results)

Occupation	No.	MRT related
Professional	91	N
Self-employed	32	N
Other student	32	N
Tourism employee	14	N
Public Service	12	N
Management	10	N
Other	8	N
Office/Clerical	7	N
Domestic duties	1	N
Manual/Factory worker	1	N
Postgraduate marine research student	41	Y
Marine scientist	22	Y
Undergraduate marine research student	16	Y
Marine educator	10	Y
Dive instructor or master	8	Y
Retired marine scientist	6	Y

Market segmentation of respondents

A range of MRT market segments (Table 6-7) were used to profile respondents and then identify what market segments have higher or lower preferences for different MRT products and associated benefits. The breakdown of these market segments (n=11) across the 311 respondents are shown in the below tables (i.e. Table 6-7 to Table 6-15).

Table 6-7: Market segments (n=11) used to profile respondents (Source: analysis of survey results)

ID	Key market segment criteria
1	Educational background
2	Number of nature documentaries watched per week
3	Support of an environmental conservation organisation
4	Active membership of a volunteer organisation
5	Working background in natural science of the environment
6	Frequency of work in an outdoors environment
7	Whale watching experience
8	Snorkelling experience
9	Number of certified SCUBA dives
10	Relative level of adventure that the respondent considers to be high
11	Basic level of accommodation that the respondent would be satisfied with

Table 6-8: Respondent (n=311) by number of nature documentaries watched per week (Source: analysis of survey results)

No. of nature documentaries watched per week	No.	%
Not at all	53	17%
Once or twice	177	57%
3 to 5 times	56	18%
More than 5 times	25	8%
Total	311	100%

Table 6-9: Respondents (n=311) and support of an environmental conservation organisation (Source: analysis of survey results)

Support of an environmental conservation organisation	No.	%
Yes	189	61%
No	122	39%
Total	311	100%

Table 6-10: Respondents (n=311) and membership of a volunteer organisation (Source: analysis of survey results)

Active membership of a volunteer organisation	No.	%
No	201	65%
Yes	110	35%
Total	311	100%

Table 6-11: Respondents (n=311) and their working background in natural science or the environment (Source: analysis of survey results)

Natural sciences or environment background	No.	%
No	134	43%
Yes	175	56%
Not stated	2	1%
Total	311	100%

Table 6-12: Respondents (n=311) and how often they work in an outdoor environment (Source: analysis of survey results)

Amount of outdoors work	**No.**	**%**
Not often	122	39%
Sometimes	103	33%
A lot	83	27%
Not stated	3	1%
Total	311	100%

Table 6-13: Respondents (n=311) and number of whale or dolphin watching tours (Source: analysis of survey results)

No. of whale watching tours	**No.**	**%**
No	95	31%
Once	73	23%
2 to 4 times	83	27%
5 to 10 times	16	5%
11 or more times	36	12%
Not stated	8	3%
Total	311	100%

Table 6-14: Respondents and No. marine snorkelling experiences (Source: analysis of survey results)

No. of snorkelling experiences	**No.**	**%**
No	24	8%
Once	17	5%
2 to 10 times	59	19%
11 to 50 times	57	18%
51 or more times	150	48%
Not stated	4	1%
Total	311	100%

Table 6-15: Respondents (n=311) and number of certified dives (Source: analysis of survey results)

No. of certified SCUBA dives	**No.**	**%**
No	101	32%
1–10	22	7%
11 – 30	23	7%
31 – 100	27	9%
101 +	138	44%
Total	311	100%

Table 6-16: Activities that respondents (n= 311) describe as a very high level of adventure (Source: analysis of survey results)

Maximum level of adventure	No.	%
Swimming	3	1%
Snorkelling	12	4%
SCUBA diving	4	1%
Open ocean sailing	50	16%
Swimming with tiger sharks	222	71%
Total	311	100%

Table 6-17: Basic levels of accommodation that respondents (n= 311) would be satisfied with (Source: analysis of survey results)

Basic level of satisfying accommodation	No.	%
Camping	152	49%
Self contained beach hut	131	42%
English Pub	9	3%
4 star accom in Fiji	12	4%
Super yacht	6	2%
Other	1	0%
Total	311	100%

Data limitations

It is important to note that the resulting data was somewhat skewed in terms of nationality and gender of respondents. That is, twenty seven percent of respondents from outside of Australia were more likely to have SCUBA diving experience; support conservation programs (12.3%); watch nature documentaries (10.9%); volunteer (10.7%); work in the outdoors (9.8%); and watch whales and dolphins (8.1%). Furthermore, sixty six percent of respondents between the ages of 18 to 30 were female, and fifty eight percent of respondents over the age of 30 were male. This skewness should be considered when assessing any nationality and gender related outcomes.

6.3.1. Marine tourism holiday preferences of respondents

When asked about their usual marine tourism holiday preferences, fifty three percent of respondents identified as SCUBA divers, forty seven percent as nature enthusiasts, forty three percent as marine wildlife tourists, forty two percent as ecotourists, and thirty five percent as adventure tourists (Table 6-18). Twenty nine percent identified as an experienced MRT tourist, twelve percent as a marine resort tourist, fifteen percent as a volunteer tourist, and fourteen percent as a backpacker. With the above market segment information, this marine holiday preference information is subsequently used to profile the 311 respondents and their preferences for different MRT products and benefits.

Table 6-18: The usual _marine tourism holiday' type of respondents (Source: analysis of survey results)

Marine tourist type	No.	% of 311 respondents
SCUBA diver	166	53%
Nature enthusiast	145	47%
Marine wildlife tourist	134	43%
Ecotourist	131	42%
Adventure tourist	109	35%
Experience seeker	105	34%
Snorkeler	99	32%
Free and independent traveller	94	30%
Experienced MRT tourist	90	29%
Educational tourist	86	28%
Volunteer tourist	47	15%
Backpacker	42	14%
Marine resort tourist	36	12%
Gap year traveller	3	1%
Other	8	3%

To better understand the holiday preferences of respondents, an AHC Euclidean and furthest neighbour cluster analysis was undertaken on the above _marine tourism holiday' data. The outcome was the identification of four classes of potential MRT tourist (Table 6-19). Specifically,

these classes were A) MRT tourists who are generally comprised of ecotourists and SCUBA divers; B) SCUBA divers comprised of SCUBA divers but not ecotourists; C) Land-based ecotourists comprised of ecotourist but not SCUBA diver; and D) Other tourists who are generally not ecotourists and not SCUBA divers. These four classes are used later in this chapter to further understand different MRT market segments, benefit preferences and MRT product preferences.

Table 6-19: Four classes of marine holiday type and their marine holiday type composition (Source: analysis of survey results)

No.	82	84	49	96	
Marine holiday type Class	**MRT tourist (A)**	**SCUBA diver (B)**	**Land-based ecotourist (C)**	**Other tourist (D)**	**MDBV**
Ecotourist	100%	0%	100%	0%	100%
SCUBA diver	100%	100%	0%	0%	100%
Marine wildlife tourist	70%	45%	49%	16%	54%
Nature enthusiast	71%	23%	67%	36%	48%
Educational tourist	39%	14%	53%	17%	39%
Experience seeker	54%	26%	49%	16%	38%
Adventure tourist	52%	38%	35%	18%	35%
Volunteer tourist	37%	7%	14%	4%	32%
Experienced marine research tourist	29%	8%	2%	2%	27%
Snorkeller	46%	25%	43%	20%	27%
Free and independent	32%	21%	45%	29%	23%
Backpacker	27%	10%	16%	4%	23%
Marine resort tourist	12%	14%	10%	9%	5%

Note: A lower % such as 9% is shown red and a higher value such as 100% is shown blue. Tick

The composition of these four MRT tourist classes can be further understood in terms of the thirteen distinct marine tourism holiday types (Table 6-19). For example, Class 1 - MRT tourists is comprised of marine wildlife tourists (70%), nature enthusiasts (71%), experience seekers (54%), adventure tourists (52%), and has higher levels of volunteer tourists (32%), and repeat MRT tourists (27%). Class 2 - SCUBA diver has marine wildlife tourists (45%), adventure tourists (38%); and lower levels of volunteer tourist (7%) and nature enthusiasts (23%). Class

three - land-based ecotourist has nature enthusiasts (67%), educational tourists (53%), marine wildlife tourists (49%), experience seekers (49%), and free and independent tourists (43%). Finally, Class 4 - other tourists has lower levels of nature enthusiasts (36%), and lower levels of marine wildlife tourists (16%) and volunteer tourists (4%).

6.3.2. Marine tourism holiday preferences and related market segments

These above four MRT tourist classes can also be further understood in terms of their associated market segments (Table 6-20). For instance, the MRT tourist and SCUBA diver class is more likely to have a natural sciences education background (4.0). The MRT tourist class is also more likely to 1) have an outdoors work background (3.4); 2) be female (3.2); 3) have a marine research related occupation (3.6); and 4) are more likely to actively support volunteer (3.7) and conservation organisations (3.6). The SCUBA diver class is 1) more likely to be male (2.5); 2) more likely to support a conservation organisation (3.8); 3) less likely to volunteer (2.5); and 4) more likely to be relatively older (2.4). Land-based ecotourists are 1) less likely to be repeat MRT tourists; 2) more likely to be Australian (4.3); 3) be female (3.5); 4) have low active membership of a volunteer group (2.1); and 5) are relatively younger (2.0). The other tourist group is 1) more likely to be from Australia (4.0); 2) be male; and 3) more likely to not be associated with volunteering (2.0) and conservation groups (2.8).

Table 6-20: Four classes of marine holiday and their market segments (Source: analysis of survey results)

	No.	96	49	84	82	
Market segment criteria	**Direction Class**	**Other tourist**	**Land-based ecotourist**	**SCUBA diver**	**MRT tourist**	**MDBV**
SCUBA diving	Less to more	2.0	1.7	4.3	4.3	66%
Snorkel experience	Less to more	3.2	3.4	4.3	4.6	34%
Repeat MRT tourist	No to yes	1.8	1.4	2.5	2.7	32%
Natural sciences background	No to yes	2.8	3.4	2.9	4.0	31%
Nationality	International/ Australian	4.0	4.3	3.1	3.1	29%
Outdoor work background	Less to more	2.3	2.5	2.7	3.4	27%
Gender	Male to female	2.7	3.5	2.5	3.2	26%
Active volunteer membership	No to yes	2.0	2.1	2.5	3.0	26%
Conservation organisation support	No to yes	2.8	3.5	3.8	3.7	24%
A marine research related occupation	No to yes	3.0	3.2	2.9	3.6	18%
Age group	Less to higher	2.6	2.0	2.4	2.0	16%
Whale and Dolphin watching	Less to more	2.1	2.3	2.5	2.6	13%
Education	Less to higher	4.4	4.9	4.5	4.6	13%
Nature documentary watching	Less to more	2.3	2.5	2.8	2.7	13%

Note: Values are from 1 to 5. The midpoint is 3.0. A lower value such as 2.0 is shown as red/orange and a higher value such as 4.0 is shown as blue.

6.4. Marine research tourists and their benefit preferences

The previous section explored various market segments of the 311 respondents. This section explores the preferences of those research participants for twelve different MRT benefits. Many of these benefits were identified from different tourism typologies (e.g. marine tourism and adventure tourism typologies) from this proposed conceptual framework (Figure 1.1). Criteria from these typologies form the basis of many of this study‘s survey questions. First, this next section lists the top five and bottom five MRT benefit preferences of respondents and the inter-relationships between different MRT benefits. Second, it then examines the respondent‘s MRT benefit preferences as they compare to the respondent‘s various market segments and marine

tourism holiday preferences. Lastly, it applies these results to derive a conceptual model about the preferences of different MRT tourists for different MRT benefits.

6.4.1. The preferences of respondents for different MRT benefits

The top five MRT benefits preferred by respondents (Table 6-21) were; the opportunity to explore marine phenomena and discover new things (88%), learning from marine researchers (86%), the quality (83%) and experience (82%) of marine researchers, and the opportunity to have fun (80%). The results indicate that many potential MRT tourists prefer MRT product that combines a _marine discovery' focused marine research program, with quality and experienced marine researchers and the opportunity to have fun.

Table 6-21: The 5 top and bottom MRT related benefits preferred by respondents (n=311) (Source: analysis of survey results)

Top 5	MRT benefit	Important or very important
1	The opportunity to explore marine phenomena and discover new things	88%
2	Learning from the marine researchers	86%
3	The high quality of the marine researchers who are undertaking the research	83%
4	The experience of the marine researchers who are undertaking the research	82%
5	The opportunity to have fun	80%
Bottom 5		
22	The high number of training days you can be involved with	54%
23	A high level of self sufficiency needed while on the venture	53%
24	The high level of skill and knowledge needed to participate	46%
25	A high level of social interaction with others on the venture	46%
26	There is an offshore boating or sailing experience	40%

The bottom five benefits were; an offshore boating or sailing experience (40%), social interaction (46%), pre-requisite skill and knowledge (46%), a high level of self sufficiency (53%), and a high number of training days (54%). Many of these benefits have features that can be identified in both the volunteer and vacation mindedness spectrum, and the market profiles of the respondents. This suggests that volunteer mindedness and market profiles such as market segments, demographic data and usual marine tourism holiday type have a role in explaining the preferences of potential MRT tourists for different MRT related benefits.

MRT benefit preference factors

To further explore the relationships amongst the different MRT benefit preferences, a combined factor and correlation analysis (Chonbach alpha = 0.85) was undertaken across the various MRT benefit related criteria. An abridged version of factor analysis results are presented in Table 6-23 and Table 6-24. Full factor analysis results are presented in Appendix 34. The resulting nine factors are further described in Table 6-22.

It is important to note that Kramer (2005) and Hair et al (1998) both advise that a factor consisting of one criterion is not useful for extended factor analysis and subsequent structural equation analysis. In Table 6-22 and Figure 6.2, Factor 9 - Marine Discovery is one of those factors as it is comprised of just benefit criterion namely ‗the opportunity to explore marine phenomena and discover new things'. As such it would normally be removed from this factor analysis. However in this study, because this criterion is clearly a prominent aspect of MRT (Table 6-21), it is recognised and applied as a discrete factor.

Table 6-22: Nine benefit related factors that underpin the product preferences of MRT products in Australia

Factor name	Description	Explained variance
1. Marine research training and education	Comprised of 1) higher levels of education and learning from the marine researchers; 2) a higher level of involvement in the marine research program; 3) Marine research training; 4) the marine research technology or research facility; 5) an opportunity to receive recognised marine research education and training; and 6) higher levels of skills needed to participate.	20.8%
2. Importance of the marine research	Comprised of 1) higher levels of importance attached to the marine research program to the tourist; 2) a high level of involvement in conservation of marine wildlife or habitat; and 3) high quality and experience of involved marine researchers.	9.9%
3. The MRT Product	Comprised of 1) the destination attractiveness (e.g. an island, a coral reef, a sailing trip, etc.); 2) the opportunity to have fun; 3) the main vessel (e.g. ship or boat); 4) the marine wildlife that is being researched; and 5) the duration of the trip	5.6%
4. Higher levels of learning	Comprised of 1) high levels of learning; 2) experiencing new things; 3) small expedition group; and 4) a high level of social interaction	5.0%
5. Self sufficiency	Comprised of 1) a high level of self sufficiency; 2) a high level of solitude, tranquillity, and closeness; and 3) avoiding sun burn, cold exposure and/or sea sickness	4.7%
6. Physical adventure	Comprised of 1) a higher maximum level of adventure; 2) an opportunity for an offshore boating or sailing experience; and 3) and an opportunity to SCUBA dive.	4.4%
7. Comfort and hospitality	Comprised of higher levels of hospitality and a higher level of comfort to be satisfied with.	3.9%
8. Social interaction	Comprised if a high level of 1) adventure found on the venture; 2) social interaction with others on the venture; and 3) interaction with the local people	3.4%
9. Marine discovery	Comprised of the opportunity to explore marine phenomena and discover new things	3%

It is possible that the ‗marine discovery' criterion could have been included in Factor 1 - Marine research training and education or Factor 2 – importance of the marine research to tourist, because it had low correlations with some of the criteria from those factors (Table 6-23). However, its factor loading for those two factors is 0.277 and 0.196 respectively, and according to this thesis's factor loading guidelines (Table 3-4), it is therefore statistically unsuitable (Hair et al, 1998) to include it as part of either of those two factors.

Based on this information, a conceptual model that visualizes the important features and relationships from this analysis is developed (Figure 6.2). The model acts as a tool to quickly visualize the important benefit presences and key markets in MRT in Australia and their likely relationships. A summary of key features and likely processes that describe this model is as follows.

Factor 1 indicates that different MRT tourist preferences for 1) higher levels of education, training; and 2) the tourist‘s level of involvement in marine research on a MRT product are likely to explain much of the variation (i.e. 20.8%) behind potential MRT tourist‘s choice of MRT product. Within Factor 1, these two criteria are well associated with 1) a MRT tourist‘s preference for learning from marine researchers; 2) higher skill and knowledge re-requisites; and 3) more marine technology. Criteria from Factor 1 are also well correlated with criteria from Factor 2. This includes 1) the importance that the MRT tourist places on the marine research project; 2) higher levels of conservation; and 3) experience and quality of the marine researchers who are part of MRT product.

Table 6-23: Correlation and factor analysis of MRT benefits sought by respondents, Factors 1 to 3 (Source: analysis of Study three survey results)

			Factor Group	1								2				3				
			Factor name	**Marine research training and education**								**Importance of the marine research**				**The MRT Product**				
			Explained variance (%)	20.8								9.9				5.6				
Factor loading	**Factor Group**	**ID**	**MRT benefit** **ID**	1	2	3	4	5	6	7	8	26	27	28	29	9	10	11	12	13
0.59	1	1	Learning from the marine researchers																	
0.63	1	2	A high level of involvement in the marine research program	0.6*																
0.79	1	3	The high level of marine research training that you can receive	0.5*	0.6*															
0.81	1	4	The high number of training days you can be involved with	0.5*	0.5*	0.6*														
0.63	1	5	The high level of skill and knowledge needed to participate	0.3	0.4*	0.4*	0.5*													
0.78	1	6	A high level of marine research education you can receive	0.5*	0.5*	0.6*	0.6*	0.4*												
0.55	1	7	The marine research technology or research facility that the tourist can be involved with	0.4*	0.4*	0.4*	0.5*	0.4*	0.5*											
0.68	1	8	An opportunity to receive recognised marine research education and training	0.3	0.3*	0.5*	0.5*	0.4*	0.4*	0.4*										
-0.56	2	26	The importance of marine research program to the marine research community	0.6*	0.4*	0.4*	0.4*	0.3	0.4*	0.4*	0.3									
-0.79	2	27	The experience of the marine researchers who are undertaking the research	0.3*	0.3*	0.2	0.2	0.3	0.2	0.4*	0.2	0.4*								
-0.30	2	28	Your high level of involvement in conservation of marine wildlife or habitat	0.4*	0.5*	0.4*	0.3	0.2	0.4*	0.3	0.3	0.3*	0.3							
-0.75	2	29	The high quality of the marine researchers who are undertaking the research	0.4*	0.4*	0.3	0.3	0.3	0.2	0.4*	0.2	0.4*	0.6*	0.3						
0.77	3	9	The destination (e.g. an island, a coral reef, a sailing trip, etc.)	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	-0.1	0.1	0.0	0.1					
0.62	3	10	The opportunity to have fun	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.2	0.1	0.4*				
0.64	3	11	The main vessel (e.g. ship or boat) that is used for travel and research (if applicable)	0.1	0.0	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.3	0.1	0.2	0.5*	0.3*			
0.64	3	12	The marine wildlife that is being researched	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.3	0.3	0.4*	0.3	0.4*		
0.68	3	13	The duration of the trip (including any time on a boat)	0.0	-0.1	-0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.1	0.0	0.1	0.4*	0.3	0.4*	0.3	
-0.60	4	14	High levels of learning	0.3	0.3	0.3	0.3*	0.2	0.3*	0.2	0.3	0.2	0.1	0.3	0.1	-0.1	0.0	0.0	0.1	-0.1
-0.73	4	15	Experiencing new things	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.0	0.2	0.1	0.1	0.1
-0.72	5	20	A high level of self sufficiency needed while on the venture	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3
0.73	9	34	The opportunity to explore marine phenomena and discover new things	0.3	0.3	0.3	0.3	0.1	0.3*	0.2	0.2	0.2	0.2	0.4*	0.2	0.2	0.3	0.1	0.2	0.1

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange.
Note 2: * shows a likely significant relationship ($p < 0.05$) between criteria
Note 3: Source for each MRT criteria is provided in Table 3-36 and Table 3-37

Table 6-24: Correlation and factor analysis of MRT benefits sought by respondents, Factors 4 to 9 (Source: analysis of Study three survey results)

			Factor Group	4				5			6			7		8			9	
			Factor name	**Higher levels of learning**				**Self sufficiency**			**Adventure**			**Comfort and hospitality**		**Social interaction**			**Discovery**	
			Explained variance (%)	5.0				4.7			4.4			3.9		3.4			3.0	
Factor loading	**Factor Group**	**ID**	**MRT benefit** **ID**	14	15	16	17	18	19	20	21	22	23	24	25	30	31	32	34	35
-0.59	4	17	A high level of social interaction on the expedition	0.3	0.4*	0.3														
-0.37	5	18	A high level of solitude, tranquillity, and closeness	0.2	0.1	0.2	0.1													
-0.59	5	19	Avoiding sun burn, cold exposure and/or sea sickness	0.0	0.0	0.1	0.1	0.1												
-0.72	5	20	A high level of self sufficiency needed while on the venture	0.1	0.0	0.1	0.2	0.3	0.4*											
0.63	6	21	Maximum level of adventure	0.0	-0.1	0.1	-0.1	-0.1	-0.3	-0.1										
0.58	6	22	There is an offshore boating or sailing experience	0.1	0.0	0.1	0.2	0.1	0.0	0.3	0.0									
0.77	6	23	The opportunity to SCUBA dive	0.2	0.0	0.0	0.1	0.0	-0.1	0.1	0.4*	0.4*								
-0.67	7	24	High levels of hospitality	0.0	0.1	0.0	0.1	-0.1	0.2	0.1	-0.1	0.1	0.1							
-0.76	7	25	Basic level of comfort	-0.1	0.0	-0.1	-0.2	0.0	0.2	0.1	0.0	0.0	0.1	0.3						
-0.47	8	30	A high level of physical adventure found on the venture	0.2	0.2	0.1	0.2	0.3	0.0	0.2	0.0	0.3	0.3	0.0	0.0					
-0.71	8	31	A high level of social interaction with others on the venture	0.1	0.2	0.0	0.2	0.2	0.1	0.3	-0.1	0.3	0.2	0.1	0.1	0.4*				
-0.69	8	32	A high level of interaction with the local people	0.2	0.2	0.0	0.6*	0.3	0.2	0.3	-0.1	0.2	0.1	0.0	-0.1	0.3	0.5*			
0.73	9	34	The opportunity to explore marine phenomena and discover new things	0.2	0.2	0.1	0.2	0.2	0.0	0.2	0.1	0.2	0.3	0.0	0.0	0.2	0.2	0.2		

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange.
Note 2: * shows a likely significant relationship ($p < 0.05$) between criteria
Note 3: Source for each MRT criteria is provided in Table 3-36 and Table 3-37

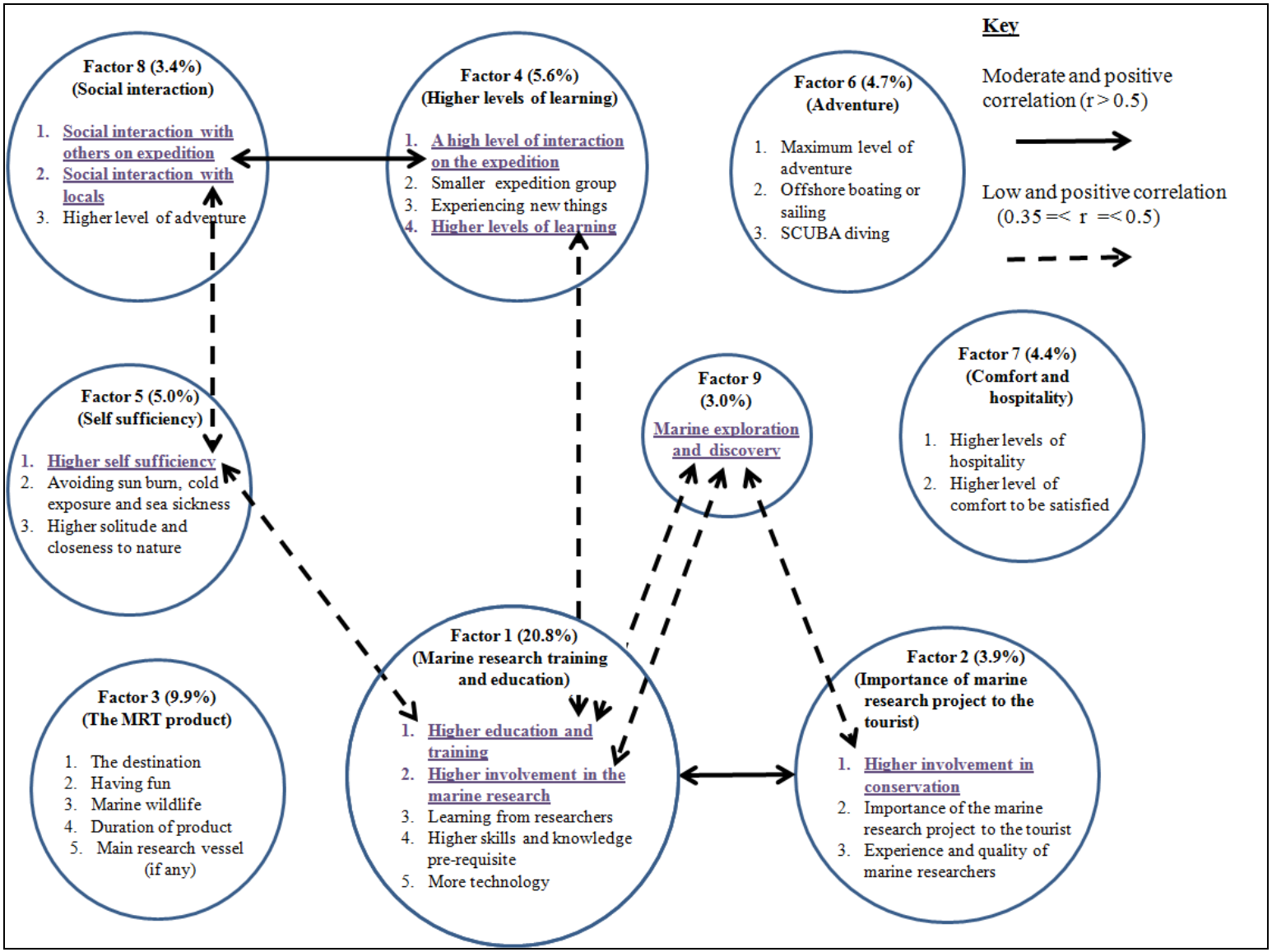


Figure 6.2: A conceptual model of the preferences potential MRT tourists for of different MRT benefits (Source: analysis of survey results)
Note: Bold and underline criteria are criteria with one or more external links between factors. Also, circle size is not important in this figure.

As the marine education and training (Factor 1) increases the respondents‘ preferences for a higher level of self sufficiency on the venture (Factor 5) also increases. Following this, self sufficiency in Factor 2 is associated with 1) avoiding sun burn, cold expose and sea sickness; and 2) closer solitude and closeness to nature. Higher level of self sufficiency (Factor 2) is then associated with an overall preference for higher levels of social interaction (Factor 8) with fellow MRT tourists and staff and this is associated with higher levels of learning (Factor 4). Within Factor 4, higher levels of learning are also associated with experiencing new things. In turn higher levels of learning (Factor 1) is associated with higher education and training (Factor 1) and this is positively associated with the MRT tourist preferences for marine exploration and discovery (Factor 9).

Perhaps surprisingly, Figure 6.2 shows that Factor 3 (The MRT product), Factor 6 (Adventure), and Factor 7 (Comfort and Hospitality) are not associated with the other factor groups. This indicates that a respondents‘ preferences for the destination, marine wildlife adventure, offshore boating, SCUBA diving, comfort and/or hospitality have little influence on (or are not influenced by) their preference for other MRT benefits outside that factor like marine science, conservation, learning and/or discovery. For example, a respondent‘s preference for higher levels of comfort appears not to affect their preference for 1) marine exploration and discovery (Factor 9); 2) a smaller expedition group (Factor 4); or 3) the marine wildlife that is being researched (factor 3). This is not to say that these benefits are not important influence on a MRT tourist but rather just to say that, based on this study, they appear to be relatively independent to other factors. It is possible that those MRT factors may be indirectly linked by the preferences of different MRT market segments for those benefits.

6.4.2. The preferences of four MRT tourist classes for different MRT benefits

As highlighted earlier, this chapter derived four MRT tourist classes namely A) MRT tourists; B) SCUBA divers; C) land-based ecotourists; and D) other tourists. MDBV and MANOVA analysis were used with these classes to further understand the preferences by different MRT tourists for 25 different MRT benefits. Significant results are shown in Table 6-25 and the results on all benefit criteria are included as Appendix 35. Specifically, Table 6-25 lists 13 MRT benefits that have a significant linear relationship across all of the MRT tourist classes. A significant relationship is identified when the MANOVA p value is less than 0.005 and the MDBV value is a higher). Results in Table 6-25 infer that those 13 MRT benefit criteria have a significant role towards explaining the desired benefits of each MRT tourist class.

For example, Table 6-25 shows that the ‗MRT tourist' class places relatively higher levels of importance on all MRT criteria apart from 1) the duration of the trip (from Factor 3) and 2) avoiding sun burn, cold exposure and/or sea sickness (From Factor 5). Similar to the MRT Tourist class, the ‗SCUBA diver' class place 1) higher levels of importance on SCUBA diving, maximum level of adventure, and learning from the researcher; and 2) lower levels of importance on the duration of the trip, and avoiding sun burn, cold exposure and/or sea sickness. Noteworthy differences between MRT tourist and the SCUBA diver classes is that the MRT tourist places more importance on criteria such as 1) marine education and training; 2) a high level of conservation; 3) higher levels of learning; and the opportunity to explore marine phenomena and discover new things.

Table 6-25: MRT benefit s (n=13) that have a significant linear relationship across the four MRT tourist classes (Source: analysis of survey results)

		No.	96	49	84	12	
Factor group	**p value**	**MRT benefit**	**Other tourist**	**Land-based ecotourist**	**SCUBA diver**	**MRT tourist**	**%MDBV**
6	0.000*	The opportunity to SCUBA dive	2.13	2.00	3.26	3.22	42%
1	0.000*	The high level of marine research training that you can receive	2.55	2.59	2.80	3.37	27%
2	0.000*	A high level of involvement in conservation of marine wildlife or habitat	2.72	3.14	3.10	3.44	24%
1	0.000*	A high level of marine research education you can receive	2.53	2.76	2.83	3.24	24%
6	0.000*	Maximum level of adventure	3.26	3.20	3.84	3.89	23%
1	0.000*	An opportunity to receive recognised marine research education	2.20	2.49	2.54	2.88	23%
1	0.000*	The high number of training days you can be involved with	2.35	2.27	2.58	2.91	22%
4	0.001*	Higher levels of learning	2.50	2.93	2.95	3.12	21%
1	0.000*	A high level of involvement in the marine research program	2.76	2.98	3.19	3.37	20%
5	0.001*	Avoiding sun burn, cold exposure and/or sea sickness	2.38	2.37	1.79	1.96	20%
3	0.002*	The duration of the trip (including any time on a boat)	2.91	3.14	2.71	2.57	19%
9	0.003*	The opportunity to explore marine phenomena and discover new things	3.16	3.39	3.31	3.66	17%
1	0.004*	Learning from the marine researchers	3.11	3.16	3.40	3.45	11%

Note 1: For the p value column, * indicates a significant linear relationship between a MRT criteria and type of MRT organisation
Note 2: A value of 2 (orange) is somewhat important, 3 is important, and 4 (blue) is very important to the respondent (n=311).

When compared to MRT tourists, the land-based ecotourist class placed less importance on most (n=11) criteria. Two exceptions being 1) the duration of the trip; and 2) avoiding sun burn, cold exposure and/or sea sickness. When compared to the SCUBA diver class, the land-based ecotourist group placed similar importance on a high level of involvement in conservation, and a high level of marine research education and learning. They placed less importance on number of training days and involvement in the marine research program when compared to the SCUBA diver class. This indicates that when compared to MRT tourists and SCUBA divers, land-based ecotourists prefer a longer trip, avoiding sun burn, cold exposure and/or sea sickness, involvement in conservation, but prefer less marine education, training and involvement in marine science.

Finally, when the _other tourist‘ class is compared to the MRT tourist and SCUBA diver classes, they placed substantially less importance on all MRT benefit criteria apart from avoiding sun burn, cold exposure and/or sea sickness. When compared to the land-based ecotourist, the _other tourist‘ class placed less importance on involvement in conservation, higher levels of education and learning, the duration of the trip, involvement in the marine research program, and opportunity to explore marine phenomena and discover new things.

6.5. A conceptual model of MRT tourist preferences and benefits

The previous section examined the preferences of four MRT tourist classes for different MRT benefits. These four MRT tourist classes are also comprised of different market segments (i.e. marine tourism holiday types, market segments, and demographics) as shown in Table 6-19 and 6-20. Given this, it is reasonable to suggest that key associations can be made between these

different market segments and their preferences for different MRT benefits. To identify such associations, this study undertook MDBV and MANOVA analysis on the market segments and MRT benefits survey data. Higher MDBV values and/or lower MANOVA (=< 0.005) values are considered to be key associations between market segments and MRT benefit criteria. The detailed outcomes of this analysis are presented in Appendix 36.

Towards communicating these results in a concise way, a conceptual model (Figure 6.2) was drafted that links many of the different MRT market segments with their preferences for different MRT related benefits. The foundation of this model is the conceptual model shown in Figure 6.2. Market segments with notably higher or lower levels of importance for various MRT benefits (Appendix 36) by different market segments were added to create the new conceptual model (Figure 6.3). Higher levels of importance are highlighted by straight green arrows and lower levels of importance by curving orange arrows.

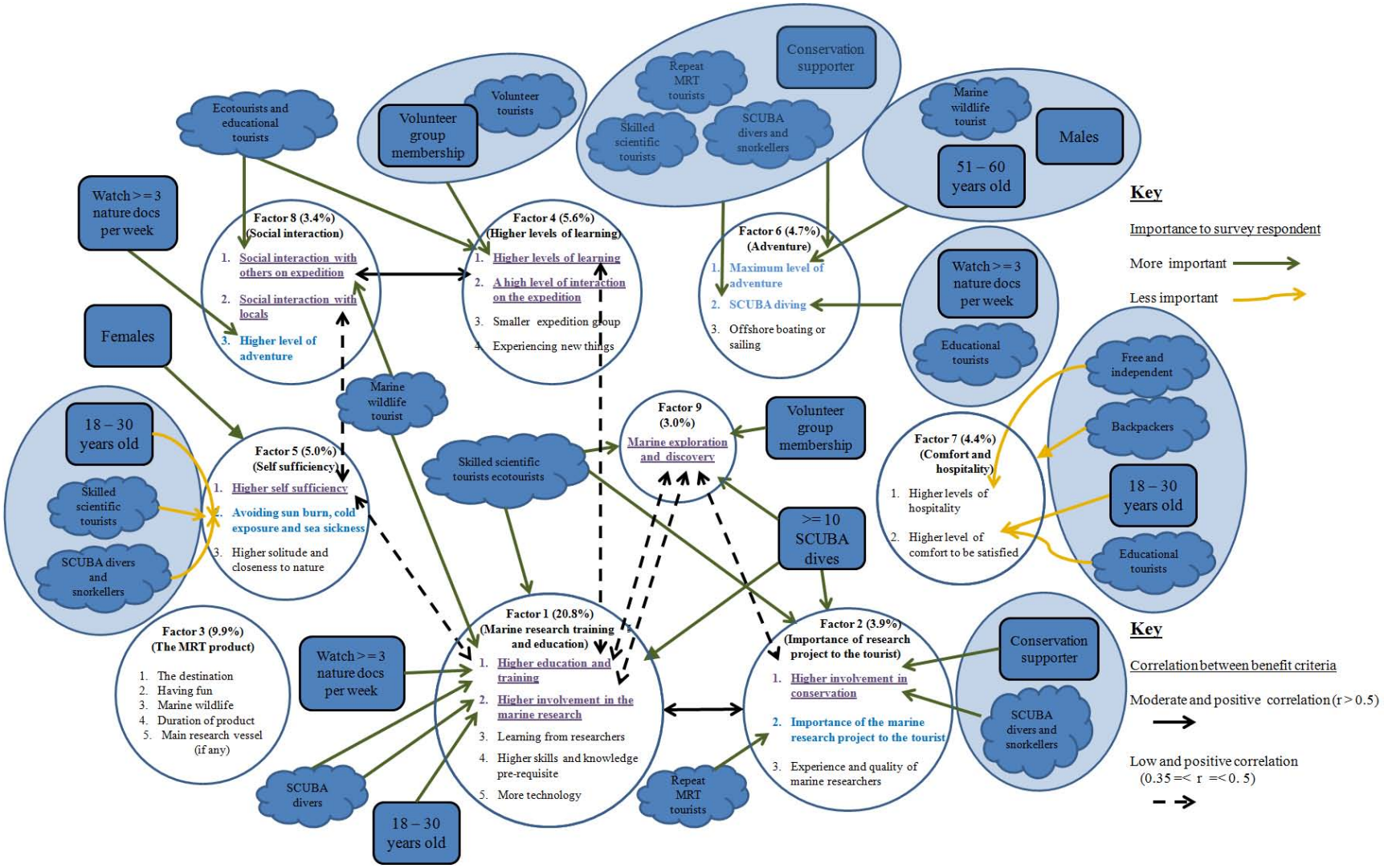


Figure 6.3: Conceptual model of the preferences of MRT market segments for various MRT related benefits. (Source: analysis of survey results). Note: Bold and underline criteria are criteria with one or more external links between factors. Also, NB, circle size is not important in this figure.

6.6. MRT product preferences of respondents

The previous section assessed the varying preferences of different MRT market segments for various MRT benefits. The next section presents and compares the preferences of respondents (n=311) for twelve MRT products (Table 1-4) and associated MRT benefits. First, it identifies the overall preferences of respondents for each MRT product. Second, it seeks to possibly explain these overall preferences by comparing the respondents' product preferences with their preferences for different MRT benefits. Third, it seeks to further understand what market segments appear be interested in different MRT products and why. Lastly, twelve information sheets are presented that summarise outstanding market segments and associated benefits for each of the twelve MRT products.

6.6.1. Overall preferences of respondents for different MRT products

The preferences of 311 potential MRT tourists for the twelve MRT products are presented in Table 6-26. The MRT products with the highest preferences (i.e. very interested) were product twelve (i.e. the submersible expedition) (57%), and product eleven (i.e. coral spawning research) (55%). The MRT products with the lowest preferences (i.e. not interested) were product three (i.e. volunteering at a penguin rescue centre) (32%) and product six (i.e. biodiversity and habitat mapping) (30%).

Table 6-26: The preferences of respondents (n = 311) for the 12 different MRT products (Source: analysis of survey results)

Product class	MRT product	Very interested	Possibly interested	Not interested
F	12. A submersible research expedition to Australia's Bon Hommey undersea ridge	57%	18%	25%
F	11. A coral spawning research and adventure trip on a tropical coral reef	55%	31%	14%
E	9. Sail, volunteer and track blue whales in the Southern Ocean	53%	26%	21%
A	1. Work with marine turtles and indigenous rangers in remote northern Australia	52%	30%	18%
C	5. Survey coral reefs and help assess the impacts of climate change on coral reefs	52%	32%	16%
D	8. Day trip to the reef with some marine research as part of the attraction	44%	31%	25%
B	4. Research, education and adventure across the Whitsundays	44%	31%	25%
E	10. A continuous sailing expedition to explore and help research the oceans of Australia	43%	37%	20%
A	2. Volunteer and train at an Australian whale and dolphin research institute	41%	30%	29%
D	7. A bottlenose dolphin education holiday on the southern Australian coastline	37%	41%	22%
C	6. Biodiversity and habitat mapping in north Western Australia	34%	36%	30%
B	3. Volunteer at a penguin rescue centre in southern Australia	32%	36%	32%

Note, % very interested, % possibly interested, and % not-interested values do not add up to 100% for each product as they were separate survey questions.

Four MRT tourist classes and their product preferences

Earlier in this study, four MRT tourist classes of respondent were identified. These were A) MRT tourists; B) SCUBA divers; C) land-based ecotourists; and D) other tourists. Table 6-27 shows the overall preferences of these four MRT classes for each of the twelve MRT products. Particularly, the _MRT tourist' class has highest levels of interest (e.g. 2.61) for all MRT products apart from MRT products 8 (i.e. day trip to the reef) and 7 (i.e. the bottlenose education holiday). Both those products were particularly lower in marine research significance and higher levels of adventure.

The _SCUBA diver‘ class has the highest level of interest in the day trip to reef product. The _land-based ecotourist‘ class has lower levels of interest in all MRT products than the _SCUBA diver‘ and _MRT tourist‘ classes. An exception to this is the working with marine turtles product (Product 1) where the land-based ecotourist (2.33) class has a slightly higher level of interest than the SCUBA diver‘ class (2.26). Finally, when compared with the other MRT tourist classes, the _other tourist‘ class has the lowest or near lowest levels of interest in all MRT products.

Table 6-27: The preferences of the four MRT tourist classes for different MRT products (Source: analysis of survey results)

No.	96	49	84	82	
MRT product	**Other tourist**	**Land-based ecotourist**	**SCUBA diver**	**MRT tourist**	**MDBV**
5. Survey coral reefs and help assess the impacts of climate change on coral reefs	2.06	2.14	2.55	2.61	27%
12. A submersible research expedition to Australia‘s Bon Hommey undersea ridge	2.06	2.10	2.49	2.55	24%
11. A coral spawning research and adventure trip on a tropical coral reef	2.20	2.22	2.52	2.63	22%
2. Volunteer and train at an Australian whale and dolphin research institute	1.92	1.88	2.29	2.30	21%
6. Biodiversity and habitat mapping in north Western Australia	2.08	1.80	2.00	2.22	21%
1. Work with marine turtles and indigenous rangers in remote northern Australia	2.22	2.33	2.26	2.56	17%
10. A continuous sailing expedition to explore and help research the oceans of Australia	2.21	2.08	2.06	2.35	15%
3. Volunteer at a penguin rescue centre on the southern Australian coastline	1.92	1.96	1.94	2.21	15%
9. Sail, volunteer and track blue whales in the Southern Ocean	2.28	2.22	2.31	2.41	10%
8. Day trip to the reef with some marine research as part of the attraction	2.14	2.27	2.26	2.12	7%
4. Research, education and adventure across the Whitsundays of Tropical Queensland	2.22	2.20	2.20	2.33	6%
7. A bottlenose dolphin education holiday on the southern Australian coastline	2.16	2.10	2.19	2.17	4%
MDBV	12%	18%	20%	17%	

Note: Interest levels range from 1 to 3. The midpoint is 2.0. A lower value such as 2 (red) indicates somewhat interested in a specific MRT product and a higher value such as 2.63 (blue) in indicates very interested.

These results are significant in at least four ways. First, MRT tourists (i.e. SCUBA divers and ecotourists) and SCUBA divers (i.e. SCUBA and not ecotourists) are more likely to be potential

MRT tourists. Second, they are likely to be key potential markets for MRT. Third, many potential MRT tourists who have SCUBA diving experience may not specifically seek an ecotourism focused MRT experience. That is, environmental conservation, education and/or community interests may not always be their main focus. Fourth, potential MRT tourists who are regular SCUBA divers when on a marine tourism holiday are, on average, much likely to be interested in both SCUBA and non-SCUBA MRT products such as whale watching and penguin related products.

6.7. The preferences of respondents for different MRT products and benefits

To further understand the varying preferences of respondents for different MRT products and benefits Table 6-28 shows the noteworthy (i.e. higher MDBV value) MRT benefit preferences for those respondents who were, on average, very interested in participating in one or more of the twelve MRT products. Particularly, Table 6-28 shows that those respondents who were very interested in products one, seven, eight and eleven (i.e. all coastal based ventures) placed relatively less importance (i.e. 2.7 to 2.8) on the opportunity to SCUBA dive. Respondents who were very interested in product ten (i.e. A continuous sailing expedition) placed a higher level of importance (i.e. 2.7) in an offshore boating or sailing experience. Interestingly, respondents who were very interested in product three (i.e. the penguin rescue centre) placed a higher level of importance (i.e. 2.9) on high level of solitude, tranquility, and closeness to nature. Importantly, all respondents who were very interested in all products considered the destination to be important (i.e. > 2.9) when choosing a MRT venture. This indicates that the quality of destination is still a major interest for most MRT tourists. The full list of product associations between benefit preferences and high interest by respondents in different MRT products is in Appendix 37.

Table 6-28: Benefit preferences for respondents who were very interested in participating in one or more of the 12 products (Source: analysis of survey results)

No. of respondents	**162**	**126**	**100**	**135**	**161**	**107**	**116**	**137**	**164**	**136**	**170**	**176**		
Benefit criteria **Product ID**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**MDBV**	**Average**
The opportunity to SCUBA dive	2.8	3.0	2.7	2.9	3.1	2.7	2.8	2.8	2.9	2.9	3.0	3.0	0.4	2.9
There is an offshore boating or sailing experience	2.5	2.4	2.4	2.5	2.4	2.5	2.3	2.3	2.5	2.7	2.4	2.3	0.4	2.4
Avoiding sun burn, cold exposure and/or sea sickness	2.1	2.1	2.1	2.1	2.0	1.9	2.2	2.2	2.0	1.9	2.0	1.9	0.4	2.0
The destination (e.g. an island, a coral reef, the southern ocean, a sailing trip, a resort, etc.)	3.1	2.9	3.0	3.1	3.0	3.0	3.1	3.2	3.1	3.1	3.1	3.1	0.3	3.1
The main vessel (e.g. ship or boat) that is used for travel and research (if applicable)	2.7	2.7	2.6	2.7	2.6	2.5	2.7	2.8	2.6	2.6	2.7	2.7	0.3	2.7
The high number of training days you can be involved with	2.7	2.8	2.7	2.7	2.8	2.7	2.8	2.6	2.6	2.7	2.7	2.7	0.3	2.7
A high level of solitude, tranquillity, and closeness to nature whilst on the venture	2.8	2.7	2.9	2.7	2.6	2.8	2.8	2.7	2.7	2.7	2.6	2.7	0.3	2.7

Note. Importance levels range from 1 to 5. The midpoint is 3.0. A value of 2 (orange) is somewhat important, 3 is important, and 4 (blue) is very important. The bold values indicate highly important outcomes.

In contrast to very interested results of Table 6-28, Table 6-29 shows the noteworthy benefit preferences of those respondents who were, on average, not interested in one or more of the twelve products. For example, respondents who were not interested in open ocean expeditions (i.e. MRT products five, two and ten) placed relatively more importance (i.e. on avoiding sun burn, cold exposure and/or sea sickness.

Specifically, Table 6-29 shows that respondents who were not interested in products eleven and four (i.e. ventures with relatively less active involvement and less research significance) considered a relatively high level of involvement in the marine research program, conservation of wildlife, marine research technology, and marine research training, as most important. Those respondents who were not interested in products eleven and five (i.e. both coral reef expeditions) considered SCUBA diving (i.e. values 2.0 and 2.1), a high level of involvement in the conservation of wildlife (2.6 and 2.6), high level involvement with the research program (2.6 and 2.6), and a high level of marine research training (2.3 and 2.4) as less important.

Table 6-29 also shows that respondents who were not interested in the less popular (Table 6-26) products three (i.e. the penguin rescue centre) and product two (i.e. the Australian whale and dolphin research institute) considered the destination as most important (3.3 and 3.4). Those respondents who were not interested in product one (i.e. turtle rescue with Indigenous rangers) placed the least importance (2.4) on involvement experiencing solitude and interacting with the local people. These results indicate that ‗disinterest' in different MRT products can be an effective approach to discern MRT market preferences.

Table 6-29: Benefit preferences for respondents who were not interested in participating in one or more of the 12 products (Source: analysis of survey results)

No. of respondent that were not interested in the product	57	91	98	60	52	91	66	79	66	78	44	79		
Benefit criteria	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**MDBV**	**Average**
The opportunity to SCUBA dive	2.4	2.4	2.7	2.6	2.1	2.7	2.4	2.5	2.4	2.4	2.0	2.3	0.6	2.4
The high level of marine research training that you can receive	2.6	2.5	2.6	2.6	2.4	2.5	2.8	2.8	2.6	2.6	2.3	2.6	0.5	2.6
The marine research technology or research facility that you can be involved with	2.4	2.5	2.5	2.7	2.4	2.5	2.6	2.7	2.5	2.4	2.2	2.4	0.5	2.5
A high level of involvement in the marine research program	2.8	2.7	2.8	3.0	2.6	2.9	3.0	3.1	2.8	2.8	2.6	2.8	0.5	2.8
Avoiding sun burn, cold exposure and/or sea sickness	2.1	2.2	2.1	2.0	2.4	2.4	2.0	2.0	2.4	2.5	2.3	2.4	0.5	2.2
The destination (e.g. an island, a coral reef, the southern ocean, a sailing trip, a resort, etc.)	3.1	3.4	3.3	3.0	3.1	3.1	3.2	3.1	3.3	3.1	3.2	3.2	0.4	3.2
There is an offshore boating or sailing experience	1.9	2.1	2.1	1.9	2.0	2.1	2.1	2.1	1.8	1.7	2.0	2.0	0.4	2.0
Your high level of involvement in conservation of marine wildlife or habitat	2.8	2.9	2.8	3.0	2.6	3.0	2.9	2.9	2.9	3.0	2.6	2.8	0.4	2.8
The high number of training days you can be involved with	2.2	2.2	2.3	2.4	2.1	2.2	2.3	2.5	2.4	2.4	2.1	2.3	0.4	2.3
The high quality of the marine researchers who are undertaking the research	3.1	3.2	3.3	3.2	3.1	3.2	3.3	3.3	3.2	3.1	2.9	3.0	0.4	3.2
Basic level of comfort to be satisfied	2.0	1.9	1.8	1.9	1.9	1.8	1.7	1.6	2.0	1.8	1.8	1.8	0.4	1.8
Experiencing solitude, tranquillity, and closeness to nature	2.1	2.4	2.4	2.3	2.3	2.4	2.5	2.4	2.3	2.2	2.3	2.4	0.4	2.3
High levels of learning	2.0	2.0	2.0	2.1	1.8	2.1	2.2	2.2	2.1	2.1	1.9	2.2	0.4	2.1
A high level of interaction with the local people	2.3	2.4	2.5	2.6	2.5	2.6	2.4	2.7	2.5	2.6	2.6	2.6	0.4	2.5
A high level of solitude, tranquillity, and closeness to nature whilst on the venture	2.4	2.6	2.6	2.6	2.7	2.6	2.6	2.7	2.7	2.5	2.6	2.6	0.4	2.6
An opportunity to receive recognised marine research education and training	2.1	2.2	2.2	2.3	2.2	2.4	2.2	2.3	2.4	2.4	2.0	2.3	0.4	2.3
High levels of hospitality	2.3	2.2	2.2	2.2	2.2	2.2	2.0	2.0	2.1	2.1	2.2	2.0	0.4	2.1

Note. Importance levels range from 1 to 5. The midpoint is 3.0. A value of 2 (orange) is somewhat important, 3 is important, and 4 (blue) is very important. The bold values indicate highly notable outcomes.

6.7.1. Market segments and their preferences for twelve different MRT products

To further understand who may be interested in different MRT products and why, the next section reports on the preferences of different market segments for each of twelve possible Australian MRT products. Such information can be used to evaluate the relative potential of different MRT market segments criteria for different MRT products (both existing and possible) across Australia.

Table 6-30 shows the variability in MDBV levels of respondent interest (1 – low to 3 - high) in each of the twelve MRT products for various market segment criteria. The higher the MDBV value, the more likely that the corresponding criteria will have a greater influence on a respondent‘s interest in each of the twelve MRT products. The _max‘ value indicates the highest MDBV value for each criterion from across the twelve MRT products.

An example of this is the _the level of nature documentary watching per week‘ criterion. The average MDBV value for this criterion across all twelve products is 0.56 (Table 6-30). This strongly indicates that the level of nature documentary watching per week is a major criterion for determining the preferences of MRT tourists for different MRT products. Furthermore, the average MDBV value for snorkeling is 0.78 (Table 6-30) and this indicates that level of snorkelling experience is a key criterion for influencing the product preferences of MRT tourist.

Table 6-30: The variability of respondent interest (MDBV) in each of the twelve MRT products for each market segment criterion (Source: analysis of survey results)

Market segment criteria	**Overall direction**	1	2	3	4	5	6	7	8	9	10	11	12	**Ave**	**Max**
Nature documentary viewing per week (None, 1 to 2, 3 to 5, > 5)	Less to more	0.5	1.0	0.6	0.6	0.7	0.5	0.6	0.5	0.5	0.4	0.5	0.4	0.56	0.98
Snorkeling experience (None, Once, 2 to 10, 11 to 50, 51 +)	Less to more	0.6	0.2	0.3	0.5	0.5	0.1	0.4	0.6	0.2	0.2	0.3	0.8	0.40	0.78
SCUBA diving experience (None, 1–10, 11 – 30, 31-100, 101 +)	Less to more	0.3	0.3	0.0	0.3	0.5	0.4	0.4	0.4	0.3	0.3	0.6	0.6	0.37	0.64
Frequency of work in an outdoor environment (Not often, sometimes, a lot)	Less to more	0.3	0.4	0.2	0.1	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.5	0.29	0.49
Age group (18-40, 31-40, 41-50, 51- 60)	Less to higher	0.3	0.4	0.5	0.4	0.2	0.1	0.2	0.3	0.5	0.5	0.3	0.2	0.32	0.49
Gender (M/F)	M to F	0.3	0.4	0.5	0.1	0.0	0.1	0.3	0.2	0.2	0.1	0.1	0.1	0.19	0.48
Whale and/or dolphin watching experience (None, Once, 2 to 4, 5 to 10, > 10)	Less to more	0.1	0.3	0.1	0.2	0.4	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.23	0.42
Education level (High school, technical college, university)	Less to higher	0.2	0.3	0.3	0.4	0.2	0.2	0.4	0.3	0.1	0.3	0.4	0.2	0.28	0.42
Marine research related occupation or not (Y/N)	N to Y	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.3	0.13	0.33
Working background in natural science or the environment (Y/N)	N to Y	0.1	0.0	0.0	0.0	0.2	0.3	0.1	0.1	0.1	0.2	0.2	0.4	0.15	0.36
supporter of an environmental conservation organisation	N to Y	0.2	0.3	0.2	0.1	0.3	0.1	0.1	0.0	0.1	0.1	0.3	0.3	0.17	0.32
Active membership of a volunteer organisation (Y/N)	N to Y	0.1	0.2	0.2	0.0	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.2	0.15	0.29
Australian or other nationality	International/ Australian	0.1	0.2	0.2	0.1	0.3	0.0	0.3	0.1	0.0	0.1	0.3	0.2	0.16	0.29
Repeat MRT tourist or not (Y/N)	N to Y	0.3	0.2	0.2	0.1	0.3	0.1	0.2	0.0	0.2	0.2	0.2	0.3	0.19	0.29

Note: Level of interest ranges from not interested (1), possible interested (2) and very interested (3). Red cells are lower values and blue cells are higher values.

To further illustrate the affect of different market segments such as nature documentary watching on MRT preference for different products, the following sections of this chapter highlight the possible roles of nature documentaries, snorkeling experience, SCUBA diving experience, and gender in influencing the preferences of different respondents for different MRT products. Similar MDBV tables for the other market segments are shown in Appendix 38.

Nature documentaries

Table 6-31 shows the respondent‘s _level of nature documentary watching‘ and their average levels of interest in different MRT products. Across the range of nature documentary viewing (i.e. 0 to greater than 5 per week), the _greatest MDBV‘ value (between interest levels of 1 to 3) in products ranges from 0.98 to 0.37. Aforementioned, this indicates that different levels of nature documentary watching are a likely key factor for identifying suitable market segment for different MRT products. An example of this is the increase in interest in the whale and dolphin research centre (i.e. product 2) as the level of documentary watching increases. For this product, the level of interest (i.e. interest = 1.7) was particularly less for respondents who did not watch nature documentaries when compared with respondents who watched nature documentaries more than five times per week (i.e. interest = 2.7). Table 6-31 also shows a similar trend for the other 11 products. The lowest difference in interest (i.e. MDBV = 0.37) is shown for the submersible research expedition (i.e. product 12). This result when combined with an average value between 2.1 and 2.5 indicates a consistently higher level of interest by respondents in the submersible research expedition (i.e. product 12). This is consistent with submersible expedition being one of the most popular products as shown in Table 6-26.

Table 6-31: Nature documentary viewing per week and respondent interest in the 12 products (Source: analysis of survey results)

No. of respondents	53	177	56	25	
Product no.	**0**	**1 to 2**	**3 to 5**	**> 5**	**MBDV**
2. An Australian whale and dolphin research institute	1.7	2.1	2.4	2.7	0.98
5. Survey coral reefs and climate change	2.1	2.3	2.5	2.8	0.72
4. Research, education and adventure	1.9	2.2	2.5	2.4	0.61
3. Volunteer at a penguin rescue centre	1.7	2.0	2.1	2.3	0.58
7. A bottlenose dolphin education holiday	1.9	2.1	2.5	2.4	0.58
6. Biodiversity and habitat mapping	1.9	2.0	2.1	2.5	0.54
9. Sail, volunteer and track blue whales	2.0	2.4	2.5	2.4	0.48
11. A coral spawning research and adventure trip	2.1	2.4	2.6	2.6	0.48
1. Work with marine turtles and indigenous rangers	2.1	2.3	2.5	2.6	0.47
8. Day trip to the reef	2.0	2.1	2.4	2.4	0.46
10. A continuous sailing expedition	2.0	2.2	2.4	2.2	0.39
12. A submersible research expedition	2.1	2.3	2.5	2.4	0.37
Average	1.9	2.2	2.4	2.5	0.56

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

These results show that respondents who do not watch nature documentaries (n=53) were notably less interested (average interest = 2.0) in all MRT products, than other respondents. For example, respondents who watched nature documentaries three or more times per week (n=81) were substantially more interested (i.e. average interest > 2.4 of total 3) in all MRT products. These results suggest that MRT marketing programs should focus on market segments that are likely to regularly watch nature documentaries.

Snorkelling experience

The level of snorkelling experience of respondents and their average levels of interest in different MRT products is shown in Table 6-32. The higher MDBV (i.e. 0.78 to 0.29) values are for products twelve, eight, one, four, five, eight, seven and three. Such results indicate that snorkelling experience is also a likely key factor for identifying suitable market segments for those MRT products. Snorkelling experience has a relatively lower MDBV (i.e. 0.13 to 0.24) for products two, six, ten and nine. These lower MDBV values are likely to be explained by the absence or low levels of snorkelling activity within those products.

Table 6-32: Snorkelling experience of respondents and their interest in the 12 products (Source: analysis of survey results)

No. of respondents	28	17	59	57	150	311
Product Name	**None**	**Once**	**2 to 10**	**11 to 50**	**51 +**	**MBDV**
12. A submersible research expedition	1.8	2.1	2.3	2.5	2.2	0.78
8. Day trip to the reef	2.0	2.6	2.3	2.1	2.1	0.61
1. Work with marine turtles and indigenous rangers	2.1	2.7	2.2	2.4	2.3	0.56
4. Research, education and adventure	1.9	2.4	2.5	2.2	2.3	0.53
5. Survey coral reefs and climate change	2.0	2.0	2.2	2.5	2.5	0.47
7. A bottlenose dolphin education holiday	2.2	2.5	2.1	2.2	2.0	0.44
3. Volunteer at a penguin rescue centre	1.9	2.2	2.0	2.0	2.1	0.34
11. A coral spawning research and adventure trip	2.2	2.4	2.2	2.5	2.5	0.29
2. An Australian whale and dolphin research institute	2.0	2.2	2.0	2.2	2.1	0.24
9. Sail, volunteer and track blue whales	2.2	2.2	2.2	2.4	2.2	0.23
10. A continuous sailing expedition	2.2	2.1	2.1	2.2	2.1	0.19
6. Biodiversity and habitat mapping	2.0	1.9	2.1	2.1	2.1	0.13
Average	2.0	2.3	2.2	2.3	2.2	0.4

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

An significant result from Table 6-32 is that, on average, when compared with more experienced snorkellers (i.e. one or more experiences, and average interest of approx. 2.3), respondents with no snorkel experience were particularly less interested (i.e. 2.0) in MRT. For example, interest in submersible expedition (product 12) clearly varies from no snorkelling experience (1.8) to just one snorkeling experience (2.1). This result indicates that MRT marketing programs should focus on potential MRT tourists with at least one snorkelling experience. This suggests that prospective MRT tourists, who have no prior snorkel experience, could receive an obligation free snorkel experience towards increasing their interest in other MRT products. However, whether such an initiative would have the desired effect on those tourists in the short term is not clear, and additional research on this topic may be warranted.

SCUBA diving

The level of SCUBA diving experience of respondents and their average level of interest in the 12 different MRT products is shown in Table 6-33. Notably, more experienced SCUBA divers (e.g. 11 or more SCUBA dives) were more interested in products eleven, twelve, eight, six, and five (i.e. underwater experiences), when compared with respondents with no or little SCUBA diving experience. For example, respondent interest in product five (i.e. survey coral reefs) clearly varies from no SCUBA experience (2.0) to 101 or more SCUBA experiences (2.6). Not surprisingly perhaps, this trend for SCUBA diving is similar to the above trend for snorkellers.

Table 6-33: SCUBA diving experience of respondents and their interest in 12 products (Source: analysis of survey results)

No. of respondents	**101**	**22**	**23**	**27**	**138**	**311**
Product Name	**None**	**1–10**	**11 – 30**	**31-100**	**101 +**	**MBDV**
12. A submersible research expedition	2.0	2.0	2.4	2.6	2.6	0.64
11. A coral spawning research and adventure trip	2.1	2.5	2.6	2.7	2.5	0.59
5. Survey coral reefs and climate change	2.0	2.4	2.3	2.4	2.6	0.53
6. Biodiversity and habitat mapping	2.0	1.9	2.3	2.0	2.1	0.44
8. Day trip to the reef	2.2	2.5	2.5	2.1	2.1	0.40
7. A bottlenose dolphin education holiday	2.2	2.2	2.0	1.9	2.2	0.38
2. An Australian whale and dolphin research institute	1.9	2.0	2.3	2.1	2.2	0.33
4. Research, education and adventure	2.2	2.5	2.4	2.3	2.2	0.32
9. Sail, volunteer and track blue whales	2.2	2.4	2.5	2.4	2.3	0.27
10. A continuous sailing expedition	2.1	2.2	2.3	2.2	2.2	0.27
1. Work with marine turtles and indigenous rangers	2.3	2.3	2.2	2.2	2.4	0.26
3. Volunteer at a penguin rescue centre	2.0	2.0	2.0	2.0	2.0	0.05
Average	2.1	2.2	2.3	2.2	2.3	0.4

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

The highest MDBV (e.g. > 0.38) is for products eleven, twelve, five, six, and eight. This higher MDBV can be somewhat explained by the variation in SCUBA diving experience across the survey sample. Those respondents with no SCUBA diving experience (n=101) would be more interested in products twelve, seven and four (i.e. non SCUBA diving products) and less interested

in products eleven, eight and five (i.e. SCUBA diving products). Conversely, those respondent with 101 or more SCUBA dives (n=138) would be more interested in products eleven, eight and five (i.e. SCUBA diving products) and perhaps less interested in products twelve, seven and four (i.e. non SCUBA diving products). The lower MDBV (e.g. =< 0.27) is for products three, one, four and nine. Similar to snorkelling, this lower difference can be explained by the combination of no requisite SCUBA diving activity for those products but higher levels of scientific research that can appeal to both novice and experienced SCUBA divers who are possibly or very interested in the marine research.

Particularly, more experienced SCUBA divers (e.g. 11 or more SCUBA dives) were more interested in products eleven, twelve, eight, six, and five (i.e. underwater experiences), when compared with respondents with no or little SCUBA diving experience. For example, respondent interest in product five (i.e. survey coral reefs) clearly varies from no SCUBA experience (2.0) to 101 or more SCUBA experiences (2.6). Not surprisingly perhaps, this trend for SCUBA diving is similar to the above trend for snorkellers.

Gender

The gender of respondents and their average levels of interest in different MRT products are shown in Table 6-34. The highest MDBV value (e.g. > 0.33) is for products three, two, seven, and one. These results show that female respondents have, on average, a higher interest in products that involve research into mega fauna such as penguins, whales, dolphins and sea turtles. For the penguin rescue centre (i.e. product five), this result is important because only thirty two percent (Table 8) of respondents were very interested in that product. Such results could have

important implications for the marketing program of a product like the penguin rescue centre. In contrast, male respondents had, on average, lower interest in most MRT products. The exception to this is the deep sea submersible expedition.

Table 6-34: Gender of respondents and their interest in the 12 products (Source: analysis of survey results)

No. of respondents	**152**	**156**	**311**
Product Name	**Female**	**Male**	**MBDV**
3. Volunteer at a penguin rescue centre	2.24	1.76	0.48
2. An Australian whale and dolphin research institute	2.29	1.93	0.36
7. A bottlenose dolphin education holiday	2.30	2.01	0.29
1. Work with marine turtles and indigenous rangers	2.47	2.19	0.28
9. Sail, volunteer and track blue whales	2.40	2.22	0.18
8. Day trip to the reef	2.27	2.09	0.18
4. Research, education and adventure	2.30	2.17	0.14
12. A submersible research expedition	2.24	2.37	0.13
6. Biodiversity and habitat mapping	2.01	2.09	0.08
10. A continuous sailing expedition	2.22	2.14	0.08
11. A coral spawning research and adventure trip	2.43	2.38	0.06
5. Survey coral reefs and climate change	2.37	2.33	0.04
Average	2.30	2.14	0.19

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

These probable different MRT product preferences between genders are also informed by the two of the four MRT tourist classes (i.e. the MRT tourist class and SCUBA diver classes) that were identified in Section 6.3.2 of this chapter. Both classes are more likely to be potential MRT tourists; have natural sciences education background; and actively support conservation organisations. However the MRT tourist class is more likely to 1) be female; 2) an ecotourist; and 3) actively support volunteer organisations. On the other hand, the SCUBA diver class is more likely to be male, less likely to support volunteer organisations, and is relatively older.

6.8. Summary sheets of MRT products, market segment and benefits

To illustrate significant and useful outcomes from this study, this next section presents twelve information tables that summarise the outstanding market segments and associated benefits for each of the twelve MRT products. Outstanding market segments and benefits were identified if they were in the top thirty percent or thirty percent of their range. The full method for this selection process is described Appendix 14. As described in Chapter Three, to complement this information, notable MRT product criteria (Table 6-21 and Table 6-22) are linked to those twelve products. When combined, these findings represent a completion of study three of this thesis namely; a description of the preferences of potential MRT tourists for different MRT products, locations and activities in Australia. Such information would be useful to further explain why certain MRT market segments may prefer certain MRT products across Australia. Because of their size, all the twelve summary sheets are included in Appendix 39. However, an example of these summary sheets is provided in Table 6-35 . This information sheet describes the outstanding MRT segments, benefits and related product criteria for MRT product 1 - Work with marine turtles and indigenous rangers at Mapoon, Queensland, Australia.

For MRT Product 1, Table 6-35 shows the outstanding market segments that were very interested in that product and the outstanding MRT benefits that they preferred. Table 6-35 also shows the benefit preferences of respondents who were not interested in that product. To complement this information, Table 6-36 also lists the outstanding MRT criteria and MRT tourist types from chapter four that best distinguish MRT product 1 from the eleven other MRT products. When all this information is considered, it is intended to provide a more complete picture of who

are the most likely markets for MRT product 1 and why. Such information could be applied to better design and/or operate turtle based MRT products in Northern Australia and elsewhere.

Table 6-35: MRT product 1 - benefits and market segments (Source: analysis of results from Study three)

MRT product 1 - Work with marine turtles and indigenous rangers in remote northern Australia
VERY INTERESTED (n=162 52%)
Benefits sought by those who are very interested in the product
The destination
A high level of solitude, tranquillity, and closeness to nature whilst on the venture
Market segments that are relatively more interested in the product
MRT tourist, SCUBA diver, land-based ecotourist, and other tourist classes
Females
One or more snorkel experiences
101 or more SCUBA diving experiences
Marine wildlife tourist
Marine resort tourist
Marine research related occupation
NOT INTERESTED (n= 57, 18%)
Benefits sought by those who are not interested in the product
Basic level of comfort to be satisfied with is higher
Higher levels of hospitality

Table 6-36: MRT product 1 - MRT criteria and market segments (Source: analysis of Study one results in Study three)

MRT product 1 - Work with marine turtles and indigenous rangers in remote northern Australia
Outstanding product criteria from Study one
Low skill pre-requisites
Low relative levels of comfort and hospitality
Volunteer minded
Located in a coastal and inter-tidal zone
Close local association and cultural focus with Australian indigenous people
Small and independent organisation (SIO)
Higher cost per day (USD$312 per day)
Shorter duration (6 days)
Marine turtles are the main attraction
Type of MRT tourist from Study two
Backpackers
Volunteers
Paying scientific tourists
Independent travellers
NO SCUBA or snorkelling

6.9. Summary

Study three responded to the question, what are the preferences of potential MRT tourists for different MRT products in Australia and why? This chapter presented key results from that study. However, this thesis is comprised of three studies into the conceptual, supply, and demand nature of MRT. To synthesise key findings from these studies, the next chapter discusses those key findings and then links them to generate an integrated conceptual model of Australian MRT.

Chapter 7 Discussion

7.1. Introduction

This thesis aims to explore and describe the conceptual, supply, and demand nature of MRT with a specific focus on MRT in Australia. There are three research questions namely:

Question 1. Based on the proposed conceptual framework for MRT, what are the key characteristics of MRT worldwide and in Australia?

Question 2. What are the shared and contested views of supply-side key stakeholder groups about the present and future of MRT in Australia?

Question 3. What are the preferences of potential MRT tourists for different MRT products in Australia and why?

The purpose of this chapter is three-fold. First, it discusses key findings from each of this thesis's three studies. This is done in terms of the relevant academic literature and implications of those findings for the conceptual study of MRT. Second, based on those findings, three conceptual models of the conceptual, supply, and demand nature of MRT are derived. Third, it links key findings and models from those studies to derive a new tourism-system model of MRT in Australia.

When relevant this chapter identifies those findings as an advance or contribution to the body of knowledge about MRT. An advance is defined as a research finding that confirms expectations from the existing literature but it is the first time that this has been done for MRT (adapted from

Perry, 1998). A contribution is defined as a research finding that involves new ideas which have not been previously raised in the academic literature; and/or ideas about MRT which there were some speculation about in the literature but there had been no empirical testing (adapted from Perry, 1998).

7.2. Significant outcomes from study one

Study one found that MRT products are found worldwide (n=126) (Figure 4.1) including in Australia (n=30) (Figure 4.3). When compared with MRT elsewhere, Australian MRT is characterised by a prevalence of smaller (SO) (n=16) and Australian owned MRT organisations (n=17). These SO organisations are typically liveaboard MRT expeditions that operate in isolated, uninhabited and/or pristine locations; and often focus on 1) whales, sharks, dolphins or 2) coral reefs. They also attract skilled scientific tourists and vacation minded travellers like older travellers and families more often, cost more per day (i.e. 80 $USD), and have less duration (i.e. 11 days).

However, in contrast to the prevalence of smaller and Australian owned MRT organisations, Australian MRT also had a higher percentage (14% more) of turtle focused MRT. Six of those eight (75%) MRT products are operated by four larger and/or international MRT organisations (LO) namely Conservation Volunteers Australia, Landscope Expeditions, Biosphere Expeditions, and The Earthwatch Institute. The other two turtle focused MRT products are operated by two SO organisations namely Cape York Turtle Rescue in Mapoon, Queensland, and Ningaloo Turtles at Coral Bay, Western Australia.

In contrast to Australian MRT, MRT elsewhere is dominated by UK or USA owned (87%) larger and/or international MRT organisations (99%) such as The Earthwatch Institute, Coral Cay

Conservation, and Greenforce. These organisations are typified by coastal or island-based operations, volunteer mindedness, less comfort for the tourist, more skills training, higher quality research by volunteer tourists, more interaction with local communities, and more coral reef and turtle focused MRT products.

Worldwide, in terms of region of operation (i.e. temperate or tropical) sixty three percent of MRT products had a research focus in a tropical region, and thirty four percent had a research focus in a temperate region. In terms of mode of marine research and associated marine wildlife, SCUBA or snorkel based marine research is usually focused on coral reefs (e.g. tropical and temperate reefs and reef wildlife) (84%), and sometimes on sharks (11%). Boat based marine research often focuses on cetaceans (74%), great white sharks (11%), and sea birds (11%). Coastal based marine research is frequently focused on marine turtles (54%), dolphins (17%) and other marine wildlife such as penguins (4%), sea birds (4%), whale sharks (4%) and mangroves (4%). Perhaps not surprisingly, eighty nine percent of all SCUBA and/or snorkel based research occurs in the tropics (i.e. warmer water). Conversely, seventy two percent of MRT marine research in colder temperate regions occurs either by boat or from a coast.

Lorimer (2009) and Whatmore (2008) ask what wildlife species could attract MRT tourists to remote or less popular destinations. Study one outcomes suggest that it is quite possible that many ‗charismatic marine mega fauna' may be attractive enough to achieve this. This is because many of the sampled MRT products occur in countries that are distant from the source markets (e.g. the UK and USA); and in remote marine locations (Orams, 1999), and these products are also regularly associated with more popular marine wildlife attractions such as whales, turtles, dolphins

and coral reefs. If this is so, the choice of MRT marine research topic appears to be often be driven by consumer demand for interactions with charismatic marine mega fauna.

This in turn leads to a possible answer to Ellis's (2003b) question about whether the extent that the popularity of certain species or groups of species within research tourism is supply or demand driven. Based on the prevalence of charismatic marine wildlife in MRT, a likely answer is while many marine research agencies will want to study charismatic marine mega fauna, a MRT product that will meet their research needs is more likely to occur if potential MRT tourists are first willing to pay for, travel to, and be involved in that MRT product. However, further study would be required to fully test if this demand driven basis for MRT is the case, and if so, to evaluate the implications of this for effective marine research and conservation.

Ellis (2003b) asked how research and management agencies can be further involved in research tourism. Based on this study two's outcomes, it can be concluded that this depends on the marine research and management benefits that can be attained through MRT. Significant to that point, study one reports that mainly across MRT worldwide, there does appear to be committed involvement by a government marine research agency and/or trained marine scientists within the operator's organisation; and marine research and/or monitoring activities by marine scientists. Hence, it is possible that if study one's outcomes were reported to marine research and management agencies, they may be more interested in MRT. However, due to the acknowledged inadequacy of website analysis to reliably measure such topics, those stakeholder groups may need more convincing. Hence, it is recommended that a widespread field-based assessment of the marine research aspects of MRT products would further compel Australian marine research and management agencies to be more involved in MRT.

Study one outcomes indicate that MRT marine research significance and quality will improve with an increased level of skilled scientific tourists. In turn, the presence of skilled scientific tourists in MRT appears to be related to higher levels of physical adventure, SCUBA diving, live aboard expeditions, evironmental remoteness, tranquility, isolated coasts, higher cost per day, shorter trips, and the presence of vacation minded tourists. This is is a signficant contribution as it links higher research significance and quality with more skilled scientific tourists, higher physical adventure, SCUBA diving, evironmental remoteness, isolated coasts, offshore sailing, tranquility, shorter trips, higher costs, and the presence of vacation minded tourists. Such a finding had not been reported in the academic literature.

This outcome indicates that certain MRT products can be designed and certain markets can found to derive higher quality marine research outcomes. Due to this importance, it is worth reviewing the reliability of this outcome. That is, it may be seem that the reliability of this outcome is somewhat limited because it is based on a review (albeit rigourous) of MRT product web sites (n=85). However, this thesis argues that this outcome is well founded because seven reasons can readily be found to support it:

- The 85 reviewed MRT product web sites are representative of MRT products worldwide (Section 3.7.2);
- Research significance and quality of MRT marine research projects is logicaly related to scientific knowledge and this is found in skilled marine scientific tourists;
- It is reasonable to suggest that many skilled marine scientific tourists seek to explore remote coastal and marine environments;
- It is plausible that many skilled marine scientific tourist are experienced in physically challenging and adventurous marine environments (e.g. SCUBA and offshore sailing;
- Higher costs for MRT are usually associated with travel to remote coastal or marine locations by liveaboard vessels;
- Shorter duration products are inversely related to higher costs and also offer suitably short term opportunities to MRT tourists with a busy schedule of other commitments‘;
- The presence of vacation minded (i.e. less actively involved in the marine science and conservation) MRT tourists is less of a deterrent to skilled scientific tourists because any supervision of those vacation minded tourists is usually far less than supervision of volunteer minded tourists (i.e. who are more actively involved in the marine research and conservation activity).

Longer term conservation benefits are found to be related to increased levels of volunteer mindedness, educational outcomes, and the reliability of the tourist‘s (not skilled scientists) research. In turn, volunteer mindedness is shown to be related to more coastal MRT products (i.e. lower levels of locations and activity criteria (Orams, 1999)); higher levels of tourist involvement in the research; and lower levels of comfort and hospitality. In turn, these products are often

correlated with lower costs per day; higher skills pre-requisites for the tourist; higher levels of skills or qualification offered on the trip; and the presence of volunteer tourists and backpackers. This finding is an advance in the study of research tourism as it affirms that volunteer minded research tourism can lead to quality conservation and educational outcomes (Cousins, 2007; Lorimer, 2009).

However, once again, this finding may seem somewhat limited as it is based on a review of MRT product web sites (n=85). To counter this, this thesis argues that this linkage between volunteer minded tourism, longer term conservation benefits, lower costs, comfort and coastal based MRT is valid because of four reasons:

- Higher conservation outcomes are often associated with able and committed people and this is typical of volunteer minded tourism (Brown & Lehto, 2005);
- Volunteer minded tourists are often educated backpackers and gap year travellers (Weiller & Richines, 1995; Clifton & Benson, 2006) who due to the extended nature of their travel are able to participate in tourism products of longer duration;
- The lower cost per day and relative comfort of volunteer minded products are probably related to the limited budgets of these travellers;
- As offshore MRT products have higher operating costs (e.g. operating a liveaboard vessel), these limited budgets are a reason why volunteer minded MRT products are often coastal or island based (Study one outcome) product with lower operating costs.

Study one found that across the sampled MRT product worldwide, marine conservation focus, higher levels of tourist education, and high levels of tourist supervision appear to be a widespread feature of MRT. This is not to say that the marine conservation, education, and tourist supervision outcomes are always a high quality in MRT but rather it indicates that most of the sampled MRT web sites promote the message that they have 1) a marine conservation focus; 2) high levels of tourist education; and 3) high levels of tourist supervision. To accurately assess the features and effectiveness of marine conservation, tourist education and tourist supervision on MRT, further field and/or interview based study across a representative sample of MRT products is recommended.

It was found that close interaction and/or cultural exchange with the local community by the MRT tourist occurs in thirty five percent and twenty nine of MRT products worldwide respectively. Those criteria were found to be highly influenced by whether MRT products mainly operate in an offshore environment or not. For example, just 2 (9%) of 22 offshore MRT products were considered to be local community orientated MRT products. In contrast, 27 (43%) of 63 coastal or island-based products regularly involved the MRT tourist with the local community. This study found that culturally focused MRT tourists were usually associated with lower levels of comfort and hospitality, costs per day, and longer trips. Such an outcome indicates that close interaction and/or cultural exchange with the local community are important but only occasional key elements of MRT.

Significantly, study one empirically validated this thesis‘s proposed conceptual framework (Figure 1.1). This was achieved by measuring the presence and absence of 25 criteria across a representative sample of 85 MRT products globally and in Australia. This research found that MRT

has nine key elements namely 1) marine, volunteer, ecotourism, scientific tourism, wildlife, educational tourism, and adventure tourism; and 2) marine research and conservation. Additionally close interaction with the local community and/or cultural exchange forms an intermittent but important part of many MRT products. It is proposed that this validated conceptual framework may be seen as an extension on Benson's (2005) conceptual model of research tourism and Coghlan's (2007) four classes of conservation volunteer tourism organisations. The theoretical implication of this MRT model is that literature that is related to these ten MRT elements (Appendix 1 and Appendix 7) can be applied to further understand and investigate MRT. This finding can be considered to be a contribution by this thesis to the body of knowledge about MRT.

Study one also conducted factor analysis of MRT products and MRT market segments across 85 MRT web sites. This analysis identified key factors that underpin the variation of MRT worldwide. In MRT product terms, it was found that the variation across MRT products worldwide is highly influenced by six key factors (Table 7-1). These were termed location (Orams, 1999); research and conservation benefits; marine wildlife; cultural focus; SCUBA diving; and volunteer mindedness. This finding reaffirms the role of the present literature (Table 7-2) in effectively describing the underlying variability of MRT and is an important advance of this thesis.

Table 7-1: Six key factors that underpin the conceptual nature of MRT products worldwide (Source: Chapter Four)

Factor	Description
1. Locations (Orams, 1999)	Comprised of 1) Orams' (1999) four marine tourism criteria; 2) the cost per day; and 3) the likely involvement of skilled scientific tourists. Together, they have a strong influence (i.e. explained variance = 28.8%) in determining the character of MRT worldwide.
2. Research and conservation benefits	Comprised of higher levels of research significance, marine research reliability, educational tourism, longer term conservation contribution, and skill pre-requisite to participate. Explained variance is 16.9%.
3. Marine wildlife	Higher wildlife popularity and higher dependency on wildlife migration are related. Explained variance is 8.7%.
4. Cultural focus	Higher levels of cultural focus, close local association, and higher duration of trip are related. Explained variance is 6.4%.
5. SCUBA diving	SCUBA diving and tropical regions are related. Explained variance is 5.3%
6. Volunteer mindedness	Comprised of 1) higher levels of active involvement in research; 2) volunteer mindedness; 3) Reliability of tourist's research; and 4) skill or qualifications; 5) lower levels comfort; and 6) lower levels of hospitality. Explained variance is 4.5%.

Table 7-2: Literature that describes the identified six key factors of MRT products worldwide (Source: Chapter Three)

Factor No.	**Factor**	**Literature**
1	Location (Orams, 1999);	Orams' (1999) Spectrum of Marine Recreational Opportunities
2	Marine research and conservation benefits	(Benson, 2005; Cousins, 2007; Ellis, 2003b; Lorimer, 2009; Whatmore, 2008)
3	Marine wildlife	(Coghlan, 2007; Cousins, 2007; Ellis, 2003b; Lorimer, 2009)
4	Cultural focus	(Clifton, 2004; Clifton & Benson, 2006; Coghlan, 2006, 2007)
5	SCUBA diving	(Dunstan, 2009)
6	Volunteer mindedness	(Brown & Lehto, 2005)

Factor analysis of market segments found that market variation across MRT products worldwide is highly influenced by three key market segments namely volunteers and backpackers, skilled scientific tourists, and SCUBA divers (Table 7-3). This outcome reaffirms the important role of volunteers and backpackers (Clifton & Benson, 2006; Coghlan, 2005, 2006; Weiler & Richins, 1995) and skilled scientific tourists in MRT (Benson, 2005; Lindberg, 1991; Mieczkowski, 1995; Musso & Inglis, 1998) in influencing the nature of MRT.

Table 7-3: Description of three key factors that underpin MRT market differences worldwide (Source: From Chapter Four)

Factor	Description
1. Volunteer tourists and backpackers	Comprised of the presence of backpackers, volunteers, gap year travellers and tourists with cultural focus, and absence of families, older travellers and liveaboard travellers Together, they have a strong influence (i.e. explained variance = 33.7 %) in determining the MRT market segment difference worldwide.
2. Skilled scientific tourists	Comprised of the presence of skilled scientific tourists and independent travellers, and the absence of package tour travellers. Explained variance is 17.5%.
3. SCUBA divers	The presence of SCUBA divers and snorkellers Explained variance is 12.1%.

SCUBA diving and SCUBA divers are identified in study one as a major MRT factor (Table 7-1, Table 7-3). However, apart from Clifton (2004), Hughes (2008), and Dunstan (2009) who recognise the role of SCUBA diving in MRT, the function of SCUBA diving and SCUBA divers in MRT is not well described in the academic literature. Given this and study one outcomes, there is a substantial opportunity to further describe the role of SCUBA diving in MRT.

Study one also found that there appears to be relationships between the marine research focus of various MRT products, and the various MRT criteria or tourist types that describe those products. For example, whale and dolphin focused MRT products are less likely to involve SCUBA diving but are more likely to offer skills or qualifications to the tourist; generate more reliable marine research outcomes; and produce higher educational outcomes. Also, shark related MRT products are often associated with independent and older travellers aboard liveaboard vessels in more offshore and pristine locations. While these likely relationships may well be an advance to the study of MRT, it is recommended that more field and/or interview related data is collected to test and further explore these likely relationships.

Using the findings above, a conceptual model of MRT worldwide can then be derived (Figure 7.1). This model is based on Moscardo et al.'s (2003) tourism system shows the governing factors that will affect the nature of different MRT products, tourists, locations, activities, and intended benefits worldwide. It is a substantial contribution from this thesis. For this study, governing factors are described as those factors that are likely to universally affect both the characteristics and constraints of MRT. This model is complemented by Figure 7.2 that describes many of those key factors and their inter-relationships in more detail.

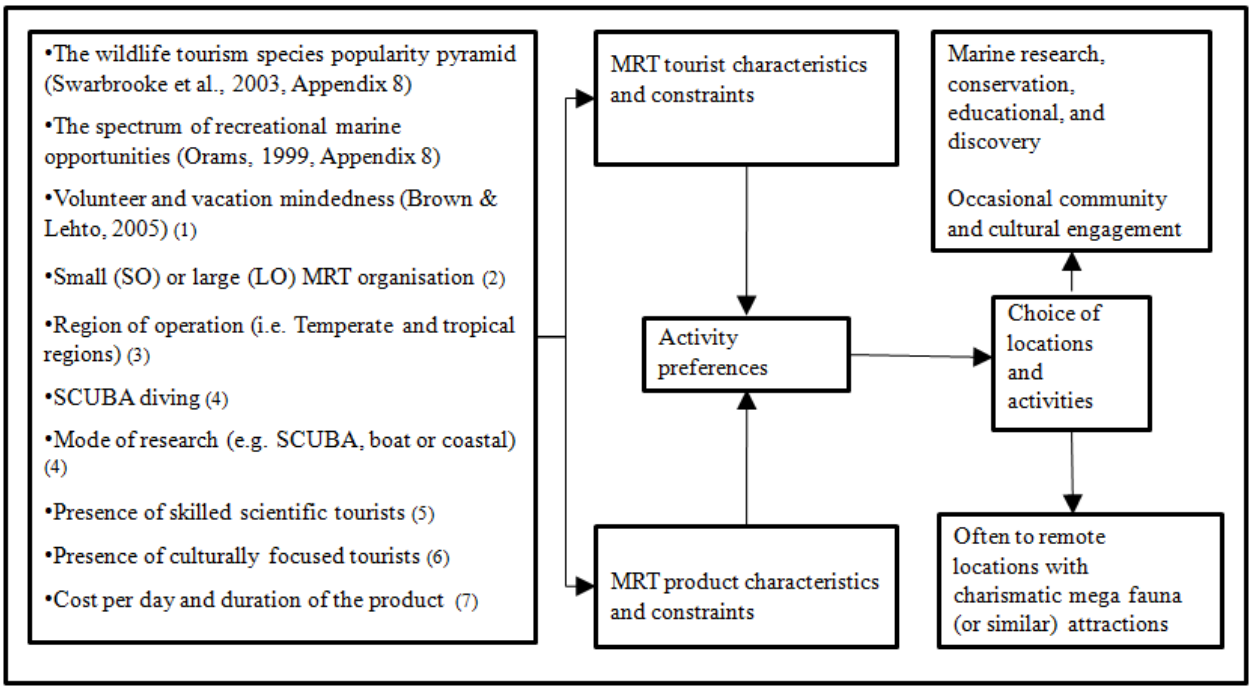


Figure 7.1: Major factors that will influence the nature of MRT worldwide (Source: The analysis of 85 MRT product web sites worldwide)

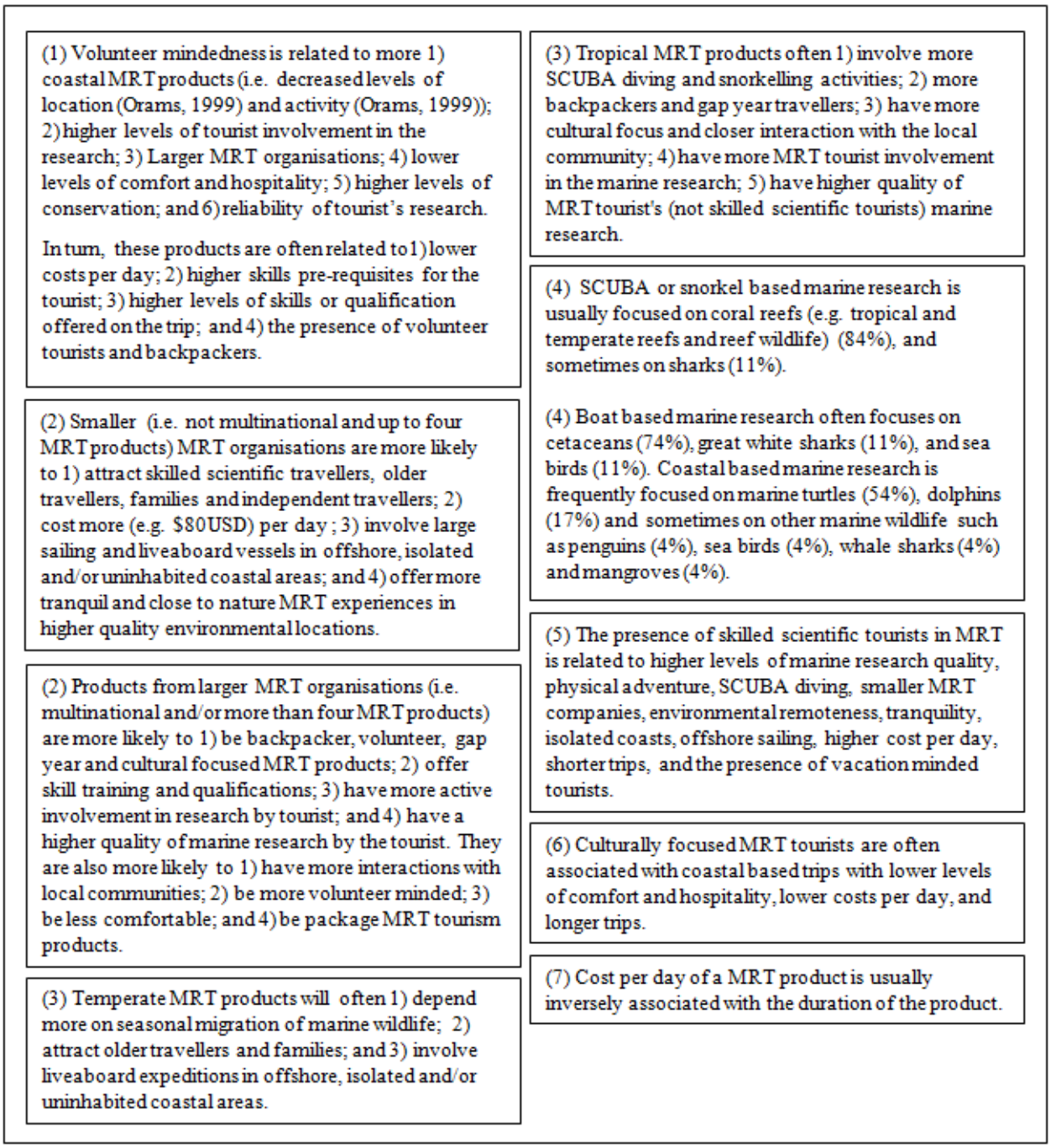


Figure 7.2: Description of the many key factors and relationships that influence the conceptual nature of MRT as shown in Figure 7.1

7.3. Significant outcomes from study two

Ellis (2003b) emphasised the need to examine the potential growth of research tourism. Towards this, study two acquired and compared the views of supply-side key stakeholders about the supply, demand and potential for MRT products, locations and activities in Australia. As a result, study two identified and described eight aspects of MRT (Figure 7.3) that are relevant to Australian MRT. These aspects are termed; driving forces, major factors, benefits, physical constraints, opportunities, issues, contested views, and shared stakeholder views. Separately, these aspects can be considered to be a unique contribution to the body of knowledge about MRT. Together, they represent a range of influences that are likely to affect the future of MRT in Australia. In that order, those eight aspects are presented and discussed below.

7.3.1. Driving forces, main factors, and physical constraints for Australian MRT

Increasingly educated, active, conservation volunteer focused, environmentally responsible, marine documentary watching, and alternative tourist markets are the most likely driving forces behind MRT. These markets include marine wildlife tourists, repeat MRT tourists, ecotourists, scientists, volunteers, SCUBA divers, and educational tourists from countries such as Australia, the United Kingdom, the United States of America, Canada, Germany, The Netherlands, New Zealand, Argentina, and Chile. Factors that influence MRT in Australia are Australia‘s marine natural wildlife and assets; relatively well managed marine environment; and a large coastline and ocean region. Major physical constraints for Australian MRT are unsafe and uncomfortable weather and ocean conditions; and the seasonality of wildlife migrations and related marine research of that wildlife; dangerous wildlife such saltwater crocodiles; and great distances from larger population

centres and tourism infrastructure. Much of this information is reflected in the present research tourism literature (e.g. Ellis 2003a; Ellis, 2003b; Benson; 2005; Cousins, 2007; Lorimer, 2009). However, the identification of these driving forces, factors, and physical constraints as they relate to Australian MRT from the point of view of many key supply-side stakeholders is a new contribution to body of knowledge about MRT.

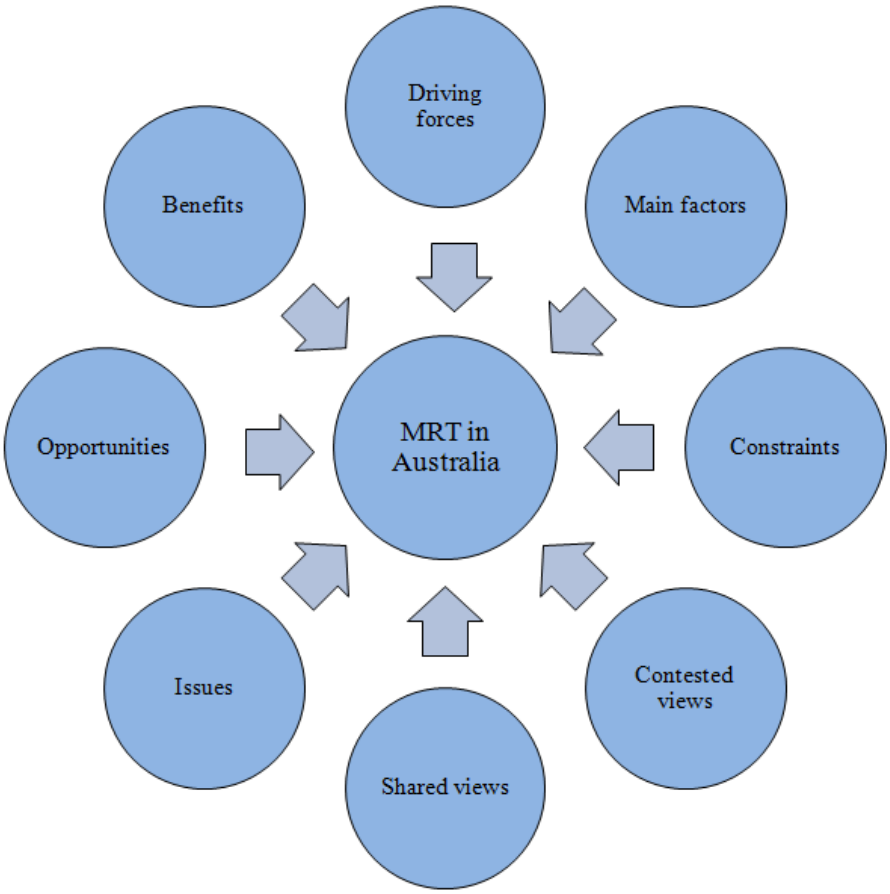


Figure 7.3: Eight main aspects of MRT that is relevant to the MRT in Australia

7.3.2. Benefits of marine research tourism

Ellis (2003b) inquired about the ability of research tourism to provide positive benefits to its stakeholders (e.g. marine managers, tourists, and local communities). Study two identified a set of stakeholder views that can be seen as likely benefits of MRT (Table 7-4). Most of these benefits can be conceptually found in the marine research, conservation and/or community elements of this thesis's proposed conceptual framework (Figure 1.1). However, a new intended benefit of MRT can be identified from this study namely _A rich tourist experience'. These would consist of benefits such as the professional development of tourists; contributing to something important; and exceeding the expectations of the tourist.

Table 7-4: Likely benefits from MRT to marine research and ecotourism

ID	Identified likely benefit	No. of survey responses.
1	Increased community awareness and stewardship of research and conservation issues	17
2	Increased funding and other resources for marine research	17
3	Increased and faster monitoring, data collection and processing	11
4	Increased community support and subsequent capacity in marine management and research	5
5	Increased speed, spatial range and effectiveness of research	2
6	Better marine research access to remote locations	2
7	Co-management and funding of resources	1
8	Diversity of tourist worldviews and skills that can assist the research process	1
9	Professional development of tourists	1
10	Tourists who feel they have contributed to something important like a significant marine conservation outcome	1
11	Improved experience for tourists by exceeding their expectations of involvement with the marine environment and researchers	1

Given this, this thesis recommends that a new MRT element termed _A rich tourist experience' element be added to Chapter Five's conceptual model (Figure 5.21) of key supply-side stakeholder's views. Such an addition highlights that many supply side stakeholders' view a rich

tourist experience as a sought after and expected outcome from MRT. There is a subsequent research opportunity to study how this rich MRT tourist experience is generated through MRT and how such an experience may be incorporated into other non-MRT tourism products.

This study's recognition of a rich tourist experience in MRT can be linked to Coghlan (2006)'s identification of desired research tourist benefits like knowledge acquisition, training, fun, and a holiday. It may also provide an insight into Brown and Lehto's (2005) questions about the motivations of some vacation minded tourists, particularly conservation volunteer vacation tourists. It can also be linked to the concept of _discovery tourism' which is considered to be –somewhat lengthier than in adventure tourism and contains elements that offer self enrichment via exposure to novel places, novel cultures, novel activities and a requirement for the tourist to immerse him/herself in a learning environment provided by the tourism product" (Muller and Cleaver, 2000, cited in Swarbrooke et al., 2003, p. 23).

Stakeholder suggestions to increase the marine research related benefits from MRT included developing coordinated lines of communication amongst potential users of the marine research from MRT; increasing data quality from volunteer tourists via improved training and supervision; and; making as many tourists as possible feel part of the marine research (Table 5-9). Stakeholders also nominated the likely beneficiaries of MRT in Australia to include indigenous Australian organisations, private marine researchers, dive training organisations, and government marine management, and marine research agencies (Figure 5.2).

7.3.3. Opportunities for marine research tourism

Study two identified a range of potential MRT activities, issues and related marine research and conservation programs that are likely to be suitable for Australian MRT (Table 7-5). The application of these results to specifically identify where and what types of MRT products are possible across Australia is a recommended opportunity for further study.

Table 7-5: Marine research, conservation and tourism activities, concerns, and programs that are likely to be suitable for MRT

Activity, issues and/or programs	Description
Likely marine research species or topics	Whales, dolphin, turtle, seals, sharks, dugongs, manta rays, penguin, coral reefs, sea dragon, sea birds, coral reef spawning, ship wreck, mangroves, sea grass, sea lions, kelp forests, tidal pools, and crown of thorns starfish .
Likely marine research concerns	Endangered species, conservation focused projects, climate change, indigenous knowledge preservation and sharing.
Likely marine research programs	Coral reefs, charismatic mega fauna, marine archaeology, bird watching, seasonal migration and breeding, and possibly cultural mapping.
Likely marine research activities for minimally trained MRT tourists	Cameras, videos, binoculars, bleach watch (i.e. coral bleach monitoring), coral watch (i.e. coral watch monitoring), fish counts, taking notes, temperature measurements, data input, interacting with scientists, habitat restoration, and assisting with logistics.
Examples of unlikely marine research activities for minimally trained MRT tourists	Species identification, handling wildlife, measuring wildlife, plankton sampling, reef surveys, mangrove surveys, sail a boat, and use a multi-beam echo sounder.
Tourism related and other industries that could have an increased role in MRT	SCUBA diving, snorkelling, live aboards, whale and dolphin watching, aquariums, day cruises, intertidal-walks, other coastal based research tours, land-based research tourism, fishing and universities.

To assist with such a project, key stakeholders gave suggestions about the design of suitable MRT marine research programs namely:

- Anything that provides a simple mechanism for tourists to get involved and actually participate in the research process is a potential marine research program for MRT;
- Nearly any specialty area can be made attractive to specialty interest groups if the groups are very well defined and marketed to;
- Survey work associated with the design and establishment of marine protected areas;

- Programs which cater to the various skill levels of the volunteer, have an outcome the volunteer can relate to, and provide hands on experiences;
- Programs that provides rapid feedback to the participant such as turtle surveys;
- Projects that are likely be affected by media, contemporary trends and fashions such as climate change for example, but itself can take many forms;
- It would be difficult to develop meaningful and genuine research involvement for tourists on short duration trips and in large group sizes.

The spatial distribution for potential Australian MRT products was considered by key stakeholders to be wide spread across Australia but with less emphasis on the Northern Territory coast, far North Western Australia, and far north Queensland (i.e. Cape York and Gulf of Carpentaria), and cold southern Australian waters (i.e. the Great Australian Bight and Tasmania). Likely reasons for this are an overall absence of larger population centres and tourism infrastructure in those regions; relatively harsh coastal and ocean environments; and/or dangerous animals such as saltwater crocodiles and box jelly fish. Research outcomes also suggest that marine areas with World Heritage and other marine conservation status can act as an effective attraction for MRT tourists. While this information may well be seen as general knowledge regarding the spatial distribution of ecotourism in Australia (Weaver & Lawton, 2001), it‘s inclusion as an important aspect of MRT in Australian is an important advance in the study of MRT.

Lorimer (2009) and Whatmore (2008) were skeptical about the efficacy of MRT to conserve less visible, accessible and/or charismatic marine wildlife such as many birds, plants, fish and invertebrates. They also questioned how such marine wildlife could better appeal to the MRT market. Studies one and two both suggest that that larger and more charismatic and accessible

wildlife is the primary focus of most MRT products today. However, study two has identified some ‗less charismatic' wildlife habitats as possibly MRT marine research topics. These are sea grass habitats, mangroves, kelp forests, and tidal pools. This suggests that certain marine habitats may have a higher appeal to MRT tourists and those habitats may act as a way to focus the interest of potential MRT tourists on the less charismatic species that live within those habitats. However, while this outcome may be a significant advance to the body of knowledge about MRT, it is not clear if this is the case, so further study is recommended on this topic.

Study two found three key stakeholder groups namely Australian indigenous people, marine conservation organisations, and marine education societies that could readily contribute to and benefit from Australian MRT. Australian indigenous people could and should commercially share their unique indigenous cultural and marine environmental knowledge with MRT tourists. Results also suggest that conservation non government organisations and marine education societies would be well suited for leading, advocating, endorsing and marketing MRT products in Australia. They could also provide staff, guides, interpretation services, and MRT tourists from their memberships. This explicit identification of these stakeholder groups as prospective key players in the future of Australian MRT is an original and potentially significant contribution. Investigating the present and potential role of these stakeholder groups in Australian MRT is a recommended research opportunity.

7.3.4. Issues for marine research tourism in Australia

A range of stakeholder issues about present MRT in Australia were identified in this study. These issues affirm the prevalent view in the academic literature (Ellis, 2003b; Musso & Inglis, 1998;

Coghlan, 2008; Brightsmith, 2009) that marine researchers and managers have real concerns that tourists can somehow be central to a marine research project and how their needs would be catered for. Specifically, those issues are:

- The collaboration required between marine researchers, marine managers and marine tour operators;
- MRT as a reliable marine research capability;
- Occupational health and safety for tourists;
- Public liability insurance for MRT operators;
- Keeping the tourist satisfied while doing marine research;
- The quality of the tourist's research contribution;
- Supervising the tourist while doing marine research;
- A MRT guide role playing a central role in any marine research;
- Some MRT products can have quality educational outcomes but relatively poor marine research outcomes (39% contestability across all key stakeholder groups).

Similar to Brightsmith et al. (2008) and Coghlan (2008), a number of key stakeholders suggested a somewhat compelling way to address these issues. That is, MRT operators can use staff such as marine interpreters, tour guides, and deck hands to undertake much of the required supervision of any volunteer tourists. However, when asked about a formalised MRT guide role, forty four percent (4 of 9) of marine researchers were not in favour of this. This thesis did not explore why this may be the case, however, it may indicate that some marine researchers are hesitant to encourage the development of marine research programs in which tour guides, tour operators, and

tourists are involved. If this is in fact the case, then involving Australian marine researchers in MRT will clearly be a problematic issue for Australian MRT. To further clarify if this is the case, a further in-depth study (e.g. focus groups, interviews, and/or surveys) of the views of Australian marine researchers about their possible participation in MRT is recommended.

7.3.5. Contestable stakeholder views regarding future MRT in Australia

Study two found that there are a number of contested stakeholder views that may not be well recognised as a MRT issue today, but may be an issue in the future. These findings represent new contributions and/or advances to the body of knowledge about stakeholder concerns about the supply of Australian MRT and/or MRT in general. Those findings may be applicable to other MRT regions worldwide such as the Caribbean, South Africa, South East Asia and/or Canada.

The most contested issues (Section 5.4.2) relate to the concerns of Australian marine research and management agencies about marine research quality if they were involved in such collaboration. As well as those views, there are other contested stakeholder views about the type of marine research programs that could occur through MRT. The first view is about whether marine research programs in MRT products should always be relevant to government priorities. The second such issue was whether MRT ventures can involve popular marine science (e.g. whale, turtle and shark research) that does not address government marine research or management priorities.

The third issue (and the most highly contested stakeholder view (50%) of study two was about MRT operators having to meet the Discovery Channel expectations of many potential MRT

tourists. At least one representative from all stakeholder groups disagreed with this statement. The only exception was the marine educator group (n=6) who agreed with the view that Discovery channel expectations should be met by MRT operators. Two open text statements from study two illustrate the nature of these contested views. First, a postgraduate marine research student stated that –The marine environment is not a zoo. 'Discovery Channel' expectations can be completely unrealistic". Second, a marine researcher stated that –It is almost impossible to meet Discovery Channel expectations on a regular basis. Tourists should be made aware of how long documentary teams spend getting their footage." A recommended approach to address this was given by another marine researcher who stated that –The conditions and goals of the trip should be explained and it should be up to the volunteer if they want to participate under those conditions". However, such an approach is clearly centred on the needs of the marine researcher and not on the needs of the MRT tourist and other stakeholders as identified by Musso and Inglis (1998) and Cuthill (2000).

Given this, it can be reasoned that MRT sponsored research that only deals with popular marine wildlife (e.g. Discovery Channel topics) and/or does not address the research priorities of government marine researchers and managers, would be quite controversial across two or more key stakeholders, especially marine researchers and managers. They reaffirm the reported tension between research tourism operators, marine researchers, managers and tourists as previously identified by Ellis (2003b), Cousins (2007), Coghlan (2008), Lorimer (2009) and Brightsmith et al. (2009). Quite probably, much of this tension may be resolved by communication and a shared vision, however, it is quite probable that some of this tension is problematical in MRT, cannot be readily resolved, and is best addressed by the disagreeing parties going their own ways. Such a choice would be naturally up to the participating parties and their circumstances.

A contested view (30% contested) was that; in many cases, marine research is too complicated for the general public, and to counter this, MRT ventures should undertake more popular and discovery orientated marine research programs. This view was contested by many stakeholders. For example, in study two a marine educator stated that:

> *It is surprising how much the general public gain from 'real' and complicated marine research. We should never assume we are talking to uneducated idiots - the majority of tourists wanting to participate in this type of tourism activity will be ready for the complexities that come with it - or they will just ask and learn more!*

Furthermore, a marine researcher stated that:

> *Some complicated things can be done effectively with (usually) small numbers of tourists. A general recommendation to dumb-down all research done by MRT ventures is misplaced. Understanding the behaviour of a single marine organism can be fascinating and would appeal to some tourists - but it is not going to save the world. Such topics are Discovery Channel fodder and they get an audience!*

However, a majority (70%) of key stakeholders agreed with such a view. And this indicates that while this view is contested, many key stakeholders would believe that MRT should be focused on popular and discovery orientated marine research programs. To illustrate why this may be the case, a marine conservationist stated that:

> *The issue here is that tourism is principally a business of delivering satisfying tourism experiences. This will always be the #1 focus of MRT --- think about it. I think in terms of 'telling stories' when I do anything with people and you need to tell stories that meet expectations and make people feel good. This depends on many factors -- being 'real' and honest is one of the most important.*

It is important to note that these views about popular discovery orientated marine research programs are not at necessarily at odds with each other. For instance, a MRT sponsored MRT program could focus on a smaller organism that when described properly provides a fascinating experience for the tourist, and when scientifically studied provides significant scientific outcomes. This idea is significant, as it guides towards the concept that MRT that focuses on initially less charismatic yet fascinating and scientifically significant marine phenomena can be conducted.

Another contested view (17%) was that unless volunteers are needed, marine research that can be undertaken on MRT ventures could also be done on normal marine tour ventures, by scientists and crew, and without the active involvement of tourists. This was disagreed by marine researchers, marine research students, and marine tour operators. On the other hand, the sample of marine conservationists, marine educators, managers, and MRT operators agreed with this view. Just why these views are distributed across different key stakeholders in this way is a not clear and is a worthy topic of future study. Again, more views from larger sample of key stakeholders may help identify clearer trends across key stakeholder groups and explain why.

Study two outcomes also suggest that many marine researchers and managers would also be skeptical about the commercial viability of including a MRT experience in a marine tour; the commercial training of potentially MRT tourists; and whether MRT can be used to successfully diversify marine tourism or not. By contrast, a majority of MRT operators, tourism organisations, marine education societies, environmental conservation organisations, and marine research students had favourable views about these topics. Why these views are contested along these lines and how such differences may be addressed is a future opportunity for study.

In marine tour operator terms, this research advocates that as long as a MRT product is likely to be commercially viable, they will generally be positive about MRT due to their innate and learned capability to develop and operate tourism products; the marine related lifestyle that can be achieved by MRT tourism; and the potential profits that they may gain. Similarly, many marine educators and environmental conservation organisers will be positive about MRT because MRT may deliver high marine research, conservation and educational outcomes. Furthermore, many conservation

organisations in particular, may see MRT as an opportunity to viably and independently participate in the Australia's marine research, conservation and management programs. Study outcomes are not clear about the attitude of marine research students to MRT. For many issues (i.e. data quality and publications) their views are likely to be similar to professional marine researcher. However, it is also possible that many marine research students (unlike many professional marine researchers) may be enthusiastic for MRT because it may offer them increased access to the marine environment for their field work; and employment in marine research (albeit often episodic). However this study certainly does not establish if this is the case and further research is needed.

There were other contested views that are important to understanding the potential future of Australian MRT. First, the potential role of marine research stations as MRT destinations was also considered to be contestable across stakeholder groups (12%). To illustrate the contested nature of this topic, a marine researcher stated that "marine research stations that are under-utilised may benefit from an association with marine research tourism". However, busy research stations could not be involved in logistical support or as destinations for MRT without it interfering with their own work". Similarly, a marine manager stated that –Perhaps one or two research stations could have limited visits at specific times, but in general they should remain fit-for-purpose and dedicated to purpose".

There was also a contested view (16%) that Australian government marine management and research organisations often have an institutional prejudice against MRT. It was also stated that due to government funding constraints, one can assume that suitable financial or human resources for MRT will not be available from existing Government marine research and management agencies (12%); and the development of MRT in Australia will be limited by the availability of willing and skilled marine researchers (11%)

Collectively, these contested views suggest that like land-based research tourism (Ellis, 2003b; Coghlan, 2008; Brightsmith et al., 2009), Australian MRT has similar issues. To further illustrate the opportunity for MRT in Australia and potential tension amongst key stakeholder groups to realise such an opportunity, the following open text statements from the second survey of study two are provided.

Opportunity

The lack of involvement of the tourist is a missed opportunity to educate and inspire the tourist. Normal marine tourism ventures mostly stay at well visited locations and will often not go to locations where important and interesting marine research can take place. It is the demand of interested tourists for an interesting marine research experience in locations away from regularly visited areas that can fund marine research tourism tours and scientists (and documentary makers) to visit less regularly visited marine research.

(Marine research tourism operator)

I think that marine tourism operators do represent 'ships of opportunity' for the Australian marine research effort. We need all the help we can get given the size of our marine jurisdiction and the limited resources (people and funding and research vessels) available. Such a contribution would certainly lift our capability and build capacity for long term data collection (much needed in the face of climate change) and ongoing monitoring programs. Data could also be in terms of many different aspects, (e.g. time-based digital imagery, water chemistry or samples, biological sampling, behavioural observations, other observations). If these activities are conducted under appropriate guidance, quality assurance, and with appropriate training or instruction, then they will make excellent contribution to the national marine research effort.

(Marine manager)

Tensions amongst stakeholders

Who are the 'marine research tourism operators'? They are usually companies. Presumably they should employ people who already have (not 'reach for') a high level of relevant competence. You don't develop this skill by working in the tourism industry in my opinion.

(Marine researcher)

The industry must be more than financially self supporting; it must be profitable to ensure its future. Marine research tourism should not rely at all on government funding and should be able to contribute towards researchers and research.

(Marine research tour ism operator)

Commercial pressures will dominate the viability of tourism research and while there are small percentages of tourists that will pay to be actively involved it will be difficult in the extreme to set up multiple tourism research ventures and have them succeed.

(Marine research tourism operator)

Not sure why government monies should be given to the research tourism ventures - they are a profit organisation getting monies from the tourists!

(Marine conservation organisation)

Science is not democratic or community driven -- You need a question and methods to answer the question. Feedback on participant's involvement to enrich that process is fine not science lead by consensus.

(Marine conservation organisation)

With the current, very low level of research funding available, researchers would not take kindly to having some carved off and applied to an industry that probably appears of pretty marginal relevance to them at present.

(Marine researcher)

Because there are various levels of research involved in tourism ventures, if an operator wants to do something in the name of research that most tourism operators can't, then there must be a very rigorous process.

(Marine researcher)

Marine researchers need to accept the concept of marine research tourism and its usefulness. This concept needs to also be recognised by their peers. Issues - the length of research project such as a PhD = No. of weeks required to collect data. There is a lack of institutional support (i.e. ‚the ivory tower'). You are assuming that government is the driving the research, but it is directed through institutions with a big interest in protecting their territory. However, unskilled people can pick up equipment such as cameras, data loggers. At the very least, skilled people are needed for collecting observational data.

(Marine research tourism operator)

There is no point promoting a marine research tourism venture as such unless the first priority is rigorous scientific research, with the needs of the tourist secondary. Otherwise, the tourist may as well just go snorkelling on their own!

(Marine educator)

We need to take a deep breath and be honest with ourselves that MRT is really marine TOURISM FIRST with some real research added where it makes sense. We have a huge industry that has developed for the Ecotourism industry that yielded lots of fees, policy, etc and very little true ecotourism. Why will this be any different?

(Marine conservation organisation)

I'm sceptical at the value of all these disparate groups working together. I've been involved in similar and there are too many agendas. Again -- what is the primary role of MRT and it must be tourism, tourism and tourism. The marine research is a layer not the cake.

(Marine conservation organisation)

7.3.6. Shared stakeholder views regarding the present and future of MRT in Australia

Study two identified a range of contested views about Australian MRT. This study also identified a number of shared stakeholder views regarding the present and future of MRT in Australia. These shared views may likely be agreed principles for effective collaboration amongst stakeholder regarding Australian MRT in the future. The top fifteen shared key stakeholder views are presented here. In desired MRT product characteristic constraint terms they are:

Desired MRT product characteristics

- To achieve a successful MRT product, the needs of the marine researchers, managers, tour operators, and tourist should be satisfied;
- MRT in Australia should always act to promote and create the most environmentally responsible tourism;
- MRT should always have clear, honest and achievable scientific goals;
- Where possible, Indigenous Australians should be involved in MRT as knowledge providers and beneficiaries from MRT.
- With mass media, MRT can act to assist in changing public awareness and increasing the public's interest in marine research, conservation and management;

- MRT should always seek to effectively analyse and communicate knowledge to marine researchers, tourists and other key stakeholders;
- MRT should always treat MRT tourists in a professional manner, open the marine ream to them, make them feel welcome, and thank them for their contributions;
- In the future, the involvement of Government marine research agencies in MRT across Australia is important and or essential;
- Academic publications and conference presentations are important and/or essential for MRT.
- Academic publications and conference presentations can increase Australian government involvement in MRT. Other benefits from such publications include the longer term credibility of the MRT product; attracting scientists to participate; and the increased involvement of conservation groups;
- To get permitted research access to government restricted research areas, a MRT venture would need to demonstrate that their marine research is high quality;
- MRT in Australia should aim to link, learn from and support MRT in developed and less developed countries across the World;
- MRT can be used to effectively compete with many international marine tourism products.

MRT product constraints

- In most cases (except with highly trained tourists and marine tour operators), marine researchers are essential for coordinating and quality assuring the research, monitoring and survey activity.
- The willingness of many marine researchers to participate in MRT will be dependent on their recognition and acceptance of the benefits of MRT.

This thesis advocates that these shared views represent a likely basis for effective key stakeholder collaboration towards future development and management of MRT in Australia and quite possibly elsewhere. Furthermore, regardless of the perceived tensions, these shared views show a likely optimism by key MRT stakeholder groups that if such effective collaboration occurred, then MRT in Australia can in fact make an increasing and worthwhile contribution to the research, conservation, exploration, and public awareness of the Australia's marine realm.

7.3.7. Relevance to the academic literature

Twelve stakeholder issues that have been identified in the relevant literature (Table 7-6) are advanced by this study. This thesis proposes that these issues could readily be resolved if stakeholder collaboration was guided by the shared views that are presented above. However, there are three supply-side issues that may not be so easily resolved by stakeholders in this manner. Both issues were contested by one or more marine researcher, marine manager, conservationist, and MRT operator.

The first issue deals with skepticism about the efficacy of MRT to conserve less visible, accessible, and/or charismatic marine wildlife such as many birds, plants, fish and invertebrates (Lorimer, 2009; Whatmore, 2008). Towards addressing this, this study has highlighted that some marine habitats such as mangroves, sea grasses, kelp forests, coral reefs, and the deep sea may be _charismatic' enough to attract MRT tourists to that wildlife, and subsequently deliver research and conservation benefits to those habitats and wildlife. However, whether this is the case, and what habitats would operate this way is not clear. Further study is recommended on this topic.

Table 7-6: Supply-side issues (n=12) about research tourism that are likely to be resolvable across certain (✓) key stakeholders if shared views were applied

Identified stakeholder issue and/or potential conflict	Source	Tourists	Marine researchers	Marine managers	Conserv-ationists	MRT operators	Other tourism operators
Expedition researchers are typically more focused on their research rather than a role of tour guide and hospitality provider	Coghlan, 2008	✓	✓				
Expedition researchers often only see volunteer tourists as a source of funding, labour and entertainment.	Coghlan, 2008	✓	✓				
Marine tour operators may be too busy, not inclined or not suitably trained to effectively support the interests of marine researchers.	Musso and Inglis, 1998		✓			✓	✓
Operational issues for research tourism operators include managing volunteers to get work done, and occupational health and safety issues.	Ellis, 2003a	✓				✓	
Volunteers were very interested in interacting with the lead researcher(s) and this, along with the intensive training and frequent formal and informal presentations, required a great deal of energy and commitment from researchers.	Brightsmith, Stronza & Holle, 2008	✓	✓				
Supervising a large number of unskilled volunteers may cause some researchers to become disillusioned.	Brightsmith et al., 2008	✓	✓				
Researchers are concerned about the ability to quickly train volunteers in the required protocols.	Ellis, 2003a	✓	✓				
Expedition leaders expect volunteers to be hard working, perform at the best of their ability, enjoy the work given, and good sense of humour, however, volunteer tourists can often see themselves as holiday makers and can be motivated by the social aspects of expeditions, developing practical skills, cultural exchange, as well as sightseeing.	Coghlan, 2008	✓	✓				
Research tourism can provide interruptions to the logistics of carrying out a scientific study.	Brightsmith et al., 2008		✓			✓	
The boundary between science, resource management and industry in coastal and marine tourism is turbulent. Marine tour operators, managers and scientists come from different backgrounds and work in remarkably different cultures. They often have a fairly poor understanding and tolerance of each other.	Alcock & Woodley, 1999		✓	✓		✓	✓
Tour operators often seek greater access to wildlife and marine managers will often seek to restrict access to certain species and increase the viewing distance between tourists and species.	Moscardo et al. 2001			✓		✓	
Unprofitable or zero profit research tourism trips are less interest to commercial tour operations.	Ellis, 2003b		✓	✓	✓	✓	✓

The second issue deals with the Ellis's (2003b) proposition that some natural resource managers may prefer to keep control of research and conservation through licensing or other schemes, rather than allowing private sector involvement. This is because of a perceived clash between the profit motives of tourism and the long term conservation aspects of natural resource managers (Ellis, 2003b). This study found that many marine managers, researchers and conservationists would consider this to be a likely issue in MRT.

The third issue is raised by Lorimer (2009) and Cousins et al. (2009) and deals with the possible competition between scientists and the research tourism industry for funding of marine science and conservation. As an affirmation of this issue, this thesis reports that eight (21%) of 33 key stakeholder (including all marine researchers (n=6) and managers (n=2)) from survey two agreed with the statement that "the diversion of Government funds from pure research to research tourism will divide the academic and the tourism industry and this would reduce the possibility of collaboration between marine researchers and marine research tourism industry". Also, fifty percent of the survey respondents stated 'maybe' when asked about this statement.

These stakeholder views suggest that many marine researchers and managers would believe that an effective marine research capability via MRT may alter the Australian Government's present allocation of marine research and conservation funding. This would especially be so if Australian MRT continues to grow, and is increasingly recognised by Government funding agencies to have an effective marine research and conservation capability. Given this, it is reasonable to suggest that to protect their government funding, some (at least)

Australian marine researchers and managers may choose to not recognise the stated benefits of MRT; and even limit approval of marine research permits to MRT operations.

This issue is clearly contentious and quite possibly an affront to some marine managers and researchers; however research outcomes suggest that it may be a significant issue for Australian MRT in the future. What adds the potential impacts of this issue are two of this study‘s shared constraints for MRT. First, marine researchers are essential for coordinating and quality assuring the research, monitoring and survey activity of MRT. Second, the willingness of many marine researchers to participate in MRT will be dependent on their recognition and acceptance of the benefits of MRT. Given the potential implications of this issue for Australian MRT, this thesis recommends further research to understand if marine researchers and managers across Australia could see an effective marine research capability from Australian MRT as an unwanted competition for government marine research funding.

Finally, study two analysed 232 stakeholder group views about Australian MRT today and in the future. These views are based on surveys and interviews with approximately 70 key stakeholders from eight key stakeholder groups. A key outcome of this analysis is a tourism-system model of key stakeholder‘s views of MRT in Australia (Figure 5.21). This model is based on Moscardo et al.‘s (2003) tourism system and shows the key components that are likely to contribute to changes in MRT across Australia. When findings from this thesis‘s discussion are integrated to that model, a more refined supply-side model of the Australian MRT system is subsequently proposed (Figure 7.4). Together with study two results (Table 5-58 to Table 5-62)

that underpin its derivation and conceptual description, this model represents a significant contribution to the body of knowledge about MRT from this study.

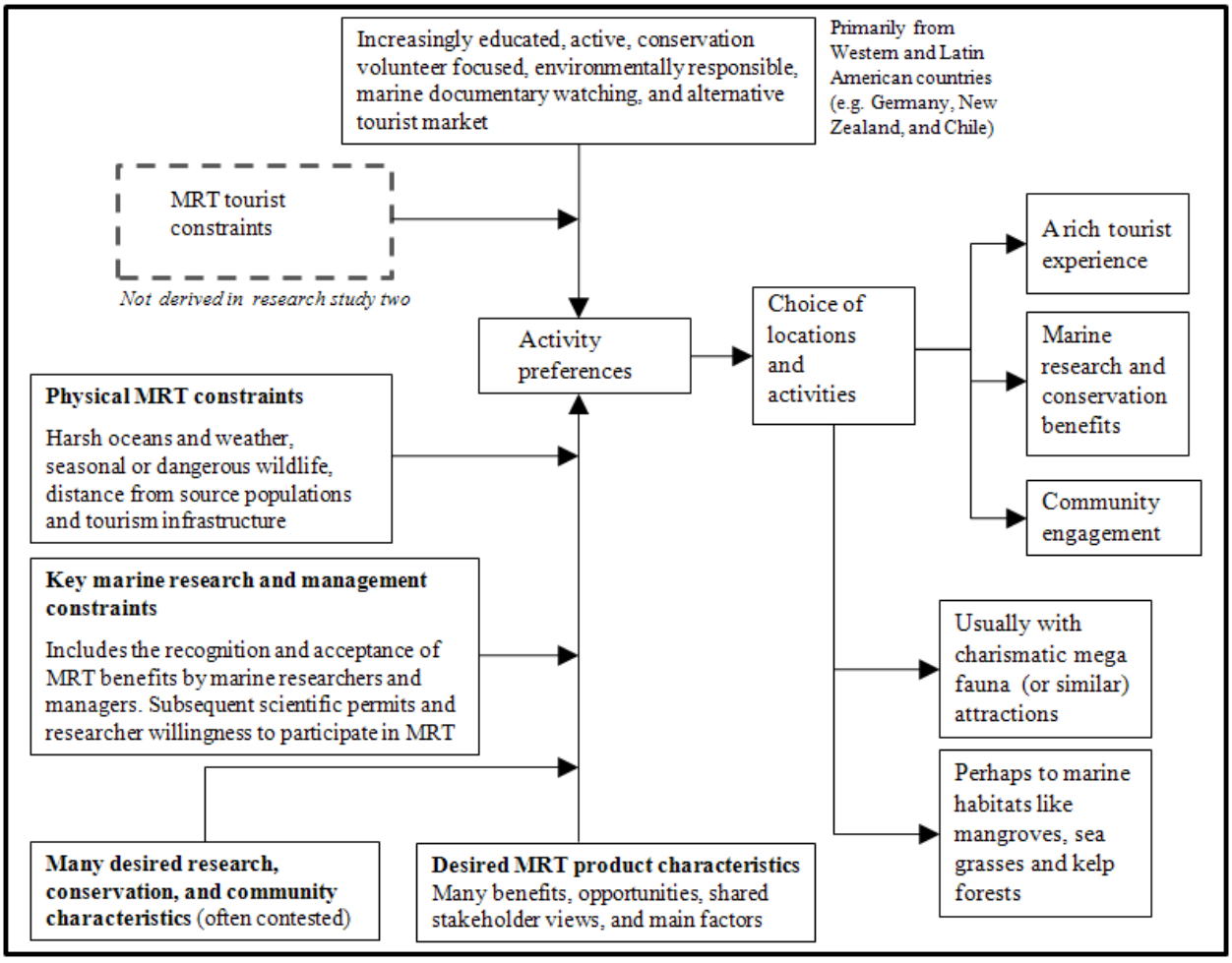


Figure 7.4: A proposed conceptual model of key supply-side stakeholder's views of MRT in Australia

7.4. Significant outcomes from study three

Study three assessed the preferences of potential MRT tourists for different Australian MRT products and related benefits? Specifically, it created twelve Australian MRT product brochures (Table 1-4 and Appendix 4) and surveyed the preferences of potential MRT tourists

for those products and twenty five associated benefits (Table 3-36 and Table 3-53). These twelve MRT product brochures were derived from market segments (Table 3-34) identified in study one and represent six types of MRT products that appeal to six classes of MRT tourists (Table 3-38) worldwide. The types of benefits (Table 3-36 and Table 3-53) were derived from the literature related to the proposed conceptual framework (Figure 1.1).

Key findings include twelve summary tables (Appendix 39) that provide insight about the likely preferences of potential MRT tourists for twelve Australian different MRT products and benefits. Specifically, these tables show the outstanding benefit preferences for different market segments that were either interested or not interested in each MRT product. To complement this, MRT criteria and MRT tourist types from study two that also differentiate the twelve MRT products are presented. The resultant information is a significant contribution and provides a more complete picture of the likely markets for Australian MRT products and benefits. To refine these models, it is recommended that interviews occur with the owners of MRT companies that operate similar MRT products in Australia and elsewhere. An aim of such interviews would be to evaluate how well these product models match those companies' assessment of their products. Such research could add to the conceptual knowledge about MRT but also assist MRT operators to better promote, design and operate their MRT products (Based on Coghlan, 2006; Weaver, 2001).

Study three found that, notwithstanding costs, the most preferred MRT products were the deep sea submersible expedition and coral spawning liveaboard products (Table 6-26). Study three identified these as class F MRT products (Table 3-54 and Table 6-26) that are typified by SCUBA diving, offshore liveaboards, higher adventure challenge, less volunteer mindedness, higher comfort and hospitality (Table 6-1). They often involve lower quality of marine research by non

skilled tourists and offer less skills or qualifications to that tourist (Table 6-2). They also often attract independent travellers, families, older travellers and/or skilled scientific tourists (Table 3-38). Often they are associated with coral reefs; and often use SCUBA or snorkeling as their mode of marine research; and can involve the use of submarines (Table 6-3). Other examples of class F products are presented in Table 7-7.

Table 7-7: Class F MRT products (n=11) (Source Analysis of 85 MRT product web sites)

MRT product	Type of organisation	Region of operation	Mode of marine research	Main wildlife attraction
Deep Ocean Expeditions - Expedition to the Titanic	LO	Temperate	Submarine	Deep sea ship wreck
Biosphere Expeditions - Azores Expeditions, Atlantic Ocean	LO	Temperate	Boat	Whales, dolphins, turtles
Deep Ocean Expeditions - Pacific Hydrothermal Vents	LO	Temperate	Submarine	Deep sea, hydrothermal vents
The Shark Research Institute - Indian Ocean Live aboard, Mozambique	LO	Tropics	SCUBA/ snorkel	Whale sharks, whales, dolphins, and large pelagic fish
Eye to Eye Encounters - Great Barrier Reef, Australia	SO	Tropics	SCUBA/ snorkel	Whales, sharks, coral reefs
Marine Wildlife Adventures - Coral Sea, Australia	SO	Tropics	SCUBA/ snorkel	Coral reefs, sharks, fish
Kalinda - Great Barrier Reef Discovery, Australia	SO	Tropics	SCUBA/ snorkel	Coral reefs, sharks, fish
The Undersea Explorer - Osprey Reef Shark Encounter, Australia	SO	Tropics	SCUBA/ snorkel	Coral reefs, whales, manta rays, sharks, fish
The Undersea Explorer - Far Northern Expedition, Australia	SO	Tropics	SCUBA/ snorkel	Coral reefs, whales, manta rays, sharks, fish
Tevene'i Marine - Eco Expeditions on the Great Barrier Reef, Australia	SO	Tropics	SCUBA/ snorkel	Coral reefs, sharks, fish

It is therefore reasonable to suggest that many class F products will be preferred by the largest percentage of the MRT market. However, while class F products are likely to be the most sought, their average cost per day is the highest ($ USD372) of all classes, and their marine research and conservation outcomes are not rated as high as MRT product classes A, C and E. (Table 6-1 and Table 6-2). This higher cost is likely to deter the interested public, and the lower

marine research and conservation outcomes are less likely to attract Australian marine research and management agencies (from study two). In future terms, this may mean that class F products will continue to be popular but elusive (due to cost) for the majority of interested parties; and not recognised (due to research and conservation outputs) as important to Australia‘s marine research and management effort.

On the other hand, less popular MRT product types (A and C in Table 3-38) deliver higher marine research and conservation outcomes and often cost less per day. Both these product classes involve independent volunteer minded tourists and backpackers, often gap year travellers, and sometimes have a cultural focus (Table 3-38). An example of a ‗class A‘ product is the Australian whale and dolphin research institute product (product two) described in Appendix 4. An example of a ‗class C‘ product is the coral reef survey and climate change product (product five) described in Appendix 4. However, study three shows that class A and C products are not always the most popular products, and some of those products may therefore face a challenge to gain a viable share of the market. To counter this, it may be that the marine wildlife or comfort/hospitality focus of the MRT product will generate the required popularity and subsequent viable market share.

Both Lorimer (2009) and Whatmore (2008) highlighted the need for further study into the role of free ranging wildlife in research tourism. Higginbottom, Rann, Moscardo, Davis, and Muloin(2001) undertook an assessment of the status of wildlife tourism in Australia. They called for research that further determines visitor satisfaction in relation to wildlife tourism products (Higginbottom et al., 2001). In this respect, it was found that MRT products with the highest

respondent interest are the deep sea submersible expedition, coral spawning, blue whale, and marine turtle products. The MRT products with the lowest interest are the penguin rescue centre, biodiversity and habitat mapping, and bottlenose dolphin education holiday products. This may indicate that deep sea, coral reef, whale and turtle expeditions are likely to attract and satisfy potential MRT tourists. On the other hand, penguin, biodiversity mapping and bottlenose dolphins may be less likely to attract and satisfy potential MRT tourists

Similar to the wildlife related outcomes of studies one and two, study three results indicate that MRT tourist preference for difference MRT products broadly adheres to Swarbrooke et al.'s (2003) wildlife tourism species popularity pyramid (Appendix 7). The exception is the bottlenose dolphin education holiday where dolphins are clearly charismatic mega fauna yet respondent interest in that product was relatively low (i.e. second lowest). Other factors such as less adventure, less marine research significance, and a temperate destination may explain why the dolphin education holiday was of less interest to this study's respondents.

This study found that a majority of potential MRT tourists will prefer MRT products that combine marine discovery and exploration with quality and experienced marine researchers, and the opportunity to have fun (Table 6-21). The marine discovery and exploration element can be found in Benson' (2005) description of scientific tourism, Morse's (1997) account of the scientific study tour and Swarbrooke et al. (2003)'s typology for adventure tourism. The experienced marine researcher element can also be found in Llyina and Mieczkowski's (1992) definition of scientific tourism. The opportunity to have fun element can be found in Coghlan (2006) and Caissie and Halpenny (2003). Therefore this study advances their findings.

This study found that benefits such as; the opportunity for an offshore boating or sailing experience, avoiding sun burn, cold exposure, sea sickness, and the destination, were shown to particularly influence a potential MRT tourist‘s positive interest in different MRT products. Similarly, 1) high levels of marine research training; 2) social interaction with the local people; 3) high levels of skills or self sufficiency to participate; 4) a lower level of solitude, tranquility; and/or 5) closeness to nature were shown to especially influence a potential MRT tourist‘s‘ disinterest in various MRT products. The observations that offshore sailing and solitude, tranquility and /or closeness to nature are influential criteria highlight Orams‘ (1999) spectrum of recreational marine opportunities as a useful model to understand the preferences of MRT tourists.

This study also found that the market characteristics include; nature documentary viewing, snorkelling experience, SCUBA experience, age, gender, and outdoors working background will significantly influence the preference of potential MRT tourists for different MRT products. These findings are clear advances to the study of MRT. The role of the nature documentary in research tourism has been previously flagged in the relevant literature by Morse (1997), and Clifton and Benson (2006). Additionally, popular media (e.g. television) has been identified as a driving force for adventure tourism (Buckley, 2000; Kelly & Nankervis, 2001), marine tourism (Orams, 1999; Garrod, 2008), and the public‘s increasing interest in science and adventure (Fursich, 2002).

A significant contribution was the identification of four classes of potential MRT tourists from 311 respondents. In order of overall interest in MRT, these were ‗MRT tourists' who are generally comprised of ecotourists and SCUBA divers; ‗SCUBA divers' comprised of SCUBA divers but not ecotourists; ‗Land-based ecotourists' comprised of ecotourist but not SCUBA diver; and Other Tourists' who are not ecotourists and not SCUBA divers. The socio-demographic profile of those four MRT tourist classes is presented in Table 7-8.

Table 7-8: Socio-demographic profile of four MRT Tourist classes (Source: Chapter Six)

MRT tourist class	**Profile**
The MRT tourist	They identify as marine wildlife tourists, nature enthusiasts, experience seekers, adventure tourists, and repeat MRT tourists. They are more likely to 1) have a natural sciences education background 2) have an outdoors work background; 3) be female ; 3) have a marine research related occupation; and 5) are more likely to actively support volunteer and conservation organisations. They place relatively higher levels of importance on all MRT criteria apart from: the duration of the trip and avoiding sun burn, cold exposure and/or sea sickness which was similar to the SCUBA diver class.
SCUBA diver	They identified as marine wildlife tourists, adventure tourists; with less likelihood of identify as a volunteer tourist. They are 1) more likely to have a natural sciences education background; 2) more likely to be male; 3) more likely to support a conservation organisation; 4) less likely to volunteer; and 5) more likely to be relatively older. They also place 1) higher levels of importance on SCUBA diving, maximum level of adventure, and learning from the researcher; 2) lower levels of importance on the duration of the trip, and 3) importance on avoiding sun burn, cold exposure and/or sea sickness.
Land-based ecotourist	They identify as nature enthusiasts, educational tourists, marine wildlife tourists, experience seekers, and free and independent tourists. They are 1) less likely to be repeat MRT tourists; 2) more likely to be Australian; 3) be female; 4) have low active membership of a volunteer group; and 5) are relatively younger. When compared to MRT tourists and SCUBA divers, land-based ecotourists prefer a longer trip, avoiding sun burn, cold exposure and/or sea sickness, involvement in conservation, but prefer less marine education, training and involvement in marine science.
Other tourist class	They are less likely to identify as nature enthusiasts, marine wildlife tourists and volunteer tourists. They are 1) more likely to be from Australia; 2) be male; and 3) less likely to be associated with volunteering and conservation groups. When compared to the land-based ecotourist, the 'other tourist' class placed less importance on involvement in conservation, higher levels of education and learning, the duration of the trip, involvement in the marine research program, and opportunity to explore marine phenomena and discover new things.

In terms of their preference for different MRT products, the ‗MRT tourist' class was shown to have the highest levels of interest for all MRT products, apart from day trip to the reef and the bottlenose education holiday. Those latter two products were markedly lower in marine research significance and higher levels of adventure. The ‗SCUBA diver' class has the highest level of interest in the day trip to reef product. When compared to the SCUBA diver and MRT tourist classes, the ‗land-based ecotourist' class has lower levels of interest in all MRT products. The exception is the land-based marine turtle trip where the land-based ecotourist has slightly higher interest than the SCUBA diver class. These outcomes suggest that the MRT Tourist, SCUBA diver, and land-based ecotourist classes are all potential markets for Australian MRT. When compared with the other tourist classes, the ‗Other Tourist' class has the lowest or near lowest levels of interest in all MRT products. This indicates that ‗Other Tourist' class is less likely to be a suitable market for Australian MRT.

Significantly, the MRT tourist class profile matches the profile of a land-based research tourist reported in the relevant literature (Weiler & Richins, 1995; Galley & Clifton, 2004; Clifton & Benson, 2006; Campbell & Smith, 2006). This is an advance on those former studies. That is, many MRT tourists are more likely to have natural sciences education background, be female, have an outdoors work background, have a marine research related occupation, and more likely to actively support volunteer and conservation organisations.

However, this study discovered a class of potential MRT tourist (i.e. the SCUBA diver class) that appears not to match the typical land-based research tourist profile in the academic literature. That is, when compared to the MRT tourist class, the SCUBA diver class does not

identify as an ecotourist; is more likely to be male; is more likely to be older; and is less likely to a member of a volunteer organisation. Given this, this thesis proposes that this thesis's identification of this non-ecotourism focused MRT tourist is a contribution to the body of knowledge about research tourists. However, further investigation of the presence and nature of this non-ecotourism class of MRT tourist in MRT is recommended.

The distinction between the MRT Tourist class and the SCUBA Diver class may indicate a gender difference in the MRT market. That is, the MRT Tourist class is more likely to be female and the SCUBA Diver class is more likely to be male. More specifically, female respondents from this study had on average, a particularly higher interest in products that involve research into mega fauna such as penguins, whales, dolphins and sea turtles. In contrast, males from this study had, on average, lower interest in most MRT products, except the deep sea submersible expedition. These differences may be partly related to the facts that sixty six percent of respondents between the ages of 18 to 30 were female, and fifty eight percent of respondents over the age of 30 were male. It is not clear why these differences are so? This thesis does not investigate these apparent gender related differences in any depth. Further research on this topic and other gender related criteria is recommended. Such research could identify unique aspects of different MRT products that appeal to females and/or males and why.

SCUBA divers (i.e. with one or more SCUBA dives) have been identified as an important market segment for MRT. Perhaps initially surprising, SCUBA divers in this study were found to be interested in both SCUBA and non SCUBA MRT products (e.g. whales and turtles). A likely reason for this is that many SCUBA divers are interested in discovering the

marine realm by SCUBA and/or other means (i.e. boats and whale watching). Notwithstanding this, the preference of the SCUBA divers market for different MRT products was not studied in any depth in this study. Nor is this topic extensively addressed in relevant research tourism literature (Clifton, 2004; Ellis, 2003b; Musso & Inglis, 1998). Given the apparent importance of SCUBA diving for MRT, this role of SCUBA diving in MRT is a recommended topic for the future study.

Factor analysis was undertaken on survey data and found that a tourist's preference for various MRT benefits is highly influenced by the variability of nine factors. In order of influence, these factors are:

1. Marine research training and education;
2. Importance of the marine research to the tourist;
3. The MRT product (i.e. the destination, duration, vessel, wildlife, and having fun);
4. Higher levels of learning;
5. Self sufficiency of the tourist;
6. Physical adventure;
7. Comfort and hospitality;
8. Social interaction;
9. Marine discovery.

Those factors and associated correlations (Table 6-23 and Table 6-24) are illustrated as a conceptual model (Figure 6.2) of the preferences potential MRT tourists for different benefits. Significantly, this model shows that the MRT product, comfort and hospitality, and physical

adventure factors had a negligible correlation with the other factors. This indicates that, on average, a MRT tourist's preferences for scientific research, conservation, education, social interaction, and discovery are independent of their product, comfort and hospitality, and physical adventure preferences. This finding suggests that a MRT tourist has at least two mindsets when assessing a MRT product. The first considers the MRT specific aspects (e.g. marine research and education) of that product. The second considers other more generic aspects such as destination, the marine wildlife, comfort and hospitality, and physical adventure. An implication of this is that MRT operators should focus on both the MRT specific and more general marine tourism aspects when marketing to potential MRT tourists. Such a finding is similar to the holiday, wildlife and adventure elements within conservation volunteer tourism identified by Coghlan (2007).

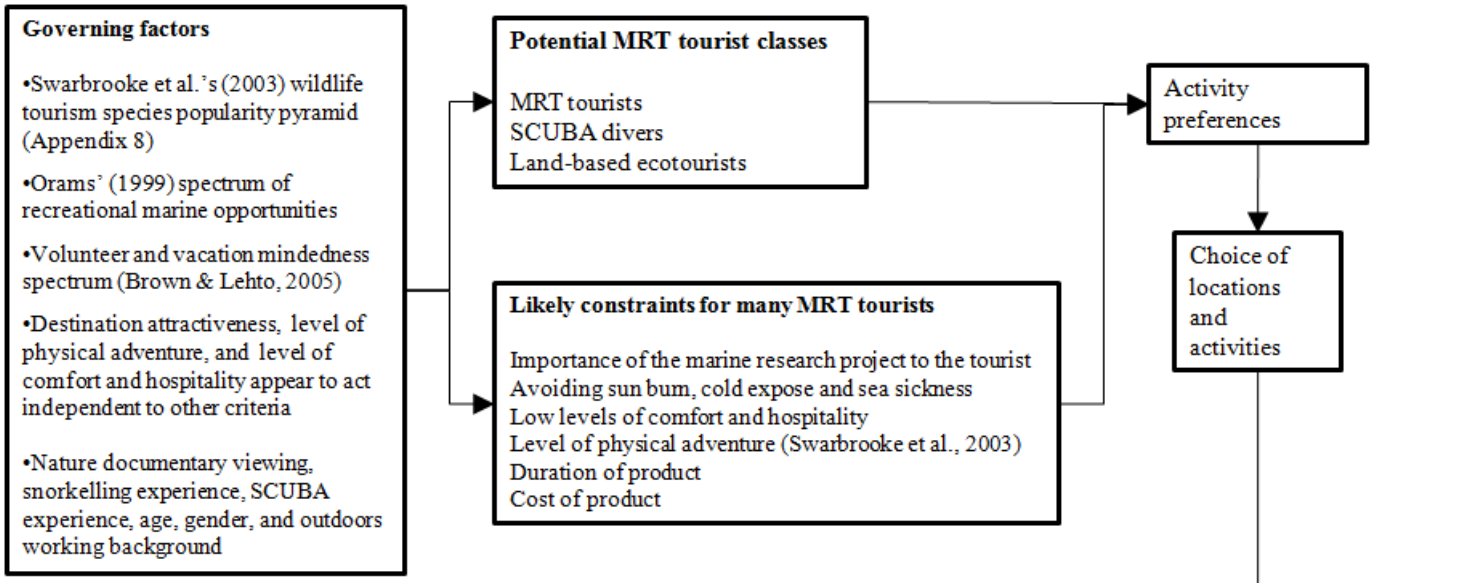
It is important to note that this conceptual model (Figure 6.2) was developed from answers to survey questions (Table 3-36 and Table 3-53). Those questions were mainly derived from the proposed conceptual framework (Figure 1.1) which has its origins in Benson (2005), Coghlan (2007), Caissie and Halpenny (2003), and other relevant literature. In turn, this conceptual model can be seen as an advance on Benson (2005), Coghlan (2007), Caissie and Halpenny (2003), and related literature.

Study three then extended this new conceptual model to develop another conceptual model that links various market segments with their preferred MRT benefits (Figure 6.3). Like Figure 6.2, this model represents an advance on earlier research tourism models by researchers such as Benson (2005), Coghlan (2007); and Caissie and Halpenny (2003). Importantly however, unlike those models, Figure 6.3 and underlying data can be applied by MRT operators to market specific MRT

benefits to particular MRT markets segments. As such this model can be seen as an original contribution to the study of MRT.

Study three's findings can be combined to create another advanced model (Figure 7.1) of MRT. This model is based on Moscardo et al.'s (2003) tourism system and shows many of the governing factors and constraints that will influence the preferences of different MRT market segments for different Australian MRT products and associated benefits. This model also shows the three potential MRT tourist classes for Australian MRT; the top and bottom benefits sought by MRT tourists; and the MRT product preferences of those tourists.

There are some likely practical applications of these outcomes. That is, supply side stakeholders can make more informed choices about the most suitable MRT products and benefits for different MRT markets and destinations (Ellis, 2003b). In turn, this could assist MRT operators to meet their marine research, conservation and community focused goals in a more efficient way (Coghlan, 2006). They can also be used by MRT operators to develop effective and appropriate promotional campaigns that match their marketing images with their customers' expectations (Weaver 2001; Coghlan, 2006).



MRT product preferences of 311 potential MRT tourists (Source: Chapter 6)

Australian MRT product name	Very interested
A submersible research expedition to Australia's Bon Hommey undersea ridge	57%
A coral spawning research and adventure trip on a tropical coral reef	55%
Sail, volunteer and track blue whales in the Southern Ocean	53%
Work with marine turtles and indigenous rangers in remote northern Australia	52%
Survey coral reefs and help assess the impacts of climate change on coral reefs	52%
Day trip to the reef with some marine research as part of the attraction	44%
Research, education and adventure across the Whitsundays	44%
A continuous sailing expedition to explore and help research the oceans	43%
Volunteer and train at an Australian whale and dolphin research institute	41%
A bottlenose dolphin education holiday on the southern Australian coastline	37%
Biodiversity and habitat mapping in north Western Australia	34%
Volunteer at a penguin rescue centre in southern Australia	32%

Figure 7.5: Key factors that will influence the preferences of different MRT markets for Australian MRT products and associated benefits (Source: Chapter Six)

7.5. An integrated model of conceptual, supply, and demand nature of MRT in Australia

Studies one, two and three investigated the conceptual, supply, and demand components of the MRT system in Australia. Study one outcomes represent the nature of MRT worldwide and in Australia at the present. Study two outcomes represent the contestability of stakeholder's views about the present and future of MRT products and markets in Australia. Study three outcomes represent the demand of potential MRT tourists for existing and potential MRT products in Australia. Together, they found that there are a range of governing factors, characteristics, constraints, and shared and contested views, and intended benefits that will determine the choices of MRT tourists and supply-side stakeholders to participate in different MRT products, locations and activities across Australia (Figure 7.1, Figure 7.4 and Figure 7.5).

When linked together (Figure 7.6), they represent a new system model that describes the present and possible future of MRT in Australia. This model can be used in an explanatory way to understand the present nature of MRT in Australia. It can also be used to predict the likely future of MRT in Australia under present supply and demand conditions. Supporting this model are the range of observations, models, main features, relationships, and other key findings about MRT that are identified and discussed in Chapters four, five, six and seven.

This thesis contends that this model represents significant theoretical contribution to understanding the conceptual and operational nature of MRT. It is proposed that it is also an advance on the previous theoretical studies by Ellis (2003b), Benson (2005), Coghlan (2007), Caissie and Halpenny (2003) and others. It can be used as a valid and reliable basis for the future study of research tourism both marine and land based.

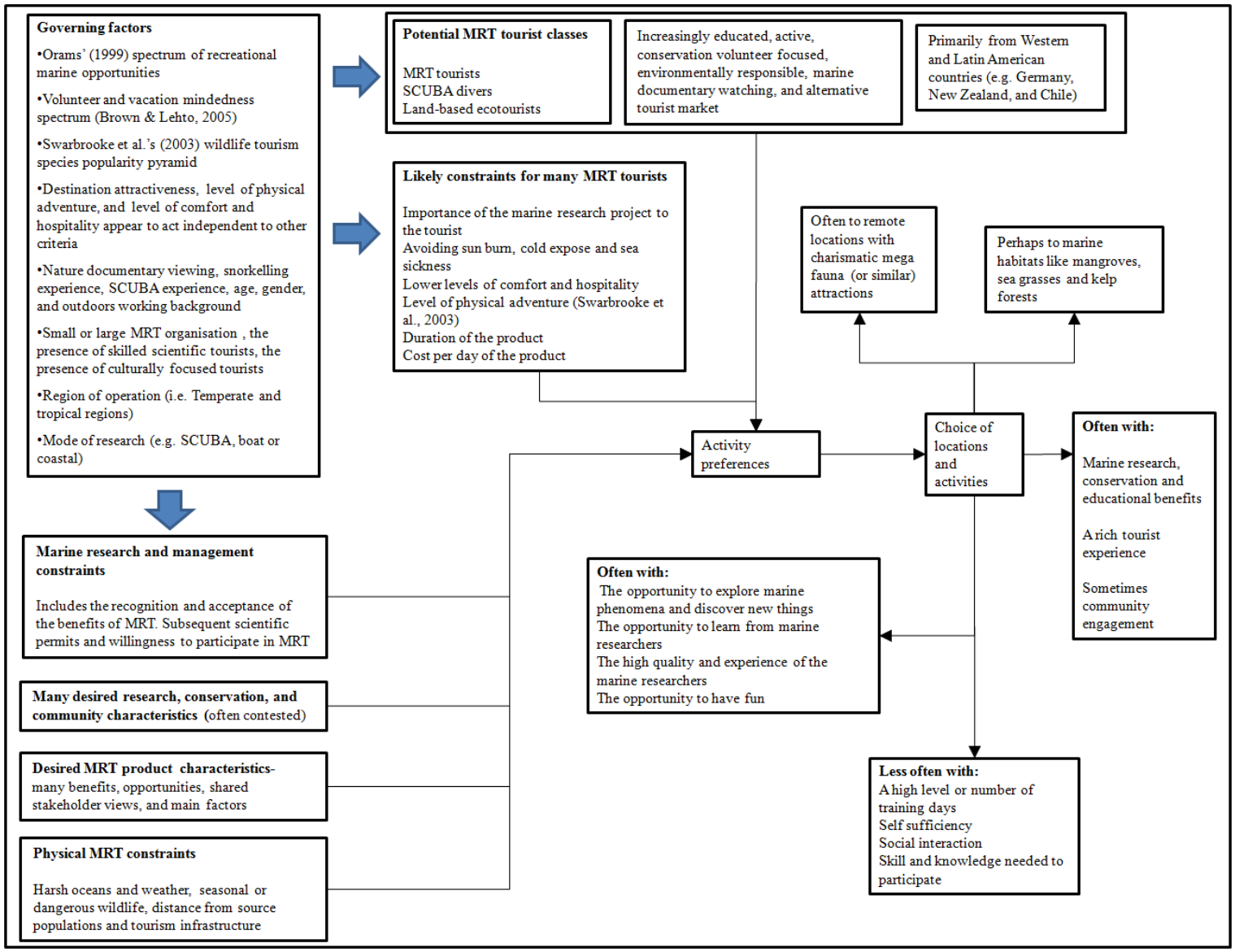


Figure 7.6: An integrated system model that represents the conceptual, supply, and demand nature of MRT in Australia

Chapter 8 Conclusions and implications

8.1. Introduction

Prior to this study, the literature that described MRT in detail was limited to the case studies of Hughes (2008) and Dunstan (2009). The literature that described research tourism in Australia in any detail was also limited to Hughes (2008) and Dunstan (2009). To address these gaps, this thesis aimed to explore and describe the conceptual, supply, and demand nature of MRT with a specific focus on marine research tourism in Australia. As a response to this aim and the three associated research questions, this thesis identified, described, and modeled:

1. Key conceptual characteristics of the supply and demand of MRT worldwide and in Australia;
2. The various shared and contested views of supply-side key stakeholder groups about the present and future of MRT in Australia, and;
3. The preferences of potential MRT tourists for different Australian MRT products and associated benefits.

This chapter synthesises the outcomes of each study to describe how this thesis answered each of the three research questions. It then describes the implications of these answers to the theoretical study of MRT, and the policy and practice of MRT. Following this, it outlines any outstanding limitations of this thesis, and discusses its methodological implications for the future study of MRT. Lastly, based on this on this thesis, it outlines a comprehensive set of future opportunities to study MRT and research tourism in general.

8.2. The conceptual nature of MRT worldwide and in Australia

Research question one asked; *based on the proposed conceptual framework for MRT, what are the key characteristics of MRT worldwide and in Australia?* Essentially, it was found that MRT worldwide is influenced by traits from the ten key MRT elements from the proposed conceptual framework (Figure 1.1). The only caveat is that community development does occur but is not a consistent feature across all MRT products. This proposed framework can be seen as an extension of Benson's (2005) conceptual model for research tourism and Coghlan (2007)'s four classes of conservation volunteer tourism organisations.

When this conceptual framework was applied to describe MRT products and markets worldwide (n=85) it was found that MRT can be re-interpreted as comprising six product related factors (Table 7-1) and three market related factors (Table 4-24). The six product factors are termed location (Orams, 1999); research and conservation benefits; marine wildlife; cultural focus; SCUBA diving; and volunteer mindedness. The three market factors were termed volunteers and backpackers, skilled scientific tourists, and SCUBA divers. These factors reaffirm the role of Orams' (1999) Spectrum of Marine Recreational Opportunities and Brown and Lehto's (2005) volunteer and vacation minded spectrum in describing MRT. They also highlight the central roles of SCUBA diving, skilled scientific tourists (e.g. university science students and other marine science enthusiasts), marine wildlife tourism, volunteers and backpackers, and/or cultural engagement in influencing the nature of MRT worldwide.

Analysis of the data underlying those factors found certain combinations of MRT product traits and markets that may lead to higher research significance and quality, or longer term conservation benefits from MRT. Higher research significance and quality can be achieved by attracting more skilled scientific tourists through the design of MRT products that have physical adventure, SCUBA diving, evironmental remoteness, isolated coasts, offshore sailing, tranquility, shorter trips, higher costs, and the presence of vacation minded tourists.

Longer term conservation benefits are found to associated with increased levels of volunteer mindedness. Volunteer mindedness is well associated with the presence of volunteer tourists and backpackers; coastal MRT products; lower costs per day; longer duration; and less comfort and hospitality for the tourist. It is also associated with higher educational outcomes; higher involvement of non-skilled tourists; and/or skills or qualifications offered by a MRT product.

Study one also found that Australia can be considered to be a hotspot for MRT with twenty four percent (n=30) of worldwide MRT products (n=125) occurring in Australia. When compared with MRT elsewhere, Australian MRT is typified by a prevalence of small and independent organisations (80%). These smaller organisations are typified by liveaboard MRT products that operate in isolated, uninhabited and/or pristine locations, and marine research that focuses on coral reefs, whales, sea birds, sharks, and dolphins. Skilled scientific tourists are more often attracted to those MRT products whilst and backpackers and volunteer tourists are often less involved. On the other hand, MRT elsewhere is dominated by UK or USA owned (87%) larger and/or international MRT organisations (99%) such as The Earthwatch Institute, Coral Cay Conservation, and Greenforce. Those larger organisations are typified by coastal or island-

based operations, volunteer mindedness, backpackers and volunteer tourists, less comfort for the tourist, more skills training, higher quality research by volunteer tourists, more interaction with local communities, and coral reef and turtle MRT products.

8.3. Stakeholder views of marine research tourism in Australia

Research question two asked; *what are the shared and contested views of supply-side key stakeholder groups about the present and future of MRT in Australia?* Outcomes include an array of shared and contested views about the driving forces, major factors, benefits, physical constraints, opportunities and issues that are relevant to MRT in Australia. Two hundred and thirty two views were acquired and importantly eighty eight percent of those views were shared across all stakeholder groups. Such a result indicates that future Australian MRT endeavour will have a basis for consensus and subsequent collaboration amongst key stakeholder groups.

There is however a set of contested views about Australian MRT that will create inertia against any sizeable expansion of MRT across Australia. These contested views are mainly associated with the desired characteristics and constraints of MRT that relate to marine research and conservation programs (Figure 7.4). Hence, many Australian Government marine researchers and managers do have and will likely continue to have issues about their involvement in Australian MRT. Their overall point is that MRT is essentially a tourism enterprise and Government marine research programs are serious endeavours that should not have to cater to the needs of tourists nor be beholden to funding via a tourism industry. However, MRT is likely to continue to deliver significant marine research and conservation outcomes, and provide

regular access to remote marine and coastal locations for marine scientists. The implication of this is that some sections of the Australian marine research and management sector may increasingly view MRT as a viable source of funding for their projects. To harness this interest, devising policy that addresses the contested aspects of MRT is a recommended strategic goal for the Australian government and associated MRT stakeholders.

As extra motivation for such a proposal, this thesis identified a multitude of benefits and opportunities for MRT in Australia (Section 5.2). Importantly MRT opportunities are identified as being possible at many Australian regions, involving existing marine tourism endeavour, and supporting many existing marine research programs (Section 5.2). There are also many marine research and conservation activities and experiences that are likely attract, involve and satisfy the MRT tourist, and also contribute to worthwhile marine research, conservation and /or educational outcomes (Section 5.2). These activities and experiences combine to provide a rich tourist experience and while not unique to MRT it is an important aspect of MRT and should be broadly recognised as such. In turn, MRT products that encapsulate those activities and experiences can act as a unique image for Australia‘s marine ecotourism sector and subsequently act as a flagship for the Australian tourism industry. This is also the potential for MRT elsewhere across the globe.

The driving forces behind any growth of MRT in Australia are mainly demand related. These driving forces include an increasingly educated, active, conservation volunteer focused, environmentally responsible, marine documentary watching, and alternative tourist market who are seeking to connect with the marine realm through a MRT product. Such a product can be devised to meet the expectations and needs of potential MRT tourists depending on their prior

experience with the marine realm, age, education, gender, and cultural background. That is, MRT can be developed for people from all walks of life provided they have an interest in exploring and discovering the marine realm in some way. To harness these driving forces, this thesis found that marine conservation and education organisations across Australia are likely to be very ardent advocates and facilitators of increased growth of MRT in Australia.

Finally, while MRT in Australia has its issues and constraints, it is has become clear that MRT is often a participatory process that involves stakeholders in the research, management, conservation, education, and usage of the marine and coastal environment. This suggests that unlike many forms of tourism including many instances of marine ecotourism; MRT is also a form of participatory marine and coastal management that can be applied to achieve many positive marine management and educational outcomes. That is, MRT is a form of tourism but when thoughtfully implemented, it can also be a legitimate method for participatory and sustainable marine and coastal management of an area. Apart from land-based research tourism, it is difficult to think of other forms of tourism that seek to and can achieve this.

8.4. Potential MRT tourists and their preferences for MRT products and benefits

Research question three asked; *what are the preferences of potential MRT tourists for different MRT products in Australia and why?* The answer to this question is encapsulated in Figure 7.5 and the underlying observations, findings, and models that underpin it from study three. The relationships between market segments and preferred benefits are also visualised in Figure 6.3. Both figures show that the product preferences of a potential MRT tourist is governed by a complex array of related factors, market segments, desired benefits and constraints. The

answer to why potential MRT tourists prefer different products and benefits is therefore better understood by inspection of those two models and the underlying data, findings, and models.

This study also revealed that a potential MRT tourist is likely to have at least two mindsets when assessing a MRT product. The first considers the MRT specific aspects (e.g. marine research and education) of that product. The second considers other more generic aspects such as the destination, the marine wildlife, comfort and hospitality and physical adventure. An implication of this would be that MRT operators should focus on both the MRT specific and more general marine tourism aspects when marketing to potential MRT tourists.

This thesis identified that potential MRT tourists are likely to seek marine education, training and involvement in marine science. They are more likely to SCUBA dive; have a natural sciences education background; have an outdoors work background; have a marine research related occupation; and actively support conservation and volunteer organisations. They are also more concerned about avoiding sun burn, cold exposure and/or sea sickness.

This group of likely MRT tourists can be divided into two groups termed ‗MRT tourists' and ‗SCUBA divers' (Table 7-8). Of the two groups, the ‗MRT tourist' is the most likely to be a MRT tourist. The ‗MRT tourist' matches the profile of a land-based research tourist reported in the relevant literature (Weiler & Richins, 1995; Galley & Clifton, 2004; Clifton & Benson, 2006; Campbell & Smith, 2006). That is, the MRT tourist class is more likely to be female, have natural sciences education background, have an outdoors work background, have a marine research related occupation, and more likely to actively support volunteer and conservation organisations.

However, the SCUBA Diver‘ group has some characteristics that do not match the typical profile of a research tourist. That is, when compared to ‗the MRT tourist‘, the ‗SCUBA diver‘ is more likely to be male; do not always identify as an ecotourist; seek higher levels of physical adventure, more likely to be older; and are less likely to a member of a volunteer organisation. The implication of this result is that MRT will not only appeal to eco-friendly SCUBA divers but will appeal to other SCUBA divers as well. This result indicates that SCUBA diving experience is a key identifier of a likely MRT market. Such is the influence of a SCUBA diving that SCUBA divers have high interest in both SCUBA and non SCUBA MRT products (i.e. whales and turtles). What this infers is that many SCUBA divers will have an interest in discovering the marine realm by SCUBA and by other means such as whale watching, turtle watching, and submarines.

Experience in SCUBA diving experience was found to be just one key characteristic of a likely MRT tourist. It was also found that regular nature documentary viewing; snorkelling experience; age; gender; and outdoors working background also strongly influence the preference of potential MRT tourists for MRT. Importantly, those who are interested in MRT seek the opportunity to explore marine phenomena and discover new things; learn from experienced marine researchers; and the opportunity to have fun. In contrast, those who were less interested in MRT seek to avoid an offshore boating or sailing experience, social interaction, high skills or knowledge to participate, a high level of self sufficiency, and a high number of training days.

Hence, a majority of MRT tourists will seek an engaging and enjoyable experience that explores and discovers marine phenomena and is free of hardship and unnecessary expectations. This outcome parallels Caissie and Halpenny (2003), Benson (2005), Coghlan (2006), Coghlan (2008) and Brightsmith (2009)'s findings that fun, enjoyment, learning, discovery and exploration, and engaging with the expedition leader, are key elements that are sought by a research tourist. As well as cost, their final choice of MRT product will depend on their prior experience of the marine realm, education, age, gender, occupation, and expectations through media such as nature documentaries.

8.5. The conceptual, supply, and demand nature of marine research tourism in Australia

This thesis aimed to explore and describe the conceptual, supply, and demand nature of MRT with a specific focus on MRT in Australia. The outcome is a large and complex set of knowledge about the MRT in Australia. The first study found a range of factors and relationships that influence the conceptual nature of MRT products and markets in Australia. These factors include remoteness of a marine destination (Orams, 1999), volunteer and vacation mindedness (Brown & Lehto, 2005), the popularity of wildlife (Swarbrooke et al, 2003), SCUBA diving, the presence of skilled scientific tourists, and whether an MRT organisation is a large and multinational company (LO) or a small and independent business (SO). The second study found that the supply of MRT in Australia is not constrained by demand or opportunities, but rather constrained by recognition of the marine research, conservation, and educational benefits of MRT, and the participation of key stakeholders to participate. The third study found that notwithstanding a MRT tourist's prior experience with the marine realm, their preferences for

different products is primarily guided by a need for an engaging and enjoyable experience that explores and discovers marine phenomena and is free of hardship and unnecessary expectations.

Within a tourism systems framework (Moscardo et al, 2003), these findings have been merged to create a final integrated model of the conceptual, supply, and demand nature of MRT (Figure 7.6). In answer to the question, what is the conceptual nature of MRT; this model shows MRT as a tourism phenomenon with many interacting governing, supply, and demand factors that given the right external circumstances can manifest into many MRT products with significant scientific, environmental, and social benefits. It is these underlying and interactive features of MRT in Australia that are a fundamental conceptual contribution from this thesis.

8.5.1. A new definition for marine research tourism

Based on Figure 7.6 and associated findings, a new definition for MRT is proposed. That is, MRT is marine ecotourism where skilled and non-skilled scientific tourists explore and discover marine phenomena, and learn through experienced marine scientists and/or enthusiasts. Also, it is typically focused on charismatic megafauna; governed by the nature of the marine environment; offers a passive and/or active experience; delivers significant marine research, conservation biology, and/or educational outcomes; and a rich tourist experience.

8.6. The theoretical study of marine research tourism

This section outlines some of the implications of this thesis's findings to the 1) further exploration of MRT and research tourism in general; 2) application of well-known tourism typologies to investigate lesser known forms of tourism; and 3) tourism theories that were not

raised in this thesis's literature review. Specifically, those tourism theories are niche tourism theory and recreational specialisation.

Ellis (2003b) called for more study about the theoretical variation of research tourism. This thesis is also a response to that call. The major theoretical outcome from this thesis is the successful application of criteria from 10 key MRT elements (Figure 1.1) to empirically study MRT. That is, MRT products, their markets, constraints, and intended benefits have been empirically shown to be understood in terms of those key MRT elements. Seven of those ten key elements are well-known tourism types namely; marine tourism, scientific tourism, volunteer tourism, ecotourism, educational tourism, adventure tourism, and wildlife tourism.

In tourism theory terms, this is a key thesis finding as it means that MRT can be conceptually and practically understood in tourism terms as a combination of traits that describe those well-known tourism types. As such, tourism typologies such as those shown in Table 8-4 are applicable to the study of MRT and research tourism in general.

Table 8-1: Examples of well-known tourism typologies used in this study

Tourism typology
Marine tourism – A spectrum of marine recreation opportunities (Orams 1999)
Volunteer tourism - A conceptual framework for volunteer tourists (Callanan & Thomas 2005)
Adventure tourism - Activity spectrum (Swarbrooke et al., 2003)
The ecotourism spectrum (Weaver & Lawton, 2001)
Wildlife tourism - Tourism species popularity pyramid (Swarbrooke et al., 2003)

This validated conceptual model of MRT has many applications to further understand the nature of MRT. For example a brief analysis (Table 8-2) of the trends and driving forces behind the seven well-known tourism types of MRT provides significant insight into the trends and driving forces behind MRT. That is, Table 8-2 indicates that the trends and driving forces behind

MRT are likely to include 1) a more accessible marine environment; 2) safer and comfortable marine travel; 3) the public's desire see wildlife in natural state; and 4) a worldwide demand by the public for _knowledge-orientated' tourism experiences.

Table 8-2: Brief summary of the driving forces behind the seven well-known tourism types of MRT

Well-known tourism type	**Description of driving force**
Marine tourism	Since the 1950s, new technology such as Self Contained Underwater Breathing Apparatus (SCUBA) diving equipment, Global Positioning System (GPS), Emergency Position Indicating Radio Beacon (EPIRBs), and high speed, high volume water craft have made the marine environment more accessible, safer and comfortable travel for tourists (Garrod and Wilson, 2002; Musso and Inglis, 1998; Orams, 1999).
Ecotourism	Developed as part of the environment movement of the 1970s and 1980s, ecotourism reflects growing environmental concern coupled with a growing dissatisfaction with mass tourism that led to increased demand in alternative nature based experiences (Blamey, 2001; Brown and Lehto, 2005). Kelly and Nankervis (2001) attribute much of the growth in demand for ecotourism products to; 1) prospective tourists with interest in nature and cultures being highly influenced by a proliferation of television documentaries and nature publications, and 2) the public's perception that the world is becoming increasingly homogenised and rapidly running out of _untouched' areas.
Scientific tourism	Llyina and Mieczkowski (1992) saw scientific tourism as only the beginning of a worldwide expansion of _knowledge-orientated' tourism that that overlaps with ecotourism, adventure tourism and cultural tourism experiences.
Educational tourism	Since the 1800s and particularly since the 1970s, Educational tourism is driven by research funding cuts and increased number of scientific facilities worldwide and demand by amateur natural history enthusiasts for nature science experiences (Morse, 1997) It is also driven by an increasingly educated tourism market, and has led to a growth in nature based and cultural educational tourism programmes (e.g. Ecotourism interpretation and scientific study tours) (Weaver, 2001).
Volunteer tourism	Volunteer tourism has been significantly increasing since the (Brown and Morrison, 2003; Wearing, 2003 & Wearing, 2001). It would appear to bridge the altruistic motives of volunteering with the general commodified tourism experiences (Brown & Lehto, 2005). Callanan and Thomas (2005) describe this trend as society's reaction to mass tourism and the media's role in communicating the divisions between the haves and _have nots' in society. They conclude that in the early twentieth first century, there is a volunteer tourism rush influenced by an ever _guilt conscious' society.
Wildlife tourism	Wildlife tourists can be motivated to study wildlife scientifically (Swarbrooke et al., 2003). Since the 1980s, the public's desire to see wildlife in natural state, particularly charismatic wildlife such as whales, dolphins, turtles and sharks has experienced rapid growth (Curtin & Wilkes, 2005)
Adventure tourism	From the 1950s, Demand for adventure tourism is due to increasingly urbanised and relatively affluent western societies who have some appreciation of the environment from television programmes and magazine articles, but little or no contact with natural or even rural landscapes (Buckley, 2000). Often these urban dwellers have relatively little leisure time and limited skills and equipment for adventure and nature tours, so they rely on tour operators to provide packaged adventure and nature tours (Buckley, 2000).

There is also an opportunity to study other niche types of tourism (e.g. musical festivals, food and wine trails, or cultural pilgrimages) through the analysis of well-known tourism types. That is, if a form of tourism can be interpreted as being comprised well-known tourism types, then it is quite possible that descriptive knowledge and ordinal scales from well-known tourism types can be applied to study that form of tourism. Intended benefits would include 1) the availability of existing conceptual frameworks which are based on well established academic literature; 2) the opportunity for new and original insights into the phenomena; 3) the potential integration of different typologies into a new and innovative tourism typology; and 4) testing and developing well-known tourism type typologies.

The existing tourism literature has many examples of how tourism phenomena (e.g. research tourism, wildlife tourism, marine tourism, and volunteer tourism) can be conceptually understood as overlapping tourism types (Benson, 2005; Coghlan, 2007; Higginbottom et al., 2001; Miller, 2008; Robinson & Novelli, 2005; Swarbrooke et al., 2003; Wearing, 2001; Weaver, 2001). However, it appears that the application of such a multiple-tourism typology approach to empirically study less-known forms of tourism is scarce in the literature. For example, this study's literature review did not find one study that undertook such an approach. Hence, in this respect, this study can be seen as a major theoretical contribution to the fields of MRT and research tourism; and perhaps a significant contribution to the study of tourism. This thesis does claim the latter, but raises it as possibility that is worthy of further reflection.

8.6.1. Niche tourism

Research tourism is theoretically identified as a form of niche tourism by Benson (2005) and Robinson and Novelli (2005). Robinson and Novelli (2005) identified volunteer, scientific, educational, alternative wildlife, ecotourism, adventure, and cultural tourism within a niche tourism framework. The niche tourism concept is metaphorically related to the discipline of ecology where an organism‘s niche location is an optimum location where the organism can successfully exploit the location‘s resources in the presence of its competitors (Robinson & Novelli, 2005). In tourism market terms, the niche tourism market is a market segment whereby the individual tourists are identifiable by the same specialised needs or interests, and also have a strong desire for the products on offer (Robinson & Novelli, 2005).

In niche tourism operator terms, Robinson and Novelli (2005) report that niche tourism businesses appear to build on the special interests of enthusiasts who seek to transform their interests into a business venture. Due to competition for optimum condition, often very precise niches in the tourism market have been claimed that allow small businesses to gain their own edge in a highly competitive and generally price sensitive market (Robinson & Novelli, 2005). The size of a niche market can vary considerably but it is essentially a balance between being large enough to produce sufficient business and small enough so it is overlooked by its competitors (Robinson and Novelli, 2005).

This thesis did not explore the niche tourism nature of MRT as it was considered to be a study in its own right. However, the operations of specialised MRT operators, their optimal habitats, and specialised market segments within a competitive marine tourism ‗ecosystem' could be studied in the context of niche tourism theory. As such, this thesis highly recommends that niche tourism theory be applied to further study the supply and demand, and potential future of MRT. An advantage of this is that the niche ecology theories and methods would then be applied to study of MRT. Given the well established nature of ecological studies, it is quite possible that such an approach would provide new and original findings about the nature of MRT, research tourism in general, and possibly tourism on the whole. Australian MRT would be an excellent case study because it has a significant prevalence (80%) of small and independent MRT organisations.

8.6.2. Recreational specialisation

This study and associated literature shows that MRT often involves tourists with higher levels of education, scientific skills, SCUBA diving skills, maritime skills, and conservation awareness (Benson, 2005; Coghlan, 2006; Ellis, 2003b; Galley & Clifton, 2004). Similarly, this study has shown that different MRT products also often involve varying levels of; 1) marine research significance; 2) vacation or volunteer mindedness (Brown & Lehto, 2005); 3) passive or active involvement (Callanan & Thomas, 2005); 4) pre-requisite skills (Callanan & Thomas, 2005); 5) adventure challenge (Swarbrooke et al, 2004); and 6) involvement with wildlife (Woods, 2001). That is, MRT tourists are often relatively specialised in their MRT pursuits and many MRT products will require a degree of specialisation from their customers if they are to effectively participate.

Recreational specialisation is defined as ‗a continuum of behaviour from the general to the particular, reflected by the varying equipment and skills used in sport, and activity settings' (Bryan, 2007). Recreational specialisation traits include previous experience, level of education and interest, type of equipment used, time and economic commitments, travel patterns including tourism infrastructure desires, and membership of organisations (Malcolm & Duffus, 2008). The theory of recreational specialisation is developed from Butler's (1980) tourism area life cycle and integrates the level and change of a tourist's specialisation to the tourist's preferences for different experiences and activities; their resulting travel behaviour; and the subsequent change in density of tourists at a destination (Dearden, Bennett, & Rollins, 2006).

To link recreational specialisation with MRT, a comparison can be made between findings from Malcolm and Duffus' (2007) recreational specialisation focused study of the whale watchers in British Columbia, Canada; and key finding from this thesis. Malcolm and Duffus (2007) found that experienced whale watchers 1) seek to address the ecological and social aspects of whale watching and marine conservation; 2) have more advanced whale and marine ecology education programs; and 3) were more likely to found further away from large numbers of generalised tourists (i.e. with smaller tour operators). This thesis found that the presence of skilled scientific tourists in MRT is associated with the occurrence of higher levels of marine research quality, isolated coasts, offshore sailing, and smaller MRT companies (Figure 7.2). This suggests that experienced whale watchers, and skilled MRT tourists have much in common, and consequently MRT may also be studied within a recreational specialisation framework.

Furthermore, recreational specialisation theory has been applied to the study of the ecotourism (Duffus & Dearden, 1990), sea turtle watching (Wilson & Tisdell, 2001), and SCUBA diving (Dearden et al., 2006) destinations. In those cases, the recreational specialisation of tourists was also shown to markedly influence their behaviour and subsequent choice of destination, product and experience. As MRT has been shown to regularly involve ecotourism, whale watching, sea turtle watching, and SCUBA diving, this thesis proposes that recreational specialisation theory can be used to describe and explain the character and behaviour of MRT or research tourists at a destination. Based on this study's literature review, it is apparent that such a study has not been done yet. Given this, this thesis highly recommends that recreational specialisation theory also be applied to further study of MRT and research tourism in general.

8.6.3. A combination of niche tourism and recreational specialisation theory

This thesis proposes that there is an opportunity to combine niche tourism theory and recreational specialisation to further understand the theoretical nature of MRT. That is, the specialised nature of MRT operators and specialised market segments, and the relevant niche ecology theories can be combined with recreational specialisation theory that links 1) the level and change of a tourist's specialisation to the tourist's preferences for different experiences and activities; 2) the tourist's subsequent travel behaviour; and 3) the ensuing change in density of tourists at a destination (Dearden et al., 2006). Such a combination would integrate well-established spatial ecology theories with a well-established spatial tourism theory and would be a outstanding opportunity to advance the field of research tourism.

8.7. The practice and policy of marine research tourism in Australia

The policy and practice of MRT are not the focus of this thesis. However, there are at least three policy and/or practical implications from this conceptual study that are worth highlighting. They relate to MRT as a recognised form of marine ecotourism; the affect of smaller and larger MRT organisations in Australian MRT; and policy options for increasing stakeholder collaboration and subsequent growth of MRT.

8.7.1. Marine research tourism as a recognised form of marine ecotourism

MRT has been shown to be a form of marine ecotourism (Section 4.3; Benson 2005). Given this, it is therefore likely that MRT is typified by many of the principles of ecotourism that include 1) environmental sustainability; 2) interpretation and education; 3) contribution to conservation; 4) working with local communities; and 5) cultural respect and sensitivity Ecotourism-Australia, 2009 and Appendix 1). However, based on this thesis's findings, MRT is regularly associated with a set of benefits (Table 8-3) that are not always found in marine ecotourism. Given this, this thesis proposes that MRT be recognised as a unique form of marine ecotourism by Australian ecotourism accreditation agencies and rewarded for its environmental credentials.

Table 8-3: Unique benefits from marine research tourism (Source: Figure 7.5.1)

ID	Unique benefits of marine research tourism
1	Reliable and often significant marine research outcomes
2	Substantial and longer term marine conservation outcomes
3	Higher levels of education and training in marine science and conservation
4	Tourism that often occurs in remote marine and coastal locations
5	A richer tourist experience than other ecotourism experiences

This reward could include 1) distinctive and recognised branding for MRT companies and products; 2) increased recognition by marine research and management agencies of the benefits of MRT; 3) privileged participation in Government marine research and management programs; and 4) an increase of permitted access to scientific and high conservation areas. In turn, such reward would require MRT operators to demonstrate the usefulness of their marine research, conservation, and educational outcomes in tangible ways such as peer reviewed scientific publications; increased access for scientists to remote field locations; and reliable species monitoring and conservation.

8.7.2. The role of smaller and larger MRT organisations in Australian MRT

Assessment of the integrated conceptual model for MRT in Australia (Figure 7.6) suggests that intended benefits for a MRT product can influence the market segments, participating stakeholders, and subsequent nature of that MRT product. For example, study one found that significant marine research outcomes are well associated with the presence of skilled scientific tourists, and these tourists are more likely to be present on SO products. That study also found that increased educational, conservation and community engagement outcomes are well associated with the presence of volunteer minded tourists and these tourists are more likely to be present on LO products. An implication of this is that if key stakeholders desire more significant scientific outcomes from a MRT product then they are less likely to be involved with

LO MRT products. In the same way, if key stakeholders seek higher conservation and/or educational outcomes then are less likely to involve themselves with SO MRT products.

Following this, study two found that while marine conservation and education outcomes are considered important to them, Australian marine researchers and managers are more likely to be involved in MRT products if the marine research outcomes are constantly reliable and significant. They are also averse to supervising tourists. On the other hand marine conservationists and educators are more likely to be involved with MRT if marine conservation and education outcomes are high but the marine research is less reliable and /or significant. In this regard, Australian marine researchers and managers are more likely to be involved in SO products than LO products. In contrast, while supportive of SO products, Australian conservationists and educators are likely to be advocates for LO products even if the marine research reliability and significance is low.

However, the crux of this issue is that study two found that MRT products in Australia are only likely to receive a Government approval to conduct complex marine research if they receive research permits from Australia‘s marine management agencies (Marine manager). It is reasonable to accept that this will occur if there are tangible benefits to Australia‘s marine research program and many of the marine research constraints identified in Study two are addressed. Hence, many potential LO products that cannot do this are unlikely to receive marine research permits from Australian marine management agencies, and are therefore less likely to conduct MRT in Australia.

On the other hand, as SO products undertake marine research more often at more remote offshore locations, and usually have more significant and reliable marine research outcomes, they are more likely to receive marine research permits and subsequently conduct MRT. Such a circumstance is a likely reason as to why Australian MRT has a prevalence of SO MRT products today. It is also a reason to argue that future MRT in Australia will continue to be dominated by SO products until Australian marine research and management agencies become more accepting of MRT products that deliver less significant and reliable marine research outcomes but still deliver quality conservation and educational outcomes.

8.7.3. Policy options for increasing stakeholder collaboration and growth of MRT

To increase understanding between key stakeholders, this thesis studied the views of stakeholder groups towards present and future MRT in Australia. It revealed a set of shared and contested views for MRT in Australia. Shared stakeholder views could form the basis of increased cooperation between stakeholder groups and subsequent growth in MRT. Contested views could act to decrease stakeholder collaboration and growth in MRT. To address those contested views, a range of policy options could be implemented to resolve those concerns; increase collaboration amongst key stakeholders; and deliver greater benefits from MRT to the marine research, management, conservation, and tourism sectors. These options are:

1. Increase the recognition of MRT benefits by marine research and management agencies, and marine tour operators;
2. Develop coordinated lines of communication amongst potential users of MRT marine research outcomes and key MRT stakeholders;

3. Seek to ensure that MRT produce reliable research outcomes and academic publications;
4. Seek to integrate popular marine research from MRT with mainstream marine research programs;
5. Increase the involvement of Indigenous Australian's, and environmental conservation and marine education organisations in Australian MRT;
6. Increase the involvement of marine research agencies in the development and operation of MRT.
7. Study why Australian MRT has limited involvement (i.e. 3 organisations from a total of 19 worldwide) of larger and inter-national MRT organisations, and consider if their increase participation in Australian MRT should be actively encouraged.

To assist with the implementation of these policy options, it is possible that other key stakeholder's suggestions could be adopted. These include the professional development of MRT guide roles; establishment of government and privately funded organisation of MRT brokers to support MRT in Australia; and a privately and government funded MRT trail across Australia. A MRT guide role would address the needs of tourists, marine researchers, and tour operators; minimise occupation health and safety, and public liability issues; improve marine research, conservation and educational outcomes; and deliver rich tourist experiences. A group of MRT brokers would work collaboratively with marine research and management agencies, and marine tourism operators to deliver MRT benefits and facilitate MRT growth. A MRT trail would bring the benefits of economies of scale to small and independent MRT operators, and link them into a flagship marine tourism product for Australian tourism.

8.8. Thesis limitations

Limitations of this thesis are discussed in Chapters one, three, four, five and six of this thesis. Chapter One limitations are related to the validity (or otherwise) of the applied marine research tourism criteria; the reliability and consistency of criteria measurements; and the type and representativeness of the sampled data in studies one, two, and three. Chapter Two described the theoretical limitations of the positivistic and interpretivistic research and implications; the reliability limitations of web site analysis in study one; the limited depth of interview outcomes from a phenomenographical approach in study two; and the possible reliability limitations associated with the use of promotional brochures in study three.

Study one sampled just 86 (68%) of the identified 126 MRT product web sites worldwide. However, this is not expected to bias the stage's outcomes because the MRT product web sites that were not sampled were considered to be already well represented in the actual sample. Study two outcomes are somewhat limited by just 33 key stakeholders participating in research step three. This limitation is apparent when trying to interpret whether a certain survey trend is representative of the full population of that key stakeholder group. As an opportunity to address this, it is recommended that the contestability of those issues could be further clarified by surveying more key stakeholders from the eight key stakeholder groups. A minimum number of 64 (i.e. eight stakeholders for eight groups) or more key stakeholders is recommended.

Study three outcomes had a survey bias whereby twenty seven percent of respondents from outside of Australia were more likely to have SCUBA diving experience, support conservation programs (12.3%), and watch nature documentaries (10.9%). Furthermore, sixty six percent of respondents between the ages of 18 to 30 were female, and fifty eight percent of respondents over the age of 30 were male. Additionally, to broaden the representativeness of study outcomes, the product preferences of backpackers and gap year travellers could have been sampled more. Both these limitations were due to the nature of the available respondents.

Notwithstanding these limitations, this thesis contends that the validity and reliability of this thesis's outcomes are satisfactory enough to reliably answer this thesis's research questions. Nonetheless, it is recommended that any future reporting of this thesis' findings should acknowledge the likely limitations that are associated with those findings. Notably, such limitations actually represent opportunities to study MRT with a more refined methodology.

8.9. Methodological implications

This thesis used a range of research methods to undertake its three studies. Some of those methods were not previously described in the research tourism literature. So as to communicate the benefits of methods to practically resolving research tourism related problems, the effectiveness of those research methods are briefly discussed next.

As well as descriptive analysis of web sites, study one successfully ranked (via three independent assessors) 25 MRT related criteria across 86 MRT product web sites worldwide from 35 MRT organisations. The aim of this process was identify key features and patterns of those MRT criteria across those websites. Criteria were derived through the analysis of the literature that describes the ten key MRT elements (Figure 1.1). The range of significant outcomes from this research demonstrates that such an approach is an effective way to assess a tourism phenomenon on a regional scale.

In methodological terms, a key outcome from study one is the empirically derived benchmark tables (Table 4-14and Table 4-15) of MRT criteria. These tables and underlying data show the relative average, maximum, and minimum values (ranked from 1 to 5) of those 25 MRT criteria with corresponding examples. This empirically derived table has the potential to be applied as an empirically derived scale for the further study of research tourism and related MRT key elements. An example of those tables is in Table 8-4.

Table 8-4: An example of the MRT criteria benchmark table (Source: Chapter Four)

MRT criteria	Ave	Max	Min	Example of max.	Example of min.
Activity level (Orams, 1999)	3.4	5	1	Live-aboard expedition to remote coral reefs	Live on a tropical island with regular snorkelling and beach walking
Cost per day ($USD)	34	2100	10	Witness the beauty and mystery of deep sea geysers aboard a MIR submersible in the Pacific Ocean	Volunteer at the Bunbury Dolphin Centre in Bunbury, Western Australia
Cultural focus	2.2	5	1	Camp, fish and protect turtles with Australian indigenous people	Monitor whales and dolphins in the day and then stay in conventional accommodation at night

While web site analysis has its limitations (See Chapter Three), such a method is a cost and time effective alternative to some other methods to acquire such information. Those other methods includes site observations of all 86 MRT products worldwide and/or interviewing or surveying the operators of those MRT products. A benefit of this approach is that it will reveal the actual destinations and product image (Coghlan, 2007; G. Moscardo, Morrison, Pearce, Lang, & O'Leary, 1996) that a MRT operator presents on their web sites and many tourist's draw on to purchase a tourism product. It is worth noting, this thesis's review of tourism methodology literature did not find a similar web site ranking method to obtain valid and reliable trends about a large sample of tourism product web sites. Given this, it is worth considering if this procedure is unique in the tourism literature. However this is not claimed in this discussion and such a claim would require further investigation that is outside the scope of this thesis.

A unique aspect of study two is the direct acquisition and comparison of the views of different supply side stakeholder groups. This is because the relevant research tourism studies (Ellis, 2003a; Ellis, 2003b; Cousins, 2007; Whatmore, 2008; Lorimer, 2009; Brightsmith et al., 2009; Cousins et al., 2009) appear to have directly sampled the views of research tourism operators and then inferred the concerns and issues of other key stakeholder groups (e.g. conservation groups and natural resource managers). That is, the views of other key stakeholder groups about various research tourism issues have not been directly sampled. These outcomes demonstrate that such a multi viewpoint method is a useful approach to study stakeholder issues in research tourism and other tourism phenomena.

Study two adopted a phenomenographical and semi-structured interview approach to study the variation of key stakeholder group views about Australian MRT. Such approach was found to be useful for that purpose. However, it was found that such an approach is less useful for understanding why that variation occurs. For example, this study could not explain why certain stakeholders from stakeholder groups contested the proposal that ‗unless volunteers are needed, marine research that can be undertaken on MRT ventures could also be done on normal marine tour ventures, by scientists and crew, and without the active involvement of tourists'. While this study does discuss and make claims on some of those ―why" questions, it recommends that research methods of greater depth (e.g. phenomenonology, focus groups and in-depth interviews) are used to clarify some of the more outstanding issues. This particularly would be useful when assessing why some marine researchers and managers appear to be sceptical about aspects of Australian MRT.

Study three applied a market segmentation method (Murphy & Norris, 2005) to study the preferences of different potential MRT tourists for different MRT products and benefits. To achieve this, study three used two methods that were not found in the literature about research tourism. The first method applied output from the analysis of 85 MRT product web sites in study one to identify six distinct classes of different MRT products worldwide. From those classes 12 MRT product brochures were created that describe twelve possible or existing MRT products across Australia. This approach was used so that a representative description of different Australian MRT products was readily available to all 311 respondents. An alternative approach would have been to find and survey a representative sample of potential MRT tourists who had all had similar experience with a representative sample of MRT product worldwide. Such an approach would have been nearly logistical impossible for this thesis to achieve.

Second, study three used those MRT product brochures to link the respondent's preference for those MRT products with the study one criteria that underpinned the design of those brochures. The outcome was that the each respondent is not only linked to the preferences for different MRT benefits from study three but they are also linked to the MRT attraction, benefit and concern criteria from study one. The key outcome is twelve summary tables (Appendix 39) that describe the preferences of various MRT markets for a range of Australian MRT products and associated benefits.

8.10. Future research opportunities

Based on the relevant literature and this thesis's findings, 58 opportunities to study MRT and research tourism are identified. These opportunities and underlying research gap and presented in Appendix 40. Each of those research opportunities has merit in terms of its potential contribution to the theoretical study of MRT, and practical implications for the MRT sector in Australia and elsewhere. Based on those criteria and Appendix 40, twelve relatively high priority research opportunities for MRT and/or research tourism are as follows:

- Investigate the role SCUBA diving in MRT worldwide, regionally and locally;
- Investigate research tourism that is based in USA but operates worldwide;
- Investigate land-based research tourism that occurs within Australia;
- Explore and describe the role of gap year travellers and backpackers in MRT;

- Evaluate the role of nature documentaries (i.e. Discovery Channel) in MRT demand and the affect that this demand on how MRT operators meet the expectations and/or otherwise satisfy MRT tourists;
- Test if and how MRT regularly delivers a rich tourist experience that exceeds of the expectations of the tourist;
- Evaluate the nature and significance of how higher quality marine research can be achieved by attracting more skilled scientific tourists via increased physical adventure, SCUBA diving, evironmental remoteness, offshore sailing, tranquility, and shorter trips;
- Further evaluate the nature and significance of how longer-term marine conservation benefits can be attained through volunteer minded tourists;
- Integrate MRT and research tourism with recreational specialisation theory (Malcolm & Duffus, 2008);
- Apply this thesis's outcomes to further understand the possible future of Australian MRT.
- Investigate why Australian MRT has limited involvement of larger multi-national MRT organisations and consider if and how their increase participation in Australian MRT should be actively encouraged by key stakeholders;
- Further study to understand if and why some or many marine researchers and managers across Australia could see an effective marine research capability from MRT as unwanted competition for government marine research funding.

8.11. A waypoint to the future

This thesis investigated the conceptual nature of marine research tourism in Australia. It is the first study of marine research tourism on a global and regional (i.e. Australia) scale and represents a strong foundation for the continued study of marine research tourism. It has produced many contributions and advances to the existing body of knowledge about marine research tourism and research tourism. These findings are encapsulated by the integrated model of the conceptual, supply, and demand nature of marine research tourism in Australia (Figure 7.6) developed in this thesis. This model conceptualises marine research tourism as a phenomenon of many interacting tourism typologies, supply factors, and demand factors that given the right circumstances can manifest into many different MRT products. Based on this model and related findings, a definition for MRT is proposed that reflects the well-known tourism typologies and many benefits that comprise MRT. Finally, this thesis presents a set of theoretical and applied opportunities to further investigate MRT and research tourism.

Morse (1997) describes the modern scientific study tour as a joining together of the public's interest in science, and their desire to be reconnected with nature and obtain a unique experience". These forces are also clearly behind marine research tourism. Similarly, Cater and Cater (2007, p. 2) declares that "While efforts to exploit space as the 'final frontier' for tourism continue, it is clear that the penultimate frontier - the marine realm - still offers much untapped potential". This thesis can be seen as a waypoint to harness that force, sustainably develop marine research tourism, and tap that potential. In turn, this would enable an increasingly educated and environmentally aware public and an under-funded marine research, management, education, and conservation sector to discover, study, learn about, and care for the Earth's remarkable marine realm.

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A CONCEPTUAL EXPLORATION OF MARINE RESEARCH TOURISM IN AUSTRALIA

APPENDICES

LIST OF APPENDICES

Appendix 1. Description of key elements of marine research tourism

Scientific tourism

Lindberg (1991) saw scientific tourists as a sub group of ecotourists that includes hard-core nature tourists, scientific researchers or tourists specifically interested in nature education, research or conservation. Llyina and Mieczkowski (1992) identified research tourism as scientific tourism and described it as a form of tourism that seeks to study and preserve relatively undisturbed environments under the leadership of highly qualified scientists. These scientists may work for a government agency, a private organisation or a university, and may be professional researchers or university students (Benson, 2005). The tourist element of scientific tourism is paying or not paying volunteers, and/or scientific researchers such as university based students (Benson, 2005). Llyina and Mieczkowski (1992) saw scientific tourism as only the beginning of a worldwide expansion of „knowledge-orientated" tourism that overlaps with ecotourism, adventure tourism and cultural tourism. Scientific tourism is not well described in the academic literature (Benson, 2005).

Scientific educational tourism

Scientific and educational tourism are often closely associated (Benson, 2005). Educational tourism is travel that has an educational purpose, whereby education is the organised systematic effort to foster learning, to establish the conditions, and to provide the activities through which learning can occur (Smith, cited in Benson, 2005). Morse (1997) defined

educational study tours as trips that target people interested in the research agency‟s mission, the tours are primarily for educational purposes, the subjects are related research agency programs, the tours offer special opportunities relating to the research agency‟s mission and each tour is conducted by an accredited expert. Scientific educational study tours provide access to the natural marine world through sciences such as biology, geology, as well as the human world through archaeology, anthropology and art history (Morse, 1997). An example of this are the Lindblad expeditions to Antarctica whereby cruises are accompanied by several Antarctic specialists/naturalists who share their knowledge of the continent with their guests (Ritchie, Carr, & Cooper, 2003). Educational tourism is driven by an increasingly educated tourism market, and has led to a growth in nature based and cultural educational tourism programmes (e.g. Ecotourism interpretation and scientific study tours) (Weaver, 2001).

Marine tourism

For most of human history, the majority of the Earth‟s marine environment has been inaccessible to tourists due to relatively high costs of travel and recreation at sea, and safety concerns (Orams, 1999). From the 1700s, in Europe and the USA particularly, there was increased rail access to coastal areas and the development of seaside holiday towns, which increased popular interest in the marine environment (Morse, 1997; Towner, 1996). However, prior to World War II, primarily due to technology and safety reasons, access to seas away from the coast was difficult and as a result marine tourism was constrained in its supply (Orams, 1999).

Since the 1950s, new technology such as Self Contained Underwater Breathing Apparatus (SCUBA) diving equipment, Global Positioning System (GPS), Emergency Position Indicating Radio Beacon (EPIRBs), and high speed, high volume water craft have made the marine environment more accessible, safer and comfortable for tourists (Garrod and Wilson, 2002; Musso and Inglis, 1998; Orams, 1999). Greater publicity of that technology has greatly expanded the accessibility of the marine environment (Orams, 1999). Due to these factors, there are now more locations, activities and opportunities for marine tourists to experience (Orams, 1999). For example, Musso and Inglis (1998) reported that markets for coral reef and dive tourism have expanded greatly in recent years. This is primarily due to increased promotion and access to remote coral reef environments with their clear, warm waters and diverse geophysical and biological features (Musso & Inglis, 1998).

Consumer demand for these marine tourism opportunities is considerable (Orams, 1999). Traditionally, tourist demand for marine tourism locations and activities has been driven by mental images of sun, sand and sea (Orams, 1999). Demand for marine tourism products is also motivated by a better educated public, television and movies, and a public that is rapidly developing an almost insatiable curiosity about the wonders of the sea (Garrod, 2008; Orams, 1999).

Supply of marine tourism products is governed by a basic economic principle of high demand and scarce supply and this will continue to force the cost of most marine recreational activities up (Orams, 1999). For Orams (1999), this highlighted that access to high-quality marine areas and popular activities in some areas is only afforded by the wealthy.

Notwithstanding this exclusivity, there is a consensus in the literature that coastal and marine tourism is growing at an even faster rate than the general tourism sector (Orams, 1999).

Orams (1999) expressed concern that unless the marine tourist is inspired and changed as a result of their marine tourism experiences then the marine tourism industry is simply exploitative and ultimately destructive. To this end, Orams (1999) recommends that marine tourists should become active contributors to the health and viability of the marine environment. Orams (1999) proposed a range of education based strategies to assist with this goal. Given research tourism‟s strong association with marine research, conservation and education, it is reasonable to suggest that MRT is one form of marine tourism that Orams (1999) advocates.

Wildlife tourism

Wildlife tourists can be motivated to study wildlife scientifically (Swarbrooke, Beard, Leckie, & Pomfret, 2003). Higginbottom, Pann, Moscardo, Davis and Muloin (2001) define wildlife tourism as tourism that is based on encounters with wild (non-domesticated) animals in either their natural environment or in captivity. In particular, wildlife tourism that involves interaction with large, accessible, charismatic and exciting, free-ranging animals such as whales, dolphins, whale sharks, mountain gorillas, and sea turtles has experienced rapid growth (Curtin & Wilkes, 2005).

The involvement of tourists with different wildlife species and settings will vary. Towards describing this, Woods (2001) proposed a behavioural continuum between wildlife generalists and wildlife specialists that has been applied to wildlife tourism studies. Generalists are less skilled,

devote less time to the wildlife activity, spend less money and have less specific needs and specialists have participate more frequently, higher skill levels, spend more money and have specific preferences regarding wildlife tourism.

Marine wildlife tourism

Marine wildlife tourism can be defined as wildlife tourism where the wildlife at issue has natural connections to ocean and coastal ecologies (Miller, 2008). Non consumptive (e.g. not hunting) marine wildlife tourism is essentially an activity that overlaps with ecotourism, geotourism, wildlife tourism, environmental tourism, nature tourism, polar tourism, alternative tourism, science tourism, and volunteer tourism (Miller, 2008).

Marine wildlife tourism ventures often focus on charismatic „megafauna" which Wilson and Garrod (2003) describe as larger species of animals that are easy to observe, that appear regularly, predictably and in reasonably large numbers and in specific locations. Their sheer size can add to the appeal (e.g. whales) but species that are perceived to be physically attractive or particularly responsive to humans (e.g. dolphins) are also a big draw, as are some of the relatively small populations (e.g. great white sharks) (Wilson & Garrod, 2003). Larger species tend to have relatively small populations and require large territories (of relatively undisturbed ecosystems) to support viable breeding populations (Wilson & Garrod, 2003). Due to these reasons, these charismatic megafauna are often suitable tourist attractions for the development of commercially viable marine wildlife tourism operations (Wilson & Garrod, 2003).

Marine wildlife tourism is said to be a sphere of tourism where conflicts between key marine tourism stakeholders are known to regularly occur (Moscardo, Woods & Greenwood, 2001; Birtles, Valentine & Curnock, 2001). For example, due to the low or highly variable levels of predictability of sighting certain free-ranging marine wildlife species, marine tour operators may have difficulty in sighting those species and this can create tension between tour operators, marine managers and/or tourists (Birtles, Valentine, & Curnock, 2001; Moscardo, Woods, & Greenwood, 2001). For instance, tourists expect to see particular species such as whales, turtles or dolphins, and the tour operator may be unable to deliver (Birtles, Valentine & Curnock, 2001). Additionally, tour operators often seek greater access to wildlife and marine managers will often seek to restrict access to certain species and increase the viewing distance between tourists and species (Moscardo, Woods & Greenwood, 2001). Also, difficulties in locating wildlife have occasionally resulted in inappropriate and sometimes highly competitive behaviour between marine tour operators (Birtles, Valentine and Curnock, 2001).

Nature based tourism and ecotourism

Nature based tourism can be characterised as tourism about the environment (e.g. wildlife tourism), tourism for the environment (e.g. ecotourism), and tourism in the environment (e.g. adventure tourism) (Derrett, 2001). Ecotourism is a subset of nature based tourism and is defined as ecologically sustainable tourism with a primary focus on experiencing natural areas that fosters environmental and cultural understanding, appreciation and conservation (Ecotourism Australia, 2009). The practice of ecotourism is well associated with the triple bottom line goal of economic, social and environmental sustainability (Table 1-) (Ecotourism-Australia, 2009).

Table 1-1: Best practice ecotourism principles based in triple bottom line sustainability (Source: Ecotourism-Australia, 2009)

Economic Sustainability	
1.	Business Management and Operational Planning
2.	Business Ethics
3.	Responsible Marketing
4.	Customer Satisfaction
Environmental Sustainability	
5.	Natural Area Focus
6.	Environmental Sustainability
7.	Interpretation and Education
8.	Contribution to Conservation
Social Sustainability	
9.	Working with Local Communities
10.	Cultural Respect and Sensitivity

Developed as part of the environment movement of the 1970s and 1980s, ecotourism reflects growing environmental concern coupled with a growing dissatisfaction with mass tourism that led to increased demand in alternative nature based experiences (Blamey, 2001; Brown and Lehto, 2005). Kelly and Nankervis (2001) attribute much of the growth in demand for ecotourism products to; 1) prospective tourists with interest in nature and cultures being highly influenced by a proliferation of television documentaries and nature publications, and 2) the public‟s perception that the world is becoming increasingly homogenised and rapidly running out of „untouched‟ areas.

Acott and La Trobe (1998) developed a schema that illustrates the relationship between typologies of environmentalism and sustainable development with deep/shallow ecotourism (

Table 1-2). In summary:

Shallow ecotourism represents a range of viewpoints that lie between deep ecotourism on the one hand and mass tourism on the other as shown in

Table 1-2. Within the environmental paradigm, shallow ecotourism represents a business-as-usual attitude to the environment. Nature is valued according to its usefulness to humans. The environment is seen as a resource which can be exploited to maximise the benefits to humans. There is no consideration of intrinsic value although the importance of future (human) generations is recognised. Management decisions are made from a utilitarian, anthropocentric viewpoint.

Deep ecotourism is based on the ideas expressed in ecocentrism and deep ecology. It incorporates the sub-categories deep ecologists, self-reliance and soft technologists. ..... Deep ecotourism therefore encapsulates a range of ideas which include the importance of intrinsic value in nature, emphasis on small-scale and community identity, the importance of community participation, a lack of faith in modern large scale technology and an underlying assumption that materialism for its own sake is wrong.

Acott & La Trobe, 1998

Table 1-2: the relationship between typologies of environmentalism and sustainable development with deep/shallow ecotourism (Acott & La Trobe, 1998)

Main reference	*Deep ecotourism*		*Shallow ecotourism*	*Mass tourism*
O'Riordan (1981), Pepper (1984)	Ecocentrism		Technocentrism	
Pepper (1996), O'Riordan (1989)	Gianism	Communalism	Accommodation	Intervention
Pepper (1984)	Deep Ecologists	Self-reliance, soft technologists	Environmental managers	Cornucopians
Dunlap and Van Liere (1978), Milbrath (1985)	New environmental paradigm		Dominant social paradigm	
Naess and Rothenburg (1989)	Deep ecology		Shallow ecology	
Pearce (1993), Turner *et al.* (1994)	Very strong sustainability	Strong sustainability	Weak sustainability	Very weak sustainability

Related to Acott and La Trobe (1998)"s schema, Weaver and Lawton (2001) derived an ecotourism spectrum (Figure 1.1) from hard to soft ecotourism. If operationalised, this schema can be used to derive various indicators to study ecotourism ventures. For example, a Likert like indicator cold be derived to relative level of commitment to the environment by individuals within a group of ecotourists.

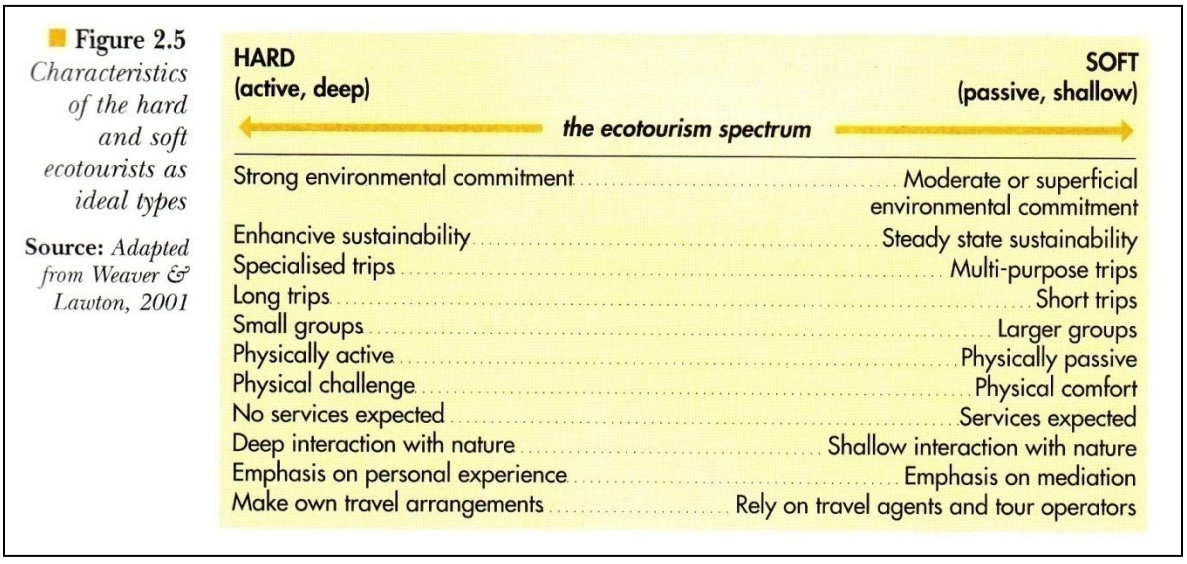


Figure 1.1: The ecotourism spectrum (Source: Weaver & Lawton, 2001)

Marine ecotourism

Marine ecotourism is often portrayed as being based on wildlife attractions such as watching whales, dolphins, other marine mammals and fish, bird watching (Wilson & Garrod, 2003). There is also a large range of physical activities to attract and interest marine ecotourists such as; SCUBA diving, beach walking, rock pooling, snorkeling, walking on coastal footpaths and sightseeing trips by surface boat, and submarine and aircraft experiences (Wilson & Garrod, 2003). Through the actions of non-government agencies, marine ecotourism is often associated with marine conservation (Halpenny, 2003). Specifically, marine ecotourism assist conservation through;

1. Ecotourism related financing mechanisms for conservation
2. The establishment of tourism industry and management standards and especially voluntary guidelines
3. Research on the challenges facing the management of coastal and marine resources and marine ecotourism‟s ability to address these issues
4. Education of coastal stakeholders regarding solutions for coastal resource use problems including the implementation of genuine ecotourism

(Halpenny, 2003)

Adventure tourism

Adventure tourism occurs when travellers expect to experience high levels of activity, varying degrees of risk, excitement, tranquillity, and to be personally tested (Mintel, 2001). Often Adventure tourists are explorers of unusual, remote or exotic wilderness destinations (Mintel, 2001). Adventure tourism can be associated with wildlife tourism, expedition tourism, discovery tourism, and activity tourism (Swarbrooke et al., 2003). Expedition tourism is "based on journeys or voyages where by the expedition can be grueling, both in physical and mental endurance, take place in remote locations, the journey is often the main activity, discovery is almost guaranteed, there is a risk factor enhanced by lack of support services and rescue options if anything goes wrong" (Swarbrooke et al., 2003, p. 24). Discovery tourism is "somewhat lengthier than in adventure tourism and contains elements that offer self enrichment via exposure to novel places, novel cultures, novel activities and a requirement for the tourist to immerse him/herself in a learning environment provided by the tourism product" (Muller and Cleaver, 2000, cited in Swarbrooke et al., 2003, p. 23). Activity based tourism is described as a "form of tourism which involves consumers whose holiday choice is inspired by the desire to pursue an activity (e.g. adventure, attending a sport event" (Robinson & Novelli, 2005 p. 143).

Demand for adventure tourism is due to increasingly urbanised and relatively affluent western societies who have some appreciation of the environment from television programmes and magazine articles, but little or no contact with natural or even rural landscapes (Buckley, 2000). Often these urban dwellers have relatively little leisure time and limited skills and equipment for adventure and nature tours, so they rely on tour operators to provide packaged

adventure and nature tours (Buckley, 2000). Similarly, research tourists who seek adventure and do not have the time, skills or equipment to conduct adventurous research tours will often depend on the services of research tourism operators.

Volunteer tourism

Research tourism has been identified as a form of volunteer tourism (Weiler & Richins, 1995; Ellis, 2003a; Benson, 2005; Cousins, 2007). Volunteer tourism has been significantly increasing since the 1970s and is now a global phenomena with Africa, Central and South America being popular locations (Brown and Morrison, 2003; Wearing, 2003 & Wearing, 2001). Wearing (2001) defined volunteer tourists as those tourists who, for various reasons, volunteer in an organised way to undertake holidays that might involve the restoration of certain environments or research into aspects of society or science. Although, the concept of travelling for the purpose of volunteering is far from new, the origins of modern volunteerism can be traced to the formation of organisations such as Australian Volunteers Abroad, Voluntary Service Abroad NZ and the United States Peace Corps in the twentieth century (Wearing, 2001).

Volunteer tourism would appear to bridge the altruistic motives of volunteering with the general commodified tourism experiences (Brown & Lehto, 2005). Today, volunteers play an increasingly important role in the global conservation of nature (Wearing, 2001). Callanan and Thomas (2005) describe this trend as society‟s reaction to mass tourism and the media‟s role in communicating the divisions between the haves and „have nots‟ in society. They state that in the early twentieth first century, there is a volunteer tourism rush influenced by an ever „guilt conscious‟ society.

Alternative tourism

Alternative tourism can be broadly defined as tourism that set out to be consistent with natural, social and community values and which allows hosts and guests to enjoy positive and worthwhile interaction and shared experiences (Wearing, 2001). Alternative tourism is distinguished by the degree in which it contrasts with mass tourism (Robinson, 2005). For example, alternative tourism is driven by the tourist‟s need for participating in, learning and being more intimate in the everyday life of the destination, and this has resulted in more specialised forms of tourism (Robinson & Novelli, 2005). Mass tourism is defined as a large scale phenomenon, packaging and selling standardised leisure services at fixed prices to mass clientele (Poon, 1993).

Alternative tourism formally emerged in the early 1980s as a tourism research, tourist industry and tourist response to the sustainability concerns about mass tourism as emphasised in the Brundtland Report (Weaver, 2006; World-Commission-on-Environment-and-Development, 1987). The recent growth in research tourism since the 1980s is related to this recent growth in alternative tourism (Ellis, 2003b). Conceptually, Wearing (2001) presented alternative tourism as an umbrella concept (Figure 1.2) for other well known tourism types that include education tourism, scientific tourism, volunteer tourism, adventure tourism and ecotourism.

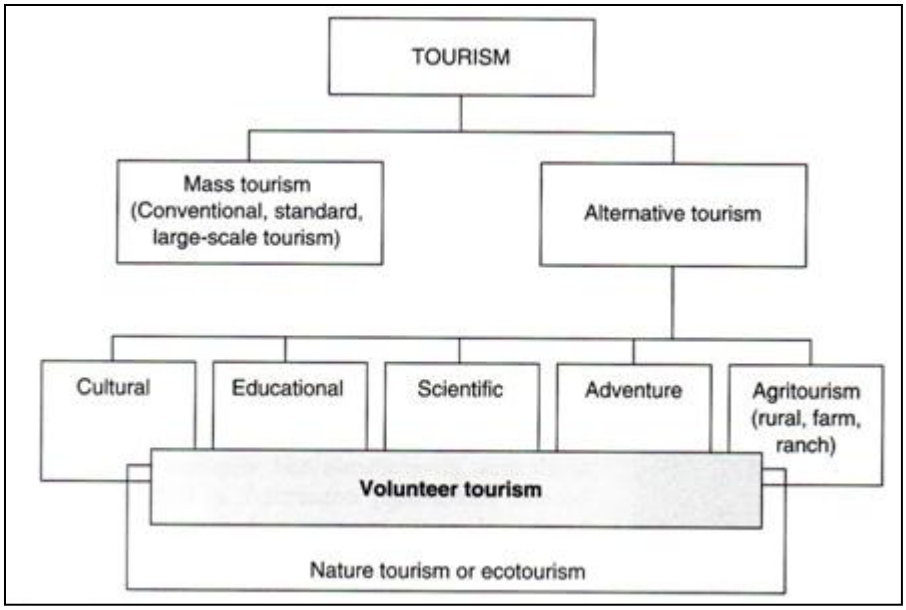


Figure 1.2: Alternative tourism as an umbrella term for related tourism types (Source: Weaver, 2006)

Niche tourism

A niche tourism market is a group of individuals who are identifiable by their same specialised needs or interests and have a strong desire for the products on offer (Robinson & Novelli, 2005). Research, scientific, wildlife, volunteer, ecotourism, educational, alternative, and adventure tourism can be conceptually located within a niche tourism context (Robinson & Novelli, 2005, p. 9). Niche tourism is fundamentally related to the niche concept within the discipline of ecology whereby the term „niche" refers to an optimum location, which an organism can exploit its resources while in the presence of its competitors (Robinson & Novelli, 2005). Like an ecological niche, the size of a niche market can vary considerably but essentially a niche tourism operation needs to be balanced between being large enough to produce sufficient business and small enough so it is overlooked by its competitors (Robinson & Novelli, 2005). These market niches have often allowed small businesses to gain their own edge in a highly competitive and generally price sensitive market (Robinson & Novelli, 2005). Niche tourism

businesses appear to build on the special interests of enthusiasts who seek to transform their interests into a business venture (Robinson & Novelli, 2005).

Environmental conservation

Research tourism represents a mechanism to fund global biodiversity conservation beyond economically rich countries and helps transfer much needed money and labour (Whatmore, 2008). Research tourism is becoming an important driving force behind environmental conservation (Cousins, 2009). As traditional income sources decline, conservation biologists and Non-Governmental Organisations (NGOs) are partnering with research tourism companies to raise funds and labor to undertake environmental conservation (Campbell & Smith, 2006; Whatmore, 2008; Cousins, 2009).

The role of science in research tourism

By definition, MRT is driven and funded by the popular public interest in marine science. This interest is driven by growing public interest in science, the marine environment and the role of the media in popularising marine science (Fürsich, 2002; Morse, 1997; Orams, 1999). For example, since, the 1950s, there has been a general swell of public interest in science and adventure, though through popular scientific television shows and books (Morse, 1997). In response, the media industry have identified and reacted to this phenomenon by developing niche media presentations, television, cable and satellite, programmes such as cable channels such as Discovery Science Channel and Nat Geo Adventures, and television nature documentaries such as David Attenborough‟s Blue Planet (Fursich, 2002). Complementary to video media, there is

also growing market in specialised travel publications such as guide books and newspaper sections that promote travel to discover natural history (Fursich, 2002).

Given these driving forces, it is reasonable to propose that media of popular marine scientists and adventurers such as Jacques Cousteau, Jean-Michel Cousteau, Val and Ron Taylor, Sylvia Earle, Ben Cropp, David Attenborough and Robert D. Ballard have created increased consumer demand for MRT experiences. In this case, not only is the science and adventure an attraction for the research tourist but the marine researcher is also part of the tourist attraction.

Sustainable community development

Sustainable community development can be assisted through the application of ecological sustainable tourism principles (Bushell, 2001). Bushell (2001) outlined six ecologically sustainable tourism principles that are relevant to sustainable community development via tourism. These principles are:

1. Tourism should help people live a healthy and productive life in harmony with nature;
2. Tourism should be planned at the local level and allow for participation of local people;
3. Tourism should recognise and support the identity, culture and interests of indigenous people;
4. International agreements to protect the environment should be respected by the tourism industry;
5. Tourism should contribute to the conservation, protection and rehabilitation of ecosystems;
6. Protection of the environment should be an integral component of tourism development.

These six principles were adopted by the World Tourism Organisation, the World Travel and Tourism Council and the Earth Council in 1995. An example of sustainable community development through research tourism is Operation Wallacea‟s marine research tourism experiences in south-east Sulawesi, Indonesia. This research tourism experience 1) depends upon local suppliers for much of their food and other services such as the operation and maintenance of dive boats; 2) has regular and informal contact between tourists and local communities, and 3) has assisted with the research and management of the nearby Wakatobi Marine National Park (Clifton, 2004; Galley & Clifton, 2004).

Appendix 2. The case of the Undersea Explorer MRT company

Undersea Explorer's adventure diving tourism, and benefactor support from the Grollo Foundation, provided the funding to allow the permanent employment of marine scientists and to provide berth space, equipment and funding for external scientists onboard Undersea (Dunstan, 2009; Undersea, 2009). Researchers were invited to apply for sea time to undertake fieldwork aboard Undersea (Undersea, 2009). Marine research projects were focused on understanding reef ecology, biodiversity, conservation and minimising human impacts on marine resources. Research projects investigated include dwarf minke whales, white tip reef sharks, octopuses, nautilus, fluorescent corals, coral bleaching, water quality and more (Undersea, 2009).

Dunstan (2009, p 166) reports that a long term goal for the Undersea Explorer was to be credible institution in its own right, in order to create new ways of thinking and to drive research and conservation." This paradigm shift would mean that external scientists and Undersea Discovery biologists would be collecting quality research data all year round (Dunstan, 2009). As well as peer reviewed journal articles (Arnold, Birtles, Sobtzick, Matthews, & Dunstan, 2005; Birtles, Arnold, & Dunstan, 2002; Dunstan, Sobtzick, Birtles, & Arnold., 2007; Valentine, Birtles, Curnock, Arnold, & Dunstan, 2004), research on the Undersea Explorer attracted journalists, photographers, and documentary makers that promoted Undersea Explorer in a way that no purely commercial dive boat could conceive (Dunstan, 2009). Undersea Explorer research also served as a backbone to providing scientific information to manage the Great Barrier Reef (Dunstan, 2009). For example, Undersea Explorer's research on dwarf minke whales, shark, turtle, and dugong influenced government management policy and guidelines

towards this wildlife. Undersea Explorer also had an influential presence within key stakeholder groups such as marine park managers, scientists, conservation groups and the community (Dunstan, 2009).

Undersea Explorer was not a volunteer focused research tourism company such as the Earthwatch Institute and Coral Cay Conservation (Dunstan, 2009). Undersea Explorer had concerns about the scientific credibility of the research data collected by volunteers and the value that volunteers felt they contributed to the project (Dunstan, 2009). Often data collection can be mundane, and Undersea Explorer believed that performing such tasks in beautiful reef surrounds was not the best option for many ecotourists (Dunstan, 2009). In the words of Undersea Explorer's founder John Rumney "They wouldn't be giving up their vacation to help the research" (Dunstan, 2009, p 171).

The interpretive role on Undersea Explorer was considered to be different than many other marine tourism companies. For Undersea Explorer, the interpreter is a biologist, researcher and SCUBA instructor, who act as a conduit between visiting researchers, the passenger and crew (Dunstan, 2009). This allowed researchers and crew to get on with work while a quality experience is still provided for passengers. Dunstan (2009) acknowledges that the availability of biologists who met these criteria was limited so the Undersea Explorer had a program to ensure quality staff. On the Undersea Explorer, the scientific interpretative material was designed to involve the passenger in the research on a first hand basis, and would seek to engage the passenger with a much higher level of current and cutting edge information about most relevant issues (Dunstan, 2009). Lectures about marine science and conservation would be more like

open discussion and presentations, and often some of the world's marine experts mixed informally with the passengers (Dunstan, 2009).

In February 2009, the Undersea Explorer ceased operations (Undersea, 2009). This coincided with the 2008 and 2009 Global Financial Crisis and this crisis would have affected consumer confidence which in turn would have affected consumer demand for the Undersea Explorer. There is evidence that the Undersea Explorer was operating outside its budget and this indicates that without ongoing benefactor support, the Undersea Explorer may not have been able to achieve what it did. For example, "Expense overtook the budget, the Grollo Foundation (the benefactors) maintained their support" (Dunstan, 2009, p. 165). Nonetheless, Dunstan (2009) advises that the success of the Undersea Explorer should not be purely assessed in terms of cash flow but rather, Undersea Explorer's innovative contribution to marine science and conservation.

Appendix 3. A brief description of phenomenography

Research study two of this thesis uses a phenomenographic research approach to study the variation in key stakeholder views about the supply of MRT in Australia. This appendix outlines the key principles of phenomenography and describes how it was specifically applied to the study and comparison of key MRT stakeholder views in Australia.

Phenomenography aims to map the hidden world of thoughts about various aspects of the world (Marton, 2000 p. 103). A key assumption of phenomenography is that people experience the world differently (Dunkin, 2000). Their ways of experiencing differ because individuals vary in their comprehension and perception of phenomena and situations (Dunkin, 2000). At any one time, each person will discern, different elements of the phenomenon, the situation, and some relationships between the elements of the situation (Dunkin, 2000). By studying stakeholder differences and relationships within a situation, phenomenography can identify a range of stakeholder views and issues that can lead to possible change within a social setting (Dunkin, 2000).

Phenomenography is a methodological specialisation that usually uses semi-structured interviews as the main method of data collection (Bowden, 2000). The questions which focus the interview are usually open-ended so as to allow the interviewees to decide on those aspects of the question which appear most relevant to them (Bowden, 2000). From the researcher's point of view, interview questions should be designed to be diagnostic, and reveal the different ways of understanding the phenomenon within that context (Bowden, 2000). Phenomenographic

interviews usually begin with interviewees being asked to respond to a planned question or a given situation (Bowden, 2000). For this thesis, the views of stakeholder about the present status and possible future of MRT were of interest. Hence, interviewees were asked to answer questions within the following context *'if and/or why MRT is underdeveloped in Australia and how MRT could be further developed across Australia?'*

During the analysis phase, phenomenography seeks to refine data through iteration to conform to a set of categories which are internally consistent, and intelligible and satisfactory for experts who intend to use the results for some further end (Walsh, 2000). The intended outcome of the phenomenographic research is a set of categories that contain a variety of conceptions and thus indicate that differences in the ways a phenomenon is understood; furthermore, comparison within the categories illuminates the nature of those differences (Walsh, 2000). When analysing interview data, the researcher's understanding of the phenomenon under study clearly influences the construction of categories (Walsh, 2000). The overall process to analyse interview transcripts is described this way

> *The first phase of the analysis is a kind of selection procedure based on criteria of relevance. Utterances found to be of interest for the question being investigated . . . are selected and marked. The meaning of an utterance occasionally lies in the utterance itself, but in general the interpretation must be made in relation to the context from which the utterance was taken. . . . The phenomenon in question is narrowed down to and interpreted in terms of selected quotes from all the interviews. Next, the quotes themselves are interpreted and classified in terms of the contexts from which they are taken. The selected quotes make up the data pool which forms the basis for the next and crucial step in the analysis. The researcher's attention is now shifted from the individual*

subjects (i.e. from the interviews from which the quotes were abstracted) to the meaning embedded in the quotes themselves. The boundaries separating individuals are abandoned and interest focused on the 'pool of meanings' discovered in the data. Thus each quote has two contexts in relation to which it has been interpreted: first the interview from which it was taken and second the 'pool of meanings' to which it belongs. The interpretation is an interactive procedure which reverberates between these two contexts. A step-by-step differentiation is made within the pool of meanings. As a result of the interpretative work, utterances are brought together into categories on the basis of their similarities. Categories are differentiated from one another in terms of their differences. In concrete terms, the process looks like this: quotes are sorted into piles, borderline cases are examined, and eventually criterion attributes for each group are made explicit. In this way, the group of quotes are arranged and re-arranged, are narrowed into categories and finally are defined in terms of core meanings, on the one hand, and borderline cases on the other. Each category is illustrated by quotes from the data

(Marton 1986, p. 42–3)

.

There are acknowledged limitations and risk with phenomenographic analysis. For example, the researcher may 1) add or adjust categories that are not supported by the data, 2) impose a logical framework on the data where this is not justified, and 3) analyse the data from the researcher's or content expert's framework, so that the interpretation of the data and/or phenomenon is skewed towards an accepted or preferred view of the researcher (Walsh, 2000). To minimise the problem it is necessary to have researchers who are alert to the problem of potential researcher bias (Walsh, 2000).

Bowden, J. A. (2000). Chapter 1, Research Method - The nature of phenomenographic research. In J. A. Bowden & E. Walsh (Eds.), *Phenomenography* (pp. 1-24). Melboune: RMIT University Press.

Dunkin, R. (2000). Chapter 9, Using phenomenography to study organisational change. In J. A. Bowden & E. Walsh (Eds.), *Phenomenography* (pp. 137-152). Melboune: RMIT University Press.

Marton, F. (2000). Chapter 1, The structure of awareness. In J. A. Bowden & E. Walsh (Eds.), *Phenomenography* (pp. 102-116). Melboune: RMIT University Press.

Walsh, E. (2000). Chapter 2, Phenomenographic analysis of interview transcripts. In J. A. Bowden & E. Walsh (Eds.), *Phenomenography* (pp. 25-39). Melboune: RMIT University Press.

Appendix 4. Twelve MRT product brochures used in Study two

Table 4-1 Summary of twelve MRT product brochures (Source: 85 MRT product web sites)

ID	Name of MRT product	Notable feature	Region
1	Work with marine turtles and indigenous rangers in remote northern Australia	Coastal based	Tropical
2	Volunteer and train at an Australian whale and dolphin research institute	Cetacean attraction	Temperate
3	Volunteer at a penguin rescue centre on the southern Australian coastline	Penguins and volunteering	Temperate
4	Research, education and adventure across the Whitsundays of tropical Queensland	Education and adventure	Tropical
5	Survey coral reefs and help assess the impacts of climate change on coral reefs	Reef attraction	Tropical
6	Biodiversity and habitat mapping in north Western Australia	Rugged trip	Tropical
7	A bottlenose dolphin education holiday on the southern Australian coastline	Pub	Temperate
8	Day trip to the reef with some marine research as part of the attraction	Day trip	Tropical
9	Sail, volunteer and track blue whales in the Southern Ocean	Sailing vessel	Temperate
10	A continuous sailing expedition to explore and help research the oceans of Australia	Continuous expedition	Both tropical and temperate
11	A coral spawning research and adventure trip on a tropical coral reef	Liveaboard vessel	Tropical
12	A submersible research expedition to Australia's Bon Hommey undersea ridge	A submersible	Temperate

1. Marine turtles – Work with marine turtles and indigenous rangers in remote northern Australia

Cost 3 – 5 days for A$1, 275- A$2, 125 or approx. A$425 per day

Introduction

Travel to remote northern Australia and work with indigenous rangers, residents and researchers to monitor and protect turtles, and other marine life from ghost nets and feral pigs. Accommodation is new 3m x 3m insect proof canvas tents located on raised timber platforms. Each tent has two fold-out single beds. Bed linen and a bath towel are supplied. Breakfast - cereal, milk, toast and juice, Lunch - cold meat and salads, salad sandwiches, fish, Dinner - good healthy meals with an emphasis on carbohydrates to fuel the evening's activities, Snacks - dried fruit, cookies/biscuits, self-saucing pudding, fruit cake, tinned fruit, bread, fresh fruit. There are composting toilets, showers, screened dining area, bush kitchen, BBQ, reference library, DVD player & monitor for viewing research DVDs.

Marine research

This research programs aims to survey and quantify the size, structure of and trends of nesting populations, quantify nesting turtle fecundity including clutch size, clutches per season, egg morphometrics, and protect nesting sites from feral pig predation. The research project also evaluates and installs feral pig exclusion devices, identify and record ghost nets on beach, and to develop a sustainable management strategy. Every day, you will receive full training to assist rangers with identifying nesting turtles, installing feral pig exclusion devices, and collecting and compiling data. You will assist with counting, tagging and measuring nesting turtles, counting and measuring turtle eggs, installing feral pig exclusion devices, removing ghost nets, and the operation of 4 wheel drive vehicles. Conservation and research activities will involve patrols of up to 24 kilometres of beach

Other activity

There will be close interaction Indigenous Australian Rangers and turtle researchers. There will be opportunity for some of the best fishing in Australia. There is a regular opportunity to discuss turtle research and conservation with staff at the camp site. There is no swimming as saltwater crocodiles frequent the beaches and we often see them during our activities. Our campsite has crocodile proof fencing around the boundary.

Much of the information for this page was acquired or drawn from http://www.capeyorkturtlerescue.com

2. Dolphin and whale institute – Volunteer and train at an Australian whale and dolphin research institute


Cost 6 days for A$1, 245 for six days or approx. A$207 per day

Introduction

You will stay and participate in research at a renowned whale and dolphin (i.e. cetaceans) research field institute on the Eastern Australian Coast. The project needs enthusiastic people willing to help to collect data and co-operate in the many aspects of the field work. The contributions of the participants represent the main funding source for the research, which contributes to the conservation of cetaceans and their environment. Accommodation is functional and tidy. There are cooking facilities in the field station kitchen and there are regular opportunities for participants to enjoy the facilities of the nearby town.


Marine research

Research methods used by the Institute included the use of remote sensing and telemetry data, relative abundance and line-transect population studies, the combined use of laser range-finding binoculars and GPS to passively track and record the horizontal movements of whales, bio-acoustic research, photo-identification and behaviour. You will be involved in activities conducted in the field including cetacean sightings, interpreting cetacean behaviour, and data collection at sea using sonar, hydrophones, voice recorders and video. While on the research vessel and living side by side with researchers, there is a regular opportunity to discuss whale and dolphin research and conservation project staff and other volunteers. There will also be informal lectures held by marine researchers.


Training activity

On the job training will include photographic and photo-identification techniques, methods for conducting visual and acoustic surveys, cetacean behaviour, population studies, using binoculars, GPS acoustic array, navigation and sailing techniques, nautical charts, planning and management of a field research projects, and useful information and contacts for beginning a career as a cetacean naturalist. During training, you will gain a comprehensive view on the problems faced by cetacean researchers. By working side by side with the researchers, participants also acquire essential background to initiate their own field studies. You will also learn how to plan and develop their own research project, how to analyse the data, spread the results, and turn these into improved management programs for cetaceans.

Much of the information for this page was acquired or drawn from http://www.tethys.org/index_e.htm

3. Penguin rescue – Volunteer at a penguin rescue centre on the southern Australian coastline

Cost 6 weeks for A$2, 500 for six weeks or approx. A$60 per day

Introduction

Live nearby and volunteer at a penguin rescue centre has cared for over 83,000 seabirds during its 38 years. As this is not a group expedition it suits more independent or experienced travellers. You will typically volunteer at the penguin rescue centre for 5 days a week leaving a couple of days free each week to check out the beach or explore all the neighbouring towns. The accommodation at the hostel is on a self catering basis. You will be provided with a food allowance to purchase food at the markets for cooking at your accommodation. The hostel is 20-25 minutes walk one way to the Penguin rescue centre and 15 minutes walk to the beach.

Marine research

The penguin rescue centre was primarily set up to rehabilitate penguins during major oil spills, but now has a mandate from the government to oversee the rehabilitation of a number of seabirds. You will be working with dedicated penguin rescue centre staff and scientists. Your marine research activity will assist with the rescue, rehabilitation, long term monitoring and conservation of seabird populations including penguins, pelicans and even the odd albatross. You will learn how to catch, handle, clean, feed, tube, and administer medication to a variety of seabirds, as well as assist in the Intensive Care Unit.

Other activity

On your days off, you can have a mountain biking adventure through the nearby hills. There is also a mountain biking wine tour through vineyards where wine tasting is included. Furthermore, you can sail to adjacent islands with penguin colonies and release rescued penguins.

Much of the information for this page was acquired or drawn from http://www.greenforce.org/destinations/south_africa/penguin_rescue/

4. Research, education and adventure across the Whitsundays of Tropical Queensland

Cost Minimum of 1 month from A$6,000 or approx. A$200 per day

Introduction

Are you fascinated with the tropical reefs and marine creatures or interested in a career in the marine sciences? Tropical Encounter Voyages provide a unique opportunity to gain marine research experience and academic credit in marine biology while adventuring throughout the amazing Whitsundays Islands of Australia. You will live aboard sailing catamarans and sail the blue passages between the islands. You will be the crew, learning to raise and lower the sails, navigate, be the helmsman, and drop the anchor all in time for volleyball, wakeboarding, and kayaking.

Marine research

These voyages focus on coral reef and tropical island research and conservation throughout the Whitsunday Islands. Working with the marine parks and international monitoring organizations, we conduct surveys on wild dolphin populations in Whitsunday Passage, coral health assessments in the Great Barrier Marine Park, ReefCheck surveys in tranquil Cid Harbour, and assist with sea turtle population rehabilitation efforts in Whitehaven Beach.

Education

Topical Encounter voyages offer a range of coral reef biology and ecology accredited education programs. Discover the deeply interconnected ways the coral, invertebrates, and fishes work together in amazing efficiency. Aboard your vessel are microscopes and lab equipment and a staff of enthusiastic marine biologists ready to teach you how to collect scientifically sound ecological data as you explore your interest in a science career or just enjoy learning about the unique aspects of the reefs creatures. You will earn to identify the top 25 corals and their common ailments as well as over 100 reef fishes in preparation for conducting biodiversity surveys of the reefs for the Reef Check initiative. During this process you will learn about coral aggression, learn to treat coral Black Band disease, and discover the different coral growth forms

Adventure

You will sail throughout the Whitsundays, dive the coral walls, pinnacles, and reefs, explore shipwrecks hike through the rainforest national parks and experience refreshing waterfalls. With lots of SCUBA diving, you can earn multiple PADI SCUBA certifications including Advanced, Night Diver, Underwater Photography and Research Diver certification.

Much of the information for this page was acquired or drawn from http://www.odysseyexpeditions.com/6-seanorthsouthcombo.htm

5. Reef survey – Survey coral reefs and help assess the impacts of climate change on coral reefs

Cost 12 days for A$2, 555 for 12 days or approx. A$212 per day

Introduction

As part of a global effort to assess the impacts of climate change on coral reefs and assist with the formulation of effective conservation strategies, you will be trained in diving and coral reef survey techniques and then assist in an international reef survey programme. You don't need to be a scientist, but you do need to be a qualified diver (minimum Open Water or equivalent). You will live on Bay Island near the research station.

Marine research

The aim of this research program is to coordinate and undertake regular survey work on a coral reef and surrounding seas, assess the impacts of climate change on coral reefs, and prepare effective conservation strategies for local communities and Government. On a typical survey day, you will work closely with marine researchers you should spend roughly two to four hours diving and two hours on data processing and analysis. Over three days, you will be taught how to spot and identify animals, and record data.

Each dive team will then lay a transect (a straight line through the reef) along which survey pairs will move slowly and record items such as substrate (i.e. hard and soft coral, sponges, silt or sand), fish and invertebrates, coral bleaching and disease. You will have access to a well-equipped scientific station that is accessible only for research personnel. There is a fully equipped dive centre with compressors and equipment for hire, wet and dry labs, a computer and lecture room. There is a regular opportunity to discuss the research, results and conservation strategies with expedition crew and staff at the research station.

Other activity

Two to four of you will share a comfortable and spacious wooden bungalow cabin by the beach with a lounge, toilets and showers. All meals are provided by an expedition cook. Vegetarians and special diets can be catered for and filtered drinking water is constantly available. The expedition to Bay Island will involve 12 team members, 2 marine research / divemasters and 1 expedition leader / divemaster.

Much of the information for this page was acquired or drawn from http://www.biosphere-expeditions.org/2-week-expeditions/scuba-divingconservation-volunteer-holidays-working-on-coral-reefs-in-honduras-cari.html

6. Tropical coastal research– Biodiversity and habitat mapping in north Western Australia

Cost 2 to 20 weeks for A$2, 000 - $A7260 or approx. A$140 per day. Operates only from May to October.

Introduction

On this venture, you will have the opportunity to be involved in biodiversity surveying, habitat mapping and land management at a remote coastal region of Western Australia. You will have an intimate experience of Western Australia's majestic and unique coastline, estuaries and mangrove habitats. Accommodation is basic but comfortable. You'll live on a remote coastal camp where you will most likely be sleeping in a hammock underneath a tarpaulin cover. You will help run camp from day-to-day, taking turns to stay at base camp for a day to help with cooking, firewood collection, water purification, and other essential things. You will access to satellite and Internet communications to contact the outside world.

Marine research

Your research activity will involve biodiversity inventories, habitat mapping, and transect and quadrant surveys, of mangroves and coastal shorelines. Species surveyed will include crocodiles, other reptiles, birds, rays, sharks and turtles. You will have the opportunity to observe marine researchers catch, satellite tag and release saltwater crocodiles. You will also contribute to recording the distribution of feral pigs, cane toads, weeds and illegal netting. All the surveys and research is designed to benefit marine management programs for the Western Australian Government. You will have the opportunity to use small boats, 4 wheel drive vehicles, radio equipment, GPS, binoculars, crocodile cages, radio trackers, satellite tags, computers and geographic information systems.

Other activity

Participants can obtain an internationally recognised Advanced Diploma (10 weeks or longer) or Advanced Certificate (4 weeks or longer) in Marine and Coastal Habitat Conservation. Participants can also train in Emergency First Response at discounted costs. Once a week there will be the opportunity to go on hunting and bush tucker gathering with the Traditional Aboriginal Owners of the region. Every two weeks, participants will have the opportunity to visit Wangalee Falls for two days of rejuvenation and closer interaction with the Traditional Aboriginal Owners.

Much of the information for this page was acquired or drawn from http://www.gvi.co.uk/pages/projectDetail.asp?page=datesc&expedition=57

7. Dolphin holiday – A bottlenose dolphin education holiday on the southern Australian coastline

Cost 4 days for A$1, 400 for four days or approx. A$280 per day

Introduction

This educational holiday involves participating in specially chartered research boat trips, visiting a historic lighthouse research station, and five night's full board at a refurbished old brewery. All meals are included and rooms have shared facilities. Your marine research activity will assist with long term monitoring and the conservation of the bottlenose dolphin population and habitat.

Marine research

The research program uses land and marine based surveys, photo identification, acoustic analysis to assist with long term monitoring and the conservation of the bottlenose dolphin population and habitat. By working closely alongside a dedicated research team, you can learn the skills and techniques used by marine mammal scientists to study the life histories of bottlenose dolphin. There will be professional workshops that outline up-to-date dolphin research techniques including photo-identification, acoustic analysis and land-based surveys. There are regular opportunity to discuss bottlenose dolphin research and conservation with the research team.

Other activity

There will be a visit to the local marine mammal centre and a chance to meet the resident field officer to discuss dolphin and wildlife photography. There may be an opportunity to see Humpback and Orca whales while on dolphin survey. During evenings there will be the opportunity to visit the old township.

Much of the information for this page was acquired or drawn from http://www2.wdcs.org/outoftheblue/dolphinresearch.php

8. Day trip to the reef with some marine research as part of the attraction

Cost A$250 for 1 day

Introduction

This day trip to the Hastings atoll and Lawrence reef aboard the ***RV Coral Sea*** is an opportunity to swim, snorkel, scuba, and explore at one of the beautiful hidden secrets along the Great Barrier Reef. This trip includes a three course lunch, refreshments, drinks, snorkel gear and instruction, marine research education, optional marine researcher training, and scuba diving. The RV Coral Sea is a comfortable vessel with video entertainment, bathrooms, fresh water showers and shade, and carries a maximum of 20 people.

Hastings Atoll is a pristine sand cay (coral atoll), 23 nautical miles (approximately 38 kms) from the mainland, with soft, and sparkling white sand that you can walk on with bare feet. Lawrence reef is renowned for crystal clear water with an average visibility in excess of 100 feet. You can expect to see many corals, reef fish, turtles, sharks, schooling barracuda, trevally, and other wildlife. In the winter months you may have the opportunity to see Dwarf Minke whales and Humpback Whales migrating near Hastings Atoll.

Marine research

This marine wildlife experience is increased by your opportunity to watch our trained marine researchers in action. Their research includes undertaking atoll and coral reef transects, and reporting marine wildlife such Dwarf Minke whales, Olive Ridley turtles, coral trout, jelly fish, giant clams, birdlife, crown of thorns starfish, coral bleaching, coral diseases, algal blooms and water quality. You will have the opportunity to learn from our enthusiastic team about the official Government marine research program that sponsors our research program. On board entertainment includes coral reef research videos and computer multi-media that presents the past, present and future research endeavours of the ***RV Coral Sea***.

Training activity

The ***RV Coral Sea*** provides the unique opportunity for you to participate in our marine research programs. This involves taking videos or photographs of the marine wildlife and coral, and then working with our marine researchers to interpret the species and location of Lawrence Reef's marine wildlife and coral. This interpretation will include the review of videos or photographs and use of our automated wildlife and coral recognition software to assist with species identification and mapping. You will receive 30 minutes induction into using marine research cameras, videos, binoculars and recording sheets. Participants will have the opportunity to discuss the professional world of marine research with our crew.

9. Sail, volunteer and track blue whales in the Southern Ocean

Cost Minimum of 2 days at A$200 per day

Introduction

Your participation can help to ensure the continued welfare of a unique population of blue whales. Scientists will track blue whales via satellite then mount a research voyage to study them first hand in their winter environment believed to be in the Southern Ocean. You have a unique opportunity to participate as volunteers and learn directly from the experts by observing and helping out with the many research tasks. This project may involve the making of a documentary for television.

Marine research

The research involves field trips of between 1 and 4 days each, moving out from Victor Harbour to areas where blue whales are feeding. During each research voyage, the ***RV Albatross*** is either 'heaved to' at night, drifting near the research area, or is anchored in sheltered bays nearby. At first light, we are off to find the whales. Sometimes they will be in the same place as 'yesterday' and other times the circus will have moved on as the krill is eaten or dispersed. At times we will be doing surveys along chosen track lines, monitoring the properties of the ocean as we went, surveying underwater krill with sonar, and searching for blue whales. At other times, we will stop in areas where whales were feeding and gather as much information as we can, while we can.

Your participation

We may sail along for hours, patiently looking for blows of whales, krill swarms, changes in water colour or temperature, or other telltale signs of the ecosystem in action. When we find whales, encounters are often frantic affairs, with a flood of data coming in and being recorded on film, video, voice recorder, hydrophone, sonar, and in nets and other sampling devices. Then, we may move on in search of another 'hot spot', before repeating it all again. Or we may search in vain, but even when we are not finding whales we are learning something about the upwelling environment and the other animals that share it. Finally, when the day's work is over, there is the often tedious task of sorting and cataloguing films, tapes and biological samples, of transcribing voice recordings of the day's events, and then debriefing and discussing what we have seen and learnt. Then we can relax and have a gin and tonic!

Other information

We know that many people want to be involved in the research and we are glad to use your help. Whale research is not all glamour and excitement (in fact it is not at all glamorous, though it can be very exciting). It often involves discomfort, frustration, weariness, and boredom. We are working with a very powerful and capricious element, the Southern Ocean; and we are working with whales, animals which seem to have an infinite talent for being unpredictable and making life difficult when you want it to be easy for a while. But the rewards are huge: aboard ***RV Albatross***, you will be out in the blue whales' world, getting unique insights into their lives, and seeing sights that are rarely seen anywhere.

Much of the information for this page was acquired or drawn from http://www.svpelican.com.au/pages/research.html#PORTLANDWHALE

10. A continous sailing expedition to explore and help research the oceans of Australia

Cost Minimum of 2 weeks from A$3, 800 or approx. A$270 per day

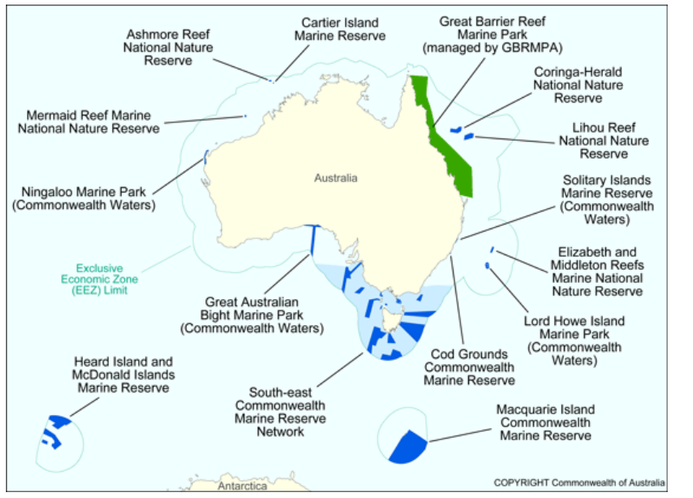
Introduction

You can join the 32 metre sailing ketch ***Mer de Passion*** and set out to discover and research some of the most beautiful important and remote marine areas about Australia. During its circumnavigation, it will survey significant corals reefs, investigate rare habitats and marine parks, monitor and track the migration paths of tuna stocks, marlin, whale sharks, humpback whales, turtles and manta rays, and report on the health of Australia's marine habitats and biodiversity. ***Mer de Passion*** serves as a logistical platform to host research, communications and sailing projects in these areas of difficult access.

The organisers of the ***Mer de Passion*** Foundation wish to share this discovery and research experience with those who wish to engage in marine research projects. A live-aboard trip on a sailing boat is a great experience in itself. But a stay on board ***Mer de Passion*** can offer a lot more, namely contributing to the conservation of the marine environment and learning about marine biology from leading scientists. Every guest on board is expected to contribute to the ongoing projects through their respective talents. Contributions can take on different forms: photography, video, assisting the crew or the scientists. Any volunteer training in marine research techniques will be provided by on board scientists.

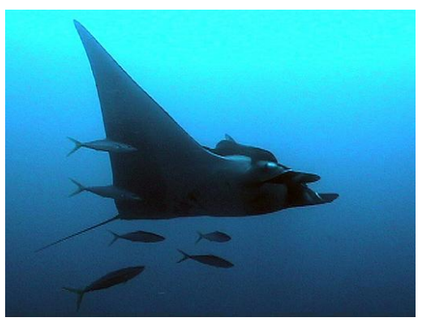
Marine research

The mission of the ***Mer de Passion*** Foundation is to contribute to a better scientific understanding of the marine environment, raise public awareness on the importance to protect it and enable individuals to experience life at sea by participating in its projects. Given that many existing scientific projects are confronted by a lack of infrastructure and have difficulty accessing remote regions, the ***Mer de Passion*** is a unique scientific platform that supports the marine research goals of partnering universities and institutions. The boat can host research teams around the World for various durations depending upon each projects need. The unusual route taken by the ship and its experienced crew allow the ***Mer de Passion*** Foundation to improve on actual research by putting the ***Mer de Passion*** at the disposal of science.



Other information

Mer de Passion's multi-disciplinary approach and Australian outreach is made possible because people from different disciplines and with complementary skills (sailors, scientists, journalists, filmmakers, photographers and eco-volunteers) meet on board the ship. A permanent crew of 4 manages the boat and coordinates the logistics of the different projects. Between 12 and 20 people are on board at once.



Much of the information for this page was acquired or drawn from http://www.antinea-foundation.org

11. Coral Spawning – A coral spawning research and adventure trip on a tropical coral reef

Cost 6 Days for A$2, 600 for six days or approx. A$433 per day

Introduction

This venture is a liveaboard scuba diving operation, which combines adventure diving with coral spawning research and education. The liveaboard vessel ***MV Great Kenya*** is a twenty five metre steel motor vessel that takes twenty passengers, two researchers and five crew. Accommodation includes air-conditioned 2 berth cabins, 5 x Queen cabins, 5 x twin cabins, and 5 x toilets and showers. All meals are prepared by the onboard chef with special dietary requirements catered for. There will be light refreshments provided after every dive.

Marine research

Occurring near the end of the year, coral spawning (i.e. the annual release and cross fertilisation of coral eggs and sperm) brings some amazing aggregations of reef animals together. Observations of coral spawning can lead to both scientific knowledge and great diving opportunities. Marine researchers' record important observations at all dive sites on the itinerary. This includes the presence of key reef animals, spawning aggregations, coral bleaching events, manta ray feeding, pelagic action weather, sea temperature, currents and tidal observations. Often key reef animals are important due to their threatened/endangered status, diver interest, or as indicators of reef impacts. Research and education facilities include a hydraulic dive platform, video and TV, microscope linked to TV, digital underwater video and camera, lecture room and a marine library with computer.

Other activity

A marine scientist is employed as a crew member and research activities fit around the diving program, adding an atmosphere of discovery to all expeditions. If you choose, you can assist marine researchers through the identification, recording and photographing of coral spawning events. Over a few house of formal training spread over six days, there will be a series of presentations to introduce divers to corals and spawning and in particular what to look for and how to record observations. Briefings will also be given on photographic techniques for the capture of scientifically reliable coral spawning images. There will be daily interpretive presentations from marine researchers, and additional opportunities to discuss marine research topics with crew and marine researchers. There is lots of night diving, and enjoying the action in the shallows of the reef as many of the animals move there to spawn. As well as possible coral spawning you may see are aggregations of thousands of surgeonfish, trigger fish, parrotfish, damsels, wrasse and other species coming together in the reef shallows to spawn. Scuba dive training is also available.

Much of the information for this page was acquired or drawn from http://www.undersea.com.au/information_coral_spawn_expedition.htm

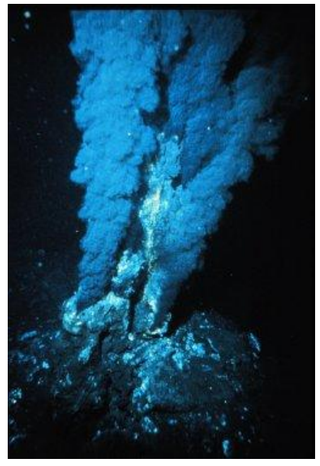
12. A submersible research expedition to Australia's Bon Hommey undersea ridge

Cost Minimum 1 week on the ***RV Nerthus*** from A$8, 000 per week or A$1,142 per day.
Submersible travel to and from the Bon Hommey Ridge from an extra A$19, 000 per trip

Introduction

The role of Deep Sea Expeditions is to work with and provide scientists, ocean explorers, film makers, organisations, governments, NGOs and individuals with access to a unique manned deep submergence and science capability. Our vessel, the ***RV Nerthus*** combines shipboard comfort with the capabilities of a modern oceanographic research ship and there is simply no other vessel in the world like her. The ***RV Nerthus*** services two submersibles, the ***Deep Explorer*** and ***Ocean Rover***, and these submersibles provide scientists and adventurers with a unique opportunity to experience and participate in deep ocean exploration and research.

In May 2008, the next research expedition is to the Bon Hommey undersea ridge situated between Australia and New Zealand at 4500 m depth. We welcome private individuals, families and other groups who may wish to enjoy this research cruise and also descend to the depths of the oceans in our submersibles. ***The RV Nerthus*** is a very comfortable vessel with luxury yacht style passenger accommodation for up to 13 paying passengers. The well equipped galley enables the ship's chefs to prepare four star cuisines. You will have the opportunity to regularly interact with many of the world's best deep sea scientists and submariners.



Marine research

Only a small percentage of the world's oceans have been explored. Deep Sea Ventures are trying to make this percentage bigger whilst discovering new species and promoting science. Deep Sea Ventures has three simple founding principles 1) To offer unique expeditions for the adventurer 2) To educate people about the world's deep oceans and 3) To help support scientific research. The ***RV Nerthus*** and its submersibles provide a privately funded and advanced marine research platform for marine scientists to explore the Australia's deepest oceans.

Other information

Deep Sea Ventures is always planning an array of exciting expeditions through all levels of the water column, on features both natural and man-made. Underlying this expansion of itineraries is consistent attention to the founding principles: adventure, education and science. All visits to the seafloor are conducted with negligible or no impact on our oceans. All sites whether they be manmade or natural history are treated with the greatest of respect.

Much of the information for this page was acquired or drawn from http://www.deepoceanexpeditions.com and http://www.deepoceanquest.com/

Appendix 5. Factor analysis – Reasons for the selection of principal components analysis and varimax rotation methods

There are two main approaches in factor analysis namely principal component analysis and confirmatory factor analysis (Cramer, 2003; Hair et al., 1998). A principal component analysis considers the total variance of all criteria across a sample, and derives hitherto not predetermined factors that contain smaller parts of the overall total variance (Cramer, 2003). That is, a principal component analysis is an inductive approach to discover naturally occurring factors that describe the associations between and across different variables (Cramer, 2003). A confirmatory factor analysis provides a measure about the extent to which a predetermined or hypothesised structure can satisfactory accounted by the association of variables (Cramer, 2003). Research studies one and three of this thesis have a focus on the exploration and discovery of natural associations between and across different MRT related criteria. Therefore, the factor analysis method used in these research studies is a principal component analysis.

An important step when interpreting the results of a factor analysis is factor rotation method (Hair et al., 1998). A factor rotation acts to redistribute the variance across all variables to achieve a simpler and theoretically more meaningful factor pattern (Hair et al., 1998). This study considered two rotation methods considered namely 1) an orthogonal varimax rotation and 2) a non-orthogonal oblique rotation. A varimax rotation is the most commonly used form of orthogonal rotation and seeks to 1) maximise the independence between the resulting factors; 2) maximise the variance explained by those factors; 3) and minimise the correlation between factors (Cramer, 2003; Hair et al., 1998). In contrast, an oblique rotation approach 1) does not

seek to maximise the independence between the resulting factors; 2) seeks a more natural clustering of variables; and 3) and seeks to provide information about how the resulting factors are actually correlated with each other (Hair et al., 1998).

Hair et al. (2008) reports that a varimax and oblique rotation can be often result in similar outcomes. In the event that this occurs both Hair et al. (2008) and Cramer (2003) recommend using a varimax rotation because it is far easier to interpret the results of a factor analysis into clear and usable factors. After a trial of both varimax and oblique rotations in research studies one and three, this is what occurred. Consequently, a varimax rotation instead of an oblique rotation was the selected rotation method throughout those studies.

Appendix 6: Guidelines for designing system flow charts

As features and processed become evident in research stage one and three of this study, a system flow chart approach is used to display some of those more notable features and processes. System flow charts are used to develop a shared understanding of complex processes (Salba, 2010). This is often in contrast to the writing of a myriad of reports and reducing complex systems to many parts and dealing with each part discretely (Salba, 2010). An example of system flow chart is Moscardo et al.'s (2003) tourism system. In this study, system flow charts are used to represent key features of MRT, key associations and/or processes between them, and the likely direction of control (i.e. likely cause and effect) between key features (adapted from Capron, 1986). Guidelines that this study used to develop system flow charts are presented in Appendix 5.

When designing a system flow chart, identified MRT features and processes are only be included if, based on the available empirical data and/or literature, they appear to play a major role in describing; the occurrence of and/or underlying variation across different marine research tourism products and market segments. This inclusion process is guided by a number of system design or statistical principles that are shown in Table 6-. Significantly, principle number 5 of Table 6- shows that system that flow chart design can also have an interpretative research component undertaken by the researcher. For example, the researcher may highlight certain features and processes on a system flow chart so as to suit the chart's intended purpose. Additionally, for complex systems, it is likely that too much information is available and a flow chart may become too cluttered and unclear if all available information is included. In both cases, researchers use their judgment to include or exclude the most significant information.

Table 6-1: System design or statistical principles to guide the design of system flow charts

Principle	Description
1	If after descriptive or numeric analysis, the feature or process is evidently a key component of MRT products and market segments.
2	A grouping of criteria that has been derived through a factor analysis is likely to be a key feature.
3	The % MDBV between the maximum and minimum values of a criterion across sample is notably higher than the error margin associated with that criterion. For rating scale data between 1 and 5, this error margin is nominally said to be +/-0.25.
4	A Pearson (r) correlation coefficient between any two criteria is greater than 0.4 or less than -0.4. This represents a possibly significant relation between those two criteria.
5	Human judgment has a central role of making inclusion and design decisions (Capron, 1986).

Appendix 7. Better known tourism conceptual models that are applicable to this thesis

1. Marine tourism – A spectrum of marine recreation opportunities (Orams 1999)

While acknowledging that there are difficulties in applying tourism schemas absolutely, Orams (1999) provides a framework, namely the 'Spectrum of Marine Recreation Opportunities' (Table 7-) to classify marine tourism products according to distance from shore, the characteristics of the environment and the experiences sought by marine tourists (Orams, 1999).

Table 7-1: Spectrum of Marine Recreation Opportunities (Source: Orams, 1999)

Associated rating value	**1**	**2**	**3**	**4**	**5**
Class	**Class I**	**Class II**	**Class III**	**Class IV**	**Class IV**
Characteristics	**Easily accessible**	**Accessible**	**Less accessible**	**Semi-remote**	**Remote**
Experience	Much social interaction with others	Often contact with others	Some contact with others	Peace and quiet, close to nature	Solitude
	High degree of services and support			Safety-rescue available	Tranquillity
	Usually crowded			Occasional contact with others	Closeness to nature
					Self-sufficiency
Environment	Many human influences and structures	Human structure/ influences visible and close by	few human structures close by - some visible	Evidence of some human activity, e.g. Lights on shore, mooring buoys	Isolated
	Lower quality natural environment				High-quality
					Few human structures/influences
Locations	Close to or in urban areas	Intertidal ----> 100 metres offshore	100 metres ----> 1km offshore	Isolated coasts, 1-50kms offshore	Uninhabited coastal areas > 50 kms offshore
	Beaches and intertidal area				
Examples of activities	Sunbathing	Swimming	Usually boat based	Some SCUBA diving	Offshore sailing
	People watching	Snorkeling	Sailing	Submarining	Live-aboard offshore fishing
	Swimming	Fishing	Fishing	Powerboat (offshore equipped)	Remote coast sea kayaking
	Playing games	Jet-skiing	Snorkel/SCUBA diving	Sailing - larger sailboats	
	Eating	Non-powered boating			
	Skimboarding	Surfing			
	Sightseeing	Para-sailing			
		Windsurfing			
		←			
			Intensity of use		
		←			
			Human impact		

2. Volunteer tourism - A conceptual framework for volunteer tourists (Callanan & Thomas 2005)

Drawing an Acott, La Trobe and Howard's (1998) deep to shallow ecotourism conceptual framework, Callanan and Thomas (2005) developed a conceptual framework (Table 7-2) to describe volunteer tourists. Callanan and Thomas (2008, p. 196) state that 'it is not assumed that all volunteer tourists can be neatly classified within the simple classification below; the aim of this framework is to provide a general conceptualisation of the range of volunteer tourists around.

Table 7-2: A conceptual framework for volunteer tourists (Source: Callanan & Thomas, 2005)

	Shallow volunteer tourism	**intermediate volunteer tourism**	**Deep volunteer tourism**
Importance of the destination	The destination is important in decision making	Focuses on both the project and the destination	More attention is given to the project than the destination
Duration of participation	Short-term, typically less than 4 weeks in duration	Medium-term, typically less than 6 months in duration	Medium to long term, 6 months or intensive shorter term projects
Focus of experience: altruistic v. self interest	Self-interest motive are more important than altruistic ones	Self-interest motives are of similar importance to altruistic ones	Altruistic motives are more important than self-interest ones
Skills/Qualifications of participants	Offer minimal skills or qualifications	May offer generic skills	May offer some technical/professional skills and experience and/or time
Active/Passive participation	Tends to be more passive in nature	Mixture of passive and active participation	Tends to be more active in nature
Level of contribution to locals	Minimal direct contribution to local area	Moderate direct contribution to local area	High level of direct contribution to the local area

3. Adventure tourism – Tourism activity spectrum (Swarbrooke et al., 2003, adapted from Fennel and Eagles, 1990);

Based on Fennel and Eagles (1990), Swarbrooke et al. (2003) developed a tourism activity spectrum (Table 7-3) to assist the evaluation of the risk, motivations and benefits that associated with adventure activity.

Table 7-3: Tourism activity spectrum (Source: Swarbrooke et al., 2003)

Increasing certainty/safety and known results →				
Advenure travel (e.g. Mountain climbing)	↔	**Ecotourism (e.g. Birdwatching)**	↔	**Tour travel (e.g. Package holiday)**
Lack of certainty / safety in adventure experience		Covers adventure and tour travel		Low level of personal preparation
Motivated by self learning and personal fulfilment		Combines educational pursuits and physical activities		High degree of safety
Personal responsibility and mental / physica preparation are important		Personal responsibility and mental / physical preparation are important		Group organisation undertaken for the traveller
		Highly personal experience: individuals benefit at different levels		
←		*Increased degree of preparation/training/unknown results and risks*		

4. Ecotourism – Hard and soft ecotourism characteristics (Weaver, 2003)

Related to Acott and La Trobe (1998)'s schema, Weaver and Lawton (2001) derived an ecotourism conceptual framework (Figure 7.1) that depicts ecotourism as a spectrum from hard to soft ecotourism. When operationalised, this schema can be used to derive various indicators to study ecotourism ventures. For example, a Likert-like indicator could be derived to measure the relative level of commitment to the environment by individuals within a group of ecotourists.

HARD (active, deep)		SOFT (passive, shallow)
←	the ecotourism spectrum	→
Strong environmental committement		Moderate of superficial environmental committment
Enhancive sustainability		Steady state sustainability
Specialised trips		Multi-purpose trips
Long trips		Short trips
Small groups		Larger groups
Physically active		Physically passive
Physical challenge		Physical comfort
No services expected		Services expected
Deep interaction with nature		Shallow interaction with nature
Emphasis on personal experience		Emphasis on mediation
Make own travel arrangements		Rely on travel agents and tour operators

Figure 7.1: The ecotourism spectrum (Source: Weaver & Lawton, 2001)

5. Wildlife tourism popularity (Swarbrooke et al, 2003).

Swarbrooke et al. (2003) derived a wildlife tourism species popularity pyramid (Figure 7.2) that illustrates that larger and more charismatic wildlife like whales are most popular followed by elephants, gorillas, monkeys, birds, plants and insects. A Likert-like indicator could be derived to measure the relative level of tourism related popularity of wildlife. For example, a minke whale could be ranked as 'high', a coral trout could be ranked 'moderate', and a star fish could be ranked as 'low'

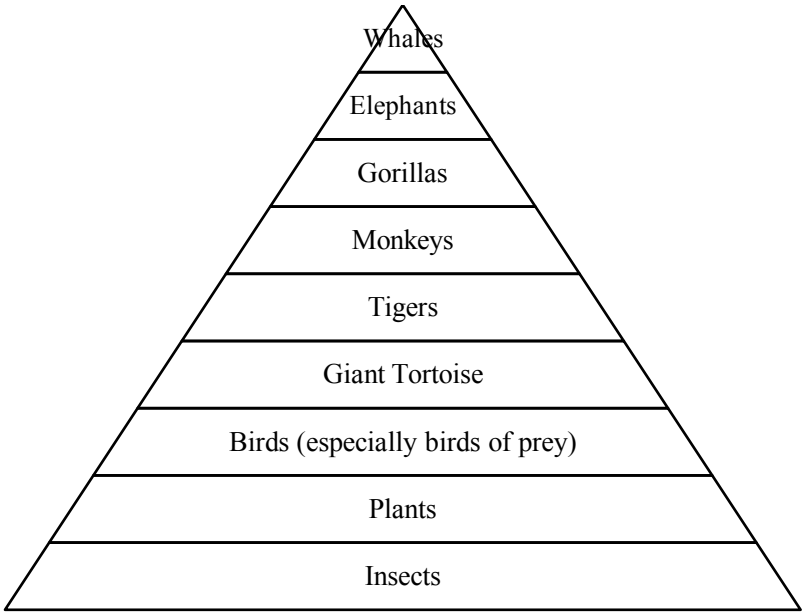


Figure 7.2: Tourism species popularity pyramid (Swarbrooke et al., 2003)

Appendix 8. The 126 MRT products evaluated in research study one

Table 8-1: List of MRT products worldwide (n=126) – Table 1

ID	Product name	ID	Product name
1	Deep Ocean Expeditions - Azores Undersea Volcanoes	22	The Dolphin Research Institute -Phillip Island, Australia
2	Deep Ocean Expeditions - Mid-Atlantic Hydrothermal Vents	23	Marine Wildlife Adventures - Tasmania's Soela Sea Mount
3	Deep Ocean Expeditions - Dive to the RMS Titanic	24	Marine Wildlife Adventures - Kimberly Adventures
4	Deep Ocean Expeditions - Operation Bismarck	25	Marine Wildlife Adventures - Whales Cruises, Australia
5	Cape York Turtle Rescue - Mapoon, Australia	26	The Royal Geographical Society of Queensland - Australia
6	The Undersea Explorer - Osprey Reef Shark Encounter, Australia	27	The Lakes Explorer - Explore the Gippsland Lakes, Australia
7	The Undersea Explorer - Far Northern Expedition, Australia	28	The Earthwatch Institute - Moreton Bay, Australia
8	Lizard Island Research Station - Volunteer at a Marine Research Station	29	The Earthwatch Institute - Sydney Harbour, Australia
9	Tevene'i Marine - Coral Reef Ecology Education Programs, Australia	30	The Earthwatch Institute - Bahamian Reef Survey, Caribbean
10	Tevene'i Marine - Eco Expeditions on the Great Barrier Reef, Australia	31	The Earthwatch Institute - Bahamian Reef Survey, Caribbean
11	The Oceania Project - Whale Research Expeditions, Australia	32	The Earthwatch Institute - Coastal Ecology of the Bahamas, Family
12	Rodney Fox Expeditions - Great White Shark Expeditions, Australia	33	Greenforce - Caribbean Adventure, Bahamas
13	Pelican Expeditions - Blue Whale Research, Australia	34	The Oceanic Society - Bahamas Project Dolphin
14	Landscope Expeditions - Loggerhead Turtles of Dirk Hartog Island, Australia	35	The Earthwatch Institute - Tidal Forests of Kenya
15	Landscope Expeditions - Wildlife of the Montebello Islands, Australia	36	The Earthwatch Institute - Tracking Baja's Black Sea Turtles
16	Conservation Volunteers Australia - Montague Island Nature Reserve, Australia	37	The Oceanic Society - Belize Crocodiles
17	Eye to Eye Encounters - Great Barrier Reef, Australia	38	The Oceanic Society - Belize Dolphin Project
18	Ningaloo Turtles - Western Australia	39	The Oceanic Society - Belize Mangrove Restoration
19	Conservation Volunteers Australia - Broome, Australia	40	The Oceanic Society - Belize Reefs - Scuba
20	Biosphere Expeditions - near Broome, Australia	41	The Oceanic Society - Belize Reefs - Snorkeling
21	Bunbury Dolphin Discovery Centre - Western Australia	42	The Earthwatch Institute - Queen Conchs of Belize

Table 8-2: List of MRT products worldwide (n=126) – Table 2

ID	Product name	ID	Product name
43	Conservation Volunteers Australia - Coburg Peninsula, Turtles, Australia	64	Blue Ventures - Belize Expeditions, Belize
44	Conservation Volunteers Australia - Coburg Peninsula, Australia	65	The Oceanic Society - Giant Otters, Pantanal, Brazil
45	Kalinda - Great Barrier Reef Discovery, Australia	66	The Earthwatch Institute - Brazil's dolphins, Brazil
46	Marine Wildlife Adventures - Coral Sea, Australia	67	Coral Cay Conservation - Cambodia
47	Coral Cay Conservation - Philippines	68	Operation Wallacea - Marine Research Expeditions, Cayos Cochinos, Honduras
48	Coral Cay Conservation - Tobago	69	The Shark Research Institute - Utila Whale Shark Research in Honduras
49	Coral Cay Conservation - School groups	70	Operation Wallacea - Marine Research Expeditions, Indonesia
50	Coral Conservation - Danjugan Island, Philippines	71	The Shark Research Institute -Lembah Straits Expeditions, Indonesia
51	The Earthwatch Institute - Whales of British Columbia	72	The Tethys Foundation - training, Cetacean Sanctuary Research, Greece
52	The Earthwatch Institute - Whales of British Columbia	73	The Tethys Foundation - Internships and Volunteering, Greece
53	The Earthwatch Institute - Whales of British Columbia - Family	74	Frontier - Kenya Whale Sharks
54	The Earthwatch Institute - Whales of British Columbia - Family	75	Global Vision International - Community Development Expedition in Kenya
55	The Earthwatch Institute - Whales of British Columbia - Teen	76	Blue Ventures - Madagascar Expeditions, Madagascar
56	The Earthwatch Institute - Whales of British Columbia - Teen	77	Frontier - Madagascar Teaching, Wildlife and Diving
57	Deep Ocean Expeditions - HMS Breadalbane, Canada	78	Frontier - Madagascar Marine Conservation & Diving
58	Frontier - Cape Verde Turtle Conservation	79	Blue Ventures - Madagascar Expeditions, Madagascar
59	Deep Ocean Expeditions - Atlantic Target	80	Blue Ventures - Malaysia Expeditions, Malaysia
60	Conservation Volunteers Australia - Costa Rica	81	The Antinea Foundation - Global Research and Sailing
61	Asociacion de Voluntarios Para el Servicio en las Areas Protegidas (ASVO) - Marine Turtles, Costa Rica	82	Deep Ocean Expeditions - Mediterranean Shipwrecks
62	The Earthwatch Institute - Lady Elliot Island, Great Barrier Reef, Australia	83	The Earthwatch Institute - Queen Conchs of Belize - Teen
63	Biosphere Expeditions - Cayos Cochinos, Honduras	84	The Earthwatch Institute - Whales and Dolphins of the Hebrides

Table 8-3: List of MRT products worldwide (n=126) – Table 3

ID	Product name	ID	Product name
85	Frontier - Sri Lanka Sea Turtle Conservation	106	Global Vision International - Marine Conservation Expedition in the Seychelles
86	The Oceanic Society - Suriname Sea Turtles	107	The Earthwatch Institute - Coral and Coastal Ecology of the Seychelles
87	Frontier - Marine Conservation and Diving, Tanzania	108	Greenforce - Six Week Penguin Rescue, South Africa
88	The Shark Research Institute - Indian Ocean Live aboard, Mozambique	109	Greenforce -Great White Shark, South Africa
89	Biosphere Expeditions - Azores Expeditions, Atlantic Ocean	110	Scientific Exploration Society - Underwater Archaeology, South Africa
90	The Earthwatch Institute - Tracking Baja's Black Sea Turtles - Teen	111	African Conservation Experience - Dolphin and Whale Research Centre, South Africa
91	The Earthwatch Institute - Trinidad's Leatherback Sea Turtles	112	The Earthwatch Institute - South African Penguins
92	The Earthwatch Institute - Trinidad's Leatherback Sea Turtles	113	The Shark Research Institute -White Sharks and Jeffreys Bay, South Africa
93	Frontier - Uruguay Sea Turtle Conservation	114	Odyssey Expeditions - Summer Educational Adventure Voyages, Caribbean
94	The Oceanic Society - Costa Rica Whales	115	Global Vision International - Mexican Marine Expedition in the Caribbean Sea
95	The Earthwatch Institute - Costa Rican Sea Turtles	116	Global Vision International - Marine Conservation Expedition in Mexico
96	Operation Wallacea - Marine Research Expeditions, Cuba, Manatees and Mangroves	117	The Oceanic Society - Midway Historic Preservation
97	Greenforce - Ecuador, Marine Conservation	118	The Oceanic Society - Midway Turtle Tracking
98	The Shark Research Institute -Galapagos Islands, Ecuador	119	Operation Wallacea - Marine Research Expeditions, Mozambique and South Africa
99	Operation Wallacea - Marine Research Training, Egypt	120	Frontier - Mozambique Whale Sharks
100	The Earthwatch Institute - Behind the Scenes of Grey Whale Conservation, United Kingdom	121	Deep Ocean Expeditions - North Pole Diving
101	Greenforce - South Pacific Adventure, Fiji	122	Biosphere Expeditions - Study and protect the unique coral reefs of Oman & UAE.
102	Frontier - Fiji Marine Conservation & Diving	123	Deep Ocean Expeditions - Pacific Hydrothermal Vents
103	Greenforce - Ecuador, Galapagos Islands	124	Blue Ventures - Marine Survey Expeditions, Scotland
104	Frontier - Greece Underwater Research and Dolphin Observation	125	The Whale and Dolphin Conservation Society - Dolphin Research Holiday, Scotland
105	The Earthwatch Institute - Dolphins of Greece	126	The Earthwatch Institute - Trinidad's Leatherback Sea Turtles - Teen

Appendix 9. Phase-one: Web site data rating and quality review process

Six team members (including the PhD researcher) ranked 28 criteria and 42 product web sites to derive a final 1176 ranked values for each team member. Ranking values were recorded in an MS-Excel worksheet. Products with a relatively low level of abundance were ranked by team members as 1. Products with a relatively low to moderate level of abundance were ranked as 2. Products with a relatively moderate level of abundance were ranked as 3. Products with a relatively moderate to high level of abundance were ranked as 4. Products with a relatively high level of abundance were ranked as 5. Additional to the ranking process, each team member also provided a brief description of each criterion for each product. The descriptions were intended to assist the team member to slowly build up an organised mental picture of relative levels of different criteria, and to provide the PhD researcher with confidence that the team member correctly considered and interpreted the various criteria.

For the marine biology group, the ranking process was done in a group environment over five days. While team members could compare notes about the measurement process if they needed, they were instructed to rank each criterion independently of the other team members. For the tourism group, the ranking process was done independently by each team member of a period of two days. This was done because it was only logistically possible to involve the 2 tourism researchers at different locations. For both teams, the PhD researcher was present at all times to guide the team members if needed. This guidance involved how to suitably interpret the intended meaning of the various criteria, and/or how to interpret the web site content. From time to time, there were discussions between a team member and the PhD researcher about the difficulties related to suitably (or otherwise) rank the relative level of some criteria for some web sites.

Data quality review

Towards addressing this latter concern, prior to the start of this web site analysis, team members were made aware of three web site analysis issues that can affect the reliability of their measurements. These are 1) some tourism web sites may display only positive information about their organisation and products and this may not accurately represent the product, 2) the likely scarcity of information about certain criteria on some web sites and hence an potential difficulty to reliably describe and/or rank that criterion, and 3) without having prior real world experience of that actual MRT product, the team member's descriptions and/or rankings will be somewhat subjective. To address the first issue, team members were instructed to familiarise themselves with all of the web site, be wary of any biased marketing, and try to reliably read 'between the lines' of any biased marketing. To address the next two issues, team members were asked to discuss any uncertain ranking choice with the PhD researcher and/or other team members, and if the ranking decision was still too uncertain, they were instructed to record an 'unknown' value for that product's criteria.

Two additional quality assurance steps were undertaken to increase the objectivity of the final ranked values. The first quality assurance step involved the PhD researcher asking each team member to redo their ranking evaluations for the first four or five web sites that they evaluated. This is because, after the first four or five web sites, the team member had begun to formulate a consistent understanding of what a certain criteria meant, what information was available on various web sites, and what is a relatively high and/or low value for a certain

criteria. Hence, for the first four or five web sites there was an increased chance of incorrect interpretation of those web sites.

Following the initial ranking process, the second quality assurance step was for the PhD researcher to compare the individual rankings from group (i.e. tourism and marine biology) to create a final ranking value for each discipline. This comparison process can be seen as form of data triangulation whereby the same method is used for different sets of data in order to verify (or otherwise) trends detected in one data set (Oppermann, 2000). If a ranked value for a certain criterion of a specific product was assigned as 'unknown' then that ranked values was considered to be anomaly value. Also, if the difference between the ranked values for a certain criterion and product were greater than 2 (e.g. three ranked values of 1.5, 3 and 4.0 have a difference of 2.5) then those ranked values for that criterion and product were also considered to be anomaly values. These anomaly values were then subject to a later review by the PhD researcher. An assessment of the number, reasons, and implications of these anomaly values is reported in Chapter 4.

The PhD researcher review of anomaly values involved a comparison of those values with 1) other team members ranked values for the same criteria and product, 2) other team members ranked values for the same criteria but different products, and then 3) with the specific web site content. Compared to other team members, the identification, selection, and supervisory ranking of product web sites provided the PhD researcher with a richer knowledge of the different product web sites. It is this knowledge that the PhD researcher used to resolve all anomaly values to a suitably accurate ranked value. Additionally, the review of anomaly values also provided the PhD researcher with an enhanced knowledge of the content of the web sites,

and hence a well tuned ability to suitably resolve any outstanding anomaly values. It could be argued that resolving the anomaly value to a suitably ranked value is compromising the reliability of the data, however it is worth noting, that where an anomaly value was identified, the ensuing review process not only acted to revise the anomaly value but also to revise the other team member's ranked values for the same criteria and product, and the other ranked values for the same criteria across different products. The outcome was a strengthening of the internal reliability among all ranked values for a specific criterion across all products.

Data limitations

Given the above data quality review, the final ranked values for each criteria and product are considered to be reasonably reliable. There will always be uncertainty with the final ranked values as those values were derived through interpretation of web sites with possibly probable or biased content. This is inherent in this study. However, short of an on-site study of the 85 MRT products, the use of this web site analysis was considered to be an optimum method to measure the valid criteria across the 85 MRT product web sites. To counter this uncertainty, the ranking process involved the triangulation of independent ranked values and an iterative revision process by the PhD researcher to ensure reliable results. An additional factor that strengthens the certainty of the final ranked results is that the content of various web sites did not change during research process. Therefore, unlike the interpretative study of transitory phenomena, the PhD researcher had the opportunity to iteratively reflect and resolve any anomaly values. The intention of that process was to ensure that the final ranked values were a reliable representation of the product's criteria, and also consistent with the relevant ranked values from other team members.

Appendix 10. Stakeholder survey one from research study two

Welcome to this survey about marine research tourism

This survey is estimated to take approximately forty to sixty minutes. There are fifty one questions.

Topics to be covered include:

1. A definition for marine research tourism

2. Supply and demand for marine research tourism in Australia

3. Benefits, issues, opportunities and constraints for marine research tourism

4. Potential products for marine research tourism

For additional information on the PhD project, please read this href="http://www.marine-research-tourism.com/Docs/Information sheet.doc" target='_blank'>PhD research project information sheet.

Your survey responses will be used to develop future scenarios for marine research tourism across Australia.

Your participation in this study is completely voluntary. You can advance to the next question or withdraw from the survey at any time. Please read the informed consent form and inform us of any confidentiality or other ethical issues if necessary.

Your survey responses will be strictly confidential, survey participation is anonymous and survey results will only be reported in aggregate.

To begin the survey, click on the **Continue button** below.

If the survey questions are on a purple background please try another web browser

If you have questions about the survey or the research, contact Peter Wood on 07 4042 1372 or peter.wood@jcu.edu.au, or Dr. Heather Zeppel on 07 4042 1446 or heather.zeppel@jcu.edu.au.

If you have questions about the ethical conduct of this survey, contact Peter Wood or the James Cook University Ethics Officer, Tina Langford on 07 4781 4342 or tina.langford@jcu.edu.au.

Postal address is James Cook University, P.O. Box 6811, Cairns Mail Centre, Cairns, Queensland, Australia . 4870. *

A definition for marine research tourism

Marine research tourism is defined as a form of marine ecotourism that provides an opportunity for paying tourists and/or volunteers to participate in marine research activity (adapted from Benson, 2005). Features of a marine research tourism venture are:

1. Marine research is an important part of the attraction

2. There are researchers who are engaged in official marine research pursuits

3. There is an official research centre that supports research activity

4. The tourist is actively involved in the marine research experience

5. There is research supervision for any tourist marine research activity

Some implications of this definition include:

1) Active tourism involvement can range from observation of marine research activity to full participation in advanced marine research activity

2) Provided the marine research is qualified, the supervision of marine research tourists can be minimal

3) A marine research tourism venture does not have to always involve coastal or marine based field work

4) A marine research tourism venture can involve land based marine research laboratories and aquaria

Please note, for this research, a marine research tourism venture should last for one or more days, be advertised publicly, take paying tourists or volunteers, and operate on a commercial basis.

References

Benson, A. (2005). Research tourism: Professional travel for useful discoveries. In M. Novelli (Ed.), Niche tourism: Contemporary issues, trends and cases. (pp. 133-144). Amsterdam: Elsevier.

Survey questions

1. **Would you briefly, tell us about your occupation?**

Would you describe yourself as a? (Please select one)

- Marine research tour operator
- Marine research tourism consultant
- Marine researcher
- Marine manager
- Marine tour operator
- Representative of a marine research society
- Representative of a marine education society
- Representative of an environmental conservation organisation
- Representative of an Aboriginal or Torres Strait Islander management organisation
- Representative of a tourism organisation
- A marine research student
- A scuba dive operator
- Other (Please list)

2.
Have you or your organisation been involved with any of the following marine research tourism organisations? (Please select those that apply)

	Yes	No
Asociacion de Voluntarios para el Servicio en las Areas Protegidas		
Biosphere Expeditions		
Blue ventures		
Cape York Turtle Rescue		
Conservation Volunteers Australia		
Coral Cay Conservation		

Frontier	○	○
Greenforce	○	○
GVI international	○	○
Landscope Expeditions	○	○
Odyssey expeditions	○	○
Operation Wallacea	○	○
Raleigh International	○	○
SV Pelican	○	○
Tevene'i Marine	○	○
The African Conservation Experience	○	○
The Antinea Foundation	○	○
The Earthwatch Institute	○	○
The Living Oceans Foundation	○	○
The Oceania Project	○	○
The Oceanic Society	○	○
The Rodney Fox Shark Experience	○	○
The Scientific Exploration Society	○	○
The Shark Research Institute	○	○
The Tethys Research Institute	○	○
The Whale and Dolphin Conservation Society	○	○
Undersea Explorer	○	○
Reef Check	○	○

3. Could you list any other marine research tourism organisations that you or your organisation been involved with?

(Please list here)

4. From your point of view, how likely are the following types of tourists to be interested in marine research tourism? (Please select those that apply)

	Very likely	Likely	Possibly	Not likely	Cannot say (i.e. not enough information)
Marine wildlife tourists					
Adventure tourists					
Gap year students					
Ecotourists					
Recreational fishers					
Volunteers					
Backpackers					
Package tour travellers					
Grey nomads					
Educational tourists					
Cruise ship tourists					
Alternative tourists					
Marine resort tourists					
Scuba divers					
Snorkellers					
Scientists					
Mass tourists					
Independent travellers					
Natural history enthusiasts					
Aboriginal and Torres Strait Islander cultural tourists					

Regular viewers of nature documentaries					
Terrestrial marine research tourists					
Holiday makers					
Nature, Eco and Adventure Tourists (NEAT)					
Repeat marine research tourists					
Spirited travellers					
Experience seekers					
Fit and Independent Travellers (FIT)					

5. Briefly, could you list any other types of tourists who may be interested in marine research tourism?

(Please list here)

6. In your view, where would prospective marine research tourists come from? (Please select those that apply)

	Very likely	Likely	Possibly	Not likely	Cannot say (i.e. not enough information)
Australia					
United Kingdom					
Canada					
Scandinavia					
Germany					
France					
Italy					
Spain					
Kenya					
USA					
New Zealand					

Brazil					
Japan					
China					
South Africa					
Korea					
India					

7.
Briefly, could you list other countries or geographic areas where prospective marine research tourists may come from?

(Please list here)

8. From your experience, what sort of marine research issues, programs and platforms would be suitable for marine research tourism? (Please select those that apply)

	Yes	Maybe	No	Cannot say (i.e. not enough information)
Charismatic marine wildlife (e.g. Turtles, whales, dolphins, sharks, penguins or seals) research programs				
Lesser charismatic marine wildlife (e.g. Molluscs, sponges, plankton, schools of mackerel) research programs				
Endangered marine species and habitat research programs				
Coral reef marine research programs				
Marine archaeology (e.g. ship wrecks) research programs				
Marine research programs with a conservation focus				
Marine fisheries programs				
Marine monitoring and sampling programs				
Marine survey programs				
Impacts of climate change on the marine environment				
Island based marine research programs				
Coastal based marine research programs				
Marine environmental impact assessments				

Vessel based marine research programs	○	○	○	○
Deep sea marine research programs (including submersibles)	○	○	○	○
Underwater laboratories	○	○	○	○
Seasonal migration and breeding marine research programs	○	○	○	○
Marine anthropology research (e.g. Indigenous heritage mapping)	○	○	○	○
Studying the marine environment within a marine aquarium	○	○	○	○
Watching and reporting marine bird sightings	○	○	○	○
Monitoring and researching tidal pools	○	○	○	○
Monitoring and researching mangrove forests	○	○	○	○
Monitoring and researching kelp forests	○	○	○	○
Coastal flooding impacts	○	○	○	○
Monitoring and researching coastal estuaries	○	○	○	○
Studying coastal geomorphology	○	○	○	○
Researching the marine biodiversity about marine pontoons	○	○	○	○
Researching the impacts of marine tourism on the marine environment	○	○	○	○

9. Briefly, in your view, what other sorts of marine research programs would be suitable for marine research tourism ventures?

(Please list here)

10.
In your view, how useful is marine research interpretation to produce a quality experience for the marine research tourist? (Please select one)

○ Not really useful ○ Useful ○ Very useful ○ Cannot say (not enough information)

11.
In your view, how useful is photography and videography as a method for involving the marine research tourist within the marine research experience? (Please select one)

○ Very useful ○ Useful ○ Not very useful ○ Cannot say (not enough information)

12.
It has been proposed that volunteer tourists can be helpful to marine research programs.

In your view, how helpful can the involvement of suitably trained volunteer tourists be to marine research programs? (Please select one)

Not very much	Somewhat	Moderately	Very much

13.
In your view, how difficult can it be for a marine researcher who is undertaking marine research to directly supervise a volunteer tourist? (Please select one)

Not very	Somewhat	Moderately	Very	Your comments here

14.
Feel free to skip the following question if you do not feel qualified to answer

Given 2 days of appropriate training, training personnel, training methods, equipment and other necessary resources.

In your belief, can volunteer tourists without prior experience, satisfactorily assist with the following activities (Please select those that apply)

	Yes	Maybe	No	Cannot say (not enough information)
Undertake pelagic fish surveys				
Drive a 4WD				
Use pen, paper and record data				
Plankton sampling				
Undertake Reef Check surveys				
Undertake inter-tidal surveys				
Listen and record whale and dolphin vocalisations				
Use computers				
Use computer databases				
Collect weather data				
Listen to and learn from the marine researchers				
Bird surveys and reporting				
Collect sea surface data				

Count marine species				
Use water sampling devices				
Assisting with DNA sampling				
Use a single beam echo sounder				
Undertake mangrove surveys				
Assist with habitat restoration				
Assisting with maintaining shark nets				
Use a Geographic Information System (GIS)				
Undertake line intercept surveys				
Use a GPS receiver				
Use bait nets				
Handle a small boat				
Use video and photo cameras to record data				
Work in teams				
Sail a boat				
Use species population modeling software				
Ethical interaction and handling of wildlife				
Assisting with the measuring of wildlife				
Assist with supplies and other logistics				
Undertake point intercept surveys				
Use species identification charts				
Assisting with mooring deployment and maintenance				
Assisting with marine pest removal				
Assist with interpretative signage and publications				
Organising slides and photos				
Assist with deploying remote oceanographic measuring buoys				
Assist with documentary making				
Undertake rehabilitation of injured wildlife				
Undertake habitat observation and reporting				
Undertake plot or quadrant surveys				

Use aerial and satellite imagery				
Assist with a multi beam echo sounder				
Report compliance issues to authorities				
Undertake benthic surveys				
Undertake scuba diving				
Use underwater slate boards				
Undertake species type and behaviour observation and reporting				
Undertake archaeological surveys				
Assist with laboratory work				
Undertake coastal based survey				
Undertake invertebrate surveys				
Use binoculars				
Towed behind a vessel using a manta-tow				
Assisting with catch, tag and release of marine species				
Liaise with research project stakeholders				
Undertake species observations and cataloguing via video or photo				
Undertake image processing				
Undertake Global Coral Reef Marine Network (GCRMN) surveys				

15.
Briefly, what issues concern you with involving volunteer tourists within marine research programs?

16.
In your view, what other marine research activities could be used by suitably trained marine research tourists?

(Please list here)

17.

In your view, what could be further done to involve the marine research tourist within a marine research experience?

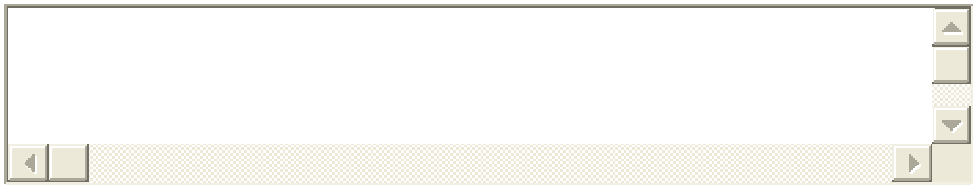
18.
In your view, who benefits from marine research tourism? (Please select those that apply)

	Very likely	Likely	Possibly	Not likely	Cannot say (not enough information)
The marine research tourist					
Marine tour operators					
Government marine research agencies					
Marine management agencies					
Conservation organisations					
Indigenous Australian organisations					
Professional marine educators					
Local communities					
Professional marine educators					
Dive training organisations					
Private marine researchers					

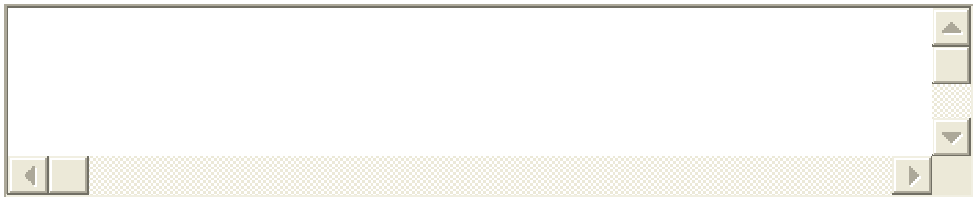
19.
Briefly, in your view, who else could benefit from marine research tourism?

(Please list here)

20. Briefly, in your view, what are the likely benefits of marine research tourism to marine research or marine management programs?



21.
Briefly, in your view, how could any benefits from marine research tourism to marine research or management be increased?



22. Do you believe that marine research programs on marine research tourism tours should always be pertinent to Government marine research or management priorities? (Please select one)

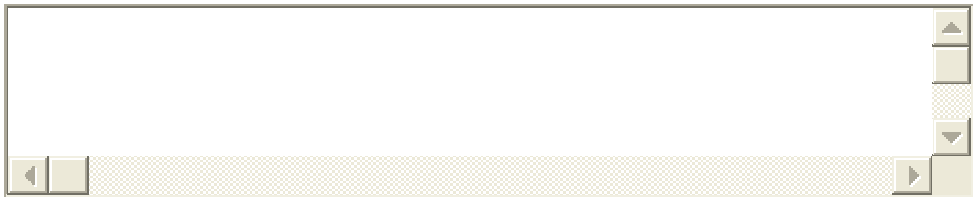
Yes ○ Maybe ○ No ○ Cannot say (not enough information) ○

23.
In your view, what types of popular marine research would appeal to marine research tourists? (Please select those that apply)

	Yes	Maybe	No	Cannot say (not enough information)
Dolphin research	○	○	○	○
Whale research	○	○	○	○
Turtle research	○	○	○	○
Shark research	○	○	○	○
Seal research	○	○	○	○
Penguin research	○	○	○	○
Coral reef research	○	○	○	○
Dugong research	○	○	○	○
Ship wreck research	○	○	○	○
Sea dragon research	○	○	○	○
Coral reef spawning research	○	○	○	○

24.
Briefly, in your view, what other types of popular marine research would appeal to marine research tourists?

(Please list here)



25. It is possible that marine research tourism ventures can involve popular marine science that does not always address current Government marine research or management priorities.

For example, at a certain location, marine research tourism programs may focus on charismatic dolphin, whale or turtle populations whereby a Government's marine research priorities may be water pollution and the sustainability of local dugong populations.

In your view, is this an occurrence that could possibly restrict any Government involvement in marine research tourism? (Please select one option)

Yes ○ Maybe ○ No ○ Cannot say (not enough information) ○

26. Often, the quality of marine research programs is indicated by related academic publications and conference presentations.

In your view, how important are academic publications and conference presentations to a marine research tourism venture? (Please select one)

○ Important and essential ○ Important but not essential ○ Not important ○ Cannot say (not enough information)

27.
A major segment of Australia's marine research program is Government funded.

In your view, could increased academic publications or conference presentations from marine research tourism ventures be an incentive for Governments to be further involved in marine research tourism ventures? (Please select one)

○ Yes ○ Maybe ○ No ○ Cannot say (not enough information)

28.
In your view, how important is the involvement of Government marine management agencies in marine research tourism across Australia?

(Please select those that apply)

	Important and essential	Important but not essential	Not important	Cannot say (not enough information)
In the present	○	○	○	○
In the future	○	○	○	○

29.
In your view, how important is the involvement of Government marine research agencies in marine research tourism across Australia?

(Please select those that apply)

	Important and essential	Important but not essential	Not important	Cannot say (not enough information)
In the present	○	○	○	○
In the future	○	○	○	○

30.
A review of existing marine research tourism venture web sites indicates that more than 95% of marine research tourism ventures are privately operated.

Would you be able to comment on why this is so?

If yes, please write here.

31. In a number of cases, a marine research tourism experience has been shown to appeal to everyday marine tourists.

In your view, how likely can the commercial viability of existing marine tourism operators be improved by introducing one or more marine research tourism experiences? (Please select one)

○ Very likely ○ Likely ○ Possibly ○ Not likely ○ Cannot say (not enough information)

32.
Can you give an example of a marine research tourism experience that could add to an everyday marine tourism experience?

If yes, please comment here.

33. It has been proposed that marine research tourism in Australia can be used to distinguish the Australian marine tourism product from competing marine research tourism products overseas.

Do you think that developing marine research tourism across Australia can be used to effectively compete with overseas marine tourism attractions?

○ Yes ○ Maybe ○ No ○ Cannot say (not enough information)

34. Marine research tourism is described as a possible way to successfully diversify marine tourism in Australia.

Do you think that marine research tourism is a tourism product that can be used to successfully diversify marine tourism in Australia? (Please select one)

Yes ○ Maybe ○ No ○ Cannot say (not enough information) ○

35.
In your view, how influential is a World Heritage, national park or reserve area as an attraction for prospective marine research tourists to that area? (Please select one)

○ Highly influential ○ Moderately influential ○ Possibly influential ○ Not very influential ○ Other (Please specify)

36. In your view, what are the constraints for expanding marine research tourism across Australia? (Please select those that apply)

	Very important	Important	Somewhat important	Not important	Cannot say (not enough information)
Seasonality of wildlife migrations and hence wildlife marine research	○	○	○	○	○
The potential risk of unsafe and uncomfortable weather and ocean conditions	○	○	○	○	○
The potential risk of dangerous marine wildlife to marine researchers, tourists and marine tour operators	○	○	○	○	○
There is a logistics related need for marine research tourism ventures to be based near a town or other tourism centre	○	○	○	○	○
Increasing costs of diesel fuel and related hindrance long distance marine travel	○	○	○	○	○
The size and nature of the marine research tourism market in Australia is not well known	○	○	○	○	○
The motivations and requirements for satisfying marine research tourists is not well known	○	○	○	○	○
Australia has a very large Exclusive Economic Zone (EEZ)	○	○	○	○	○

37.
Briefly, what are other possible constraints for expanding marine research tourism across Australia?

(Please list here)

38. In your view, what issues concern you most about expanding marine research tourism across Australia? (Please select those that apply)?

	Very important	Important	Somewhat important	Not important	Cannot say (not enough information)
Uncertainty as to the quality of marine research by tourists					
The collaboration required between marine researchers, marine managers and marine tour operators					
A shortage of skilled marine research tourists to undertake quality marine research					
A shortage of marine researchers with suitable tourism and hospitality skills					
Occupational health and safety issues for volunteer tourists who are involved in marine research programs					
Keeping the tourist satisfied while undertaking marine research programs					
A shortage of marine researchers with suitable entrepreneurial skills					
A shortage of interested marine tour operators					
Public liability insurance					
Limited marketing and promotion of marine research tourism ventures					
Acquiring or approving marine research permits					

39.
Briefly, what are other possible issues for expanding marine research tourism across Australia?

(Please list here)

40. In your view, how important are the following factors to any development of marine research tourism across Australia?

(Please select those that apply)

	Very important	Important	Somewhat important	Not important	Cannot say (not enough information)
Australia has a relatively advanced marine research sector					
Australia has a relatively mature marine tourism industry					
Sufficiently trained and experienced volunteer tourists can effectively perform basic to advanced marine monitoring and surveys					
Australia has a relatively well managed marine environment					

Australia has a large coastline and ocean region					
Australia has a wealth of marine wildlife and other marine assets					
Marine research tourism experiences appear to be sought after by well educated and well travelled markets					
International tourists coming to Australia are increasingly likely to be from Asia.					
International tourists are rapidly increasing in travel experience and thus are increasingly likely to be independent travellers					
There is insufficient knowledge about the potential future for marine research tourism across Australia					
The involvement of Australian Federal and State Government in the sponsorship of marine research tourism					

41.
Briefly, in your view, what are other possible important factors for any development of marine research tourism across Australia?

(Please list here)

42.

It is proposed that a successful marine research tourism venture should satisfy the needs of the marine researcher, the marine manager, the marine tour operator, and the marine tourist.

Please indicate how much you agree with this statement? (Please select one)

Not very Somewhat Moderately Very much

43. A marine research tourism guide role is envisioned to be a paid role that ensures that the many needs of marine researchers, managers, tour operators and tourists are met?

In your view, is there an opportunity for a marine research tourism guide role within a marine research tourism venture? (Please select one)

Yes Maybe No Cannot say (not enough information)

44. In many cases, marine research tourism ventures require a skilled and educated tourist.

Such skills include; the identification of species and habitats, survey and monitoring techniques, data recording, scientific diving, boat handling and safety, and computer skills.

In these cases, do you think that there is a potential commercial opportunity to train and educate prospective marine research tourists? (Please select one)

Yes Maybe No Cannot say (not enough information)

45. In your view, what are the driving forces behind marine research tourism? (Please select those that apply)

	Very likely	Likely	Possibly	Not likely	Cannot say (not enough information)
An increase in the conservation volunteering ethic within the travel market					
An increasingly educated travel market who are interested in more active experiences					
An increasing desire for environmentally responsible travel within the travel market					
An increasing desire for an alternative travel experience with the travel market					
The effect of marine documentaries on public awareness for a marine research experience					
A need for increased funding by marine research and management agencies					
A greater need for marine research and monitoring of Australian marine waters					
Increasingly safe and comfortable marine tourism ventures					
Marine research technology that is increasingly advanced and easier to use					

46. Briefly, in your view, what other driving forces are behind marine research tourism?

(Please list here)

47. Briefly, can you comment on the likely roles of Australian indigenous people, conservation NGO groups and/or marine education societies towards the development of marine research tourism?

Please comment in the appropriate text boxes.

Australian indigenous people

Conservation NGO groups

Marine education societies

48. From your knowledge, can you give examples of particular marine research programs in Australia that may be suitable for marine research tourism?

A possible example could be the monitoring sea dragon populations near Kangaroo Island in collaboration with the Flinders University of South Australia.

The type of information sought includes 1) where across Australia, 2) , type of marine research program and 3) potential participating marine research agency.

Please give example here

Please give example here

Please give example here

49. In your view, what current marine tourism ventures could readily be adapted to include a marine research tourism experience?

50.
If not already mentioned, what other opportunities are there for marine research tourism across Australia? Please elaborate as needed.

51. Given your knowledge, the information you have provided for this survey and the other information on the marine research tourism web site

Do you have a view that marine research tourism could be notably expanded across Australia? (Please select one)

Yes Probably Maybe Probably not No

If you have questions about this survey please contact Peter Wood at peter.wood@jcu.edu.au or please go to the marine research tourism web site.

Appendix 11. Semi structured interview method used in study two

Semi structured interviews are usually used by phenomenography to collect stakeholder views (Bowden, 2000). A semi structured interview can be used where the research objective is to explore subjective meanings that the respondents attribute to concepts or events (Jennings, 2001; Gray, 2004). As with unstructured interviews, semi structured interviews follow the thinking process of the interviewee and/or the interviewer, and are fluid in nature (Jennings, 2001; Gray, 2004). These interviews remain within the genre of conservation; however the interviewer will have a list of topics that focus the interview (Jennings, 2001). The list adds some structure to the interview, although the order of the discussion about the issues on the list may vary between interviews (Jennings, 2001; Bryman, 2001). Often, the topics are more general than those typically found in a structured interview (Bryman, 2001).

The interviewer usually has some leverage to ask further questions in response to what are seen as significant replies (Bryman, 2001). Semi structured interviews also allow for extended probing of views and opinions where it is considered desirable for the interviewee to expand on their answers (Gray, 2004; Bryman, 2001). This probing can allow for the diversion of the interview into new pathways which while not originally considered as part of the interview, help towards meeting the research objectives (Gray, 2004). Interviewee responses are usually documented by note taking or possibly by tape recording the interview (Gray, 2004). It is worth acknowledging that the capture and analysis of such documentation can be considered slow and time consuming (Gray, 2001).

Appendix 12. Stakeholder survey two from research study two

An online survey about notable statements by key stakeholders towards the present and future of marine research tourism in Australia

Introduction

This survey is part of PhD research project at the James Cook University into the potential development of marine research tourism in Australia. Marine research tourism is defined as marine tourism where marine research is an important part of the tourist attraction. 12 examples of marine research tourism can be found at this PDF document. Information about this PhD is at this research proposal web page.

The survey lists **100** notable statements by individual key stakeholders about the desired future for marine research tourism in Australia. Many of these individual statements address important issues, concerns, benefits and opportunities for marine research tourism in Australia. If these statements are validated (or otherwise) by a representative group of key stakeholders, they could form a useful basis for the appropriate development of marine research tourism in Australia. For this PhD, these validated statements will be used with other PhD derived information to further understand the possible future of marine research tourism in Australia.

The survey

The great majority of survey questions are multiple choice questions. These questions are grouped under various topic headings and at the end of each set of statements there is an open text box for any comments that you may have.

As a key stakeholder, you will be asked questions about your level of agreement with, and thoughts regarding those statements. When answering, you are asked to imagine yourself as a person who has notable influence over the future development of marine research tourism in Australia. In this role, your answers would have a notable influence on the future direction of marine research tourism in Australia.

For this study, it is important that your answers for each statement reflect your considered views about the various issues and potential for marine research tourism in Australia. Such views could combine;

1. Your overall concerns, values and/or aspirations for marine research tourism in Australia.
2. Your broad estimation of the real world resources that would be required to sustain or develop the principles or actions inherent in those statements.
3. The possible roles of government and other organisations.

This survey lists a set of **83** key stakeholder statements. You will be asked to respond to each statement in terms of how much you **agree** or **disagree** with that statement. If you read a statement that you;

1. Agree or disagree with and also consider it to be very important, then choose either the **strongly agree** or **strongly disagree** choice.
2. Agree or disagree with, then choose either the **agree** or **disagree** choice.
3. Are unsure if you agree or disagree with but would like more information to decide, then choose the **maybe** choice.
4. Do not consider to be important at all, then choose the **not important** choice.
5. Believe you are not familiar enough with the topic to suitably comment, then choose the **cannot say** choice.
6. Do not clearly understand, then choose the **statement is not clear to me** choice.

Particularly, if you disagree with a statement, please endeavour to record your reasons in the open text box at the end of each set of statements.

Each of the multiple choice questions should take about 10 to 20 seconds to answer. The estimated time taken to complete the survey is between 30 and 40 minutes. Please aim to complete all the questions. This survey is voluntary, anonymous and completely confidential.

Your views are very much appreciated.

Additional information

Please note, this survey will time out after 60 minutes of no survey activity. You will receive a message 15 minutes before this 60 minute timeout.

It has been suggested that the survey may be easier to undertake if you download the survey from here, print the survey as a landscape A4 print, read from and write notes on that printed copy, and then input the answers into the online version of the survey.

If you have questions at any time about the survey, please contact Peter Wood at 07 4042 1762 or at peter.wood@jcu.edu.au.

If you have any questions regarding the ethical conduct of the research project, please contact the James Cook University Ethics Officer, Tina Langford on 07 4781 4342 or tina.langford@jcu.edu.au.

This survey is part of PhD research project at the James Cook University titled „Development of marine research tourism across Australia". For more information on the PhD, please read the PhD information sheet.

This research is supported by the Sustainable Tourism Cooperative Research Centre, established by the Australian Commonwealth Government.

Please tell us about your occupation?

Would you describe yourself as a? (Please tick as many boxes that apply)

- [ ] Marine research tour operator
- [ ] Marine research tourism consultant
- [ ] Marine researcher
- [ ] Marine manager
- [ ] Marine tour operator
- [ ] Representative of a marine research society
- [ ] Representative of a marine education society
- [ ] Representative of an environmental conservation organisation
- [ ] Representative of a marine volunteer organisation
- [ ] Representative of an Aboriginal or Torres Strait Islander management organisation
- [ ] Representative of a tourism organisation
- [ ] Marine research student
- [ ] SCUBA dive operator
- [ ] Other

Which State of Australia (or elsewhere) do you reside in?

Northern Territory	South Australia	Tasmania	Western Australia	Queensland	New South Wales	Victoria	Australian Capital Territory	Other
○	○	○	○	○	○	○	○	○

The next part of this survey asks you questions about your level of agreement and thoughts about a number of individual statements.

These individual statements represent the views of 54 individual key stakeholders about the desired future for marine research tourism in Australia.

For convenience, these statements have been broken up into 15 different topics, namely;

1. Environmental topics
2. Community involvement
3. Education and interpretation
4. Research quality
5. Key stakeholder concerns
6. Marine researcher involvement
7. The role of marine research in marine research tourism
8. The marine research tourist
9. The marine research tourism attraction
10. The role of the media
11. Support infrastructure
12. A marine research tourism guide role
13. Good business principles
14. Proposed business aspirations
15. Marine research tourism broker and trail

Remember to answer the questions as if you are a person who has notable influence over the future development of marine research tourism in Australia.

Choose the strongly agree (or strongly disagree) option only if you consider that statement to be very important and you agree (or disagree) with it.

Topic 1. Environmental topics

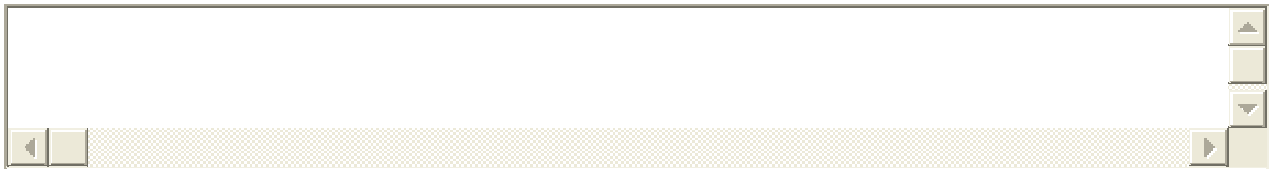
For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. Marine research tourism should always act to promote and create the most environmentally responsible tourism.

2. Marine research tourism should not only act to promote environmental sustainability and protection, but should act to promote the empowerment and restoration of nature.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.



Topic 2. Community involvement

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. Marine research tourism across Australia should have widespread and ongoing community involvement.

2. When possible, it is important that marine research tourism actively involve indigenous Australians within the direction, development, operation and benefits of Australian marine research tourism.

3. When possible, it is important that marine research tourism in Australia actively engage with indigenous Australians in the development of Indigenous focused marine research tourism businesses

_____

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.

Topic 3. Education and interpretation

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. It is satisfactory for some marine research tourism ventures to have quality educational outcomes but relatively poor marine research outcomes.

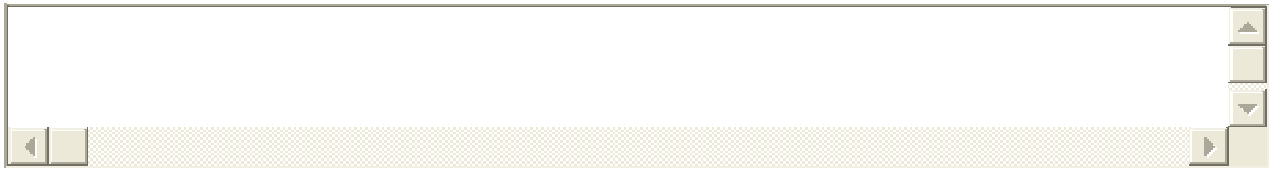
2. Marine research is a long term endeavour that is frequently set within a broad scientific context and this context needs to be carefully interpreted to tourists.

3. By adding a marine research narrative to their interpretative program, marine tour operators can enhance the tourist's experience and add to the tourist attraction.

4. The marine research program of any marine research tourism venture should always seek to effectively analyse, develop and communicate the resulting knowledge to marine researchers, tourists and other key stakeholders.

5. All marine research tourism operators should reach a high level of competence in the interpretation of the marine research.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.



Topic 4. Research quality

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. All marine research tourism ventures need to have clear, honest and achievable scientific goals.

2. The marine research on marine research tourism ventures should fit the following criteria: the data is acquired in an ethical manner, the data can be relied upon, the data is actually needed, the data is used, there is (or is credibly likely to be) a useful result, and when possible, the results should shared and published.

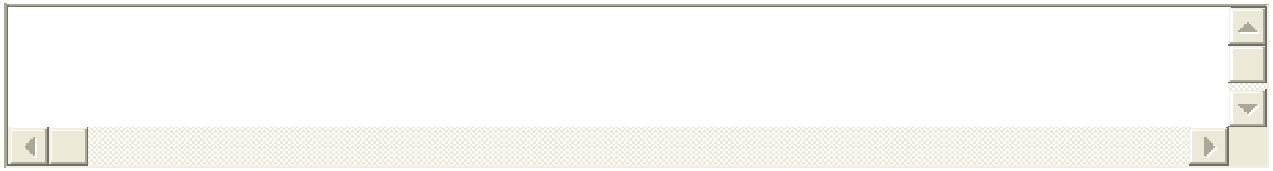
3. Until research from marine research tourism reliably meets the above conditions, many so-called marine research tourism ventures will continue to be nothing more than glorified holiday packages jumping on the "eco" bandwagon, conning their customers and devaluing the efforts of genuine marine research tourism ventures.

4. On a marine research tourism venture, the marine researcher should always be formally responsible for the quality and use of the marine research.

5. If done properly, marine research tourism can provide a cost effective option for marine research institutions to conduct effective marine research.

6. For a marine research tourism venture, there needs to be a method to capture, assess and use the tourists' own thoughts on future research directions and what they believe the key issues are for conservation.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.



Topic 5. Stakeholder concerns

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Please note, some of these key stakeholder statements could be considered contentious by other stakeholders. These statements are included in this survey so as to further understand how wide spread these contentions may be.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. A limiting factor for marine research tourism is the culture and psychology of key stakeholders such as marine managers, marine researchers and marine tour operators.

2. Australia marine research tourism needs to protect its reputation. If marine research tourists go home and say the diving was OK, the food and the company were OK, but they were 'spare wheels' as far as the project was concerned, neither they nor their friends will be back for a repeat experience. They will just go diving instead or join a marine conservation project where they can make a real contribution.

3. So that marine research tourism can assist marine management agencies, those agencies should become clearer about their research questions and what data needs collecting.

4. A potential major barrier to developing marine research tourism in Australia is lower cost marine research tourism opportunities for tourists in other regions of the world.

5. If marine research tourism is not officially considered as important by marine research and/or management agencies, then the advancement of marine research tourism is limited.

6. Australian government marine management and research organisations often act to hinder rather than help the marine research tourism industry.

7. Often the above hindrance by Australian government marine management and research organisations is due to an institutional prejudice against marine research tourism.

8. The diversion of Government funds from pure research to research tourism will divide the academic and the tourism industry and this will reduce the possibility of collaboration between marine researchers and marine research tourism industry.

9. Given Australia's sizable coastal and ocean territory, and relatively well developed marine research and tourism sectors; it is somewhat surprising that marine research tourism industry is not well developed in Australia.

10. It is somewhat surprising that there are not more marine research tourism ventures in Australia's southern temperate waters.

11. Unless volunteers are needed, marine research that can be undertaken on marine research tourism ventures could also be done on normal marine tour ventures, by scientists and crew, and without the active involvement of tourists.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.

Topic 6. Marine researcher in

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. In most cases (except with highly trained tourists and marine tour operators), marine researchers are essential for coordinating and quality assuring the research, monitoring and survey activity.

2. Willing, skilled and available marine researchers can be considered as among the rarest essential commodities for marine research tourism.

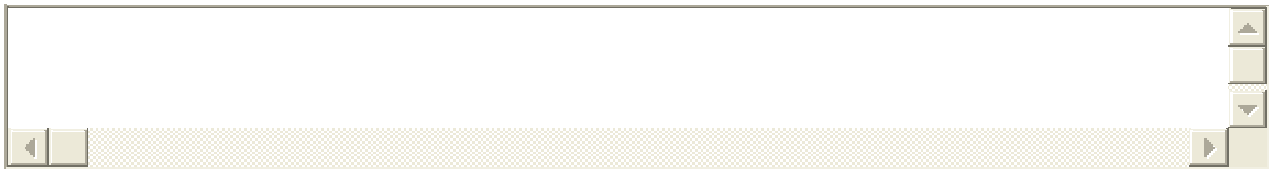
3. Hence, the development of marine research tourism in Australia will be limited by the availability of willing and skilled marine researchers.

4. The willingness of many marine researchers to participate in marine research tourism will be dependent on their recognition and acceptance of the benefits of marine research tourism.

5. Due to government funding constraints, one can assume that suitable financial or human resources for marine research tourism will not be available from existing marine research and management agencies.

6. Hence, in many cases, resources for employment of extra marine researchers on marine research tourism ventures will need to come from the private market.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.



Topic 7. The role of marine research in marine research tourism

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. A marine research tourism venture should be seen by marine research and management organisations as a highly desirable, reliable and cost-effective aspect of research operation.

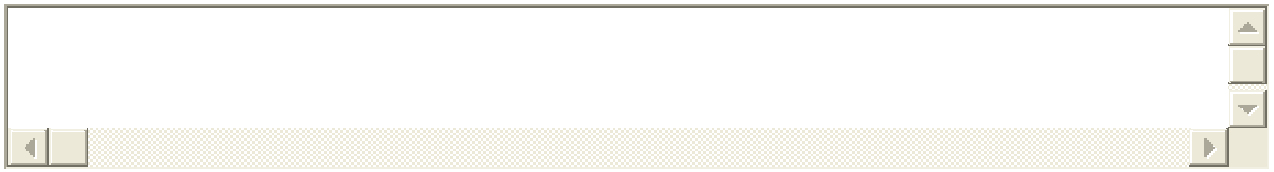
2. Supporting marine research tourism should become a mandated project area for government marine research and management programs.

3. A marine research tourism venture must be strongly supported by the researcher"s host organisations in terms of logistics and requirements for occupational health, safety and environment.

4. For commercial reasons, some marine research tourism ventures may choose to have an emphasis on satisfying the needs of tourist rather than an emphasis on research outcomes.

5. In the future, a marine research tourism venture should add to the prestige and scientific reputation of the project among scientific peers of the researcher.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.



Topic 8: The marine research tourist

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. Where possible, marine research tourism in Australia should seek to „open the doors" to the lay person and always make them feel welcome.

2. When on marine research tourism ventures, marine researchers should seek to recognise that it is a privilege to have people pay to be involved with them and to support their research.

3. Hence, marine researchers should recognise this important role of tourists by always treating them in a professional manner, communicating effectively and frequently, providing quality information about the marine research project, and thanking them for their contributions.

4. A marine research tourism experience can give a tourist a „religious" experience and an emotional connection to the marine environment, that leads to greatly enhanced and long term environmental awareness, conservation values, conservation action and stewardship.

5. The 'I always wanted to be a marine biologist' dream of many people is an important driver for marine research tourism. Marine research tourism should tap into that market.

6. In many cases, marine research is too complicated for the general public. To counter this, it is recommended that marine research tourism ventures undertake more popular and discovery - orientated marine research programs.

7. Without a clear link to a conservation goal, many marine biological studies will not appeal to tourists.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.

Topic 9. The marine research attraction

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. These days, many prospective marine research tourists have Discovery Channel expectations. To satisfy these tourists, they should receive an experience that satisfies those expectations.

2. As part of marine research tourism, marine researchers and the marine research environment are central parts of the tourist attraction.
3. Given appropriate crew, marine research tourism ventures should promote their crew as respected and renowned professionals in marine research.

4. The marine research activity that occurs at many marine research facilities can be of great interest to general members of the public including tourists.

5. Due to ongoing funding shortages, many remote marine research stations could financially benefit from appropriate involvement of marine research tourism.

6. Without interference in their marine research program, marine research stations could provide an authentic marine research backdrop for marine research tourism ventures to operate near.

7. Without interference in their marine research program, marine research stations could be involved in the logistical support for marine research tourism.

8. Without interference in their marine research program, some marine research stations could become suitable marine research tourism destinations.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.

Topic 10. The role of the media

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. Conservation and marine discovery media (e.g. documentaries, news articles, holiday TV) is part of a process that drives demand in marine ecotourism including marine research tourism.

2. This combination of media and marine research tourism can act to assist in changing public awareness and increasing the public's interest in marine research, conservation and management.

3. This in turn can act to affect government policy and action with regard to marine research, conservation and management

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.

Topic 11. Support infrastructure

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. When appropriate, marine research tourism should have strong supporting links with non government conservation organisations such as the Australian Marine Conservation Society and the World Wildlife Fund.

2. In appropriate situations, marine research tourism ventures should act to promote philanthropic donations from travellers and organisations.

3. Many marine and coastal volunteer programs can be an important part of marine research tourism infrastructure and services in Australia.

4. Marine educators and marine education societies can play an important role in the provision of organisational and information services to marine research tourism in Australia.

5. In the future, universities can play a major role in supporting, operating and benefiting from marine research tourism in Australia.

6. The long term development of marine research tourism in Australia should involve a broad network of marine research tourism ventures, marine discovery centres, community groups, volunteer groups, SCUBA groups, conservation agencies, marine research, and management agencies.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.

Topic 12. A marine research tourism guide role

A marine research tourism guide role is envisioned to be a paid role that ensures that the many needs of marine researchers, managers, tour operators and tourists are met.

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. A marine research tourism guide's formal career path could progress to a marine tour operator, marine manager, marine researcher or similar role.

2. A marine research tourism guide could be a formalised role within an organised Australian marine research tourism industry.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.

Topic 13. Good business principles

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. One important criterion for a stable marine research tourism venture is a long term government permit for access to and research in marine research areas.

2. There is a need to professionalise the marine research tourism industry in terms of staff, industry guidelines and services to tourists.

3. There is a need to professionalise the marine research tourism industry in terms of industry guidelines and services to marine researchers and managers.

4. The marine tour operator should be empowered so they are capable to undertake the high quality marine research support, interpretation and hospitality tasks that are required for a marine research tourism venture.

5. Any notable development of marine research tourism in Australia should be based on sound assessments of market/consumer demand. This would include assessments of affordability and perceived value for money.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.

Topic 14. Proposed business aspirations

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. A possible marine research tourism venture with great potential is a complete terrestrial to marine tourism research package, where people get to see an overall picture of the links between the sea and land, and how the two are intertwined.

2. The Undersea Explorer is often recognised as a good business model for marine research tourism. Is it reasonably to enquire why similar ventures have not been developed elsewhere, and also, how can similar ventures be developed elsewhere?

3. Where possible, marine research tourism vessels should at least provide free space for marine researchers.

4. Marine research tourism in Australia should aim to link, learn from and support marine research tourism in developed and less developed countries across the World.

5. To expand marine research tourism in Australia, there should be a memorandum of understanding of roles and commitments between key stakeholders.

6. When appropriate, to expand marine research tourism in Australia, there should be contractual agreements between key stakeholders that that outlines the roles and commitments of key stakeholders.

7. To expand marine research tourism in Australia, there would need to be a peer review system by the scientific community, of the research undertaken, the data collected, occupational health and safety, and education standards.

8. To expand marine research tourism in Australia and ensure desired quality, there would need to be a rigorous tender process that only grants operational licenses to quality assured marine research tourism operations.

9. To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that their marine research is high quality.

10. To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that their research knowledge will be shared with the tourist and marine research community.

11. To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that they have advanced NEAP Eco Certification (i.e. advanced ecotourism accreditation). Click here for information about NEAP Eco Certification.

12. To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that they are a best practice, ecologically sustainable tourism venture.

13. To develop marine research tourism in Australia, the first step is to convince the marine research community that; the involvement of research tourists is a good thing, that it is valuable in terms of data, that it won"t sap their time and financial resources, and that most importantly it won"t devalue their research and their sources of funding.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.

Topic 15. Marine research tourism broker and trail

For each of the following statements, please tick the box the best indicates how well you agree (or disagree) with that statement.

Strongly agree Agree Maybe Disagree Strongly disagree Not important to me Cannot say Statement is not clear to me

1. It has been suggested by key stakeholders that to notably develop marine research tourism across Australia, there is an opportunity for a number of collaborating yet competing marine research tourism broker roles across Australia. Such broker roles would act to support the interests of all key stakeholders by undertaking tasks such as the identification and development of marine research tourism, and facilitate permits, certification and training.

2. Marine research tourism should seek to develop a marine research tourism trail across Australia. This trail could consist of an organised network of different marine research tourism ventures and attractions across Australia.

3. Such a trail would be closely linked with Australian museums, zoos, aquaria, marine discovery centres, marine volunteer networks, marine research and management agencies, and the SCUBA industry.

4. Any development of such a trail would act to develop, link and co-promote a network of marine research tourism attractions across Australia.

5. Development of such a trail could be facilitated by a national organisation (comprised of representatives from Federal, State and Local organisations) that supports a number of marine research tourism broker organisations, which in turn support individual marine research tourism business.

If you have comments about the above topic, please write them in the below text box. If not, please continue to the next topic.

Finally, do you have any comments or ideas that would assist the development of marine research tourism in Australia? If so, could you write those comments or ideas in the below text box?

Thank you for taking this survey!

Your responses will assist with the development of a set of key stakeholder directed objectives for marine research tourism in Australia.

Appendix 13. Tourist preferences survey from research study three

A survey about the preferences of holiday makers for 12 marine research tourism holidays across Australia

Introduction

This survey is part of PhD research project at the James Cook University. The PhD is titled called 'Development of marine research tourism across Australia'. This PhD aims to explore the nature and future for marine research tourism across Australia. To assist with this goal, information is sought via this online survey about the preferences of holiday makers for 12 different marine research tourism experiences.

What is marine research tourism?

Marine research tourism is a form of marine tourism whereby marine research is an important part of the tourist attraction.

The survey

This survey is voluntary, anonymous and completely confidential. It consists of 22 questions and 2 parts, and is estimated to take 30 minutes.

Part 1 consists of 17 questions and should take approx. 5 minutes. Part 2 consists of 5 questions and should take between 5 and 10 minutes.

For part 2, you are asked to review **12 information sheets** about the 12 different marine research tourism holidays. For this survey, it is recommended that you print out the information sheets and familiarise yourself (5 to 10 minutes) with them.

Please aim to complete all the questions. If you have questions about the survey, please contact Peter Wood at peter.wood@jcu.edu.au or at 61+ 7 4042 1762.

If you have any questions regarding the ethical conduct of the research project, please contact the James Cook University Ethics Officer, Tina Langford on 61+ 7 4781 4342 or tina.langford@jcu.edu.au.

Please note, this survey will time out after 60 minutes of no survey activity. You will receive a message 15 minutes before this 60 minute timeout.

This research is supported by the Sustainable Tourism Cooperative Research Centre, established by the Australian Commonwealth Government.

PART 1 (Takes approximately 5 minutes)

Please tell us about yourself

1. Would you please tell us what country and town you are presently from? (Please enter your answer into the text box)

Town

Country

2. Are you male or female? (Please select one)

M F

3. Would you please indicate your age group? (Please select one)

18 – 30 31 – 40 41 – 50 51 – 60 61 – 70 71 +

4. How would you best describe your occupation? (Please select only one)

- Self-employed
- Professional
- Tourism employee
- Domestic duties
- Office/Clerical
- Marine educator
- Manual/Factory worker
- Retail
- Undergraduate marine research student
- Other student
- Public Service
- Management
- Marine scientist
- Tradesperson
- Postgraduate marine research student
- Other

5. When on a marine based holiday, would you generally describe yourself as a (Please select as many that apply)

- [ ] Marine wildlife tourist
- [ ] Adventure tourist
- [ ] Marine resort tourist
- [ ] Ecotourist (i.e. a traveller who seeks natural area experiences that foster environmental and cultural understanding, appreciation and conservation
- [ ] Scuba diver
- [ ] Volunteer tourist (i.e. a traveller who volunteers to help other people and/or the environment)
- [ ] Snorkeller
- [ ] Experienced marine research tourist
- [ ] Nature enthusiast
- [ ] Backpacker
- [ ] Educational tourist (i.e. a person who travels to learn and be educated)
- [ ] Gap year traveller (i.e. a person who takes one or more years off from a study program to travel)
- [ ] Free and independent
- [ ] Experience seeker (i.e. a traveller who seeks in depth knowledge of a destination)
- [ ] Other

6. Would you please tell us about your formal educational background? (Please select one)

( ) High School ( ) University ( ) Technical college ( ) Other

7. When at home, how many times per week would you watch television nature documentaries? (Please select one)

( ) Not at all ( ) Once or twice ( ) 3 to 5 times ( ) More than 5 times

8. When at work, do you often work in an outdoor environment? (Please select one)

( ) Not often ( ) Sometimes ( ) A lot

9. Do you have a working background in natural science or the environment? (Please select one)

( ) Yes ( ) No

9b. If you are a marine researcher, what is your research speciality? (Please enter your answer into the text box)

10. Are you a supporter of an environmental conservation organisation?
(Please select one)

No If yes, please give an example

10b. Are you an active member of a volunteer organisation?
(Please select one)

No If yes, please give an example

Please tell us about your commercial tourism experiences in whale or dolphin watching, snorkelling or scuba diving.

11. Whale or dolphin watching experience (Please tick the appropriate boxes)

	No	Once	2 to 4 times	5 to 10 times	11 or more times
Have you ever been on a whale or dolphin watching tour?					
In the last year, have you ever been on a whale or dolphin watching tour in Australia?					

12. Snorkelling experience (Please tick the appropriate boxes)

	No	Once	2 to 10 times	11 to 50 times	51 or more times
Have you ever snorkelled in a marine environment?					
In the last year, have you ever snorkelled in a marine environment in Australia?					

13. Certified scuba diving experience (Please tick the appropriate boxes)

	No	Once	2 to 5 times	6 to 20 times	21 or more times
Have you ever undertaken certified scuba diving					
In the last year, have you ever undertaken certified scuba diving in Australia?					

14. If you are a certified scuba diver, how many certified scuba dives have you undertaken (Please select one)

1–10 11 – 30 31 – 60 61 – 100 101 +

15. How would you rate the importance of the following features for any of your tourism experiences? (Please tick the appropriate boxes)

	Not very	Somewhat	Very important

	important	important	
High levels of adventure			
High levels of hospitality (e.g. accommodation, food, service, comfort)			
High levels of learning			
Having fun			
Experiencing new things			
A small size of the tour group			
A high level of interaction with the local culture			
Social interaction with others			
Experiencing solitude, tranquillity, and closeness to nature			
Being with friends, family or partner			

16. What activities would best describe what you would consider as a very high level of adventure for yourself. (Please select one or more boxes)

- [ ] Swimming
- [ ] Snorkeling
- [ ] Scuba diving
- [ ] Open ocean sailing
- [ ] Swimming with tiger sharks
- [ ] Other

17. What type of accommodation would best describe the basic level of hospitality that you would be satisfied with. (Please select one)

- ○ Camping on the beach (with basic meals)
- ○ A self contained beach hut
- ○ A fully serviced English pub
- ○ A four star resort in Fiji
- ○ A 100 foot super yacht
- ○ Other

PART 2 (Takes between 5 and 10 minutes)

Please tell us about your preference for different marine research tourism ventures

Before answering the next 5 questions, please review the 12 marine research tourism holidays that are listed in this attached **PDF file**.

When reviewing, please focus on those aspects of the 12 different ventures that you would like or not like to experience.

The 12 marine research tourism holidays are;

1. A coral spawning research and adventure trip on a tropical coral reef
2. A bottlenose dolphin education holiday on the southern Australian coastline
3. Volunteer at a penguin rescue centre on the southern Australian coastline
4. Survey coral reefs and help assess the impacts of climate change on coral reefs
5. Work with marine turtles and indigenous rangers in remote northern Australia
6. Biodiversity and habitat mapping in north Western Australia
7. Volunteer and train at an Australian whale and dolphin research institute
8. A day trip to the reef with some marine research as part of the attraction
9. Sail, volunteer and track blue whales in the Southern Ocean
10. A continuous sailing expedition to explore and help research the oceans of Australia
11. A submersible research expedition to Australia's Bon Hommey undersea ridge
12. Research, education and adventure across the Whitsundays of Tropical Queensland

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18. **If the cost of each venture was not an obstacle**, how interested would you be to participate as a tourist in each of the 12 marine research tourism ventures? (For each venture, please tick the appropriate box)

	Very interested	Possibly interested	Not interested	You would rather watch the television documentary
1. A coral spawning research and adventure trip on a tropical coral reef	○	○	○	○
2. A bottlenose dolphin education holiday on the southern Australian coastline	○	○	○	○
3. Volunteer at a penguin rescue centre on the southern Australian coastline	○	○	○	○
4. Survey coral reefs and help assess the	○	○	○	○

impacts of climate change on coral reefs				
5. Work with marine turtles and indigenous rangers in remote northern Australia				
6. Biodiversity and habitat mapping in north Western Australia				
7. Volunteer and train at an Australian whale and dolphin research institute				
8. Day trip to the reef with some marine research as part of the attraction				
9. Sail, volunteer and track blue whales in the Southern Ocean				
10. A continuous sailing expedition to explore and help research the oceans of Australia				
11. A submersible research expedition to Australia's Bon Hommey undersea ridge				
12. Research, education and adventure across the Whitsundays of Tropical Queensland				

19. If you were choosing to travel on a marine research tourism venture, how would you rate the importance of the following features in terms of your choice of marine research tourism venture? (Please tick the appropriate boxes)

	Not very important	Somewhat important	Important	Very important
The importance of marine research program to the marine research community				
Learning from the marine researchers				
A high level of involvement in the marine research program				
The high level of marine research training that you can receive				
The high number of training days you can be involved with				
The high level of skill and knowledge needed to participate				
A high level of marine research education you can receive				
The marine research technology or research facility that you can be involved with				
The experience of the marine researchers who are undertaking the research				
Your high level of involvement in conservation of marine wildlife or habitat				
The destination (e.g. an island, a coral reef, the southern ocean, a sailing trip, a resort, etc.)				
The opportunity to have fun				
The main vessel (e.g. ship or boat) that is used for travel and research (if applicable)				
The marine wildlife that is being researched				
A high level of adventure found on the venture				
The duration of the trip (including any time on a boat)				
The high quality of the marine researchers who are undertaking the research				
A high level of solitude, tranquillity, and closeness to nature whilst on the venture				
A high level of social interaction with others on the venture				
A high level of interaction with the local people				
Avoiding sun burn, cold exposure and/or sea sickness				
A high level of self sufficiency needed while on the venture				
An opportunity to receive recognised marine research education and training				
There is an offshore boating or sailing experience				
The opportunity to scuba dive				
The opportunity to explore marine phenomena and discover new things				
Other				

If other, please enter a brief description of this in the text box

20. Have **you** ever been involved with a marine research tourism experience (i.e. a marine tour where **marine research is part of the attraction**)?

If **no**, please go to question 21

If **yes**, please provide a brief summary below of one of your experiences

a. Destination (e.g. Costa Rica)

b. Company name (e.g. Norska ventures)

c. Type of marine research activity (e.g. whale watching, coral reef survey, turtle protection)

d. Year of trip (e.g. 1997)

21. **If you are a marine researcher or marine research student**, how interested would you be to have paid work as a marine researcher on each of the 12 ventures? (For each venture, please tick the appropriate box)

If you are not a marine researcher or marine research student, please go to last question.

	Not interested	Possibly interested	Interested	Very interested
1. A coral spawning research and adventure trip on a tropical coral reef	○	○	○	○
2. A bottlenose dolphin education holiday on the southern Australian coastline	○	○	○	○
3. Volunteer at a penguin rescue centre on the southern Australian coastline	○	○	○	○

4. Survey coral reefs and help assess the impacts of climate change on coral reefs				
5. Work with marine turtles and indigenous rangers in remote northern Australia				
6. Biodiversity and habitat mapping in north Western Australia				
7. Volunteer and train at an Australian whale and dolphin research institute				
8. Day trip to the reef with some marine research as part of the attraction				
9. Sail, volunteer and track blue whales in the Southern Ocean				
10. A continuous sailing expedition to explore and help research the oceans of Australia				
11. A submersible research expedition to Australia's Bon Hommey undersea ridge				
12. Research, education and adventure across the Whitsundays of Tropical Queensland				

22. Last question: Are there any other comments that you would like to make? (Please write any comment in the text box)

Thank you for taking this survey. All the very best to you!

Please contact peter.wood@jcu.edu.au if you have any questions regarding this survey.

Appendix 14. Method for selecting significant MRT product preferences, market segments and criteria in research step two, study three

This study sought to describe the preferences of potential MRT tourists for different MRT products, locations and activities in Australia. In doing so, it derived information about the preferences of potential MRT tourists for twelve MRT products in Australia and associated benefits. This next section summarises the outstanding market segments and associated benefits for each of the twelve possible MRT products for Australia. To complement this summary, outstanding MRT criteria that describe each of those MRT products from Chapter 4 are also presented.

Outstanding market segments, benefits and MRT criteria were identified if their relative levels of presence were in the top 30% or bottom 30% of their range across the relative sample. For example, a MRT product was identified as more likely to be preferred by regular nature documentary watchers if the corresponding market segment criteria was considered to be relatively more important (e.g. rated 2.5 whereby 1 is considered not important and 3 is considered to be very important) and the value of 2.5 was in top 30% of importance related values across each off the twelve MRT products. An example of this is in Table 15-1 whereby survey respondents who regularly watched nature documentaries 3 to 5 times per week placed relatively higher levels of importance on MRT products 1, 4, 5 and 11 (bold in table). This market segment and corresponding MRT products were considered to be 'outstanding' if their value was above the top 30% (i.e. 2.49) of all values across the 12 MRT products. In this case, three MRT products were identified.

Table 14-1: An example of identifying outstanding market segment criteria (i.e. regular nature documentary watchers)

	Product number												
Example market segment criteria	1	2	3	4	5	6	7	8	9	10	11	12	**Percentile (top 30%)**
Regularly watch nature documentaries 3 to 5 times per week	**2.52**	*2.41*	2.07	**2.50**	**2.52**	2.05	*2.46*	*2.41*	*2.46*	*2.43*	**2.59**	*2.48*	2.49
Regularly watch nature documentaries more than 5 times per week	**2.60**	**2.68**	2.32	2.40	**2.80**	2.48	2.36	2.44	2.44	2.20	**2.56**	2.40	2.54

To complement this numerically based selection process, the PhD researcher also reviewed the data to confirm these selected criteria and identify any outstanding criteria and corresponding products. For instance, MRT products 2, 7, 8, 9, 10, and 12 (italics in table) were also identified as outstanding because their rated importance values for the nature documentary (3 to 5 times per week) criteria were greater than 2.4 and this also indicates a relatively higher level of importance was placed on that criteria for those products. On the other hand, the nature documentary (3 to 5 times per week) criteria were not selected for MRT products 3 and 6 their importance values were 2.07 and 2.95 respectively.

Appendix 15. Full referred paper to the World Coastal and Marine Tourism (CMT) Congress at Port Elizabeth, South Africa in 2009

KEY STAKEHOLDER VIEWS OF MARINE RESEARCH TOURISM IN AUSTRALIA

Author: Peter Wood[1] and John Rumney[2]
Affiliation: James Cook University and Sustainable Tourism CRC[1] and Marine Encounters[2]
Address: Tourism Program, School of Business, James Cook University
P.O. Box 6811, Cairns Mail Centre, Cairns 4870, Queensland. Australia
E-mai1: Peter.Wood@jcu.edu.au

ABSTRACT

Marine research tourism (MRT) is defined as marine ecotourism where marine research is an important part of the tourism attraction. The the aim of this study was to further understand the supply side views of Australian MRT stakeholders towards the present and any potential development of MRT in Australia. An online survey of 49 key stakeholders views and subsequent analysis was undertaken. Stakeholders were asked 19 questions about their views on; the benefits of, driving forces, issues, and opportunities for, and the role of private industry and government in MRT in Australia.

This study identified three likely benefits of MRT that can be considered to be a core competitive advantage for MRT when compared with many marine tourism or ecotourism ventures. The potential for increased opportunities and benefits of MRT to indigenous Australians is also identified. Survey respondents also identified a range of potential coordination and service provision roles for Australian indigenous groups, environmental conservation organisations and marine education societies in any coordinated development of MRT in Australia. Academic publications and the involvement of marine research agencies with MRT were identified as important or essential to MRT.

Overall, conservation organisations, marine education societies, marine research students, tour organisations, and MRT operators had positive views about MRT in Australia. However, many marine managers, researchers and tour operators appeared to have a reticence towards MRT. This reticence is partly due to MRT related concerns that have not previously been identified in the literature. They are; possible independent influence from other MRT stakeholders on established marine research agendas, possible competition by MRT for traditional research funding, and the possibility of popular MRT science competing with less popular but important marine research priorities. To address such concerns, this paper recommends a range of strategies for any coordinated strategic plan to develop MRT in Australia.

Key Words: Marine, Science, Tourism, Stakeholder, Ecotourism

ACKNOWLEDGEMENTS

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The author thanks Dr. Heather Zeppel for the PhD supervisor overview of the PhD research that supports this paper.

INTRODUCTION

Marine research tourism is defined as marine ecotourism where marine research is an important part of the tourism attraction (adapted from Benson, 2005). This paper reports on a study that aimed to further understand the views of key stakeholders towards the supply of present and future of MRT in Australia. The following topics were addressed;

1. The potential benefits of marine research tourism
2. Private industry involvement in marine research tourism
3. Government involvement in marine research tourism
4. Driving forces and issues for marine research tourism in Australia
5. Opportunities for marine research tourism stakeholders in Australia

For this paper, key Australian marine research tourism (MRT) stakeholders include marine researchers, marine managers, marine conservation groups, marine education groups, marine tour operators, and tourists from Australia and elsewhere (adapted from Coghlan, 2007, Cuthill, 2000, Musso & Inglis, 1998). Furthermore, a MRT product must last for one or more days, be advertised publicly, take paying tourists or paying volunteers, and operate on a commercial basis (adapted from Ellis, 2003a). Additionally, likely features of a MRT product are considered to be (Benson, 2005):

1. There is an opportunity for tourists and/or volunteers to be involved with marine research activity
2. There are researchers who are engaged in genuine marine research pursuits
3. There is an official research centre that supports research activity
4. There is active involvement of the tourist in the marine research experience
5. There is research supervision for any tourist marine research activity

Significantly, this study uncovered some key stakeholder concerns or issues that have not been previously identified in the academic literature. It also identifies and discusses a range of stakeholder views, driving forces, benefits, opportunities, and other concerns or issues about the present and future of MRT in Australia. Study outcomes include a range of recommended key strategies for any coordinated strategic plan to develop MRT in Australia.

STUDY

Marine research tourism globally and in Australia

Both marine and terrestrial research tourism have developed from a handful of localised operators in the late 1960s to early 1970s to at least twenty well known regional and globally focused operators (Cousins, 2007; Ellis, 2003b; Morse, 1997). These days, the majority of regional or globally research tourism operators are companies based in the United Kingdom or United States of America (Cousins, 2007; Ellis, 2003b; Lorimer, 2008; Whatmore, 2008). Those companies include the Earthwatch Institute, the Oceanic Society, Conservation Volunteers Australia, the Tethys Institute, Global Vision International, and the Whale and Dolphin Conservation Society. The distribution of these research tourism products is not evenly distributed with Central and South America accounting for 30%, North America 20%, Europe 17%, and Australia/New Zealand and the Pacific 14% (Ellis, 2003b).

A brief assessment of MRT in Australian indicates that it is mostly characterised by about twenty five small, autonomous, and privately owned enterprises that operate about 30 ventures across Australia (Figure 1). There is a notable absence of regional and globally based operators in Australia. The exception is the Earthwatch Institute who offers whale shark research and sea turtle research marine ecotourism ventures in northern Australia. Ten of these twenty five enterprises offer MRT experiences on a regular basis, while the remainder offer MRT experiences on a seasonal and/or one off basis. Furthermore, ten enterprises offer MRT experiences that last one or more weeks and seven enterprises offer predominantly marine education experiences that can last up to one day. Examples of MRT ventures in Australia include; the Undersea Explorer (1 on Figure 1), Landscope Expeditions (7), The Pacific Marine Life Institute (12), Kangaroo Island Marine Tours (15) and the Lakes Explorer (19). 11 of these enterprises operate in the Great Barrier Reef region in Australia, 12 operate in temperate Australia, 5 in north Western Australia, and two in the Gulf of Carpentaria.

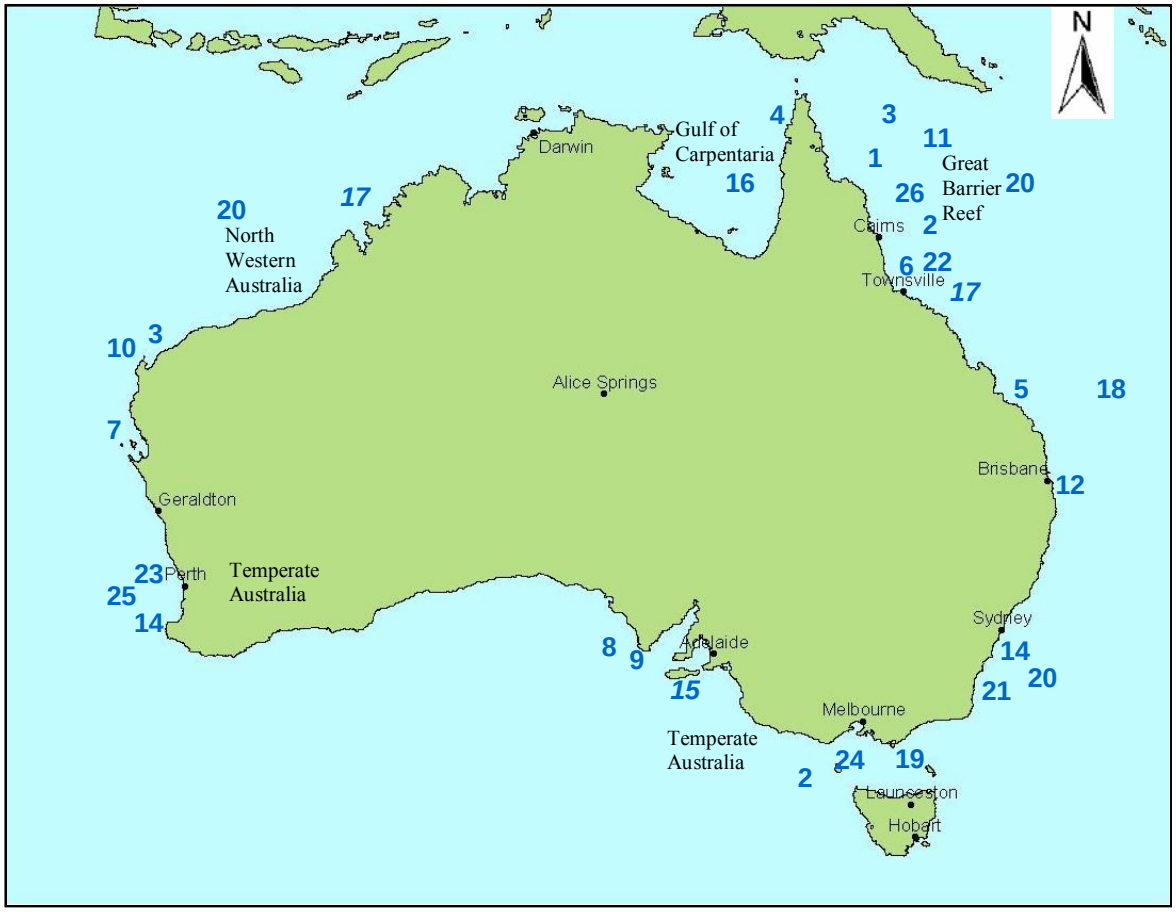

Figure 1: Distribution of known MRT ventures in Australia

When compared to the globalised MRT from the United Kingdom or United States of America, it can be reasoned that the MRT industry in Australia is relatively under developed or at least under-coordinated. This could be considered as surprising as, in world terms; Australia has a relatively mature marine tourism industry, an advanced marine research sector, a wealth of marine wildlife and other natural assets, and a large ocean and coastal region. It could be proposed that Australian MRT has potential (albeit an undetermined potential) to be further coordinated and developed.

Known stakeholder issues

Key MRT stakeholders often have conflicting views as to the operation and development of MRT ventures (Coghlan, 2008; Cuthill, 2000; Musso & Inglis, 1998). For example, research tourism participants often seek substantial personal benefits from their volunteer tourist experience (K., 1981). However, volunteer expedition leaders are typically more focused on their research rather than the interests of the tourist (Coghlan, 2008). Additionally, the marine tour operator may be too busy and not suitably trained to effectively support the interests of marine researchers (Musso and Inglis, 1998). Environmental managers and scientists can have very different perceptions and expectations regarding the role of science in managing wildlife tourism (Rodger & Moore, 2004). Furthermore, conservation organisations who may also seek to promote conservation outcomes from MRT ventures but may not appreciate the business requisites of the marine tourism operator (Cousins, 2007; Vaughn, 2000). To address such conflicting views and form partnerships, Cousins (2007), Coghlan (2007), Cuthill (2000) and Musso & Inglis (1998) all recommend that the views of stakeholders should be understood and satisfied.

The research aim

Ellis (2003a) reasoned that research tourism may continue to grow if there is an increase in the involvement of stakeholder's who are skilled and knowledgeable about MRT operations and development. It is also reasonable to suggest that increased stakeholder involvement is more likely if they have favourable views towards MRT. If key stakeholders have conflicting views towards MRT, then to progress MRT and form partnerships, these concerns would need to be addressed. However, no research has specifically reported on the views of key stakeholders about MRT in Australia. Therefore, to address this research gap, the aim of this study is to further understand the supply side views of Australian MRT stakeholders towards the present and any potential development of MRT in Australia.

Method

An anonymous online survey was devised for key stakeholders to undertake. The survey was taken by 49 key stakeholders between April 2007 and September 2007. There were 19 questions (Table 1) within this self administered survey. These survey questions were derived from a literature review and preliminary discussions with approximately 10 key stakeholders. Of the 49 survey respondents, 44 were from Australia and 5 were from elsewhere. Survey respondents were identified through word of mouth recommendations from other stakeholders, and direct contact with marine tourism, research, conservation and education institutions across Australia, and elsewhere.

Survey responses were interpreted according to the knowledge of the principal researchers, one of whom has 15 years experience as MRT operator. This knowledge was also acquired through evaluation of previous literature, previous discussion with approximately 10 key stakeholders, analysis of survey results, and follow up discussions with approximately 30 key stakeholders.

Furthermore, all survey respondents were professionals from their stakeholder group. They were also, at least from their stakeholder view point, somewhat knowledgeable about MRT. Many stakeholders had high levels of expertise in this topic. Given this, it is proposed that the survey respondent's views carry notable credence, and could, if they were asked, represent an official position from their relevant stakeholder organisation. A breakdown of the stakeholder groups of all survey respondents is shown in Table 2.

Table 1: Survey questions

Question No.	Survey questions
	Benefits of marine research tourism
1	What are the likely benefits of marine research tourism?
2	From a list, which key stakeholders possibly benefit from MRT?
3	Who else could benefit from MRT?
	Private industry involvement in marine research tourism
4	Can MRT be used to successfully diversify marine tourism in Australia?
5	Can MRT be used to effectively compete with international marine tourism attractions?
6	Can the commercial viability of existing marine tourism operators be improved by one or more MRT experiences?
7	A review of existing MRT venture web sites indicates that more than 95% of MRT ventures are privately operated. Would you be able to comment on why this is so?
	Government involvement in marine research tourism
8	Should MRT marine research programs always be relevant to Government marine research or management priorities?
9	Can MRT ventures involve popular marine science that does not address current Government marine research or management priorities?
10	How important are academic publications and conference presentations to a MRT venture?
11	Could increased academic publications or conference presentations from MRT ventures be an incentive for governments to be further involved in MRT ventures?
12	How important is the involvement of government marine management agencies in MRT across Australia?
13	How important is the involvement of government marine research agencies in MRT across Australia?
	Driving forces, major factors, issue, and constraints
17	What are the driving forces behind MRT?
15	What issues would concern you most about any expansion of MRT across Australia?
	Opportunities
16	How could the benefits from marine research tourism be increased?
17	What are the likely roles of Australian indigenous people towards the development of MRT?
18	What are the likely roles of environmental conservation groups towards the development of MRT?
19	What are the likely roles of marine education societies towards the development of MRT?

Results and discussion

Table 2: The stakeholder groups of survey respondents

Occupation of respondent	Number
Postgraduate marine research student	3
Marine manager	6
Marine research tour operator	5
Marine researcher	9
Marine tour operator	6
Marine education society	7
Tourism organisation	5
Environmental conservation organisation	7
Not known	1
Total	49

The likely benefits of marine research tourism

Question 1. What are the likely benefits of marine research tourism?

Likely benefits of MRT to stakeholders are said include; financial and human resource contributions to marine research and management programs, education benefits to marine research tourists, and a marketing brand for marine ecotourism (Curtin & Wilkes, 2005; Cuthill, 2000; Darwall & Dulvy, 1996; Ellis, 2003a, 2003b; Foster-Smith & Evans, 2003; Musso & Inglis, 1998; Villeneuve, Bouchard, & Laliberte, 2002).

Table 3 shows the views of survey respondents to the question about likely benefits of MRT. These suggested MRT benefits can be considered to be a core competitive advantage for MRT when compared with many marine tourism or ecotourism ventures. For example, MRT can provide better research access to remote marine locations, increased and faster monitoring, data collection and processing, increased spatial range and research effectiveness, and increased funding for marine research. It is likely that such potential benefits would be considered highly desirable by many marine research and management agencies.

MRT can also result in increased community (i.e. the tourist and the broader community) education, awareness and stewardship of the marine environment. This result infers that seeking such outcomes is or should be an intended objective of MRT. Five survey respondents identifies that MRT can result in increased community ownership, support and capacity in marine management and research. There are also identified opportunities for the tourist to participate through professional development and contributing their skills and worldviews to the marine research, discovery, management, and conservation process.

Table 3: Likely benefits of marine research tourism

Identified likely benefit	No.
Increased community awareness and stewardship of research and conservation issues	17
Increased funding and other resources for marine research	17
Increased and faster monitoring, data collection and processing	11
Increased community ownership, support and capacity in marine management and research	5
Increased speed, spatial range and effectiveness of research	2
Better access to remote locations	2
Co-management and funding of resources	1
Diversity of tourist worldviews and skills that can assist the research process	1
Professional development of tourists	1
Tourists who feel they have contributed to something important like a significant marine conservation outcome	1
Improve the tourist's experience by exceeding their expectations of depth of involvement with the marine environment and researchers	1

Finally, these results highlight two potential key objectives of MRT that can enhance the tourist's experience and increase their awareness and stewardship of the marine environment. That is, MRT can seek to; encourage the tourist to feel that they have contributed to something important such as a significant marine conservation outcome, and also exceed the marine tourist's expectations in terms of the depth of interaction with the marine environment and researchers. These two objectives are also important as they relate to a need to appeal to and satisfy the marine conservation and discovery preferences of marine research tourists as described by Wood and Zeppel (2008).

Question 2. Which key stakeholders could possibly benefit from MRT?

Figure 2 shows that key stakeholders considered indigenous Australian organisations, private marine researchers, dive training organisations, and government marine management and research agencies are likely or very likely to benefit from MRT in Australia. Perhaps surprisingly, is the listing of indigenous Australian organisations as the most likely to benefit from MRT as just 1 (i.e. venture no. 4) of the 30 MRT ventures shown in Figure 1 is known to involve indigenous Australian organisations. Such a result indicates then there is potential growth for MRT in Australia that involves indigenous Australian organisations.

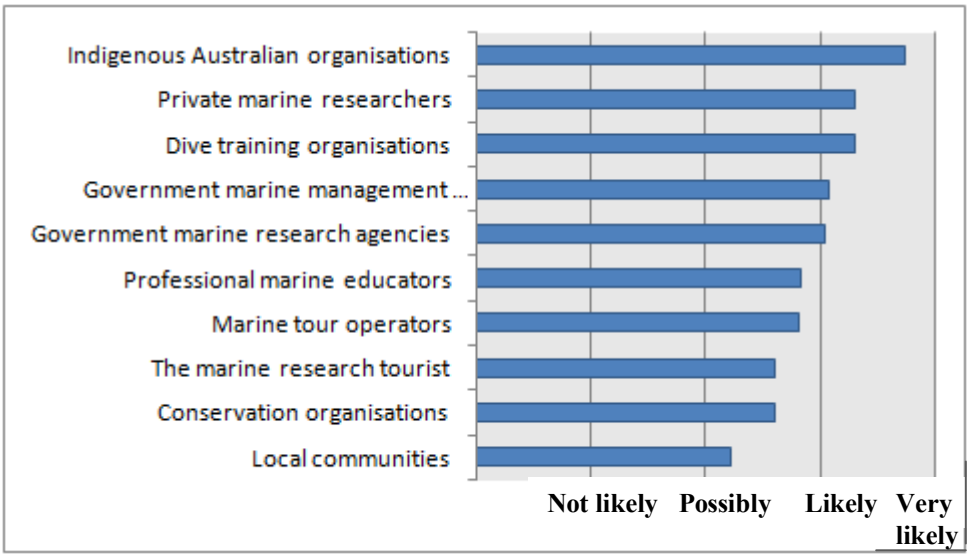

Figure 2: Possible beneficiaries from MRT

Figure 2 also shows that, on average, key stakeholders considered local communities conservation organisations as just 'possible' beneficiaries of MRT in Australia. Furthermore, marine tour operators and professional marine educators were considered to be somewhere between possible and likely beneficiaries of MRT. Analysis of the underlying data indicates that much of this outcome can be attributed to the survey responses of marine managers, tourism organisations, and marine tour operators. In contrast to the other stakeholder groups, they considered environmental conservation organisations, local communities and marine education societies as only possible beneficiaries. A possible explanation for this is that marine managers may be cautious about increasing the influence of conservation organisations, local communities and marine education societies in determining marine management priorities through MRT. Also, some tourism organisations, marine tourism operators may be cautious about involving conservation organisations, local communities and marine education societies in the operations of marine tourism.

On average, key stakeholders also considered the marine research tourist as just a 'possible' beneficiary of MRT in Australia (Figure 2). Analysis of the underlying data indicates that much of this low outcome can be attributed to the unfavourable survey responses of marine managers, researchers, and tour operators. All other stakeholders considered the marine research tourist to be a likely beneficiary. It's possible that this is explained by these three stakeholder groups being less familiar or more sceptical about tourists receiving benefits from being involved with marine research. A possibly suitable response to address the latter concern is that, if a MRT experience can be correctly delivered, then suitably motivated tourists will greatly benefit from that experience in terms of a deeper and closer encounter

with the marine environment. This in turn, may result in their increased education and awareness of marine research, conservation and management practices and issues.

Question 3. Who else could benefit from MRT?

Key stakeholders were also asked who else could benefit from MRT. Responses included universities and technical colleges, the broader tourism industry, tourists, local businesses, schools, children, the wider public, marine wildlife and habitats, commercial fisherman, and sea food consumers. This information indicates that if MRT is developed appropriately then there may be many potential beneficiaries from MRT

Supply - Private industry involvement in marine research tourism

Question 4. Can MRT successfully diversify marine tourism in Australia?

Figure 3 illustrates that most key stakeholder groups had positive views (i.e. yes or maybe) that MRT can be used to successfully diversify marine tourism? Such a result may indicate that, depending on commercial viability, there is an opportunity for an increased MRT role in some marine tourism ventures in Australia. Just two stakeholders (i.e. a marine manager and a current MRT operator) considered that marine tourism could not successfully diversify MRT in Australia. However, in other survey results, these two stakeholders positively commented about potential opportunities for MRT in Australia. A possible interpretation of their views is that they consider popular marine tourism, with its mass tourism characteristics, as unlikely to adapt or successfully support a MRT experience.

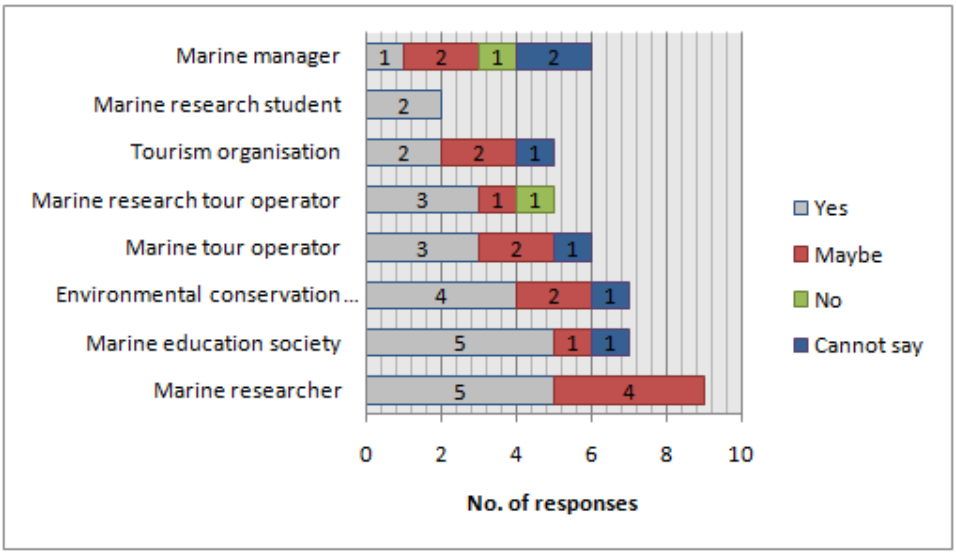

Figure 3: Using marine research tourism to successfully diversify marine tourism

Question 5. Can MRT be used to effectively compete with international marine tourism attractions?

Figure 4 illustrates that most key stakeholder groups were of the positive view that MRT can or may be used to effectively compete with international marine tourism attractions? This result indicates that there is an opportunity for Australian tourism product developers (e.g. tourism operators and marketing organisations) to actively support the development of MRT products in Australia so as to increase the competiveness of the Australian marine tourism industry.

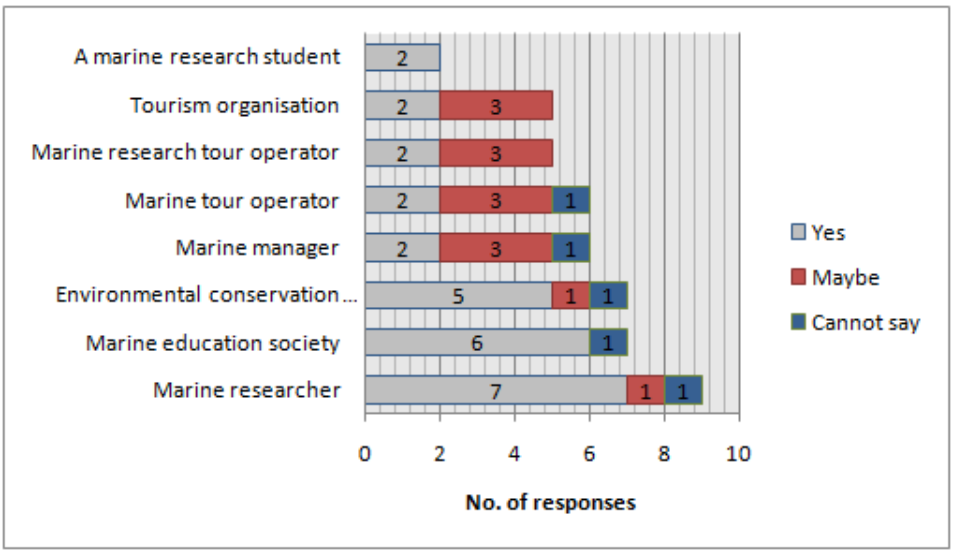

Figure 4: Using MRT effectively compete with overseas marine tourism attractions

Question 6. Can a MRT experience improve the commercial viability of marine tourism?

Figure 5 shows that 30 key stakeholders had positive responses (i.e. likely or very likely) to this question. Not surprisingly, 5 out of a total 5 MRT operators considered that a MRT experience as likely or very likely to improve the commercial viability of a marine tourism venture. Tourism organisations had a more positive view (i.e. 3 likely and 1 possibly) to this question, and this may indicate an inclination of tourism organisations to favour diversification and product development where possible. Many marine education societies, environmental conservation organisations, and marine research students also had favourable views towards this question. This is likely to represent their overall enthusiasm for the potential of MRT in Australia and perhaps reflects some naivety to the requisites of operating a commercial marine tour.

However, other marine tour operators had mixed views with 3 favourable views and 2 not favourable views (i.e. possibly or unlikely). This indicates that some marine tour operators are sceptical about the commercial viability of including a MRT experience in their marine tour. Furthermore, marine managers and researchers had mixed views as well and this may indicate that these stakeholder groups are reticent to have a service role that delivers marine research as an attraction to marine tourists.

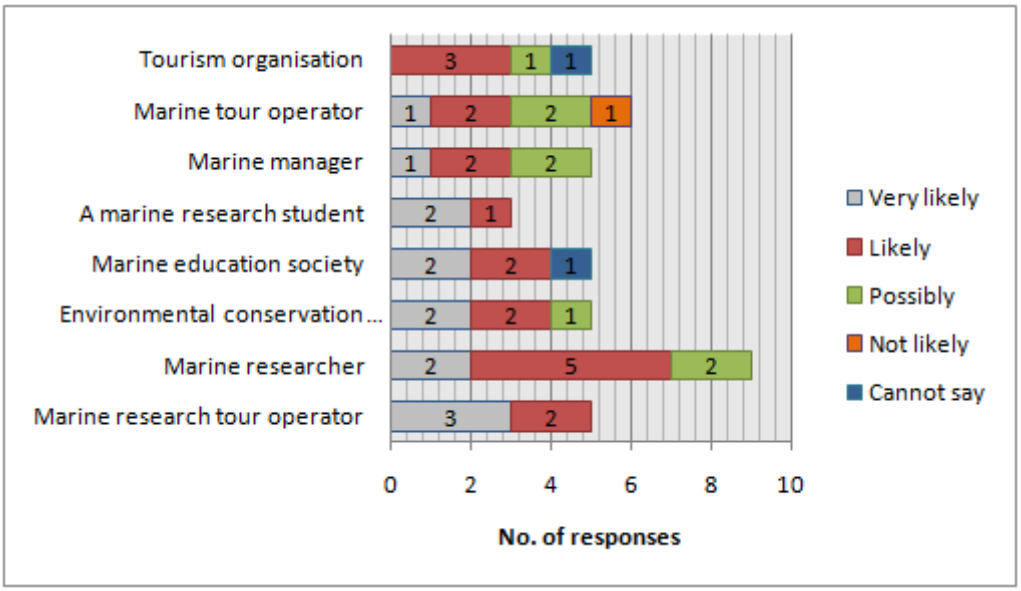

Figure 5: Possibility of improving commercial viability of marine tourism

Question 7. Why is more than 95% of Australian MRT ventures privately operated?

A pre-survey review of existing Australian MRT indicated that more than 95% of MRT ventures are privately operated. When asked about this, the overall response from survey respondents was directed at government caution to be involved, the tourism industry's higher capability to operate tourism ventures, and business and lifestyle benefits to MRT tour operators. Full results are listed in Appendix 1. Government caution was said to be due to marine research quality issues, bureaucracy, scepticism of MRT as a reliable marine research capability, and occupational health and safety issues. Such a result provides many reasons as to why government marine research and management agencies appear to be cautious when considering their involvement and role in MRT.

Supply - Government involvement in marine research tourism

Question 8. Should the marine research programs on MRT venture's research programs always be relevant to government marine research or management priorities?

Figure 6 indicates mixed views by stakeholders towards the relevance of MRT marine research programs to government marine research or management priorities. Notably, 5 out of 8 marine researchers considered marine research program relevance as not important. Only 1 of 6 marine managers considered marine research program relevance to be compulsory. These results clearly indicate that many marine researchers and managers do not believe that marine research programs on MRT ventures programs should always be relevant to government marine research or management priorities. Notably, 3 of 7 representatives of environmental conservation organisations considered marine research program relevance to be compulsory. This could be interpreted as some environmental conservation organisations having an aspiration to contribute and maybe influence government marine research and management programs through MRT.

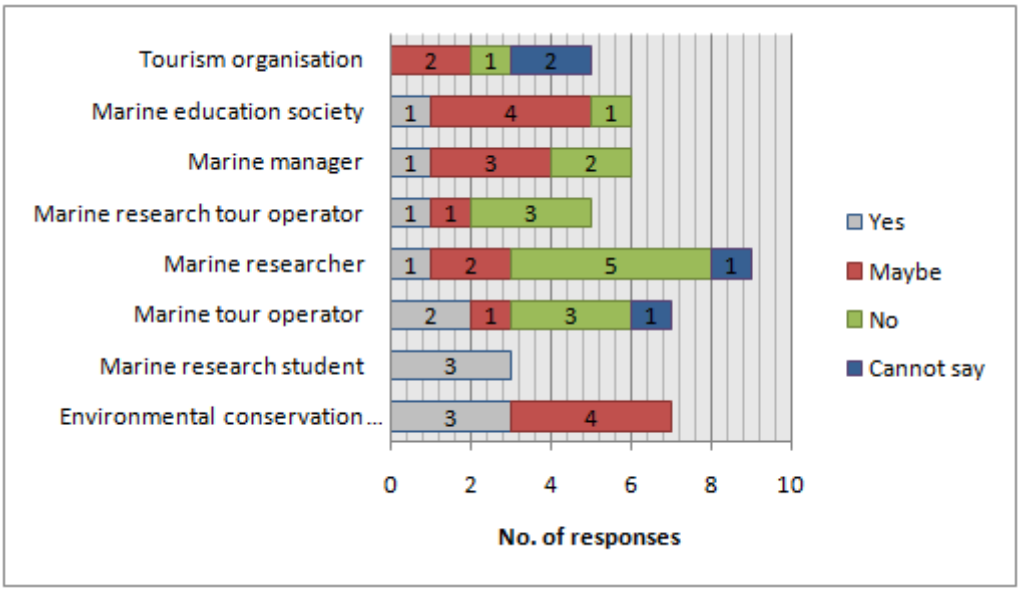

Figure 6: Relevance to government marine research or management priorities

Question 9. Can MRT ventures involve popular marine science (e.g. whale, turtle and shark research) that does not address current government marine research or management priorities?

Figure 7 shows that 9 of 49 survey respondents had positive views towards this question. These were representatives from environmental conservation organisations (3), marine education societies (3), marine researchers (2) and a marine tour operator (1). However, 15 of 40 survey respondents had a negative view (i.e. no). These were representatives from environmental conservation organisations (3), marine education societies (2), marine researchers (4), marine managers (3), tourism organisations (2) and a MRT operator (1). This indicates that amongst Australian MRT stakeholders, this question is controversial.

Some of this stakeholder concern may be due to their valid views that, in some cases, popular science focused MRT ventures will mainly focus on popular science and not focus on or contribute to less popular but perhaps more important research priorities. To these stakeholders, such research could seem like a wasted use of costly resources. Furthermore, because of the likely popularity of these ventures to tourists, these ventures may be; financially independent of government funding, therefore less directly dependent on government influence, and potentially less concerned with government research priorities.

However, when asked to address such concerns, a MRT operator stated that MRT research successes can inform and positively influence government marine research or management priorities. Examples include the role of the Undersea Explorer (Arnold & Birtles, 1999; Birtles, Valentine, Curnock, Arnold & Dunstan, 2002; Dunstan, 2009) in developing minke whale, shark and nautilus research, and the initiation of Reef Check Australia. Other examples are the Whale Shark monitoring research of Ecocean in Western Australia, turtle and ghost nest monitoring and conservation by Cape York Turtle Rescue in Queensland, sea bird research in the outer Coral Sea by Ecology Solutions, and sea dragon research by the Sapphire Coast Marine Discovery Centre in New South Wales, Australia.

Survey respondent feedback also indicates that some marine management or research organisations may be cautious about the potential redirection of traditional marine research investment from organisations such as the Australian Government into MRT operations that demonstrate that they can undertake successful marine research, conservation and education at a lower cost than them. In some cases, this is likely to be a valid concern as many MRT operators will seek to obtain investment from marine research investors and hence directly or indirectly seek to compete with some marine research or management agencies. However, many MRT operators would contend that without harnessing the tourism dollar, many of their marine research, management, conservation and education outcomes would not have occurred. MRT operators would further contend that their tourism subsidised research capability can more frequently access a great number and/or more remote of marine research locations

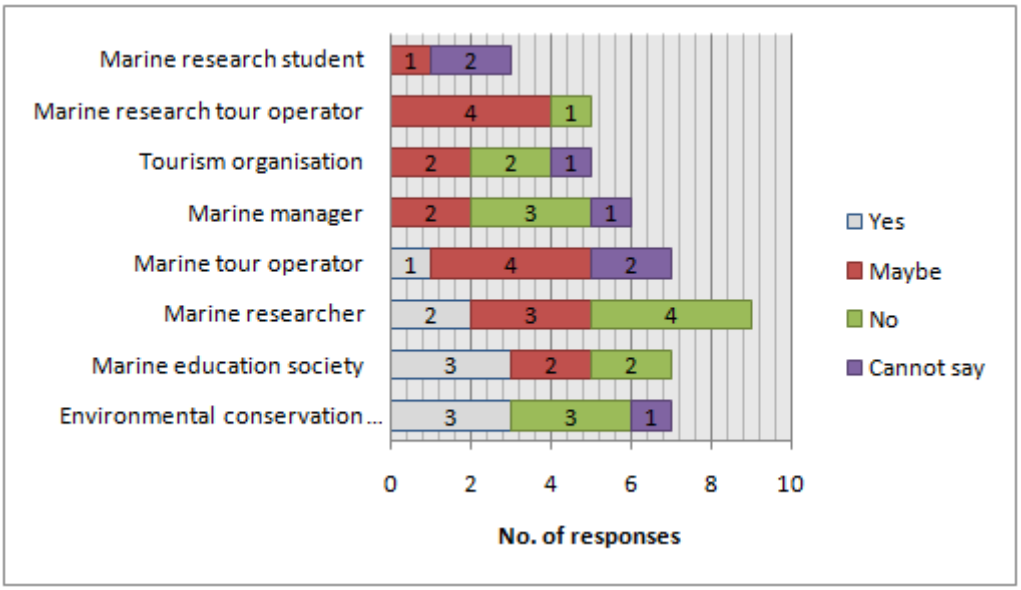

Figure 7: Popular marine science and current government marine research or management priorities

Question 10. How important are academic publications and conference presentations to a MRT venture?

Figure 8 shows that most key stakeholders believe that academic publications and conference presentations are important and/or essential to MRT. The exceptions are a marine tour operator, a MRT operator, a marine manager, and a marine researcher. A possible explanation is that these survey respondents believed that MRT can plausibly operate outside of the marine research peer review process. Such an occurrence could appeal to some MRT operators as they would have fewer publishing obligations while still attracting a suitable market and delivering conservation outcomes. However there are potential benefits to MRT operators from producing academic publications from MRT. For example, a MRT operator commented that academic publications are important for longer term credibility of the venture, attracting scientists to participate, involving conservation groups, and perhaps gaining government funding.

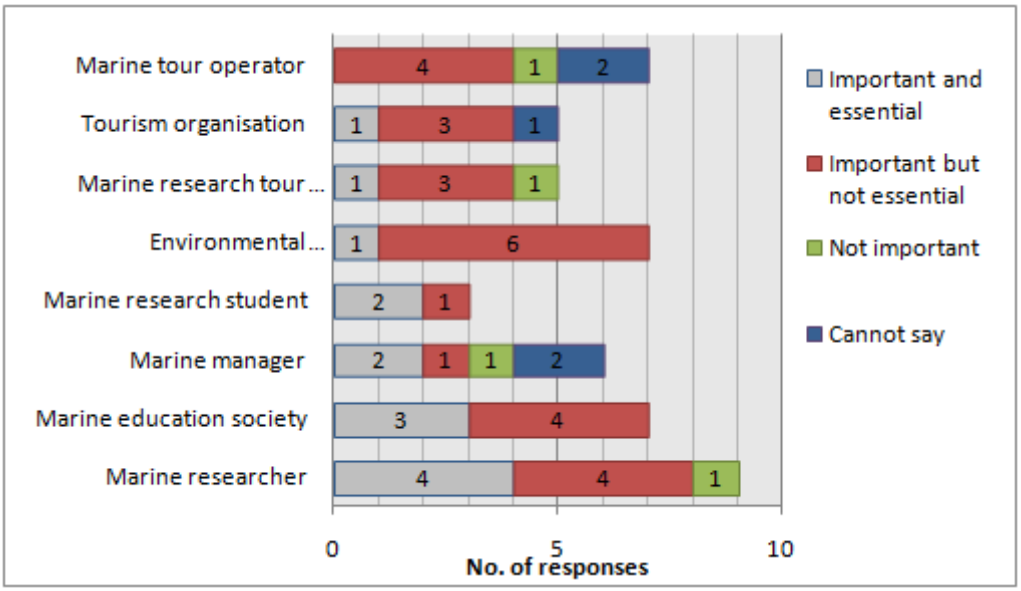

Figure 8: The importance of academic publications to marine research tourism

Question 11. Can academic publications and conference presentations increase government involvement in MRT?

Figure 9 indicates that most key stakeholders believe that academic publications and conference presentations will or may increase government involvement. The exceptions to this overall view are some marine managers and marine researchers who believe that academic publications and conference presentations will not or maybe will increase government involvement in MRT. These latter results may again indicate a reticence by marine managers and marine researchers towards increased government recognition of MRT and any potential increase in government research funding of MRT. Responding to these concerns, a MRT operator stated that publications and presentations would be an effective way to potentially convince some cautious key stakeholders that the tourism dollar can be successfully harnessed to fund worthwhile marine research projects.

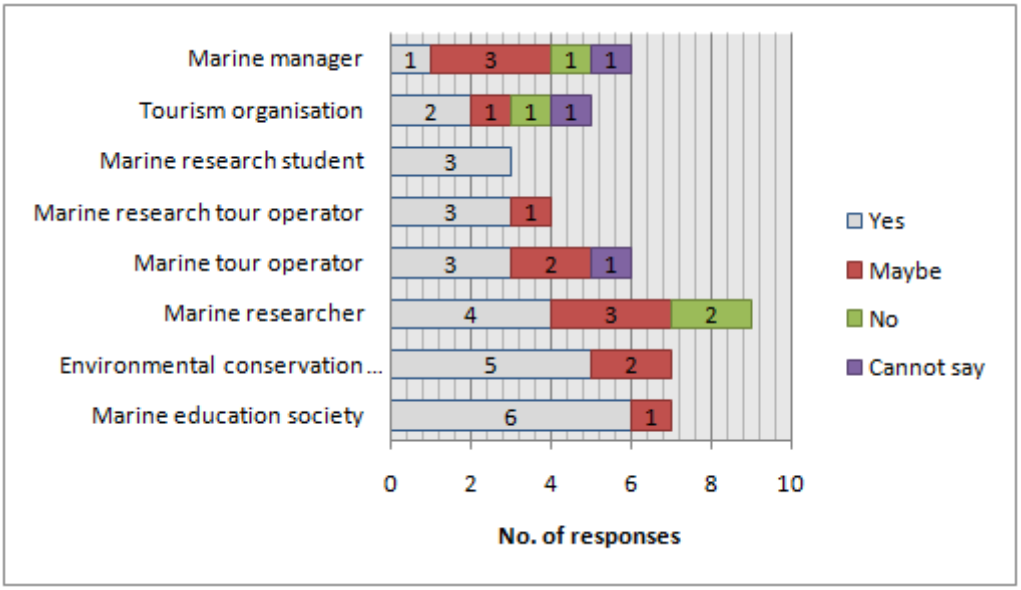

Figure 9: Academic publications and a possible increase in government involvement

Question 12. How important is the involvement of government marine management agencies in MRT across Australia?

Figure 10 indicates that most key stakeholders would believe that government marine management agency involvement in MRT is important and/or essential to MRT. Conversely, three survey respondents considered marine research agency involvement as not important. This indicates a low but existing likelihood that some stakeholders could readily participate in MRT without the involvement of marine management authorities.

Notably, 9 of 44 survey respondents would or could not answer this question. These survey respondents were from key stakeholder groups such as tourism organisations, environmental conservation organisations and marine researchers. The reason for this is not known. However, it is speculated that such reticence could be due to a respect for the jurisdiction and independence of marine management agencies, or self acknowledgement by the survey respondents that they do not have the appropriate knowledge to satisfactorily respond to the question.

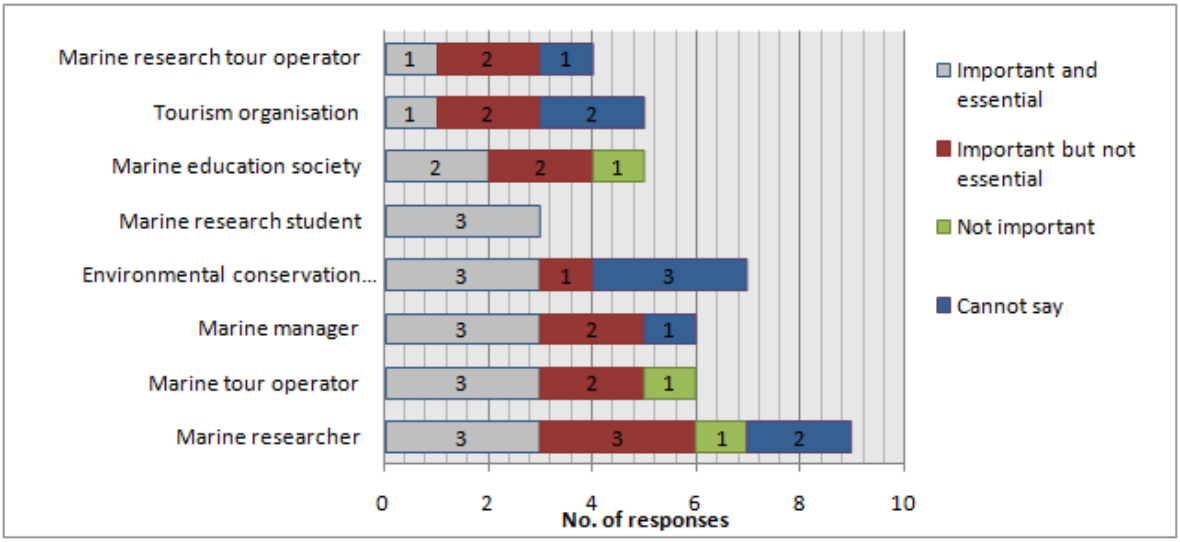

Figure 10: Importance of the involvement of government marine management agencies

Question 13. How important is the involvement of government marine research agencies in MRT?

Figure 11 shows that 37 of 42 key survey respondents believed that government marine research agency involvement in MRT is important and/or essential. This indicates that a majority of MRT stakeholders in Australia would consider that the involvement of marine research agencies is important and/or essential. This is in contrast to the 3 negative views towards the involvement of marine management agencies in MRT as identified in question 12. Seven survey respondents could not or would not answer this question.

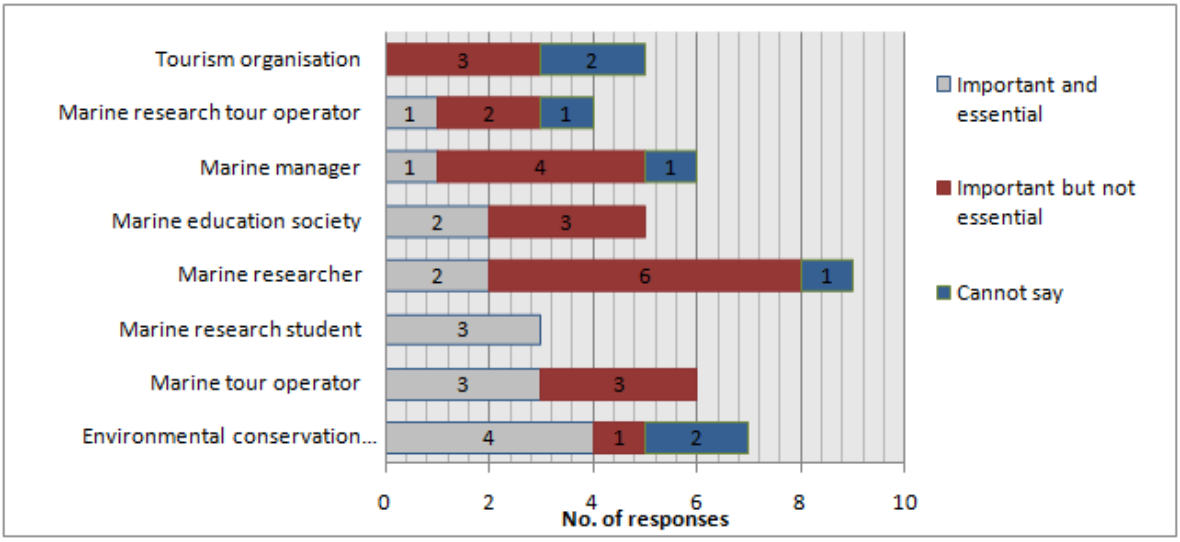

Figure 11: Importance of the involvement of government marine research agencies

Driving forces and issues

Question 14. Driving forces behind marine research tourism

Table 4 shows that key stakeholders considered the changing nature of tourists as the most important driving forces behind MRT. That is, increasingly educated, active, conservation volunteer focused, environmentally responsible, marine documentary watching, and alternative tourist market is the most likely driving force behind MRT. Driving forces such as the need for increased funding of marine research and monitoring were considered possible to likely driving forces behind MRT. Increasingly advanced and easy to use marine research technology, and increasingly safe and comfortable marine tourism ventures were considered as just possible driving forces behind MRT.

There are, at the very least, six key stakeholder groups that could directly benefit, if these driving forces were appropriately responded to. That is, environmental conservation organisations would seek to appeal and leverage support from the above potential marine research tourist. Marine education societies could provide marine education services to those tourists. Marine researchers and managers could use MRT to fund some of their marine research and monitoring. Existing MRT operators would benefit if the above driving forces of MRT experiences were further harnessed. Existing MRT operators could also diversify into MRT if these stated driving forces are valid.

Table 4: Driving forces behind marine research tourism

Driving Force	Rating
An increasingly educated travel market who are interested in more active experiences	3.5
An increase in the conservation volunteering ethic within the travel market	3.4
An increasing desire for environmentally responsible travel within the travel market	3.3
An increasing desire for an alternative travel experience with the travel market	3.2
The effect of marine documentaries on public awareness for a marine research experience	3.0
A need for increased funding by marine research and management agencies	2.6
A greater need for marine research and monitoring of Australian marine waters	2.4
Marine research technology that is increasingly advanced and easier to use	2.2
Increasingly safe and comfortable marine tourism ventures	2.1

Note, 1 is not likely, 2 is possibly, 3 is likely, and 4 is very likely

Question 15. What are the issues regarding any expansion of MRT across Australia?

Table 5 illustrates that issues that involve the marine research tourist were the biggest issues regarding any expansion of MRT in Australia. These were occupational health and safety, public liability insurance, keeping the tourist satisfied, and quality of the tourist's research contribution. Key stakeholders also considered the collaboration required between marine researchers, marine managers and marine tour operators as an important issue. The lowest rated issues were a shortage of suitably skilled tourists and interested marine tourism operators, however they were both considered as above somewhat important.

Table 5: Issues regarding any expansion of marine research tourism across Australia

Issue	Rating
Occupational health and safety issues for volunteer tourists who are involved in marine research programs	3.3
Public liability insurance	3.3
Keeping the tourist satisfied while undertaking marine research programs	3.2
The collaboration required between marine researchers, marine managers and marine tour operators	3.1
Uncertainty as to the quality of marine research by tourists	3.0
Limited marketing and promotion of MRT ventures	2.9
A shortage of marine researchers with suitable tourism and hospitality skills	2.9
A shortage of marine researchers with suitable entrepreneurial skills	2.8
Acquiring or approving marine research permits	2.7
A shortage of interested marine tour operators	2.5
A shortage of skilled marine research tourists to undertake quality marine research	2.4

Note, 1 is not important, 2 is somewhat important, 3 is important, and 4 is very important

Opportunities

Question 16. How could any benefits from marine research tourism be increased?

Table 6 summarises the suggestions by survey respondents regarding how to increase the benefits from MRT. These suggestions related to the operation and development of the MRT venture, the involvement of marine researchers and managers, and the involvement and satisfaction of MRT tourists. Popular suggestions include increased funding for any training and supervision of volunteer tourists (i.e. 6 responses), and increased recognition of MRT benefits by marine research and management agencies (i.e. 5 responses).

Table 6: How the benefits from MRT could be increased?

Suggestion	Desired benefit	No. of responses
Venture related		
A quality assured training regime for any volunteer tourists. Increased funding for training and better supervision.	Greater reliability in data collection and processing	6
Development of accredited marine research tourism guides recognised by ecotourism, marine tourism and marine research authorities	Reduce the marine researcher's obligations to look after the tourist. Reduce the workload of the marine tour operator to support marine research. Supervise the tourist. Reduce OH&S and public liability issues. Improve the tourist and marine researcher experience, and hence improve MRT outcomes.	2

Table 6 continued

Suggestion	Desired benefit	No. of responses
Special permits for access to special sites for best practice MRT operators	Increase the desirability of MRT amongst MRT operators. Improved experience for the tourist.	1
Quality insurance when actively involving tourists in marine research	Reduce liability of marine tour operators and other stakeholders if a research related accident occurs.	1
Invest in this form of tourism in a strategic manners	Further development of quality MRT products	1
Marine research and management related		
Increased recognition of MRT benefits by marine research and management agencies	Potentially increased investment in MRT by marine research and management agencies and hence more benefits from MRT	5
Develop coordinated lines of communication amongst potential users of the marine research and key stakeholders.	Increase the usefulness and communication of marine research outputs	4
Tourist related		
Make as many tourists as possible feel part of the research. Provide feedback to the tourist. Increase the presence of well known marine researchers or conservationists on MRT ventures.	The tourist will feel part of something and will contribute to more marine research and conservation programs	3
Seek to provide consistent and simplified marine research information to the tourist. Provide a quality hands on marine research tourism experience to the tourist.	A potentially more satisfied, educated and aware tourist	1
Profile the demographics and motivations of marine research tourists	Assist with development of MRT products that satisfy the tourist and harness their potential contribution	1
Promote the unique research and conservation benefits of MRT to the marine tourism market	Increased demand for a MRT experience and hence increased marine research and conservation outcomes	1
Increase accessibility and reduced costs for a MRT experience	Increased demand for a MRT experience and hence increased marine research and conservation outcomes	1
A mechanism to capture the tourist's thoughts on future research directions.	A potentially more satisfied tourist, and potential suggestions to improve marine research activity	1

Question 17. What are the likely roles of Australian indigenous people towards any development of MRT?

Table 7 indicates that there are many stakeholder suggestions about Indigenous Australians within Australian MRT. These suggestions focus on the paid involvement of and benefit to Indigenous Australians to share their unique Indigenous cultural and marine environmental knowledge with marine research tourists, and the opportunity to be involved in collaborative marine management through MRT. It is likely that when survey respondents were referring to these roles and type of involvement when they collectively stated that indigenous Australian organisations were very likely to benefit from MRT (Figure 2).

This study had logistics related difficulties in identifying a group of indigenous Australians who were available to represent likely indigenous Australian views about MRT across Australia. Hence, the direct views of Indigenous Australian towards MRT in Australia were not

acquired in this study. Therefore, given the apparent potential growth for Australian based MRT that involves indigenous Australians, this study highlights that there is a research opportunity to identify and evaluate a representative range of Indigenous Australian's views of about present and future MRT in Australia. Such a study would be integrated with results from this study.

Table 7: Suggested likely roles of Indigenous Australians

Suggested role or guidance	No. of suggestions
Great and rare, knowledge and skills	9
Custodian/Advocates	7
Unique Australian experience	6
Where appropriate, MRT should benefit Australian Indigenous people	5
Marine research tourism requires consultation with Indigenous communities and TOs	5
Access to Indigenous lands may be an issue	4
Traditional knowledge for marine research	3
Partnership with scientists and/or managers	3
Guide roles for MRT	3
Cultural connections with the marine environment	3
Local knowledge	3
Training, capacity building for Indigenous Australians	3
Coastal ventures mainly and not outer the reef	1
Managing wildlife through MRT	1

Question 18. What are the likely roles or guidance for conservation non government organisations towards any development of MRT?

Table 8 shows the suggested likely roles or guidance for the involvement of conservation organisations within Australian MRT. Notably, a role as advocate, endorsement, promotion, dissemination and organisation was suggested 9 times by key stakeholders. It was also suggested that conservation groups could provide tourists, marketing services, credibility, leadership, staff and guides, interpretation material, training, resource stewardship best practice guidelines, and research program design. This information indicates that many stakeholders can foresee a coordinating and service provision role by conservation groups for any future organisation of MRT in Australia.

Table 8: Suggested likely roles of conservation organisations

Suggested role	No. of suggestions
Advocate\endorsement\promotion\disseminate\organisers	9
Provide paying tourists from conservation groups, marketing, and add credibility to ventures	7
Provide staff and guides	4
Provide interpretation material	2
Be present and future leaders and mentors in MRT	2
Support community engagement	2
Resource stewards	2
Focus on rare, threatened, and endangered wildlife, and habitat	2
Potential benefit from MRT in terms of funding and promotion	2
Support training	1
Less constrained than government	1
Develop best practice guidelines	1
Research program design	1

Question 19. What are the likely roles or guidance for marine education societies towards any development of MRT?

Similar to environmental conservation groups, many key stakeholders recommend a coordinating and service provision role by marine education societies for any future organisation of MRT in Australia (Table 9). It was suggested that marine education societies are presently limited in their involvement in marine tourism due to a lack of financial means. These results suggest that marine education societies are likely advocates for MRT and likely financial beneficiaries from service provision to MRT ventures. With increased MRT, it is also likely that they would have increased opportunities to deliver, educate and increased awareness about the marine environment.

Table 9: Suggested likely roles of marine educators

Suggested role	No. of suggestions
Advocate/endorsement/promote	12
Trainers of tourists	4
Trainer of guides	3
Provide guides	3
Train students	2
Benefits to themselves	2
Providers of students	1
Provider of tourists	1
Provide science interpretation	1
Limited involvement due to lack of funding	1
Accreditation providers	1
Partner with ventures	1
Collaborate with local communities	1
Guide research direction	1

Discussion

This study identified a range of potential benefits, driving forces and issues that are associated with MRT. Any coordinated strategic plan to develop MRT in Australia would seek respond to these driving forces and issues, and increase the identified benefits of MRT. Given the range of inter-stakeholder issues, it is recommended that such a coordinated strategic plan would seek to form partnerships amongst representatives from all the identified key stakeholders. This involvement would depend on understanding and satisfying the views of key stakeholders (Cousins, 2007; Coghlan, 2007; Cuthill, 2000; Musso and Inglis, 1998) towards MRT and its potential development in Australia.

With regards to MRT and its potential development in Australia, this study found that amongst survey respondents, certain key stakeholder groups had consistently positive and certain key stakeholder groups had consistently mixed views. Key stakeholders with consistently positive views are environmental conservation organisations, marine education societies, marine research students, tour organisations and MRT operators. This study suggests that these stakeholder groups would be ready advocates and contributors to any coordinated strategic plan for MRT in Australia. In particular, this study reveals a range of potential roles for environmental conservation organisations and marine education societies in coordinating and providing services for future MRT in Australia.

This study also identified a range of valid reasons as to why many marine managers, researchers and tour operators would have mixed views about MRT. For example, many marine managers and researchers would appear to be cautious about the quality of the tourist's research contribution, ensuring occupational health and safety for the tourist, public liability insurance, and keeping the tourist satisfied. It has been suggested that a MRT guide role be developed to address such concerns.

This study has identified a number of valid key stakeholder concerns or issues that have not been previously identified in the academic literature. These include valid concerns that MRT may compete with marine researchers and managers for traditional marine research investment. Additionally, there is concern that MRT may also focus on popular science at the expense of research that focuses on more important and less popular research priorities. They may also have a valid concern that environmental conservation organisations may use MRT research, management, conservation, and education outcomes to influence marine management and research agendas. Furthermore, many marine managers, researchers and tour operators may be unaware or sceptical of the stated benefits of MRT for themselves and tourists.

Any coordinated strategic plan to develop MRT in Australia would seek to address and resolve the concerns of marine managers, researchers and tour operators. Suggested strategies to do this would be:

1. Increase the recognition of MRT benefits by marine research and management agencies, and marine tour operators;
2. Develop coordinated lines of communication amongst key MRT stakeholders and other potential users of MRT research;
3. Seek to ensure that MRT produce reliable research outcomes and academic publications;
4. Seek to integrate MRT popular marine research with mainstream marine research programs;
5. Increase the involvement of marine research agencies in the development and operation of MRT
6. Train and employ MRT guides that seek to:
    a. Reduce the requirement for the marine researcher to act as a tour guide;
    b. Reduce occupation health and safety, public liability issues through the adoption of best practice guidelines.
7. Develop best practice guidelines for MRT.

CONCLUSION

This study has uncovered key stakeholder concerns or issues that have not been previously identified in the academic literature. It also identified three likely benefits of MRT that can be considered to be a core competitive advantage for MRT when compared with many marine tourism or ecotourism ventures. A range of stakeholder views, driving forces, benefits, opportunities, and other concerns or issues regarding present and future MRT in Australia are also identified and discussed. Results indicate that it is likely that many key stakeholders would consider MRT to be a possible option to diversify, compete and possibly increase the viability of a marine tourism in Australia. Towards such a possible goal, this study has recommended a range of key strategies for any coordinated strategic plan to develop MRT in Australia. While the study was focused on Australia, study outcomes could be applied to any coordinated effort to develop MRT.

APPENDIX 1 - Stakeholder comments as to why there is a high level of private company involvement in Australian MRT.

Key stakeholder	Comment
	Private industry capacity
Marine research tour operator	Private enterprises are able to access resources and make effective commercial decisions in a time frame that is commercially viable.
Marine researcher	Government agencies are not set up to operate tourism. Private industry is in a better position to respond to the demand for marine research tourism.
Tourism organisation	The ventures are run for a profit which then either goes to the company or back into more research. This is not a normal government activity.
Marine research tour operator	The world is increasingly commercial and everything needs to be financially sustainable. Given necessary regulation (i.e. interactions with wildlife), the private sector can achieve this if the project has long term sustainability and can achieve long term goals.
Environmental conservation organisation	Inherently this demonstrates that it is invariably individuals who are able to perceive a need and respond to it in terms of the overall tourism market place.
Tourism organisation	The need for flexibility in dealing with the tourists to ensure the tourists are happy is not normally found in government.
Environmental conservation organisation	Creativity on the part of marine tour operators in creating an appealing product.
Marine tour operator	Nature of the tourism industry - predominantly small, privately operated business operating for economic gain.
Environmental conservation organisation	There is less need for government researchers to use tourists when student volunteers and paid tourism staff are available.
Marine education society	The research tends to be outside government priorities.
	Government capacity
Marine education society	Government agencies are constrained by red tape and bureaucracy, issues with insurances etc. that restrict their ability to work with community at this level.
Marine research tour operator	Because the government cannot think outside the box. Government relies on simplistic models of management and not a culture of cooperation. The idea of partners in conservation is too messy for a government body with occupational health and safety, and audit management by numbers.
Environmental conservation organisation	Government marine research agencies do not currently perceive a need to involve research tourists and are inherently sceptical of the value of their participation.
Environmental conservation organisation	Because they are economically based investment decisions which governments struggle to make in an opportunistic way.
Marine tour operator	Government does not like to fund organisations that can make a dollar i.e. have income, this is not a good criteria.
Marine research tour operator	The government management agencies are afraid of the unpredictability of tourists and the public in general.
Environmental conservation organisation	Government health and safety regulations.
Marine research tour operator	There are few (if any) public/government funding opportunities for such activities.
	Marine research quality
Marine manager	Governments will want to be associated with peer reviewed publications. Peer-reviewed publications need to be high quality. There is a perception that data collection and/or analyses done by volunteers are not as rigorous as trained technicians.
Marine researcher	Government does not support it. It is perceived as 'soft science'.

Marine researcher	Some would likely be conducting bogus research and using the marketing tactic for profiteering. To sort the wheat from the chaff, look for; 1. Government management agency-issued research permits (with appropriate scientific and ethical evaluation and formal reporting requirements) 2. Affiliations with legitimate research institutions (e.g. University or government agency) 3. Publications.
Marine education society	A long-standing belief by many researchers that volunteers cannot be trained adequately to provide meaningful assistance, yet private operators have recognised and addressed this issue.
	Benefits to marine research tourism operators
Marine researcher	Private motives for support such as marketing or just feel good
Marine tour operator	Great and rewarding business opportunity for individuals.
Marine education society	Initial individual passionate people who have started an organisation towards achieving a goal in the area of their interest. I.e. people have started these ventures because of their passion for it, realised that the way to get assistance in funding is by having paying tourists assisting, which lifts the burdens of needing to find large grants.
Tourism organisation	Believe that research tourism is driven more by conservationists than by government, as their environmental focus is stronger and they are smart at enlisting celebrity endorsers, media and local community support.
	Advice
Environmental conservation organisation	The potential for marine research tourism in Australia is high but underutilised. It is important to link private ventures into government agencies in a form of partnership to ensure that the information collected is validated and can be incorporated into management. The relationship may be direct or indirect through a relationship with a scientific institution/scientist that is linked into the agencies. Collecting scientific information for information sake is not appropriate in our view if better designed programs can ensure the information is used to protect and conserve marine species and habitats, which we would think most research tourists would expect they are contributing to.

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Appendix 16. Full refereed paper to the International Society of Tourism and Travel Educators (ISTTE) conference at Dublin, Ireland in 2008

THE PREFERENCES OF POTENTIAL MARINE RESEARCH TOURISTS FOR DIFFERENT MARINE RESEARCH TOURISM PRODUCTS IN AUSTRALIA

Peter Wood
James Cook University and Sustainable Tourism CRC
School of Business, Australia

Dr. Heather Zeppel
James Cook University
School of Business, Australia

ABSTRACT

Marine research tourism is a form of marine tourism whereby marine research is an important part of the tourism attraction. Research was undertaken to further understand the preferences of potential marine research tourists for different marine research tourism products and benefits. Such information can be used to identify suitable markets, develop effective promotional campaigns, and design effective and different products. To achieve the research goal, an online survey (n=311) and benefit segmentation approach was used. Different marine research tourism products (n=12) were devised from a typological assessment of forty two marine research tourism ventures. Benefits (n=26) were devised from an assessment of related tourism types and discussions with key stakeholders.

Results indicate that potential marine research tourists who regularly watch nature documentaries, volunteer, are a member of a conservation group, have a natural sciences background, SCUBA dive, snorkel or cetacean watch, have notably higher interest in more marine research tourism products. Furthermore, females and international survey respondents had notably higher interest in more marine research tourism products. The most important benefits for survey respondents were the opportunity to explore marine phenomena and discover new things (86%), and learn from marine researchers (86%). The least important benefits for survey respondents were an offshore boating or sailing experience (40%) and a high level of social interaction with others (46%). This paper identifies and affirms the existence of a set of likely relationships between marine research tourism market segments, preferred benefits and product types. Such information can be used for marine research tourism product design and marketing.

Key Words: Marine, Research, Tourism, Benefits, Preferences, Products

This research is an outcome of a PhD project funded by the Sustainable Tourism Cooperative Research Centre, established by the Australian Commonwealth Government.

INTRODUCTION

This paper outlines preliminary results from research into the preferences of potential marine research tourists (n = 311) for different marine research tourism products and associated benefits. Specifically this paper reports on;

1. A benefit segmentation and online survey method for this research
2. The preferences of potential marine research tourists for 12 different marine research tourism products
3. The preferences of potential marine research tourists for 26 different benefits
4. The preferences of potential marine research tourists and their varying interest in 12 different marine research tourism products
5. The different market segments that prefer different marine research tourism products

Marine research tourism is defined as marine ecotourism where marine research is an important part of the tourism attraction (adapted from Benson, 2005). Marine research tourism products are defined as marine research tourism attractions, destinations, benefits and activities. In this paper, a marine research tourism venture must last for one or more days, be advertised publicly, take paying tourists or volunteers, and operate on a commercial basis (adapted from Ellis, 2003a).

BACKGROUND

As tourism advances and evolves as an industry, many new specialised forms of niche tourism have emerged. Ritchie, Carr, and Cooper (2003) reported on a trend in the western tourism market from the 1980s to the present, whereby travel motivations of tourists are changing from passive activities towards learning and broadening their horizons. Among these tourism markets is the marine research tourism market where marine research is an important part of the tourist attraction (Wood & Coghlan, 2008).

Cousins (2007) and Ellis (2003b) reported that the majority of regional or globally focused marine research tourism operators worldwide are organised from companies based in the UK or USA. Examples of companies that offer marine research tourism experiences are the Earthwatch Institute, The Oceanic Society, Conservation Volunteers Australia, the Tethys Institute, Global Vision International, and the Whale and Dolphin Conservation Society.

The primary conceptual framework for this research was to envisage marine research tourism as a combination of better known tourism typologies namely; marine, ecotourism, volunteer, scientific and educational tourism, wildlife, adventure and cultural tourism (adapted from Benson, 2005; Silberberg, 1995). Inherent within this conceptual framework is that combinations of many traits from those better known tourism typologies can be manifested and measured within marine research tourism ventures.

This paper seeks to understand the preferences of potential marine research tourists who are analogous to purposeful cultural tourists as described by McKercher and du Cros (2002). Purposeful marine research tourists place a moderate to high value on marine research as part of their overall decision to visit a destination, and they seek a relatively moderate to highly deep experience when participating in marine research tourism (adapted from McKercher & du Cros, 2002).

MARINE RESEARCH TOURISM IN AUSTRALIA

Based on discussions with marine research tourism stakeholders in Australia and searching the Internet, marine research tourism in Australia is mostly characterised by approximately 25 small and independent ventures. An exception to this is The Earthwatch Institute who offer two marine research tourism ventures in northern Australia. Ten of these twenty five enterprises operate in the Great Barrier Reef region of Australia, eleven operate in temperate Australia, five in north Western Australia, and two in the Gulf of Carpentaria. Ten of these twenty five enterprises are known to offer marine research tourism experiences on a regular basis, while the remainder offer marine research tourism experiences on a seasonal and/or one off basis. Ten enterprises offer marine research tourism experiences that last one or more weeks and seven enterprises offer predominantly marine education experiences that can last for one day. Twelve of these enterprises offer marine research tourism experiences that actively involve the tourist in official marine research activity while the others generally offer more passive, comfort orientated and/or educational experiences.

In hard currency terms, it is not known what tourism revenue is generated from marine research tourism in Australia. The cost for tourist participation in marine research tourism can range from $A60 per day to $A1, 100 per day (Wood, 2008a). Cost will depend on the venture's level of volunteer activity, comfort/hospitality, technology, and/or environmental remoteness. Marine research tourism frequently involves marine wildlife as the major research attraction for the tourist. Hence, the tourism revenue from a marine research tourism enterprise is in many ways, comparable to tourism revenue gained from marine tourism based on free ranging marine wildlife as described by Birtles, Valentine and Curnock (2001). Similarly, it is not known what marine research revenue is generated from marine research tourism in Australia. However, in many cases, marine research tourism ventures are known to offer frequent, ongoing and viable opportunities for professional marine researchers and enthusiasts to carry out marine research projects. In some cases, outcomes from these projects include academic papers (Birtles, Valentine, Curnock, Arnold and Dunstan, 2002; Arnold, and Birtles, 1999) that have influenced the conservation management of endangered dwarf minke whales and increased conservation based zoning of the Great Barrier Reef in Australia.

Notably, not all marine research tourism enterprises have a high focus on quality marine research or management outcomes. For example, other enterprises advertise marine research as an important part of their attraction for tourists, but focus on offering quality

providing quality marine education, marine adventure and/or marine wildlife tourism experiences. Both cases focus less on implementing official marine research projects and often have less significant marine research outcomes. This can be a dilemma for marine research tourism enterprises that seek to involve marine researchers because most marine researchers will prefer only to be involved in ventures with high quality marine research (Wood & Coghlan 2008). Furthermore, marine researchers will also prudently prefer involvement in those marine research tourism enterprises that demonstrate economically sustainable markets and products (Ellis, 2003b).

A BENEFIT SEGMENTATION RESEARCH METHOD

Knowledge gained from market segmentation can enable tourism suppliers to identify suitable markets, design effective and different products, and develop effective and appropriate promotional campaigns (Blamey 1997; Garrod, 2008; Weaver 2001). Garrod (2008), Frochot and Morrison (2000) and, Murphy and Norris (2005) highlight benefit segmentation as a useful method to further understand the preferences of different groups of tourists for different products and benefits. For example, Murphy and Norris (2005) undertook benefit segmentation on visitor survey data from 2215 tourists to the Great Barrier Reef (GBR). Their results identified four notable market segments. Differences amongst these four market segments were attributed to the tourists' different preferences for different levels of involvement with the reef and desire for information and learning (Murphy & Norris, 2005).

Hence, to further understand the preferences of potential marine research tourists for different marine research tourism products and benefits, a benefit segmentation method was used. To achieve this, this research was required to develop;

1. An accessible and representative set of potential marine research tourists
2. A representative set of marine research tourism products
3. A conceptually sound set of benefits for marine research tourists
4. Survey questions to identify demographic characteristics of survey respondents

1. Identification of a representative set of prospective marine research tourists

Wood and Coghlan (2008) reported that much of the variation in the nature of a marine research tourism venture is due to the tourist's level of active involvement and required technical skills while on different types of marine research tourism ventures. Their research also determined that marine research tourism can appeal to a wide cross-section of potential tourists. For example, some marine research tourists may prefer a highly active, adventurous and remote experience with limited comfort, and some marine research tourists may prefer a less active, low risk, more educative and comfortable experience.

Research by Benson (2005), Clifton and Benson (2006), Cousins (2007) and, Weiler and Richins (1995), and a preliminary assessment of 42 marine research tourism venture web sites, generated a list of potential marine research tourists (Table 1). This assessment also indicated that potential marine research tourists are usually relatively highly educated, interested in marine research, and affluent enough to travel to and participate in marine research tourism. However, such information does not clarify, in any depth, what the preferences of potential marine research tourists are for different marine research tourism products and benefits.

Table 1: Potential Marine Research Tourists.

Marine wildlife tourists	Scuba divers	Nature enthusiasts
Adventure tourists	Volunteer tourists	Repeat marine research tourists
Marine resort tourists	Educational tourists	Trained marine researchers
Ecotourists	Gap year travelers	Marine tourism holiday makers
University students	Snorkellers	

2. Development of a representative set of marine research tourism products

Wood and Coghlan (2008) developed a classification methodology to classify marine research tourism ventures worldwide based on information obtained from the World Wide Web. This methodology was applied to classify 42 marine research tourism ventures worldwide into six classes (i.e. Classes 1, 2, 3, 4, 5 and 6) of marine research tourism ventures (Figure 1). The character of these six marine research tourism venture classes is largely explained by the underlying variation of seven main factors as illustrated in Figure 1.

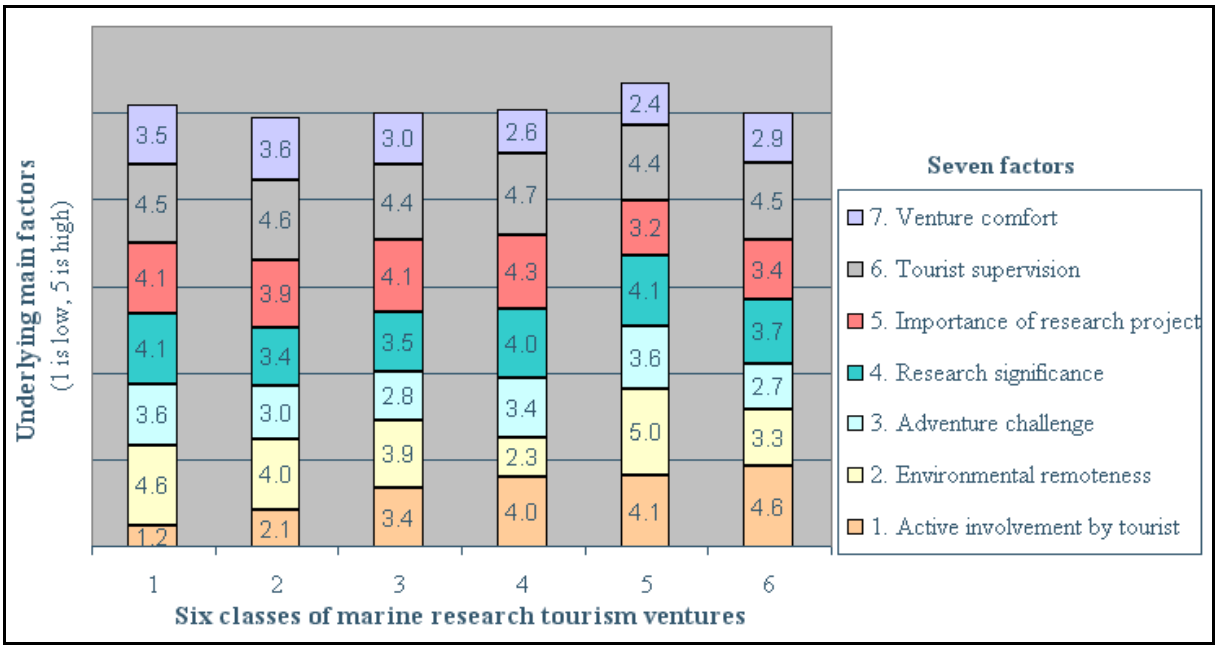

Figure 1: Six Classes of Marine Research Tourism Ventures (Source: Wood & Coghlan, 2008).

In terms of the seven underlying main factors, the level of active involvement (Brown & Lehto, 2005) accounted for 32 % of the variation, while environmental remoteness (Orams, 1999) accounted for 16 %, the level of adventure (Swarbrooke, Beard, Leckie & Pomfret, 2003) for 10%, research significance of the marine research project that the tourist is involved with (7%), importance of the destination for the tourist when compared with the research project (Callanan & Thomas, 2005; Swarbrooke et al. 2003) (6%), tourist supervision by researchers (6%), and level of tourist comfort (4%).

12 one page examples of marine research tourism products within Australia (Table 2) were developed from this classification scheme. These example marine research tourism products (Wood, 2008a) are based on existing marine research tourism products both in Australia and elsewhere. It was these one page examples that survey respondents were asked to refer to when considering their interest in different marine research tourism products. When survey respondents were asked about their level interest in different marine research tourism product, they were asked to answer as if the cost of each product was not an obstacle to any participation.

Table 2: 12 Types of Marine Research Tourism Products used for Online Survey.

Name of example marine research tourism product	**Class**	**Notable feature**
1. A coral spawning research and adventure trip on a tropical coral reef	1	Live-aboard vessel
2. A submersible research expedition to Australia's Bon Hommey undersea ridge	1	A submersible
3. A bottlenose dolphin education holiday on the southern Australian coastline	2	Pub accommodation
4. Day trip to the reef with some marine research as part of the attraction	2	Day trip
5. Volunteer at a penguin rescue centre on the southern Australian coastline	3	Temperate setting
6. Research, education and adventure across the Whitsundays of tropical Queensland	3	Tropical setting
7. Work with marine turtles and indigenous rangers in remote northern Australia	4	Coastal based
8. Biodiversity and habitat mapping in north Western Australia	4	Rugged trip
9. Sail, volunteer and track blue whales in the Southern Ocean	5	Sailing vessel
10. A continuous sailing expedition to explore and help research the oceans of Australia	5	Continuous expedition
11. Survey coral reefs and help assess the impacts of climate change on coral reefs	6	Reef attraction
12. Volunteer and train at an Australian whale and dolphin research institute	6	Cetacean attraction

3. Development of a set of conceptually sound benefits for undertaking benefit segmentation

Table 3 shows a set of benefit criteria that were used to undertake effective benefit segmentation via an online survey of potential marine research tourists. This information was derived by applying the previous conceptual framework, and other information previously gained from recent discussions with 54 key stakeholders who had experience with marine research tourism in Australia. Survey respondents were asked to indicate if their preferences for different benefit criteria were; very important, important, somewhat important, or not very important.

Table 3: Benefit criteria that were used to Assess Tourist Preferences for Different Marine Research Tourism Products.

Benefits criteria for assessing tourist preferences	**Reference**
The importance of marine research program to the marine research community	Discussions with stakeholders
Learning from the marine researchers	Ritchie, Carr, and Cooper, 2003
A high level of involvement in the marine research program	Brown and Lehto, 2005; Callanan and Thomas, 2005
The high level of marine research training that you can receive	Ritchie, Carr, and Cooper, 2003
The high number of training days you can be involved with	Discussions with stakeholders
The high level of skill and knowledge needed to participate	Discussions with stakeholders
A high level of marine research education you can receive	Ritchie, Carr, and Cooper, 2003
The marine research technology or research facility that you can be involved with	Discussions with stakeholders
The experience of the marine researchers who are undertaking the research	Discussions with stakeholders
The venture's high level of involvement in conservation of marine wildlife or habitat	Ecotourism, 2008; Weaver, 2001
The destination (e.g. an island, a coral reef, the southern ocean, a sailing trip, a resort, etc.)	Discussions with stakeholders
The opportunity to have fun	Coghlan, 2006
The main vessel (e.g. ship or boat) that is used for travel or research (if applicable)	Discussions with stakeholders
The marine wildlife that is being researched	Discussions with stakeholders
A high level of adventure found on the venture	Swarbrooke et al., 2003
The duration of the trip (including any time on a boat)	Callanan and Thomas, 2005
The high quality of the marine researchers who are undertaking the research	Discussions with stakeholders

Table 3: Continued.

A high level of solitude, tranquillity, and closeness to nature whilst on the venture	Orams, 1999
A high level of social interaction with others on the venture	Orams, 1999
A high level of interaction with the local people	Ecotourism, 2008; Weaver, 2001
Avoiding sun burn, cold exposure and/or sea sickness	Discussions with stakeholders
A high level of self sufficiency needed while on the venture	Orams, 1999
An opportunity to receive recognised marine research education and training	Ritchie, Carr, and Cooper, 2003
There is an offshore boating or sailing experience	Orams, 1999
The opportunity to scuba dive	Garrod, 2008
The opportunity to explore marine phenomena and discover new things	Ritchie, Carr, and Cooper, 2003

4. Development of survey questions to identify demographic characteristics of survey respondents

To complement this information, a range of survey questions were designed to identify market segment characteristics of survey respondents (Table 4).

Table 4: Survey Questions to Identify Market Segment Characteristics of Survey Respondents.

Market segment characteristic
What country and town are you presently from?
Are you male or female?
What is your age group?
What is your occupation?
When on a marine based holiday, what group of potential marine research tourists (Table 1) would you generally describe yourself as?
What is your formal educational background?
When at home, how many times per week would you watch television nature documentaries?
Do you have a working background in natural science or the environment?
Are you a supporter of an environmental conservation organisation?
Are you an active member of a volunteer organisation?
What is your whale or dolphin watching experience?
What is your snorkelling experience?
What is your SCUBA diving experience?

Develop, implement, analyse and interpret an online survey

Based on the information in Tables 1 to 4, an online survey instrument was devised (Wood, 2008b). The survey request was e-mailed out to at least 1800 people across Australia and the world that were likely to match the profile of potential marine research tourists that is shown in Table 1. The group comprised the researcher's associates and their colleagues, and a set of specific market segments namely; repeat marine research tourists, SCUBA divers, marine researchers and university students. The great majority of the researcher's associates could be broadly typified as professional working people or university students, and as people who are not directly involved in marine research or marine tourism. Organisations contacted included the Project Aware Foundation, Reef Check Australia, the Australian Marine Science Association, Flinders University, James Cook University, Melbourne University, Murdoch University, University of Queensland, the CSIRO, and the Australian Institute of Marine Science.

At the time of this paper, 311 people had completed the online survey. The age, gender, education and nationality demographic breakdown of survey respondents is in Table 5. There were 199 Australian and 109 international survey respondents. International survey respondents were from North America (n = 42), Central and South America (n = 16), SE Asia (n = 16), Europe (n = 22), and South Pacific, Africa and China (n = 13).

Table 5: Age, Gender, Education and Nationality Demographics of Survey Respondents.

	Gender		**Education**			**Nationality**	
Age	**F**	**M**	**High School**	**Technical college**	**University**	**Australian**	**International**
18 – 30	62	33	2	1	93	67	29
31 – 40	39	43	5	6	71	49	33
41 – 50	32	42	9	6	59	46	28
51 – 60	17	33	7	7	36	34	16
61 -70	2	5	1	1	4	3	3
Total	152	156	24	21	263	199	109
Not stated	3		1	0	2	1	2

RESULTS AND DISCUSSION

Descriptive statistical analysis was undertaken on the survey results to identify the;

A. Preferences of potential marine research tourists for the 12 different marine research tourism products
B. Preferences of potential marine research tourists for 26 different benefits
C. The benefit preferences of survey respondents and their varying interest in 12 different marine research tourism products
D. Market segments that prefer different marine research tourism products

The statistical methods used to derive the results for C and D included a discriminant analysis and heat map analysis. For results C, the discriminant analysis technique used the survey respondents' preference ranking of the benefit criteria (Table 3) as variables and the marine research tourism product names (Table 2) as the factors. For results D, the discriminant analysis technique used the survey respondents' preference ranking of marine research tourism products (Table 2) as variables and the market segment criteria (Table 4) as the factors. Results from the discriminant analysis represent the average value of the variables for each of the different factors. A heat map analysis was applied on the discriminant analysis results so as to better communicate the low to high variability of results through a colour scheme ranging from blue (i.e. low value) to tan (i.e. moderate) and yellow (i.e. high).

A. Preferences of potential marine research tourists for 12 different marine research tourism products

Table 6: The Preferences of Survey Respondents (n = 311) for 12 different Marine Research Tourism Products.

Marine research tourism venture	Very interested	Possibly interested	Not interested
2. A submersible research expedition to Australia's Bon Hommey undersea ridge	57%	18%	14%
1. A coral spawning research and adventure trip on a tropical coral reef	55%	31%	7%
9. Sail, volunteer and track blue whales in the Southern Ocean	53%	26%	13%
7. Work with marine turtles and indigenous rangers in remote northern Australia	52%	30%	13%
11. Survey coral reefs and help assess the impacts of climate change on coral reefs	52%	32%	11%
4. Day trip to the reef with some marine research as part of the attraction	44%	31%	22%
6. Research, education and adventure across the Whitsundays	44%	31%	17%
10. A continuous sailing expedition to explore and help research the oceans of Australia	43%	37%	15%
12. Volunteer and train at an Australian whale and dolphin research institute	41%	30%	23%
3. A bottlenose dolphin education holiday on the southern Australian coastline	37%	41%	16%
8. Biodiversity and habitat mapping in north Western Australia	34%	36%	22%
5. Volunteer at a penguin rescue centre in southern Australia	32%	36%	23%

Table 6 describes the overall preferences of potential marine research tourists (n = 311) for 12 types of marine research tourism products. Notably 57% survey respondents were very interested in product 2 (i.e. the submersible expedition) and 55% were very interested in product 1 (i.e. coral spawning research). Just 32% of survey respondents were very interested in product 5 (i.e. volunteering at a penguin rescue centre). Only 7% of survey respondents were not interested in product 11 (i.e. surveying coral reefs) and 23% of survey respondents were not interested in product 5 (i.e. volunteering at a penguin rescue centre).

B. Preferences of potential marine research tourists for different benefits

Table 7 lists the 5 top and bottom benefits preferred by survey respondents (n = 311). In terms of very high or high importance to survey respondents, the top benefits were the opportunity to explore marine phenomena and discover new things (88%), learning from marine researchers (86%), the quality (83%) and experience (82%) or marine researchers, and the opportunity to have fun (80%). The bottom benefits included; an offshore boating or sailing experience (40%), social interaction (46%), skill and knowledge (46%), a high level of self sufficiency (53%), and a high number of training days (54%). The latter results could be interpreted as a preference by many survey respondents for a less active marine research tourism experience that requires less skill, knowledge, training, education, self sufficiency and social interaction.

Table 7: The 5 Top and Bottom Benefits Preferred by Survey Respondents (n=311).

Top 5	**Benefit**	**Important or very important**
1	The opportunity to explore marine phenomena and discover new things	88%
2	Learning from the marine researchers	86%
3	The high quality of the marine researchers who are undertaking the research	83%
4	The experience of the marine researchers who are undertaking the research	82%
5	The opportunity to have fun	80%
Bottom 5		
22	The high number of training days you can be involved with	54%
23	A high level of self sufficiency needed while on the venture	53%
24	The high level of skill and knowledge needed to participate	46%
25	A high level of social interaction with others on the venture	46%
26	There is an offshore boating or sailing experience	40%

C. The benefit preferences of survey respondents and their varying interest in 12 different marine research tourism products

Table 8: Notable Benefit Preferences for Survey Respondents who were Very Interested in Participating in One or More of the 12 Marine Research Tourism Products.

	Product Number											
Benefit	1	2	3	4	5	6	7	8	9	10	11	12
The opportunity to SCUBA dive	3.0	3.0	2.8	2.8	2.7	2.9	2.8	2.7	2.9	2.9	3.1	3.0
There is an offshore boating or sailing experience	2.4	2.3	2.3	2.3	2.4	2.5	2.5	2.5	2.5	2.7	2.4	2.4
Avoiding sun burn, cold exposure and/or sea sickness	2.0	1.9	2.2	2.2	2.1	2.1	2.1	1.9	2.0	1.9	2.0	2.1
The destination (e.g. an island, a coral reef, the southern ocean, a sailing trip, a resort, etc.)	3.1	3.1	3.1	3.2	3.0	3.1	3.1	3.0	3.1	3.1	3.0	2.9
The main vessel (e.g. ship or boat) that is used for travel and research (if applicable)	2.7	2.7	2.7	2.8	2.6	2.7	2.7	2.5	2.6	2.6	2.6	2.7

Note: Key. A value of 2 (blue) is somewhat important, 3 (tan) is important and 4 (bright yellow) is very important.

Table 8 shows the notable benefit preferences for those survey respondents who were, on average, very interested in participating in one or more of the 12 marine research tourism products. For example, those survey respondents who were very interested in products 5 and 8 (i.e. both land based ventures) placed less importance on the opportunity to SCUBA dive and the main vessel that is used for travel and research. Those survey respondents who were very interested in product 10 (i.e. A continuous sailing expedition) placed a higher level of importance (i.e. 2.7) in an offshore boating or sailing experience. Notably those survey respondents who were very interested in all products considered avoiding sun burn, cold exposure and/or sea sickness as only somewhat important. Additionally, all survey respondents who were very interested in all products considered the destination to be important when choosing a marine research tourism venture.

Table 9 shows the notable benefit preferences for those survey respondents who were, on average, not interested in one or more of the 12 products. For example, those survey respondents who were not interested in products 1, 2 and 10 (i.e. all open ocean expeditions) placed more importance on avoiding sun burn, cold exposure and/or sea sickness. Those

survey respondents who were not interested in product 1 and 11 (i.e. Coral reef expeditions) considered a high level of involvement in the conservation of wildlife as least important (2.6 and 2.5). Furthermore, those survey respondents who were not interested in products 1 and 11 (i.e. coral reef ventures) considered SCUBA diving as least important (i.e. values 2.0 and 2.1).

Survey respondents who were not interested products 3 and 4 (i.e. ventures with less active involvement and less research significance) considered a high level of involvement in the marine research program, conservation of wildlife, and marine research education and training, as most important. Additionally, survey respondents who were not interested in product 11 (i.e. survey reefs on a tropical island and assess the impacts of climate change) placed the least importance on involvement in the marine research program, conservation of wildlife, and marine research education and training.

Table 9: Notable Benefit Preferences for Survey Respondents who were Not Interested in Participating in One or More of the 12 Marine Research Tourism Products.

	Product Number											
Benefit	1	2	3	4	5	6	7	8	9	10	11	12
Avoiding sun burn, cold exposure and/or sea sickness	2.6	2.5	1.8	1.9	2	1.9	1.9	2.3	2.3	2.4	2.3	2.2
The opportunity to SCUBA dive	2	2.5	2.7	2.7	2.7	2.5	2.4	2.7	2.6	2.6	2.1	2.4
A high level of involvement in the marine research program	2.6	2.9	3.1	3.1	2.9	2.9	2.7	2.8	2.8	2.8	2.5	2.7
Your high level of involvement in conservation of marine wildlife or habitat	2.6	2.8	3.1	3	2.9	2.9	2.8	3	3	3	2.5	2.9
The high level of marine research training that you can receive	2.5	2.8	2.8	2.8	2.7	2.4	2.6	2.5	2.6	2.6	2.3	2.5
A high level of solitude, tranquillity, and closeness to nature whilst on the venture	2.5	2.5	2.7	2.6	2.6	2.4	2.3	2.6	2.5	2.4	2.8	2.6
A high level of marine research education you can receive	2.6	2.6	2.7	2.7	2.7	2.5	2.5	2.5	2.6	2.6	2.3	2.5

Note: Key. A value of 2 (blue) is somewhat important, 3 (tan) is important and 4 (bright yellow) is very important.

D. Market segments that prefer different marine research tourism products

Table 10 shows the level of nature documentary viewing by survey respondents and their notable levels of interest in different marine research tourism products. Results indicate that when compared with survey respondents who do not watch nature documentaries (i.e. not at all), more frequent viewers (i.e. 3 or more times per week) of nature documentaries were notably more interested in a larger range of different marine research tourism products. For example, those survey respondents who did not watch nature documentaries at all were notably less interested (i.e. 1.7) in product 12 (i.e. Whale and dolphin research centre) than those who watched nature documentaries more than 5 times per week (i.e. 2.7).

Table 10: Level of Nature Documentary Viewing by Survey Respondents and their different Levels of Interest in the 12 Marine Research Tourism Products.

	Number of survey respondents			
	53	177	56	25
Product	Not at all	Once or twice	3 to 5 times	More than 5 times
1. A coral spawning research venture	2.1	2.4	2.6	2.6
2. A submersible research expedition	2.1	2.3	2.5	2.4
3. A bottlenose dolphin holiday	1.9	2.1	2.5	2.4
4. A day trip to the reef	2.0	2.1	2.4	2.4
5. Volunteer at a penguin rescue centre	1.7	2.0	2.1	2.3
6. Research, education and adventure trip	1.9	2.2	2.5	2.4
7. Marine turtles and indigenous rangers	2.1	2.3	2.5	2.6
8. Biodiversity and habitat mapping	1.9	2.0	2.1	2.5
9. Sail, volunteer and track blue whales	2.0	2.4	2.5	2.4
10. A continuous sailing expedition	2.0	2.2	2.4	2.2
11. Survey coral reefs and climate change	2.1	2.3	2.5	2.8
12. A whale and dolphin research institute	1.7	2.1	2.4	2.7

Note: Key. A value of 2 (blue) is possibly interested and 3 (bright yellow) is very interested.

Table 11 shows the notable levels of interest of volunteer, conservation group and natural sciences background market segments for different marine research tourism products. The broad distribution of tan and yellow colours on Table 11 show that survey respondents with a volunteer, conservation and/or a natural sciences background are notably more interested in all marine research tourism products. Particularly, those survey respondents with a volunteer background had higher interest in four products (i.e. products 1, 2, 9 and 11). Those survey respondents that were members of a conservation group and/or a natural sciences background were most interested in products 1, 2, 7, 9 and 11. Those survey respondents without a volunteer, conservation or natural sciences background showed most interest in products 1, 6, 7, 9 and 11 (i.e. coral reef, whale or turtle ventures). All survey respondents had lower interest in both products 5 and 8 (i.e. land based ventures that could involve some endurance).

Table 11: Volunteer, Conservation Group and Natural Sciences background of survey respondents and their different Levels of Interest in the 12 Marine Research Tourism Products.

Number of survey respondents

	110	180	122	189	175	134
Product No.	A volunteer	Not a volunteer	Member of conservation group	Not a member of a conservation group	A natural sciences background	Not a natural sciences background
1.	2.6	2.3	2.5	2.2	2.5	2.3
2.	2.4	2.3	2.4	2.1	2.5	2.1
3.	2.2	2.1	2.2	2.1	2.1	2.2
4.	2.2	2.2	2.2	2.2	2.2	2.2
5.	2.1	1.9	2.1	1.9	2.0	2.0
6.	2.3	2.2	2.3	2.2	2.3	2.2
7.	2.4	2.3	2.4	2.2	2.4	2.3
8.	2.1	2.0	2.1	2.0	2.2	1.9
9.	2.5	2.3	2.4	2.2	2.4	2.3
10.	2.3	2.1	2.2	2.1	2.3	2.1
11.	2.5	2.3	2.5	2.2	2.5	2.2
12.	2.2	2.1	2.2	2.0	2.1	2.1

Note: Key. A value of 2 (blue) is possibly interested and 3 (bright yellow) is very interested. See Table 10 for product names.

Table 12 shows the interest levels of gender and nationality based market segments for different marine research tourism products. In broad terms, females appear to be more interested in marine research tourism. Specifically, females were significantly more interested in products 2, 3, 5 and 7. Males were notably more interested in product 2 (i.e. a submersible expedition). When compared with Australians, International survey respondents appear to be also more interested in marine research tourism. The exceptions to this are products 5, 8 and 10 where both groups show similar levels of interest. To qualify these results, it should be noted that many international survey respondents had higher levels of SCUBA diving experience when compared with Australian survey respondents.

Analysis of the preferences of survey respondents with different levels of cetacean (i.e. whale and dolphin), snorkelling or SCUBA watching experience produced some interesting results. As cetacean watching experience (Table 13) increased from no experience to 11 or more experiences, there was a notable increase in interest in products 11 and 12 (i.e. advanced reseaech ventures). Conversely, for the same range, there was almost no increase in interest in products 5, 7 and 10 (i.e. penguin rescue, marine turtles and continuous sailing expedition).

With snorkelling (Table 14), as experience increased from no snorkeling experience to 51 times or more, there was a notable increase in interest in products 1, 2, 6 and 11 (i.e. the

three coral reef ventures and the submersible expedition). For SCUBA diving (Table 15), as experience increased from no experience to 101 times or more, there was a notable increase in interest in products 1, 2, and 11 (i.e. two specialised SCUBA experiences and the submersible expedition). Notably, for snorkelling and SCUBA diving, there was an increase in the level of interest (e.g. increase from 2.05 to 2.27) for all marine research tourism products as the survey respondent's experience increased from none to one or more experiences. For this range, the highest increases in interest for snorkelling were for products 4, 6 and 7 (i.e. day trip to reef, research - education and adventure, and marine turtle ventures). Similarly, the highest increases in interest for SCUBA diving were products 1, 6 and 11 (i.e. coral spawning, research - education and adventure, and survey coral reef ventures).

Table 12: Gender and Nationality of Survey Respondents and their different Levels of Interest in the 12 Marine Research Tourism Products.

Number of survey respondents

	152	156	111	200
Product	F	M	International	Australian
1. A coral spawning research venture	2.4	2.4	2.6	2.3
2. A submersible research expedition	2.3	2.0	2.3	2.1
3. A bottlenose dolphin holiday	2.2	1.8	2.1	1.9
4. A day trip to the reef	2.4	2.3	2.5	2.3
5. Volunteer at a penguin rescue centre	2.5	2.2	2.4	2.3
6. Research, education and adventure trip	2.0	2.1	2.0	2.1
7. Marine turtles and indigenous rangers	2.3	1.9	2.3	2.0
8. Biodiversity and habitat mapping	2.3	2.1	2.3	2.1
9. Sail, volunteer and track blue whales	2.4	2.2	2.3	2.3
10. A continuous sailing expedition	2.2	2.1	2.2	2.2
11. Survey coral reefs and climate change	2.2	2.4	2.4	2.2
12. A whale and dolphin research institute	2.3	2.2	2.3	2.2

Note: Key. A value of 2 (blue) is possibly interested and 3 (bright yellow) is very interested.

Table 13: Cetacean (i.e. Whale and Dolphin) Watching Experience of Survey Respondents and their different Levels of Interest in the 12 Marine Research Tourism Products.

	Number of survey respondents				
	103	73	83	16	36
Product name	No	Once	2 to 4 times	5 to 10 times	11 or more times
1. A coral spawning research venture	2.3	2.4	2.5	2.4	2.5
2. A submersible research expedition	2.3	2.1	2.4	2.4	2.4
3. A bottlenose dolphin holiday	2.1	2.2	2.1	2.4	2.3
4. A day trip to the reef	2.1	2.3	2.1	2.1	2.3
5. Volunteer at a penguin rescue centre	1.9	2.1	2.1	1.9	2.0
6. Research, education and adventure trip	2.2	2.3	2.3	2.1	2.3
7. Marine turtles and indigenous rangers	2.3	2.3	2.4	2.3	2.3
8. Biodiversity and habitat mapping	2.0	2.1	2.0	2.2	2.1
9. Sail, volunteer and track blue whales	2.2	2.3	2.3	2.5	2.4
10. A continuous sailing expedition	2.2	2.1	2.3	2.1	2.2
11. Survey coral reefs and climate change	2.3	2.3	2.3	2.3	2.7
12. A whale and dolphin research institute	2.0	2.1	2.1	2.2	2.4

Note: Key. A value of 2 (blue) is possibly interested and 3 (bright yellow) is very interested.

Table 14: Snorkelling Experience of Survey Respondents and their different Levels of Interest in the 12 Marine Research Tourism Products.

	Number of survey respondents				
	28	17	59	57	150
Product name	No	Once	2 to 10 times	11 to 50 times	51 or more times
1. A coral spawning research venture	2.2	2.4	2.2	2.5	2.5
2. A submersible research expedition	1.8	2.1	2.3	2.5	2.2
3. A bottlenose dolphin holiday	2.2	2.5	2.1	2.2	2.0
4. A day trip to the reef	2.0	2.6	2.3	2.1	2.1
5. Volunteer at a penguin rescue centre	1.9	2.2	2.0	2.0	2.1
6. Research, education and adventure trip	1.9	2.4	2.5	2.2	2.3
7. Marine turtles and indigenous rangers	2.1	2.7	2.2	2.4	2.3
8. Biodiversity and habitat mapping	2.0	1.9	2.1	2.1	2.1
9. Sail, volunteer and track blue whales	2.2	2.2	2.2	2.4	2.2
10. A continuous sailing expedition	2.2	2.1	2.1	2.2	2.1
11. Survey coral reefs and climate change	2.0	2.0	2.2	2.5	2.5
12. A whale and dolphin research institute	2.0	2.2	2.0	2.2	2.1

Note: Key. A value of 2 (blue) is possibly interested and 3 (bright yellow) is very interested.

Table 15: SCUBA Diving Experience of Survey Respondents and their different Levels of Interest in the 12 Marine Research Tourism Products.

	Number of survey respondents				
	101	22	23	27	138
Product name	No	1–10	11 – 30	31-100	101 +
1. A coral spawning research venture	2.1	2.5	2.6	2.7	2.5
2. A submersible research expedition	2.0	2.0	2.4	2.6	2.6
3. A bottlenose dolphin holiday	2.2	2.2	2.0	1.9	2.2
4. A day trip to the reef	2.2	2.5	2.5	2.1	2.1
5. Volunteer at a penguin rescue centre	2.0	2.0	2.0	2.0	2.0
6. Research, education and adventure trip	2.2	2.5	2.4	2.3	2.2
7. Marine turtles and indigenous rangers	2.3	2.3	2.2	2.2	2.4
8. Biodiversity and habitat mapping	2.0	1.9	2.3	2.0	2.1
9. Sail, volunteer and track blue whales	2.2	2.4	2.5	2.4	2.3
10. A continuous sailing expedition	2.1	2.2	2.3	2.2	2.2
11. Survey coral reefs and climate change	2.0	2.4	2.3	2.4	2.6
12. A whale and dolphin research institute	1.9	2.0	2.3	2.1	2.2

Note: Key. A value of 2 (blue) is possibly interested and 3 (bright yellow) is very interested.

SUMMARY

This paper identifies and affirms the existence of a set of likely relationships between marine research tourism market segments, preferred benefits and product types. For example, market characteristics such as nature documentary viewing, membership of volunteer groups, professional background, gender, and SCUBA experience are shown to significantly influence the interest of survey respondents (n=311) for different marine research tourism products. Similarly, the preferences of survey respondents for different benefits such as the destination, marine discovery and exploration, learn from experienced researchers, opportunity for fun, social interaction, skills, self sufficiency and/or training needed to participate are shown to notably influence their interest in different marine research tourism products. Such outcomes also demonstrate the effectiveness of using a benefit segmentation approach for identifying the preferences of potential marine research tourists.

This research contributes new information about the preferences of potential marine research tourists for different marine research tourism products and benefits. It is possible that prior to this research, much of this information could have seemed reasonable to those with some knowledge of the marine research tourism topic. For example, it could have been reasonable to propose that many potential marine research tourists would like to have the

opportunity to explore marine phenomena and discover new things, or frequent viewers of nature documentaries, cetacean watchers, snorkellers or scuba divers would have higher interest in more marine research tourism products. However, the significance of the above research is that these and other propositions have been empirically tested. The implication of this is that such information can be used by marine research tourism suppliers to help identify suitable markets, design effective and different products, and develop effective and appropriate promotional campaigns.

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Appendix 17. Full refereed paper to the Council of Australian Tourism and Hospitality Educators (CAUTHE) conference at the Gold Coast, Australia in 2008

THE CONCEPTUAL NATURE OF MARINE RESEARCH TOURISM AND KEY STAKEHOLDER INVOLVMENT IN MARINE RESEARCH TOURISM

Authors: Peter Wood[1] and Dr. Alexandra Coghlan[2]
Affiliation: James Cook University[1, 2] and Sustainable Tourism CRC[1]
School of Business, Cairns, QLD, Australia, 4870

E-mail[1]: peter.wood@jcu.edu.au
E-mail[2]: alexandra.coghlan@jcu.edu.au

Phone[1] (office) 07 4098 1523, Mobile[1] 0400 528 166
Phone[2] (office) 07 4042 1763, Mobile[2] 0439 091 731

Address: Tourism Program, School of Business, James Cook University
P.O. Box 6811, Cairns Mail Centre, Cairns 4870, Queensland. Australia

ABSTRACT

Marine research tourism is a form of marine ecotourism whereby marine research is an important part of the tourism attraction. Research was undertaken to further understand marine research tourism and how can that knowledge be used to further involve key stakeholders in marine research tourism across Australia? A secondary data analysis, Likert ranking and factor analysis was undertaken on a representative and worldwide sample of marine research tourism venture web sites. Focus was placed on exploring correlations and any notable relationships between key stakeholder preferences and conceptually derived tourism criteria. 45 marine research tourism ventures were classified into seven new marine research tourism classes. These seven classes were then classified as vacation or volunteer minded ventures. The average level of marine research quality across these seven classes ranged from moderate to high. The average level of marine research quality can be high for both vacation and volunteer minded ventures. When assessing the potential involvement of key stakeholders in marine research tourism, the research shows that there is a relatively complex array of factors at play. This complexity includes variations in the levels of marine research quality, stakeholder views, volunteer mindedness, tourist training, tourist skills, hospitality and adventure. This research paper describes and interprets this complexity in terms of potential key stakeholder involvement in marine research tourism across Australia.

Key Words: Marine Research Tourism, Volunteer Mindedness

INTRODUCTION

As tourism advances and evolves an industry, many new specialised forms of niche tourism emerge. Among these is marine research tourism, a type of tourism that is marine-based and involves some level of research. Specifically, we define marine research tourism as a form of marine ecotourism whereby marine research is an important part of the tourism attraction and there is an opportunity for paying tourists and/or paying volunteers to be actively involved in marine research activity (Adapted from Benson, 2005). Other definitional (Benson, 2005) features of a marine research tourism venture include:

1. There are researchers who are engaged in official marine research pursuits
2. There is an official research centre that supports research activity
3. There is research supervision for any tourist marine research activity

For this research, a marine research tourism venture, the venture must last for one or more days, be advertised publicly, take paying tourists or volunteers, and operate on a commercial basis (Adapted from Ellis, 2003a). Marine research tourism products are defined to include marine research programs, ventures, destinations, attractions, activities and interpretation for marine research tourists.

Cousins (2007) and Ellis (2003b) report that a majority of regional or globally focused marine research tourism operators worldwide are organised from companies based in the UK or USA. A preliminary assessment of marine research tourism across Australia indicates that there is a notable paucity of regional and globally based operators in Australia. Instead Australian marine research tourism is mostly characterised by a range of small and independent privately owned ventures. When compared to the UK and the USA, the marine research tourism industry in Australia can be considered as relatively under developed. This can be considered surprising as, in world terms; Australia has an advanced marine research sector, a relatively mature marine tourism industry, a large coastline and ocean region, and a wealth of marine wildlife and other natural assets.

As a result, the following questions arise, if marine research tourism has many potential benefits, the marine research tourism industry is rapidly growing elsewhere in the world in world terms, and Australia has many favourable conditions for marine research tourism, why is research tourism less developed in Australia and how can marine research tourism be expanded across Australia? Whilst the first question posed is an important one in the global context, the aim of this paper is to answer the second question: how can marine research tourism be expanded across Australia?

To help answer the second question, it is arguable necessary to understand the following four points;

1. ***What would be considered desirable for any marine research tourism expansion?***
2. ***What is the tourism related conceptual nature of marine research tourism?***
3. ***What is the nature of marine research tourism ventures worldwide, and***
4. ***What are implications of this knowledge for the involvement of key stakeholders in marine research tourism?***

The first two questions above are answered through a review of existing literature. In order to answer question three, the concepts and models from the literature review are applied to a sample of 45 marine research tourism ventures to develop a greater understanding of existing marine research tourism ventures as well as to test the concepts presented in the literature review. Next these results are applied to a discussion of how marine research tourism could be expanded across Australia.

LITERATURE REVIEW

This part of the paper will focus on the current state of knowledge regarding marine research tourism and its relationship to other better known forms of alternative and niche tourism sectors. Included in this review are some of the benefits of including the general public in science, and in particular using volunteers in a leisure and tourism context. Next existing frameworks borrowed from volunteer tourism, ecotourism and scientific tourism are reviewed to better our understanding of marine research tourism. These can then be applied to existing marine research tourism ventures in the results section to examine its suitability to the Australian context.

1. What would be considered desirable for any marine research tourism expansion?

There is a long tradition of using non-specialist volunteers in conservation projects, particularly in Britain and the USA (Darwall & Dulvy, 1996). Volunteers represent a large and generally cost-effective workforce that can be used to collect data in conservation projects that are labour intensive but technically straight-forward (Forster-Smith & Evans, 2003). Other advantages are that the volunteers themselves gain fulfilment and knowledge, as well as an opportunity to broaden their horizons; a research methodology is developed that is straight-forward enough for non-specialist volunteers and which is likely to be continued in the long-term using local expertise and financing; there is an increase in the level of public awareness of ecological issues through active participation of the general public; there is an opportunity for scientists to interact directly with the public and increased the perceived relevance of science to the local community; volunteers may possess their own qualities, knowledge and skills that may benefit scientific research; volunteers may provide new insights into their research by suggesting alternative hypotheses, as well as providing scientists with an opportunity to become more interdisciplinary in their approach.

On the other hand, some research into volunteer tourism suggests that participants need to feel that there are substantial benefits to be gained from their volunteering experience (Henderson, 1981). A corollary of this is that staff should become more aware of the needs of the volunteer tourists that can be fulfilled through volunteerism. Thus, it is important for researchers to remember that whilst they seek to maximise their teams‟ performance, the fact that volunteer tourists are volunteering, and have their own goals (such as enjoyment) place important constraints on management.

A pragmatic basis for understanding what would be desirable for any expansion of marine research tourism across Australia is to ensure that desired benefits and concerns of key stakeholders are understood and satisfied (Coghlan, 2007, Cuthill, 2000, Musso and Inglis, 1998). Key stakeholders of marine research tourism in Australia include Australian marine researchers, marine managers, marine conservation groups, marine education groups, marine tour operators, and tourists (Coghlan, 2007, Cuthill, 2000, Musso and Inglis, 1998).

Notably, Coghlan (2007) reports that a majority of marine researchers, when on a marine research tourism venture, prefer to focus the marine research priorities of the venture than the hospitality, tour guide and tourist training aspects of the marine research tourism venture. This is understandable as marine researchers and marine research agencies are naturally focused on high quality marine research outcomes. Furthermore, it is reasonable to suggest that they are naturally inclined and likely sponsored to only undertake marine research and not participate in marine research tourism. Their potential involvement in marine research tourism may be further troubled as marine tour operators may be too busy, not inclined or not suitably trained to

effectively support the interests of marine researchers (Musso and Inglis, 1998). Table 1 summarises these and some other notable desired benefits or concerns of key marine research tourism stakeholders regarding marine research tourism.

Table 1: Some notable desired benefits or concerns of key marine research tourism stakeholders regarding marine research tourism ventures

Key stakeholder	Desired benefits	Concerns
Marine researchers	High quality marine research outcomes	Involvement in hospitality, tour guide and/or tourist training
Marine managers	High quality marine research and management outcomes	Involvement in hospitality, tour guide and/or tourist training
Marine ecotour operators	A commercially viable marine ecotourism venture	Possibly too busy and not suitably trained to support the interests of marine researchers
Marine conservation and education groups	High quality marine research and conservation outcomes, increased skills, education and awareness of marine tourists towards marine research	
Marine research tourist	The opportunity to learn, experience new and different things, have fun and contribute to a worthwhile project (Coghlan, 2006)	

Ellis (2003b) highlighted a research need to understand how to involve research and management agencies in research tourism. Based upon the points made in Table 1, several scenarios of potential key stakeholder preferences can be proposed.

First, it is suggested that high quality marine research and management outcomes may increase the willingness of many marine researchers and management agency"s to be involved in marine research tourism. Furthermore, minimising the involvement of marine researchers and marine research agencies in providing hospitality, tour guide and/or tourist training may also increase the involvement of many marine researchers. In contrast to this, for marine research tourism ventures, marine conservation and education groups may prefer increased education, training and awareness of marine tourists towards marine research and related conservation issues.

Furthermore, the tourist"s desire to learn and experience new and different things may be at odds with the marine researcher"s preference to be less involved with tourists. This social environment provides a useful framework of understanding different key stakeholder preferences for different types of marine research tourism ventures. As the next step in this analysis, Table 2 then summarises some suitable criteria for measuring some of these key stakeholder preferences.

Table 2: Suitable criteria for measuring key stakeholder preferences on marine research tourism ventures

Criteria name	Description
Level of marine research quality	What is the relative level of research significance to the marine research tourism venture? This is related to the relative benefits of any marine research to the marine research community
Level of training of tourists	What relative level of skill training does the tourist receive on the venture?
Level of hospitality	What is the relative hospitality level based on a standard 1 to 5 accommodation star rating scheme?
Level of tourist's pre-requisite skills and education	What relative level of pre-requisite skills and education does the tourist require to participate on the venture?

2. What is the tourism related conceptual nature of marine research tourism?

As well as the adopted definition for marine research tourism, three tourism conceptual frameworks may be applied to understand marine research tourism include the volunteer and vacation minded tourism concept (Brown & Morrison, 2003), Coghlan (2007)‟s conceptual framework for volunteer marine research tourism, and Benson (2005)‟s proposed conceptual framework for research tourism.

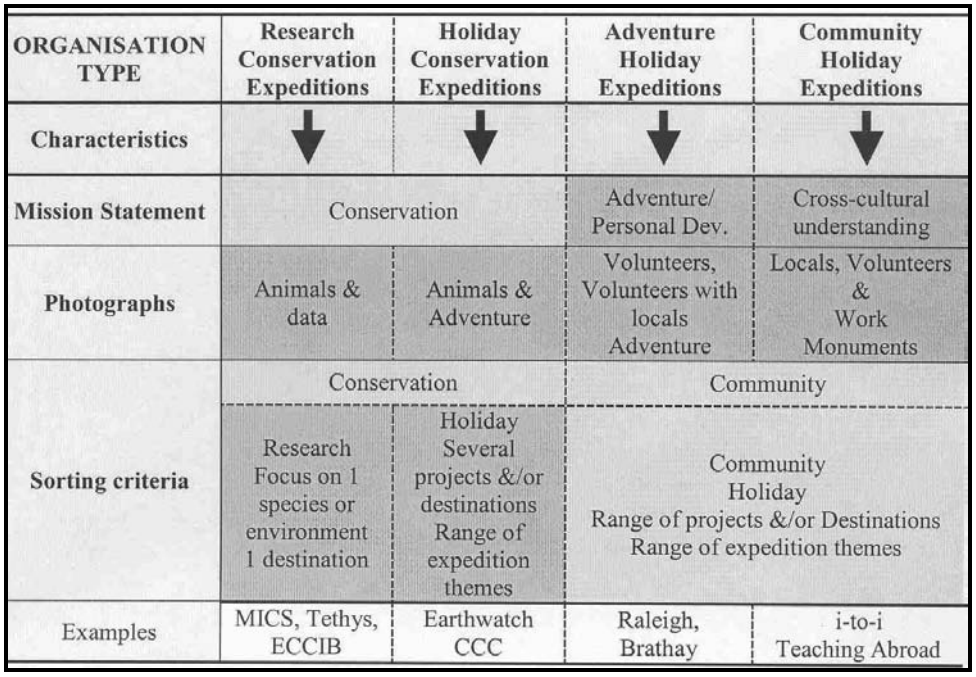
(i) Volunteer and vacation minded tourism

Brown and Morrison (2003) report that volunteer tourism can take two different forms based on participants‟ mindsets: the „volunteer-minded‟ versus the „vacation-minded‟. Volunteer-minded individuals tend to devote most or all of their vacation time to volunteer activities at the destination and this type of volunteer tourism is often called a mission or service trip (Brown & Lehto, 2005). Vacation-minded individuals spends a small portion of the vacation on volunteer work at the destination and appear to attach high values to the opportunities for educating children and bonding with family members. They also seek camaraderie on the vacation and appear to attach high values to the opportunities for educating children and bonding with family members (Brown and Lehto, 2005). Vacation minded travelers also seem to be driven by sense of adventure and desires for exploration and novelty that are not as prominent with the more serious volunteer minded travelers (Brown and Lehto, 2005). While there has been increasing research on volunteerism which sheds insights on motivational and destination choice factors of the „volunteer minded‟ service trip participants, Brown and Lehto (2005) state that very little research has been conducted on the „vacation-minded‟ volunteer tourists.

One exception to this is Coghlan (2006) who states that “potential volunteer tourists do make a distinction between trips that may be more closely related to ecotourism holidays, and trips that offer a true volunteering experience, with its emphasis on altruism, learning, and networking or meeting like-minded people”. In general, experienced volunteer tourists, or biology and environmental science students were looking for other types of benefits out of these holidays, in particular increasing their skills or knowledge (Coghlan, 2006). Conversely, volunteer tourists who were less familiar with volunteer tourism were more likely to be attracted by the „fun‟ or holiday content of the trip (Coghlan, 2006).

(ii) Coghlan (2007)’s conceptual framework for volunteer research tourism

Coghlan (2007) empirically developed a conceptual framework for volunteer research tourism ventures via a detailed content analysis of venture (n=27) mission statements and related promotional material (Figure 1). Coghlan determined that volunteer research tourism ventures can be categorised as; research conservation, holiday conservation, adventure holiday and community holiday ventures. A particularly significant outcome of Coghlan‟s conceptual framework is the empirically derived recognition of a holiday element to volunteer research tourism ventures.



ORGANISATION TYPE	Research Conservation Expeditions	Holiday Conservation Expeditions	Adventure Holiday Expeditions	Community Holiday Expeditions
Characteristics	↓	↓	↓	↓
Mission Statement	Conservation		Adventure/ Personal Dev.	Cross-cultural understanding
Photographs	Animals & data	Animals & Adventure	Volunteers, Volunteers with locals Adventure	Locals, Volunteers & Work Monuments
Sorting criteria	Conservation		Community	
	Research Focus on 1 species or environment 1 destination	Holiday Several projects &/or destinations Range of expedition themes	Community Holiday Range of projects &/or Destinations Range of expedition themes	
Examples	MICS, Tethys, ECCIB	Earthwatch CCC	Raleigh, Brathay	i-to-i Teaching Abroad

Figure 1: A proposed conceptual framework for understanding marine research tourism, based on Coghlan (2006)

(iii) Benson (2005)'s proposed conceptual framework for marine research tourism

Benson"s (2005) conceptual framework represents research tourism as a combination of better known tourism types namely; alternative, ecotourism, volunteer, scientific and educational tourism (Figure 2). Marine research tourism is clearly research tourism within a marine tourism context. It is proposed that adventure and wildlife tourism be included within this conceptual framework as after a preliminary review of marine research tourism ventures, these tourism types are present within those ventures.

Inherent within Benson"s conceptual framework is that combinations of traits from those better known tourism types can be manifested within research tourism ventures. Such traits can cover tourism concepts, models and criteria related to tourist and host typologies, motivations, markets, behaviour and satisfaction, destinations, attractions and activities. The end result is potentially powerful conceptual framework for understanding marine research tourism. However, this conceptual framework has only been empirically validated by Benson (2005)"s in-depth case study of Operation Wallacea in Indonesia. For Benson"s conceptual framework to be reliably applicable to the broader community of marine research tourism, it is proposed to be tested over a representative sample of marine research tourism ventures world wide.

In order to test Benson"s conceptual framework, criteria that relate to those better known tourism types should be identified as surrogates for measuring the presence or absence of those better known tourism types within a marine research tourism venture. Furthermore, characteristics of all those tourism criteria can be used to measure and further understand the tourism conceptual nature of marine research tourism ventures. Such tourism criteria are summarised in Table 3.

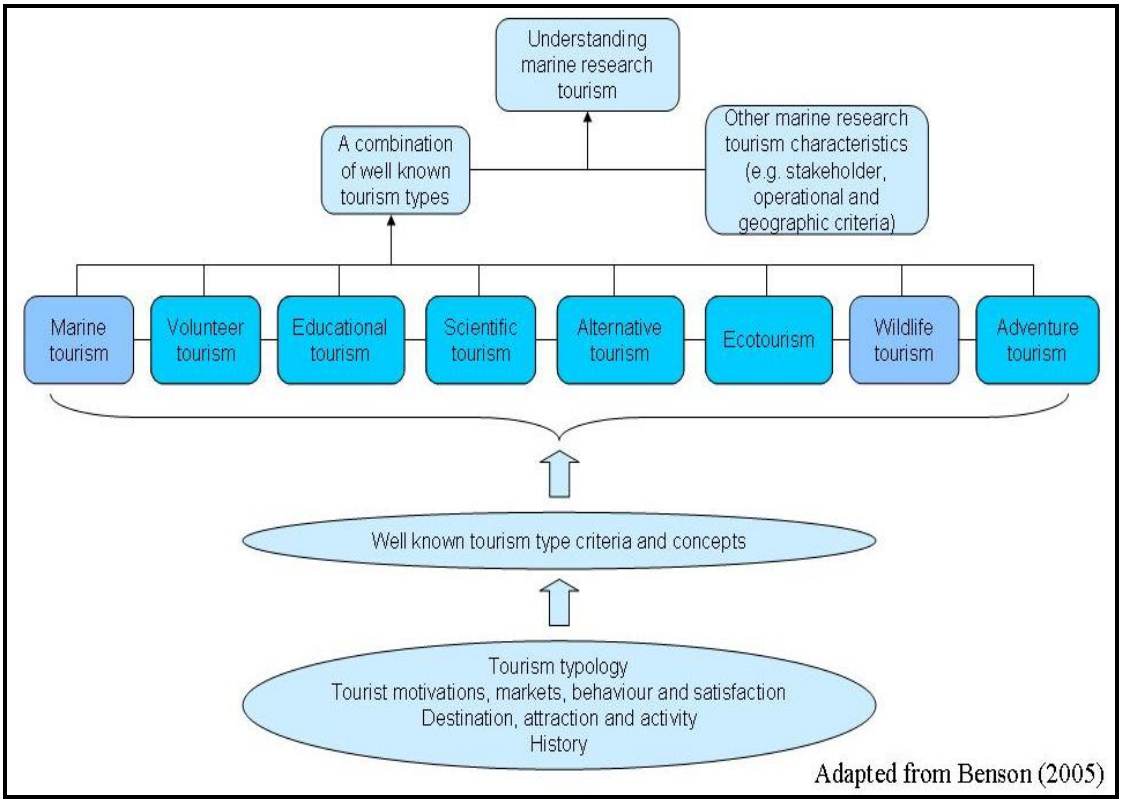


Figure 2: A proposed conceptual framework for understanding marine research tourism, adapted from Benson (2005)

Table 3: Better known tourism criteria can be used to measure and further understand marine research tourism

Better known tourism type	Criteria name	Description
Volunteer tourism	Level of volunteer mindedness	What is the relative level of the tourist's volunteer mindedness (Brown and Lehto, 2005; Brown & Morrison, 2003)?
Alternative tourism	Level of alternative tourism	What is the relative level of alternative tourism? An alternative tourism experience is defined by how unlike the tourism experience is to a mass tourism experience? (Robinson, 2005)
Ecotourism	Level of ecotourism depth	What is the level of depth along the ecotourism spectrum (Acott et al., 1998)?
Educational tourism	Level of educational tourism	What is the relative level of marine research education for the tourist while on the venture?
Scientific tourism	Level of scientific tourism	What is the likelihood that there are there scientific tourists on the venture? A scientific tourist is a scientist who pays to undertake scientific research on a tour (Benson, 2005).
Marine tourism	Presence of marine tourism characteristics	Is the venture a marine tourism venture? That is, does the venture take place in marine and/or coastal environment (Orams, 1999)
Adventure tourism	Level of adventure challenge	What is the relative level of adventure challenge (Swarbrooke et al., 2003)?
Wildlife tourism	Presence of wildlife as a marine research attraction	Does the venture involve wildlife as part of the marine research attraction?

The above conceptual frameworks and related criteria provide an opportunity to explore the nature of marine research tourism ventures worldwide. Such an exploration would be aimed at testing Benson (2005)'s proposed marine research tourism conceptual framework, classifying marine research tourism ventures and potentially illustrate any significant relationships between various marine research tourism criteria.

3. The nature of marine research tourism ventures worldwide

DATA ASSESSMENT AND ANALYSIS

As a basis for exploring the nature of marine research tourism worldwide, a representative sample (n-=45) marine research tourism ventures worldwide, a data assessment and analysis of a representative sample (n = 45) of marine research tourism venture web sites was undertaken. Potential marine research tourism venture web sites were identified with the assistance of Internet search engines, various marine research and tourism web pages, and stakeholder and researcher knowledge. Venture web sites were selected according to the adopted definition for marine research tourism. For each venture web site, the data assessment involved;

1. Recording the presence or absence of better known tourism types across different marine research tourism ventures and Likert ranking (relatively low - 1 to high – 5) of better known tourism type criteria
2. A hierarchical cluster analysis based on the better known tourism type criteria
3. A discrimant analysis (based on rankings from relatively low - 1 to high – 5) of suitable key stakeholder preference criteria, and a comparison of these with venture characteristics

The method of secondary data assessment of venture web sites was chosen as it provided a cost efficient way to obtain information on various tourism criteria about many marine research tourism ventures that operate across the world. Limitations of such a web site assessment included the collection of sometimes limited and commercially biased information and hence necessary subjective assessment and Likert ranking of criteria characteristics by the researcher. A concerted effort by the researchers was made to overcome such limitations and ensure a reliable dataset for analysis. The estimated error for each Likert ranking is nominally estimated at +/- 0.25.

Recording the presence or absence of better known tourism type criteria across different marine research tourism ventures and Likert scale ranking of the these criteria

A frequency analysis was undertaken on the Likert ranked data of better known tourism type criteria so as to identify the distribution and any potential relationships between better known tourism type criteria (Figure 3). Notably, Figure 3 shows that the proposed marine research tourism conceptual framework is mostly valid across marine research tourism ventures worldwide. The main exceptions being the ventures (n = 11) with low or low to moderate levels of volunteer mindedness and the ventures (n=13) with low to moderate levels of alternative tourism.

Ventures that exhibit lower levels of volunteer-mindedness and alternative tourism might be considered to exhibit high levels of vacation mindedness. As a consequence, the proposed marine research tourism conceptual framework should be expanded to include tourism concepts and criteria that relate to both vacation focused and less alternative marine research tourism ventures. This finding is supported by Coghlan‟s (in press) recognition of the holiday element within volunteer research tourism ventures.

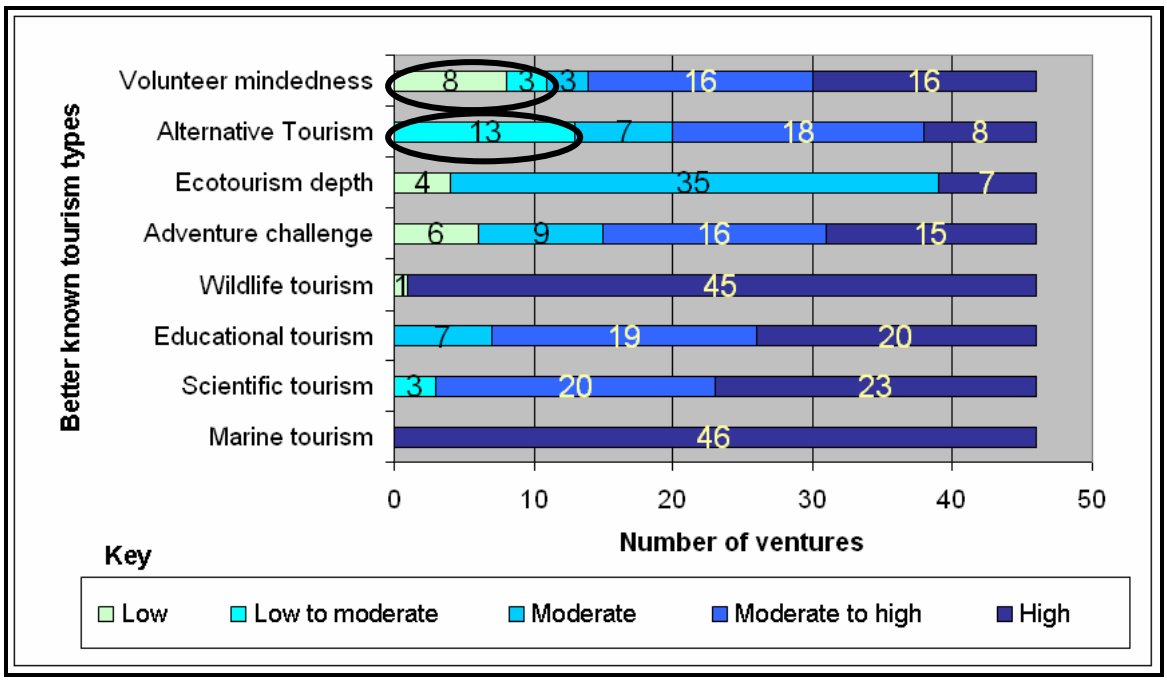


Figure 3: Distribution of better known marine research tourism types across a representative sample of marine research tourism ventures worldwide

Furthermore, Figure 3 also shows that there are four ventures with low levels of ecotourism depth, six ventures with low levels of adventure challenge, three ventures with low to moderate levels of scientific tourism, and all ventures have moderate or higher levels of educational tourism. All ventures were considered marine tourism ventures as they all took place in marine and/or coastal environment. Just one venture had low levels of wildlife present, and this indicates that the majority of marine research tourism ventures worldwide are focused on marine wildlife research.

A correlation analysis was undertaken on the relevant Likert ranked data to explore if there are any potential relationships between better known tourism types. Notable results include a high Pearson correlation ($r = 0.8$) between level of volunteer mindedness and alternative tourism, and a moderate correlation ($r = 0.52$) between level of ecotourism depth and adventure challenge. There is also a low correlation between level of volunteer mindedness, and ecotourism depth ($r = 0.16$) and adventure challenge ($r = -0.14$). These results suggest that variations in the level of volunteer mindedness and alternative tourism are a key factor that can be used to understand variations in the character of marine research tourism. Furthermore, levels of ecotourism depth and adventure challenge have similar but lesser and relatively independent role in understanding the conceptual nature of marine research tourism.

A hierarchical cluster analysis based on the better known tourism type criteria

A hierarchical cluster analysis on this Likert ranked data was undertaken to classify the 45 marine research tourism ventures into seven new marine research tourism classes (Table 4). These seven classes, termed A, B, C, D, E, F and G are organised in increasing order of relative level of volunteer mindedness. Broadly speaking, classes A and B can be considered as vacation minded ventures and classes, C, D, E, F and G can be considered as volunteer minded ventures.

Table 4: Seven new marine research tourism classes

New marine research tourism class	Number of ventures	Relative level of volunteer mindedness (low 1 to high 5)
A (Vacation minded)	6	1
B (Vacation minded)	5	2.4
C (Volunteer minded)	6	3
D (Volunteer minded)	8	4.3
E (Volunteer minded)	7	4.3
F (Volunteer minded)	6	4.7
G (Volunteer minded)	7	4.9
Total	45	

To further understand the tourism conceptual nature of these seven new marine research tourism classes, a discriminant analysis was undertaken on these seven classes and their correlation with better known tourism type criteria. Results (Figure 4) summarise the average value of each better known tourism type criteria for each of the seven new marine research tourism classes. Figure 4 highlights that classes A and B have a low to moderately low (i.e. values less than 3) average level of volunteer mindedness while classes C, D, E, F and G have a moderate to high (i.e. values greater than or equal to 3) level of volunteer mindedness. Figure 4 also highlights that the levels of alternative tourism (i.e. between 2.0 and 4.7), ecotourism depth (i.e. between 2.3 and 5), adventure challenge (i.e. between 2.4 and 4.8), and scientific tourism (i.e. between 2.8 and 5) also exhibit notable variation across the seven new marine research marine research tourism classes. In contrast, levels of educational tourism are relatively constant and moderate to high (i.e. between 3.8 and 5.0) across the seven classes.

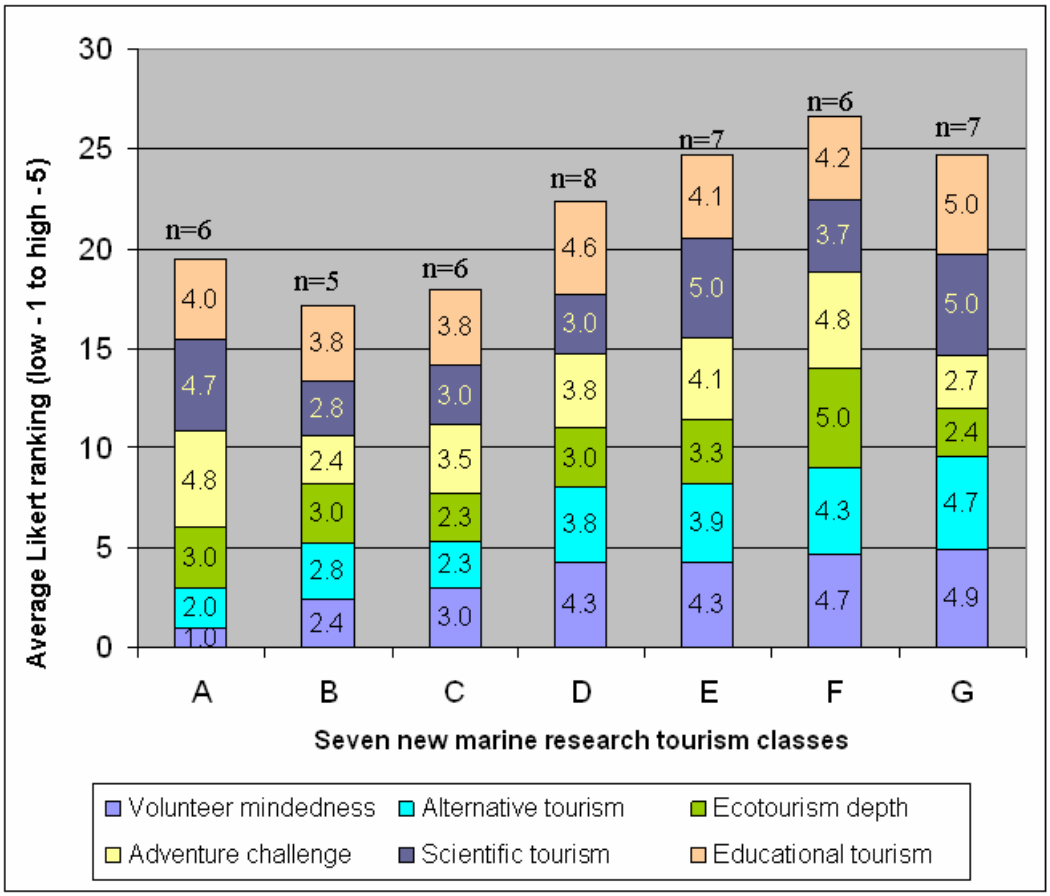


Figure 4: A classification of marine research tourism ventures based on the relative level of better known tourism type criteria

Linking key stakeholder preference criteria with marine research tourism classes

Understanding the preferences of key stakeholders for different classes of marine research tourism venture classes will assist with involving key stakeholders in any development of those marine research tourism classes. Towards this, a discriminant analysis was undertaken on the average distribution of key stakeholder preference criteria across the seven new marine research tourism classes. Results shown in Figure 5 illustrate that all ventures show an average level of marine research quality that is moderate or above (i.e. value greater than 2.8). Figure 5 also highlights that there is also notable variation in the average levels of tourist training (i.e. between 1.0 and 3.7), the tourist‟s re-requite skills (i.e. between 1.3 and 3.6), and tourist hospitality (i.e. between 2.3 and 4.0).

To explore if there are notable levels of better known tourism type criteria, key stakeholder preference criteria for each marine research tourism class, a discriminant analysis was undertaken on the various levels of marine research tourism criteria for each marine research tourism class. Results of the discriminant analysis in Table 5 illustrate the striking difference in nature of each marine research tourism class. Given, key stakeholder views regarding their preference for different characteristics of marine research tourism, this knowledge can be used to assess which marine research tourism classes could be preferred or avoided by key stakeholders. In turn, this knowledge could then be used to determine how to further involve key stakeholder in marine research tourism.

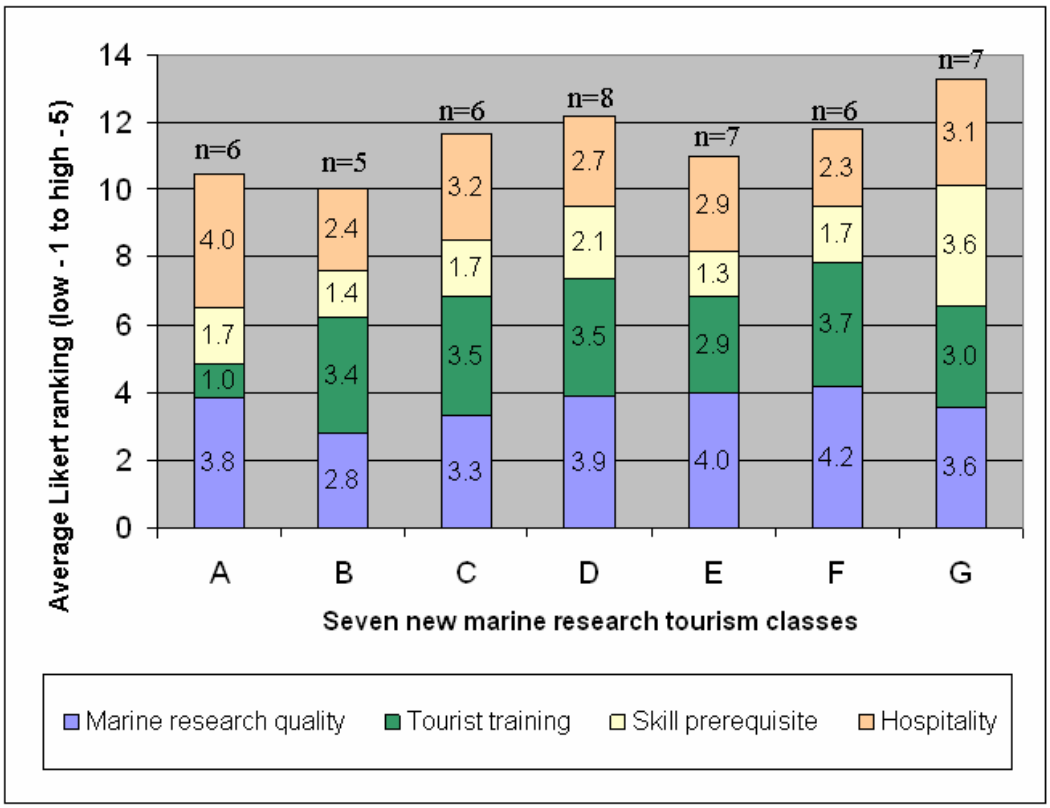


Figure 5: Distribution of key stakeholder preference criteria across the seven new marine research tourism classes

Table 5: Notable features of each new marine research tourism class

New marine research tourism class	Notable levels of marine research tourism criteria
A (Vacation minded)	A high vacation minded venture with moderately high levels of marine research quality, the lowest relative level of tourist training, highest average level of hospitality for tourists, the shared highest level of adventure challenge, and higher levels of scientific tourism.
B (Vacation minded)	A high to moderate vacation minded venture with the lowest level of marine research quality, the lowest level of adventure challenge, higher levels of tourist training, and a shared lowest level of tourist pre-requisite skills, scientific tourism and educational tourism.
C (Volunteer minded)	A vacation and volunteer minded venture with moderate levels of marine research quality, low to moderate level of ecotourism depth, and low to moderate levels of alternative tourism.
D (Volunteer minded)	A moderately high volunteer minded venture with relatively high levels of marine research quality, high levels of alternative tourism, moderate levels of ecotourism depth, moderate to high levels of adventure challenge, relatively low levels of scientific tourism, and higher levels of educational tourism.
E (Volunteer minded)	A moderately high volunteer minded venture with moderate to high levels of marine research quality, lower levels of tourist training, a shared lowest average level of tourist pre-requisite skills, moderately high levels of adventure challenge, and a shared highest level of scientific tourism.
F (Volunteer minded)	A high volunteer minded venture with the highest average level of research quality, highest level of tourist training, moderately low level of hospitality for tourists, high levels of alternative tourism, highest level of ecotourism depth, and shared highest level of adventure challenge.
G (Volunteer minded)	A highly volunteer minded venture with moderately high levels of marine research quality, the highest level of tourist pre-requisite skills, highest levels of alternative tourism, lower levels of ecotourism depth, lower levels of adventure challenge, a shared highest levels of scientific tourism, and the highest level of educational tourism.

To identify notable correlations and possible significant relationships between the various criteria, a correlation analysis was done on the average levels of marine research tourism criteria for each of the marine research tourism classes. Notable results of this correlation analysis are shown in Table 6.

Table 6: Correlation analysis of average levels of marine research tourism criteria across the seven marine research tourism classes

Level of marine research tourism criteria	Pearson (r) correlation relationship. (Between 1, 0 and -1, where 1 is full positive correlation, 0 is no correlation, and -1 is full negative (i.e. negative correlation).
Marine research quality	Positively well correlated with level of adventure challenge (r= 0.8) and level of ecotourism depth (r= 0.6), and not well correlated with level of tourist training (r = -0.18) and skill pre-requisite of tourists (r= 0.02).
Volunteer mindedness	Positively well correlated with level of alternative tourism (r= 0.9), level of educational tourism (r= 0.7), and level of tourist training (r= 0.7), and negatively correlated with level of hospitality provision (r= -0.6).
Skill training of tourists	Negatively correlated with level of hospitality (r= -0.9) and level of scientific tourism (r= 0.6), and not well correlated with level of skill pre-requisite (r= 0.05).
Skill pre-requisite of tourists	Positively well correlated with level of educational tourism (r= 0.9) and level of alternative tourism (r= 0.6), and not well correlated with level of marine research quality (r= 0.02) and tourist training (r= 0.05).
Hospitality provision	Moderately well correlated with level of scientific tourism (r= 0.5), negatively correlated with level of tourist training (r= -0.9) and level of volunteer mindedness (r= -0.06), and not well correlated with level of educational tourism (r= 0.01).

Correlation results in Table 6 indicates that, across the seven marine research tourism classes, the average level of marine research quality is not well correlated with the average level of tourists training or skill pre-requisite of tourists (Figure 6). For example, across the seven classes, there is a varying emphasis (e.g. average Likert rank) on the marine research program over tourist training (e.g. A, C and F) and skill pre-requisite (e.g. B, E and F). In terms of

possible significant relationships, this can be interpreted as, for each marine research tourism class; there are different relationships between the marine research program and its involvement of skilled tourists and the training of tourists. This in turn, indicates a different focus by the various marine research tourism operators on the intended marine research, volunteer and probably business goals of their marine research tourism ventures.

Figure 6: Distribution of average level of marine research quality with level of tourists training and skill pre-requisite of tourists, across the seven identified marine research tourism classes

Another notable correlation result is that the average level of marine research quality is well correlated with the average level of adventure challenge. While this is a perhaps surprising, this result could be interpreted as meaning that high quality marine research often occurs in remote locations, often for several days or more, and with limited supplies, and this can involve higher levels of adventure challenge for the tourist. Another outcome is that the level of skill training is inversely correlated with the level of hospitality and this perhaps reflects the case, in many cases, tourist training can be a costly, and marine research tourism operators, may reduce the levels of hospitality to keep costs down. Finally, the level of hospitality is moderately correlated with the level of scientific tourism. This can be interpreted as many scientists preferring comfortable accommodation, and quality food and service, when travelling on marine research tourism ventures.

While some of these possible interpretations of the nature marine research tourism worldwide may not be considered as surprising, it can be proposed, that the sensibleness of these interpretations indicates a fairly high degree of validity and reliability of the Likert ranked data and multivariate analysis approach. Furthermore, the empirically based derivation of these interpretations provide a basis for confirming that such phenomenon does occur in the real world, and that the marine research tourism concepts that underlie these interpretations also have a fairly high degree of validity and reliability.

DISCUSSION

4. Research Implications for key stakeholder involvement in different marine research tourism venture classes

This research illustrates that marine research tourism can be understand as a combination of better name tourism types. These tourism types being alternative, ecotourism, volunteer, scientific, educational tourism, adventure, and wildlife tourism. However, marine research tourism is not only a form of volunteer tourism and alternative tourism but can also be a form of vacation and less alternative focused tourism. This result matches well with the holiday element of volunteer research tourism as identified in Coghlan (2007). Results also indicate variation in the levels of volunteer mindedness is a key factor to understand marine research tourism. Furthermore, variation in the levels of ecotourism depth and adventure challenge has a similar but lesser and relatively independent role in understanding marine research tourism.

Marine research tourism was classified into seven new marine research tourism classes and these classes were used to analyse the distribution of better known marine research tourism type criteria with key stakeholder preferences for different marine research tourism characteristics. These seven ventures were broadly categorised into two vacation minded ventures and five volunteer minded ventures. They were also broadly categorised into one venture class where the tourist‟s interaction with marine research is mostly passive yet educationally orientated and six other venture classes where the tourist‟s interaction with marine research is more active and involves increased skill training. Notably, in terms of the potential involvement of marine researchers or managers, marine research quality was ranked at least moderate for both vacation and volunteer minded ventures.

A major implication of this knowledge for marine researchers or managers marine research tourism can be a relatively complex environment to become involved with. This is further compounded by the fact that most marine research and management agencies are not funded to be associated with marine tourism ventures. In Australia, without the involvement of marine researchers or managers in marine research tourism, it can be considered that the marine research tourism industry in Australia has little opportunity to notably expand. When considering their involvement in the marine research tourism industry, marine researchers or managers may need to consider any skill training and hospitality provisions inherent in different types of marine research tourism ventures. For example, without external assistance with hospitality, many marine researchers and managers may prefer to be not involved with vacation minded and more passive marine research tourism ventures. However, due to possible tourist training burdens, many marine researchers, managers and marine ecotourism operators may prefer to be involved in vacation minded and more passive marine research tourism ventures. Moreover, due to a preference for higher skilled tourists, many marine researchers and managers may prefer to be involved with volunteer orientated ventures that only attract higher skilled tourists. Such an environment of competing interests may be considered as a moderately complex environment for many marine researchers or managers.

The research suggests that many marine researchers of managers will have a preference for ventures that involve higher skilled tourists. However, it is likely that the tourist market potential for lesser skilled marine research tourists may be larger than the market potential for higher skilled marine research tourists. Therefore, it can be rationalised that while increasing the involvement lesser skilled marine research tourists may notably grow marine research tourism but conversely, this may discourage the involvement of marine researchers or managers in such ventures. It should be noted that while maintaining higher levels of marine research quality, any

involvement of lesser skilled tourists may be overcome by reducing the skill training and level of interaction between marine researchers and those less skilled marine research tourists. Analysis of marine research tourism ventures worldwide indicate that this can be compensated by higher levels of hospitality and adventure.

From a tourist‟s point of view, the preferences of marine research tourists may affect different levels of incentive for marine researcher and managers to be involved in marine research tourism. The literature indicates that many volunteer orientated marine research tourists may seek on-site skill training and active interaction with trained marine researchers. This need for higher levels of skill training and active interaction with marine researchers may act to deter many marine researchers, managers or marine ecotourism operators. On the other hand, more vacation minded tourists may seek lower levels less training and more passive interaction with marine researchers, and this may increase the involvement of many marine researchers, managers in those ventures

Increasing the numbers of marine research tourists can be considered as essential for any expansion of marine research tourism across Australia. While attracting prospective marine research tourists is a field for marketeers, this research suggests that prospective marine research tourists can be potentially satisfied by both vacation and volunteer minded ventures. Marine research tourist satisfaction will depend on varying levels of skill training, education, the presence of scientists, hospitality, and adventure challenge on marine research tourism ventures. Regarding the potential involvement of marine conservation or education groups, this research suggests that these key stakeholders may prefer to be involved in either vacation or volunteer minded ventures. This is because either vacation or volunteer minded ventures can offer a combination of high levels of skill training and/or education that can suit their goals of increasing awareness of marine research and conservation within the public.

CONCLUSION

These above research suggest that there is a relatively complex array of multiple factors is at play when considering how to involve key stakeholders in marine research tourism. Furthermore, unless some external intervention occurs specifically regarding the training tourists and hospitality provision, these factors appear not readily align in favour of the marine researcher or manager in any straight forward way. Such a complex environment is likely to be one of the principle reasons why many marine researcher, managers and ecotourism operators can be reticent to be involved in marine research tourism.

The relative sensibleness of research results and conclusions indicates a fairly high degree of validity and reliability of the data collection and analysis methods used for this research. Furthermore, research results and conclusions provide an empirical basis for confirming that various correlations of marine research tourism factors do occur in the real world and that the underlying marine research tourism and key stakeholder concepts have a fair degree of validity, reliability and usefulness.

This research demonstrates that relating the conceptual nature of marine research tourism with key stakeholder preferences for different marine research tourism factors does provide a useful model and knowledge that could be used to understand how to involve various key stakeholders with the different types of marine research tourism ventures. The importance of this is that such knowledge may be used to expand marine research tourism across Australia and provide new opportunities for more key stakeholders to reap the potential benefits of marine research tourism.

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Appendix 18. 26 MRT product web sites that are reviewed in study one

Table 18-1: List of MRT products and web sites (n=126) reviewed in study 1– Table 1

ID	MRT Product name	Web site (last accessed in April 2010)
1	Deep Ocean Expeditions - Azores Undersea Volcanoes	http://www.deepoceanexpeditions.com/expeditions.html
2	Deep Ocean Expeditions - Mid-Atlantic Hydrothermal Vents	http://www.deepoceanexpeditions.com/expeditions.html
3	Deep Ocean Expeditions - Dive to the RMS Titanic	http://www.deepoceanexpeditions.com/expeditions.html
4	Deep Ocean Expeditions - Operation Bismarck	http://www.deepoceanexpeditions.com/expeditions.html
5	Cape York Turtle Rescue - Mapoon, Australia	http://capeyorkturtlerescue.com/index.htm
6	The Undersea Explorer - Osprey Reef Shark Encounter, Australia	http://www.undersea.com.au/information_shark_expedition.htm
7	The Undersea Explorer - Far Northern Expedition, Australia	http://www.undersea.com.au/information_far_northern_expeditions.htm
8	Lizard Island Research Station - Volunteer at a Marine Research Station	http://www.lizardisland.net.au/volunteering/research.htm
9	Tevene'i Marine - Coral Reef Ecology Education Programs, Australia	http://www.tevenei.com/tvm/eco_exp.htm
10	Tevene'i Marine - Eco Expeditions on the Great Barrier Reef, Australia	http://www.tevenei.com/tvm/eco_exp.htm
11	The Oceania Project - Whale Research Expeditions, Australia	http://www.oceania.org.au/expedition/expedition.html
12	Rodney Fox Expeditions - Great White Shark Expeditions, Australia	http://www.rodneyfox.com.au/index.php?option=com_content&task=view&id=29&Itemid=41
13	Pelican Expeditions - Blue Whale Research, Australia	http://www.svpelican.com.au/pages/research.html#PORTLANDWHALE
14	Landscope Expeditions - Loggerhead Turtles of Dirk Hartog Island, Australia	http://www.dec.wa.gov.au/component/option,com_docman/Itemid,1/gid,3180/task,doc_download/
15	Landscope Expeditions - Wildlife of the Montebello Islands, Australia	http://www.dec.wa.gov.au/component/option,com_docman/Itemid,1/gid,3180/task,doc_download/
16	Conservation Volunteers Australia - Montague Island Nature Reserve, Australia	http://www.conservationvolunteers.com.au/volunteer/montague.htm
17	Eye to Eye Encounters - Great Barrier Reef, Australia	http://www.marineencounters.com.au/expeditions.htm
18	Ningaloo Turtles - Western Australia	http://www.ningalooturtles.org.au/volunteer.html
19	Conservation Volunteers Australia - Broome, Australia	http://www.conservationvolunteers.com.au/Volunteer/EcoBeachMonitoring-rates.htm
20	Biosphere Expeditions - near Broome, Australia	http://www.biosphere-expeditions.org/1-week-projects/voluntourism-with-turtles-in-western-aust.html
21	Bunbury Dolphin Discovery Centre - Western Australia	http://dolphins.mysouthwest.com.au/
22	The Earthwatch Institute - Lady Elliot Island, Great Barrier Reef, Australia	http://www.earthwatch.org/australia/exped/townsend.html
23	Conservation Volunteers Australia - Cobourg Peninsula, Turtles, Australia	http://www.conservationvolunteers.com.au/Volunteer/CobourgItinerary.htm
24	Conservation Volunteers Australia - Cobourg Peninsula, Australia	http://www.conservationvolunteers.com.au/Volunteer/CobourgPeninsula.htm
25	Kalinda - Great Barrier Reef Discovery, Australia	http://www.kalinda.com.au/index.htm
26	Marine Wildlife Adventures - Coral Sea, Australia	http://www.ecology-solutions.com.au/MWA/

Table 18-2: List of MRT products and web sites (n=126) reviewed in study 1– Table 2

ID	MRT Product name	Web site (last accessed in April 2010)
27	The Dolphin Research Institute -Phillip Island, Australia	http://www.dolphinresearch.org.au/volunteer.php
28	Marine Wildlife Adventures - Tasmania's Soela Sea Mount	http://www.ecology-solutions.com.au/MWA/
29	Marine Wildlife Adventures - Kimberly Adventures	http://www.ecology-solutions.com.au/MWA/
30	Marine Wildlife Adventures - Whales Cruises, Australia	http://www.ecology-solutions.com.au/MWA/
31	The Royal Geographical Society of Queensland - Australia	http://www.rgsq.org.au/heraldC.htm
32	The Lakes Explorer - Explore the Gippsland Lakes, Australia	http://www.lakes-explorer.com.au/401.html
33	The Earthwatch Institute - Moreton Bay, Australia	http://www.earthwatch.org/australia/exped/townsend_short.html
34	The Earthwatch Institute - Sydney Harbour, Australia	http://www.earthwatch.org/australia/exped/booth_short.html
35	The Earthwatch Institute - Bahamian Reef Survey, Caribbean	http://www.earthwatch.org/site/pp2.asp?c=dsJSK6PFJnH&b=1147625
36	The Earthwatch Institute - Bahamian Reef Survey, Caribbean	http://www.earthwatch.org/site/pp2.asp?c=dsJSK6PFJnH&b=1147655
37	Earthwatch Institute - Coastal Ecology of the Bahamas, Family	http://www.earthwatch.org/site/pp2.asp?c=dsJSK6PFJnH&b=1170757
38	Greenforce - Caribbean Adventure, Bahamas	http://www.greenforce.org/destinations/bahamas/
39	The Oceanic Society - Bahamas Project Dolphin	http://www.oceanicsociety.org/research
40	The Earthwatch Institute - Tidal Forests of Kenya	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=1
41	The Earthwatch Institute - Tracking Baja's Black Sea Turtles	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=1
42	The Oceanic Society - Belize Crocodiles	http://www.oceanicsociety.org/research
43	The Oceanic Society - Belize Dolphin Project	http://www.oceanicsociety.org/research
44	The Oceanic Society - Belize Mangrove Restoration	http://www.oceanicsociety.org/research
45	The Oceanic Society - Belize Reefs - Scuba	http://www.oceanicsociety.org/research
46	The Oceanic Society - Belize Reefs - Snorkeling	http://www.oceanicsociety.org/research
47	The Earthwatch Institute - Queen Conchs of Belize	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=2
48	The Earthwatch Institute - Queen Conchs of Belize - Teen	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=2
49	Blue Ventures - Belize Expeditions, Belize	http://www.blueventures.org/
50	The Oceanic Society - Giant Otters, Pantanal, Brazil	http://www.oceanic-society.org/pages/alltrips/trip38.html
51	The Earthwatch Institute - Brazil's dolphins, Brazil	http://www.earthwatch.org/site/pp2.asp?c=dsJSK6PFJnH&b=1170725#research_mission
52	Coral Cay Conservation - Cambodia	http://www.coralcay.org/content/view/770/679/
53	Coral Cay Conservation - Philippines	http://www.coralcay.org/content/blogcategory/150/509/
54	Coral Cay Conservation - Tobago	http://www.coralcay.org/content/blogcategory/151/512/
55	Coral Cay Conservation - College groups	http://www.coralcay.org/content/view/844/691/
56	Coral Cay Conservation - Danjugan Island, Philippines	http://www.coralcay.org/content/view/760/648/

Table 18-3: List of MRT products and web sites (n=126) reviewed in study 1– Table 3

ID	MRT Product name	Web site (last accessed in April 2010)
57	The Earthwatch Institute - Whales of British Columbia	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=2
58	The Earthwatch Institute - Whales of British Columbia	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=2
59	The Earthwatch Institute - Whales of British Columbia - Family	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=2
60	The Earthwatch Institute - Whales of British Columbia - Family	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=2
61	The Earthwatch Institute - Whales of British Columbia - Teen	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=2
62	The Earthwatch Institute - Whales of British Columbia - Teen	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=2
63	Deep Ocean Expeditions - HMS Breadalbane, Canada	http://www.deepoceanexpeditions.com/expeditions.html
64	Frontier - Cape Verde Turtle Conservation	http://www.frontier.ac.uk/gap_year_activities/Marine_Conservation_Diving/
65	Deep Ocean Expeditions - Atlantic Target	http://www.deepoceanexpeditions.com/expeditions.html
66	Conservation Volunteers Australia - Costa Rica	http://www.conservationvolunteers.com.au/volunteer/CostaRica.htm
67	Asociacion de Voluntarios Para el Servicio en las Areas Protegidas (ASVO) - Marine Turtles, Costa Rica	http://asvocr.org/english/leer.php/59
68	The Oceanic Society - Costa Rica Whales	http://www.oceanicsociety.org/research
69	The Earthwatch Institute - Costa Rican Sea Turtles	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=1
70	Operation Wallacea - Marine Research Expeditions, Cuba, Manatees and Mangroves	http://www.opwall.com/About/Operation%20Wallacea%20Brochure%202010-11%20reduced2.pdf
71	Greenforce - Ecuador, Marine Conservation	http://www.greenforce.org/
72	The Shark Research Institute -Galapagos Islands, Ecuador	http://www.sharks.org/expeditions.htm
73	Operation Wallacea - Marine Research Training, Egypt	http://www.opwall.com/About/Operation%20Wallacea%20Brochure%202010-11%20reduced2.pdf
74	The Earthwatch Institute - Behind the Scenes of Grey Whale Conservation, United Kingdom	http://www.earthwatch.org/site/pp2.asp?c=dsJSK6PFJnH&b=1170787
75	Greenforce - South Pacific Adventure, Fiji	http://www.greenforce.org/destinations/fiji/
76	Frontier - Fiji Marine Conservation & Diving	http://www.frontier.ac.uk/gap_year_activities/Marine_Conservation_Diving/
77	Greenforce - Ecuador, Galapagos Islands	http://www.greenforce.org/
78	Frontier - Greece Underwater Research and Dolphin Observation	http://www.frontier.ac.uk/gap_year_activities/Marine_Conservation_Diving/
79	The Earthwatch Institute - Dolphins of Greece	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=1
80	Biosphere Expeditions - Cayos Cochinos, Honduras	http://www.biosphere-expeditions.org/expeditions/honduras.htm
81	Operation Wallacea - Marine Research Expeditions, Cayos Cochinos, Honduras	http://www.opwall.com/About/Operation%20Wallacea%20Brochure%202010-11%20reduced2.pdf
82	The Shark Research Institute - Utila Whale Shark Research in Honduras	http://www.sharks.org/expeditions.htm
83	Operation Wallacea - Marine Research Expeditions, Indonesia	http://www.opwall.com/Expeditions/Indonesia/Introduction%20to%20Indonesia/index.shtml
84	The Shark Research Institute -Lembah Straits Expeditions, Indonesia	http://www.sharks.org/expeditions.htm

Table 18-4: List of MRT products and web sites (n=126) reviewed in study 1– Table 4

ID	MRT Product name	Web site (last accessed in April 2010)
85	The Tethys Foundation - training, Cetacean Sanctuary Research, Greece	http://www.tethys.org/tri_courses/courses_index_e.htm
86	The Tethys Foundation - Internships and Volunteering, Greece	http://www.tethys.org/index_e.htm
87	Frontier - Kenya Whale Sharks	http://www.frontier.ac.uk/gap_year_activities/Marine_Conservation_Diving/
88	Global Vision International - Community Development Expedition in Kenya	http://www.gvi.co.uk/volunteer-options/expeditions/marine
89	Blue Ventures - Madagascar Expeditions, Madagascar	http://www.blueventures.org/expeditions_andavadoaka.htm
90	Frontier - Madagascar Teaching, Wildlife and Diving	http://www.frontier.ac.uk/gap_year_activities/Marine_Conservation_Diving/
91	Frontier - Madagascar Marine Conservation & Diving	http://www.frontier.ac.uk/gap_year_activities/Marine_Conservation_Diving/
92	Blue Ventures - Madagascar Expeditions, Madagascar	http://www.blueventures.org/
93	Blue Ventures - Malaysia Expeditions, Malaysia	http://www.blueventures.org/
94	The Antinea Foundation - Global Research and Sailing	http://www.antinea-foundation.org/foundation/contacts/index.lbl
95	Deep Ocean Expeditions - Mediterranean Shipwrecks	http://www.deepoceanexpeditions.com/expeditions.html
96	Global Vision International - Mexican Marine Expedition in the Caribbean Sea	http://www.gvi.co.uk/volunteer-options/expeditions/marine
97	Global Vision International - Marine Conservation Expedition in Mexico	http://www.gvi.co.uk/volunteer-options/expeditions/marine
98	The Oceanic Society - Midway Historic Preservation	http://www.oceanicsociety.org/research
99	The Oceanic Society - Midway Turtle Tracking	http://www.oceanicsociety.org/research
100	Operation Wallacea - Marine Research Expeditions, Mozambique and South Africa	http://www.opwall.com/About/Operation%20Wallacea%20Brochure%202010-11%20reduced2.pdf
101	Frontier - Mozambique Whale Sharks	http://www.frontier.ac.uk/gap_year_activities/Marine_Conservation_Diving/
102	Deep Ocean Expeditions - North Pole Diving	http://www.deepoceanexpeditions.com/expeditions.html
103	Biosphere Expeditions - Study and protect the unique coral reefs of Oman & UAE.	http://www.biosphere-expeditions.org/index.php?option=com_content&task=view&id=147&Itemid=158
104	Deep Ocean Expeditions - Pacific Hydrothermal Vents	http://www.deepoceanexpeditions.com
105	Blue Ventures - Marine Survey Expeditions, Scotland	http://www.blueventures.org/expeditions_seasearch.htm
106	The Whale and Dolphin Conservation Society - Dolphin Research Holiday, Scotland	http://www2.wdcs.org/outoftheblue/dolphinresearch.php
107	The Earthwatch Institute - Trinidad's Leatherback Sea Turtles - Teen	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=2
108	The Earthwatch Institute - Whales and Dolphins of the Hebrides	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=2
109	Global Vision International - Marine Conservation Expedition in the Seychelles	http://www.gvi.co.uk/pages/projectDetail.asp?page=datesc&expedition=57
110	The Earthwatch Institute - Coral and Coastal Ecology of the Seychelles	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=1
111	Greenforce - Six Week Penguin Rescue, South Africa	http://www.greenforce.org/destinations/south_africa/penguin_rescue/
112	Greenforce -Great White Shark, South Africa	http://www.greenforce.org/destinations/south_africa/great_whites/

Table 18-5: List of MRT products and web sites (n=126) reviewed in study 1– Table 5

ID	MRT Product name	Web site (last accessed in April 2010)
113	Scientific Exploration Society - Underwater Archaeology, South Africa	http://www.ses-explore.org/Page1.aspx?PageID=3006
114	African Conservation Experience - Dolphin and Whale Research Centre, South Africa	http://www.conservationafrica.net/news/?mode=category&category_id=9
115	The Earthwatch Institute - South African Penguins	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=1
116	The Shark Research Institute -White Sharks and Jeffreys Bay, South Africa	http://www.sharks.org/expeditions.htm
117	Frontier - Sri Lanka Sea Turtle Conservation	http://www.frontier.ac.uk/gap_year_activities/Marine_Conservation_Diving/
118	The Oceanic Society - Suriname Sea Turtles	http://www.oceanicsociety.org/research
119	Frontier - Marine Conservation and Diving, Tanzania	http://www.frontier.ac.uk/search.php?p=56&d=12&a=&dm=&l=
120	The Shark Research Institute - Indian Ocean Live aboard, Mozambique	http://www.sharks.org/pdfs/Mozambique2006-2007.pdf
121	Biosphere Expeditions - Azores Expeditions, Atlantic Ocean	http://www.biosphere-expeditions.org/expeditions/azores.htm
122	The Earthwatch Institute - Tracking Baja's Black Sea Turtles - Teen	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=1
123	The Earthwatch Institute - Trinidad's Leatherback Sea Turtles	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=1
124	The Earthwatch Institute - Trinidad's Leatherback Sea Turtles	http://www.earthwatch.org/Expedition/ExpedSearchResults.aspx?research=Ocean+Health&page=1
125	Frontier - Uruguay Sea Turtle Conservation	http://www.frontier.ac.uk/gap_year_activities/Marine_Conservation_Diving/
126	Odyssey Expeditions - Summer Educational Adventure Voyages, Caribbean	http://www.odysseyexpeditions.com/6-seanorthsouthcombo.htm

Appendix 19. Additional marine research activity information about 85 MRT products

Other forms of MRT marine research activity

1. Coral reef research, invertebrate surveys, whale shark migration observations, plankton sampling, turtle nesting research and in water turtle surveys
2. The primary focus of the Photo ID work is to obtain information to enable us to recognise individual whales. Thus we carefully look at individual markings and try to associate specific under side flukes with dorsals.
3. Listen to and make recordings of whale and dolphin vocalisations and capture loggerhead turtles in the open ocean for tagging and release. You will collect sperm whale skin samples for DNA analysis without harming the animals by snorkelling to whale dive
4. Identification of the species and groups of species
5. Mapping areas of the region's marine environment as part of the national Sea-Search monitoring programme
6. Underwater marine surveys involve charting the coral with the use of GPS, identifying fish and marine movements, and locating where the breeding and feeding grounds are. We are also looking to see how different seasons could affect the marine life.
   Identifying fish and marine movements, where are the breeding grounds? Where do they feed? How will seasons affect the marine life?
7. Diving, archaeological artefact sifting, devising new methodologies
8. Locate, tag, and document the behaviour of whale sharks. DNA sampling. Oceanographic and atmospheric measurements
9. Document the behaviour of family otter groups on data sheets, map otter distribution utilizing a global positioning system, and identify individual otters through natural markings of their throat patches. Volunteers will also help collect fur samples from Otters
10. SONAR, GPS, survey, sampling, video, photos
11. Photo-identification, biopsies, DNA, databases
12. Patrol walks to protect turtle nests, females and for data collection purposes (Biometry, marking, etc.) Transfer of nests and monitoring of the breeding grounds. Collect breeding ground information.
13. Photo-identification, acoustic analysis and land-based surveys of whales
14. Identification, count and satellite tagging Great White Sharks
15. Trap for mala, boodies, Shark Bay mice and golden bandicoots; observe land snails and seabirds; search for evidence of black rats
16. Scientific data such as tagging, shell and flipper measurements, nest locations, dimensions and hatchling release will take place broad scale habitat mapping, underwater visual census, REEFWATCH transects and inter-tidal surveys
17. Survey techniques, transects, use slates, and undertake data entry
18. Record catch data in Seine netting, shark nets, long lines, and fence traps

Other examples of MRT tourist activity

1. Process digital images of whales and compare them to catalogues to identify individuals, catalogue sonar and video sequences, enter data into a database, and perhaps subject tissue samples to mechanical tests
2. Surveying dolphins from beaches and boats
3. Surveys of offshore cays and islands. Using remote sensing technology
4. Teams will help characterize the natural communities both above and below the water
5. Dive, snorkel, education, research training, recreation
6. General assistant duties for non educated assistance, specialist duties for marine scientists
7. Expedition members will have the opportunity to observe egg laying, hatchling births (depending on season) and help tag female loggerheads that nest on the Island each night This expedition will search for boodies and mala on Boodie Island, examine landsnails and observe seabird populations.
8. Monitoring, surveying, handling and protecting turtles
9. Survey reef fish, record marine mammals and turtles, and examine the effects of reef dynamiting. Mangrove biodiversity assessment. Mapping work, GIS
10. Whale and dolphin training and monitoring
11. After being trained in diving and coral reef survey techniques and then assist in an international reef survey programme by diving along coral reefs and recording various indicator fish and invertebrates
12. Collect Sperm Whale skin samples for DNA analysis without harming the animals by snorkelling to whale dive points or collecting shed skin in nets. You will listen to and make recordings of whale and dolphin vocalisations
13. Gathering the data - to the end of the research process, where you will be involved in collating data and seeing it all be put into action.
14. 2-day survey courses and 7-day diving expeditions in previously unrecorded sites
15. Learn how to catch, handle, feed, tube, and administer medication to a variety of seabirds, as well as assist in the Intensive Care Unit. You will sail and release the penguins
16. Learn about coral reef research and technology, scuba, undertake marine surveys
17. Learn about great white sharks, sea man ship, filming
18. Participate in diving and discovery, immersion in archaeology
19. Dive, biology and fisheries training, survey and research
20. Locate, tag, and document the behaviour of whale sharks
21. Patrol walks to protect nests, females and for data collection purposes (Biometry, marking, etc.)
22. Transfer of nests and monitoring of the breeding grounds. Collect breeding ground information.
23. Photo-identification, acoustic analysis and land-based surveys
24. Coral reef research, invertebrate fish surveys, whale shark migration observations, plankton sampling, turtle nesting research and in water turtle surveys

Appendix 20. Descriptive statistics for 26 MRT criteria

Table 20-1: Average and standard deviation of the measured 25 MRT criteria across the 85 MRT products

MRT criteria type	Key MRT criteria	Average	Minimum	Maximum	Range	Std Error	Std Dev.	Skewness	Kurtosis
Concern	Tourist supervision	4.5	3.7	5.0	1.3	0.0	0.3	-0.4	-0.5
Attraction	Wildlife popularity	4.3	1.5	5.0	3.5	0.1	0.9	-1.2	1.3
Benefit	Marine research reliability	3.8	2.0	5.0	3.0	0.1	0.6	-1.0	0.9
Benefit	Research significance	3.8	2.0	4.9	2.9	0.1	0.6	-1.1	1.1
Benefit	Level of educational tourism	3.6	1.2	4.7	3.5	0.1	0.6	-0.9	1.9
Benefit	Longer term conservation contribution	3.5	1.7	4.5	2.8	0.1	0.6	-0.9	0.1
Attraction	Environmental remoteness (Orams, 1999)	3.5	1.0	5.0	4.0	0.1	1.1	-0.2	-0.7
Attraction	Experience level (Orams, 1999)	3.5	1.0	5.0	4.0	0.1	1.1	-0.2	-0.8
Attraction	Locations level (Orams, 1999)	3.4	2.0	5.0	3.0	0.1	1.2	0.0	-1.5
Attraction	Level of active involvement in research	3.4	1.0	4.5	3.5	0.1	1.0	-1.1	0.1
Attraction	Volunteer mindedness	3.3	1.0	4.7	3.7	0.1	0.8	-0.8	0.3
Attraction	Activity level (Orams, 1999)	3.3	1.0	5.0	4.0	0.1	1.2	0.2	-1.3
Benefit	Reliability of tourist's research	3.2	1.0	4.8	3.8	0.1	0.9	-0.9	0.0
Attraction	Level of adventure challenge	3.2	1.0	4.5	3.5	0.1	0.8	-0.9	0.3
Benefit	Skill or qualifications offered on trip	2.9	1.0	4.6	3.6	0.1	1.1	-0.3	-1.1
Attraction	Level of comfort for tourist	2.8	1.5	4.5	3.0	0.1	0.7	0.2	-1.0
Attraction	Level of SCUBA diving	2.7	1.0	5.0	4.0	0.2	1.7	0.2	-1.8
Attraction	Level of skilled scientific tourism	2.6	1.0	4.5	3.5	0.1	1.1	-0.1	-1.2
Concern	Dependency on wildlife migration	2.6	1.0	5.0	4.0	0.2	1.5	0.1	-1.6
Attraction	Level of hospitality for tourist	2.6	1.0	4.0	3.0	0.1	0.7	0.1	-0.5
Benefit	Close local association	2.4	1.0	5.0	4.0	0.2	1.9	0.6	-1.6
Attraction	Skill pre-requisite to participate	2.3	1.0	4.5	3.5	0.1	1.0	0.4	-0.9
Attraction	Cultural focus	2.2	1.0	5.0	4.0	0.2	1.8	0.9	-1.2
Attraction	Cost per day ($USD)	204	10	2100	2090	17	156	1	-1
Attraction	Max duration (days)	34	1	180	179	5	43	2	2

Note: Apart from cost per day and max duration, a value of 1 (red) is relatively low, and 5 (darker blue) is relatively high.

Appendix 21. Spectrum of Marine Recreation Opportunities (Orams, 1999)

Table 21-1: Spectrum of Marine Recreation Opportunities (Source: Orams, 1999)

Associated rating value	**1**	**2**	**3**	**4**	**5**
Class	**Class I**	**Class II**	**Class III**	**Class IV**	**Class IV**
Characteristics	**Easily accessible**	**Accessible**	**Less accessible**	**Semi-remote**	**Remote**
Experience	Much social interaction with others	Often contact with others	Some contact with others	Peace and quiet, close to nature	Solitude
	High degree of services and support			Safety-rescue available	Tranquillity
	Usually crowded			Occasional contact with others	Closeness to nature and self sufficiency
Environmental remoteness	Many human influences and structures	Human structure/ influences visible and close by	few human structures close by - some visible	Evidence of some human activity, e.g. Lights on shore, mooring buoys	Isolated
	Lower quality natural environment				High-quality
					Few human structures/influences
Locations	Close to or in urban areas	Intertidal ----> 100 metres offshore	100 metres ----> 1km offshore	Isolated coasts, 1-50kms offshore	Uninhabited coastal areas > 50 kms offshore
	Beaches and intertidal area				
Examples of activities	Sunbathing	Swimming	Usually boat based	Some SCUBA diving	Offshore sailing
	People watching	Snorkeling	Sailing	Submarining	Live-aboard offshore fishing
	Swimming	Fishing	Fishing	Powerboat (offshore equipped)	Remote coast sea kayaking
	Playing games	Jet-skiing	Snorkel/SCUBA diving	Sailing - larger sailboats	
	Eating	Non-powered boating			
	Skimboarding	Surfing			
	Sightseeing	Para-sailing			

Appendix 22. Full output from contextual indicator analysis of 85 MRT products

Region of MRT operation

Table 22-1: MRT criteria, tourist type and region of MRT operation – full results

	No.	32	53	
Prob.	**MRT criteria or MRT tourist type**	**Temperate**	**Tropics**	**%MDBV**
0.000	Level of SCUBA diving	1.7	3.3	39%
0.008	Backpackers	2.6	3.8	29%
0.007	Cultural focus	1.5	2.6	27%
0.003	Dependency on wildlife migration	3.2	2.2	25%
0.031	Attracts older travellers	3.6	2.7	24%
0.068	Liveaboard travellers	2.4	1.7	17%
0.003	Pre-arranged accom	1.6	1.0	16%
0.019	Level of active involvement in research	3.1	3.6	14%
0.047	Skill or qualifications offered on trip	2.6	3.1	13%
0.020	Reliability of tourist's research	2.9	3.4	13%
0.055	Skill pre-requisite to participate	2.1	2.5	12%
0.288	Close local association	2.1	2.6	11%
0.228	Attracts family	2.1	1.7	11%
0.333	Gap year travellers	2.8	3.2	11%
0.040	Locations level (Orams, 1999)	3.8	3.2	10%
0.096	Level of comfort for tourist	3.0	2.7	9%
0.056	Longer term conservation contribution	3.4	3.6	9%
0.318	Cost per day ($USD)	226	191	9%
0.214	Activity level (Orams, 1999)	3.5	3.2	9%
0.150	Level of adventure challenge	3.0	3.3	7%
0.178	Wildlife popularity	4.4	4.2	7%
0.240	Level of hospitality for tourist	2.7	2.5	6%
0.321	Environmental remoteness (Orams, 1999)	3.6	3.4	6%
0.544	Experience level (Orams, 1999)	3.6	3.4	4%
0.664	Volunteer tourists	4.3	4.4	4%
0.457	Volunteer mindedness	3.2	3.4	4%
0.565	Max duration (days)	31	36	3%
0.576	Tourist supervision	4.5	4.5	3%
0.546	Research significance	3.8	3.8	3%
0.741	Level of scientific tourism	2.6	2.7	2%
0.825	Independent travellers	4.3	4.2	2%
0.865	Package tour travellers	2.1	2.1	2%
0.880	Attracts scientists	3.5	3.6	2%
0.676	Level of educational tourism	3.6	3.6	2%
0.824	Snorkel only (No SCUBA)	1.3	1.3	1%
0.825	Marine research reliability	3.8	3.8	1%

Note 1: For the prob. column, green indicates a significant linear relationship between a MRT criteria and region of MRT operation

Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Type of MRT operation

Table 22-2: MRT criteria, tourist type and type of MRT operation - full results

Prob.	MRT tourist type or criteria	Mainland coastal	Coastal and marine	Island based	Mainly marine	MDBV
0.000	Liveaboard travellers	1.0	1.4	1.0	4.1	77%
0.000	Locations level (Orams, 1999)	2.4	3.3	3.5	4.6	75%
0.000	Backpackers	4.2	3.7	4.3	1.7	65%
0.000	Volunteer tourists	5.0	4.9	5.0	2.6	59%
0.000	Activity level (Orams, 1999)	2.3	3.4	2.7	4.5	56%
0.003	Gap year travellers	2.8	3.9	3.0	1.9	50%
0.007	Attracts older travellers	3.2	2.2	3.0	4.1	47%
0.024	Attracts scientists	3.0	2.9	3.7	4.5	38%
0.035	Temperate -> Tropics	3.5	4.2	3.0	2.6	38%
0.022	Cultural focus	2.3	2.7	2.3	1.2	38%
0.000	Environmental remoteness (Orams, 1999)	3.0	3.1	3.8	4.5	37%
0.024	SCUBA divers/snorkel	2.7	3.9	3.7	2.5	36%
0.000	Experience level (Orams, 1999)	3.0	3.1	3.7	4.5	36%
0.004	Cost per day ($USD)	152	170	266	295	36%
0.014	Level of SCUBA diving	1.9	3.3	3.1	2.4	35%
0.038	Package tour travellers	2.2	2.6	2.3	1.2	35%
0.000	Level of active involvement in research	3.7	3.7	3.7	2.5	33%
0.001	Skill or qualifications offered on trip	3.0	3.4	3.0	2.2	32%
0.019	Dependency on wildlife migration	2.6	2.1	2.3	3.4	32%
0.008	Independent travellers	4.7	3.5	3.7	4.8	32%
0.093	Close local association	2.7	2.8	2.3	1.5	32%
0.063	Reliability of tourist's research	3.3	3.6	3.6	2.5	30%
0.001	Level of comfort for tourist	2.5	2.7	2.7	3.3	28%
0.001	Level of hospitality for tourist	2.4	2.4	2.6	3.1	24%
0.044	Level of scientific tourism	2.4	2.4	2.4	3.2	23%
0.017	Level of adventure challenge	2.8	3.2	3.2	3.6	21%
0.003	Volunteer mindedness	3.5	3.5	3.5	2.8	20%
0.344	Attracts family	2.0	1.5	1.7	2.3	20%
0.000	Pre-arranged accom	3.3	3.9	4.0	4.0	17%
0.082	Snorkel only (No SCUBA)	1.7	1.1	1.7	1.0	17%
0.185	Tourist supervision	4.5	4.6	4.5	4.4	14%
0.192	Max duration (days)	33	45	34	20	14%
0.207	Wildlife popularity	4.2	4.2	4.1	4.5	13%
0.540	Skill pre-requisite to participate	2.1	2.5	2.2	2.3	11%
0.292	Research significance	3.7	3.8	4.0	4.0	11%
0.461	Marine research reliability	3.7	3.8	3.8	4.0	10%
0.563	Longer term conservation contribution	3.5	3.6	3.4	3.4	9%
0.196	Level of educational tourism	3.5	3.8	3.5	3.5	9%

Note 1: For the prob. column, green indicates a significant linear relationship between a MRT criteria and type of MRT operation

Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Mode of marine research

Table 22-3: MRT criteria, tourist type and mode of marine research – full results

		Mode of marine research				
	No.	21	4	38	19	
Prob.	**MRT tourist type or criteria**	**Coastal**	**Coastal**	**SCUBA/**	**Boat**	**MDBV**
0.000	Level of SCUBA diving	1.5	1.8	4.2	1.4	71%
0.095	Package tour travellers	2.1	4.0	2.1	1.6	59%
0.001	Backpackers	4.0	4.0	3.7	1.8	55%
0.000	Locations level (Orams, 1999)	2.4	2.0	3.7	4.2	54%
0.008	Independent travellers	4.6	2.0	4.1	4.6	52%
0.018	Attracts older travellers	3.5	2.0	2.4	3.9	49%
0.003	Liveaboard	1.4	1.0	1.7	2.9	47%
0.312	Close local association	2.5	1.0	2.8	2.1	45%
0.034	Level of scientific tourism	2.4	1.4	2.7	2.8	42%
0.001	Dependency on wildlife migration	2.5	2.5	2.1	3.8	42%
0.318	Attracts scientists	3.1	2.0	3.6	3.5	41%
0.196	Gap year travellers	2.7	4.0	3.4	2.5	38%
0.002	Activity level (Orams, 1999)	2.7	2.5	3.3	4.0	38%
0.003	Environmental remoteness (Orams,	3.1	2.5	3.5	3.9	35%
0.000	Skill pre-requisite to participate	1.9	1.8	2.8	2.1	29%
0.003	Volunteer tourists	5.0	5.0	4.3	3.9	26%
0.000	Level of adventure challenge	2.7	2.6	3.5	3.2	26%
0.450	Cultural focus	2.1	2.0	2.6	1.6	24%
0.276	Experience level (Orams, 1999)	3.2	3.0	3.4	3.9	24%
0.246	Snorkel only (No SCUBA)	1.8	1.0	1.2	1.0	19%
0.202	Level of educational tourism	3.5	3.2	3.6	3.8	19%
0.308	Skill or qualifications offered on trip	2.8	2.7	3.2	2.6	19%
0.209	Cost per day ($USD)	215	215	166	240	19%
0.004	Level of active involvement in	3.6	3.0	3.5	3.0	18%
0.082	Max duration (days)	24	27	50	20	17%
0.093	Wildlife popularity	4.1	4.5	4.1	4.7	17%
0.009	Level of hospitality for tourist	2.4	2.7	2.5	2.9	16%
0.051	Level of comfort for tourist	2.6	2.9	2.7	3.1	16%
0.033	Tourist supervision	4.5	4.4	4.5	4.3	16%
0.237	Marine research reliability	3.6	3.5	3.8	3.9	15%
0.588	Pre-arranged accom	3.4	4.0	3.9	3.8	14%
0.006	Reliability of tourist's research	3.2	3.1	3.4	3.0	12%
0.018	Volunteer mindedness	3.6	3.4	3.4	3.2	11%
0.132	Attracts family	2.0	2.0	1.6	1.8	9%
0.446	Research significance	3.6	3.7	3.8	3.9	8%
0.684	Longer term conservation contribution	3.6	3.6	3.5	3.6	6%

Note 1: For the prob. column, green indicates a significant linear relationship between a MRT criteria and mode of marine research

Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Type of MRT organisation

Table 22-4: MRT criteria, tourist type and type of MRT organisation (i.e. LO or SO) – full results

	No.	20	65	
Prob.	**MRT tourist type or criteria**	**SO**	**LO**	**MDBV**
0.000	Backpackers	1.6	3.8	55%
0.000	Liveaboard travellers	3.5	1.5	51%
0.000	Volunteer tourists	2.9	4.8	47%
0.000	Gap year travellers	1.6	3.4	45%
0.005	Attracts older travellers	4.2	2.7	37%
0.008	Cultural focus	1.2	2.5	31%
0.000	Activity level (Orams, 1999)	4.3	3.0	30%
0.000	Skill or qualifications offered on trip	2.1	3.2	28%
0.001	Level of active involvement in research	2.8	3.6	23%
0.067	Package tour travellers	1.4	2.3	21%
0.007	Locations level (Orams, 1999)	4.1	3.2	21%
0.001	Reliability of tourist's research	2.6	3.4	20%
0.059	Attracts family	2.5	1.7	20%
0.049	Cost per day ($USD)	266	186	20%
0.070	Independent travellers	4.8	4.0	19%
0.144	Close local association	1.8	2.6	18%
0.017	Environmental remoteness (Orams,	4.0	3.3	17%
0.014	Experience level (Orams, 1999)	4.0	3.3	17%
0.124	Level of scientific tourism	3.0	2.5	13%
0.022	Volunteer mindedness	3.0	3.4	13%
0.038	Pre-arranged accom	3.4	3.9	13%
0.058	Tourist supervision	4.4	4.5	12%
0.070	Level of comfort for tourist	3.1	2.7	12%
0.401	Attracts scientists	3.7	3.3	11%
0.257	Longer term conservation contribution	3.4	3.6	6%
0.212	Research significance	3.7	3.8	6%
0.324	Max duration (days)	26	37	6%
0.440	Wildlife popularity	4.4	4.2	5%
0.627	Dependency on wildlife migration	2.8	2.6	5%
0.523	Marine research reliability	3.7	3.8	4%
0.811	Level of SCUBA diving	2.6	2.7	3%
0.733	Snorkel only (No SCUBA)	1.2	1.3	2%
0.803	Level of adventure challenge	3.2	3.2	2%
0.844	Skill pre-requisite to participate	2.3	2.3	1%
0.973	Level of hospitality for tourist	2.6	2.6	0%
0.986	Level of educational tourism	3.6	3.6	0%

Note 1: For the prob. column, green indicates a significant linear relationship between a MRT criteria and type of MRT organisation

Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Table 22-5: Main marine research topic and attraction related MRT criteria – full results

No.	33	13	8	7	6	3	3	2	1	1	1
MRT attraction criteria	Coral reefs	Turtles	Whales and dolphins	Whales	Dolphins	Sharks	Sea birds	Great white shark	Whales sharks	Undersea volcano	Mangroves
Close local association	2.8	2.8	3.0	1.6	2.3	1.0	1.0	1.0	1.0	1.0	1.0
Cultural focus	2.6	3.2	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Locations level (Orams, 1999)	3.5	2.3	3.8	4.3	2.5	5.0	3.7	4.5	4.0	5.0	2.0
Temperate -> Tropics	4.5	4.1	2.0	1.6	3.0	5.0	1.0	1.0	5.0	1.0	5.0
Wildlife popularity	4.1	4.8	5.0	4.7	5.0	3.3	3.0	4.0	5.0	5.0	1.5
Level of SCUBA diving	4.1	1.5	1.4	2.0	1.1	5.0	1.0	1.0	4.6	1.0	1.8
Level of comfort for tourist	2.6	2.3	2.8	2.9	3.0	3.9	3.1	3.4	4.5	4.0	2.0
Level of active involvement in research	3.7	3.8	3.5	3.4	3.6	1.4	2.5	1.1	3.0	1.3	4.0
Skill pre-requisite to participate	2.7	1.6	2.6	2.2	2.2	2.8	1.3	1.4	4.0	1.5	4.0
Level of adventure challenge	3.5	3.0	3.4	3.1	2.1	3.4	1.8	4.5	3.0	4.0	3.5
Activity level (Orams, 1999)	3.2	2.8	3.9	4.0	2.2	5.0	4.0	4.0	3.0	5.0	2.0
Experience level (Orams, 1999)	3.2	3.4	3.5	4.4	2.3	5.0	3.7	3.5	2.0	4.0	4.0
Volunteer mindedness	3.5	3.5	3.7	3.4	3.4	1.8	2.9	2.2	3.0	1.5	4.0
Level of scientific tourism	2.6	2.5	2.6	2.9	2.2	3.0	2.2	2.0	2.0	4.0	4.0
Environmental remoteness (Orams, 1999)	3.3	3.4	3.8	3.9	2.2	5.0	3.7	3.5	3.0	5.0	3.0
Level of hospitality for tourist	2.4	2.3	2.7	2.7	2.4	3.4	3.3	2.8	4.0	4.0	3.0
Skill or qualifications offered on trip	3.3	3.0	3.4	2.6	2.9	1.8	1.5	1.6	3.5	2.5	3.0
Cost per day ($USD)	156	198	217	247	156	344	248	291	220	2100	250
Max duration (days)	52	16	33	22	52	8	5	17	8	14	8

Note: Red is relatively low mean value of MRT criteria and blue is a relatively high mean value of MRT criteria

Table 22-6: Previous table continued

No.	1	1	1	1	1	1	1
MRT attraction criteria	Open ocean (e.g. Reef and cetaceans)	Island marsupials	Deep sea ship wreck	American crocodiles	Penguins	Sea otters	Conch shells
Close local association	1.0	1.0	1.0	1.0	1.0	5.0	5.0
Cultural focus	1.0	1.0	1.0	1.0	1.0	1.0	5.0
Locations level (Orams, 1999)	5.0	3.7	5.0	2.0	2.0	3.0	4.0
Temperate -> Tropics	1.0	1.0	1.0	5.0	1.0	1.0	5.0
Wildlife popularity	4.0	3.0	5.0	2.0	3.0	3.0	3.2
Level of SCUBA diving	5.0	2.4	1.0	1.8	1.0	1.0	2.0
Level of comfort for tourist	3.7	3.1	4.0	2.3	3.0	3.2	2.2
Level of active involvement in research	3.5	2.5	1.3	3.5	3.3	1.8	3.0
Skill pre-requisite to participate	2.8	1.3	1.5	3.0	1.3	1.3	2.0
Level of adventure challenge	4.0	1.8	4.0	3.0	2.8	2.0	3.4
Activity level (Orams, 1999)	5.0	4.0	5.0	2.0	2.0	2.0	2.0
Experience level (Orams, 1999)	5.0	3.7	4.0	4.0	3.0	3.0	4.0
Volunteer mindedness	2.7	2.9	1.5	4.0	3.3	4.2	3.5
Level of scientific tourism	3.5	2.2	4.0	3.5	1.5	2.5	3.0
Environmental remoteness (Orams, 1999)	5.0	3.7	5.0	3.0	3.0	3.0	4.0
Level of hospitality for tourist	3.2	3.3	4.0	3.0	2.4	3.0	2.0
Skill or qualifications offered on trip	2.0	1.5	2.5	3.0	3.3	1.5	2.5
Cost per day ($USD)	32	248	1400	250	62	432	300
Max duration (days)	70	5	14	8	42	9	8
Cost per day ($USD)	32	248	1400	250	62	432	300
Max duration (days)	70	5	14	8	42	9	8

Note: Red is relatively low mean value of MRT criteria and blue is a relatively high mean value of MRT criteria

Table 22-7: Main marine research topic and benefit or concern related MRT criteria – full results

No.	33	13	8	7	6	3	3	2	1	1	1
MRT benefit or concern related criteria	Coral reefs	Turtles	Whales and dolphins	Whales	Dolphins	Sharks	Sea birds	Great white shark	Whales sharks	Deep sea and undersea volcano	Mangroves
Reliability of tourist's research	3.5	3.4	3.6	3.3	3.0	1.7	2.7	1.5	4.0	1.0	4.0
Longer term conservation contribution	3.5	3.6	3.8	3.4	3.8	3.5	3.3	3.0	4.0	3.0	4.0
Marine research reliability	3.8	3.7	4.4	4.1	3.9	3.9	3.3	2.8	3.5	4.6	4.0
Research significance	3.8	3.7	4.3	4.1	3.8	3.9	3.3	3.0	4.0	4.6	4.0
Level of educational tourism	3.7	3.5	4.2	3.5	3.5	2.9	3.6	3.7	3.5	3.0	4.0
Dependency on wildlife migration	1.8	3.2	4.3	4.1	2.7	3.8	2.0	5.0	5.0	1.0	1.0
Tourist supervision	4.5	4.4	4.3	4.3	4.5	4.6	4.2	4.8	4.0	5.0	5.0

Note: Red is relatively low mean value of MRT criteria and blue is a relatively high mean value of MRT criteria

Table 22-8: Previous table continued

No.	1	1	1	1	1	1	1
MRT benefit or concern related criteria	Open ocean (e.g. Reef and cetaceans)	Island marsupials	Deep sea ship wreck	American crocodiles	Penguins	Sea otters	Conch shells
Reliability of tourist's research	2.5	2.7	1.0	4.0	2.5	1.8	3.4
Longer term conservation contribution	4.0	3.3	3.0	4.0	4.3	2.5	3.0
Marine research reliability	3.8	3.3	4.6	4.0	3.0	3.3	3.6
Research significance	3.6	3.3	4.0	4.0	2.9	3.0	3.5
Level of educational tourism	3.5	3.6	3.5	4.0	3.0	3.0	3.0
Dependency on wildlife migration	2.0	2.0	1.0	2.0	1.0	1.0	1.0
Tourist supervision	4.3	4.2	5.0	5.0	4.3	4.4	3.8

Note: Red is relatively low mean value of MRT criteria and blue is a relatively high mean value of MRT criteria

Table 22-9: Main marine research topic and different MRT tourist types – full results

No.	33	13	8	7	6	3	3	2	1	1	1
MRT tourist type	Coral reefs	Turtles	Whales and dolphins	Whales	Dolphins	Sharks	Sea birds	Great white shark	Whales sharks	Deep ocean and undersea volcano	Mangroves
Attracts family	1.6	2.2	1.5	1.6	1.7	3.7	3.7	1.0	1.0	5.0	1.0
Attracts older travellers	2.2	2.8	3.0	3.3	4.3	5.0	5.0	3.0	5.0	5.0	5.0
Attracts scientists	3.4	3.5	3.0	4.4	2.3	5.0	2.3	3.0	5.0	5.0	5.0
Backpackers	3.9	4.4	3.0	2.1	3.0	1.0	1.0	3.0	1.0	1.0	5.0
Cultural focus MRT tourists	2.6	3.2	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Gap year travellers	3.8	3.2	4.5	1.6	2.3	1.0	1.0	3.0	1.0	1.0	1.0
Independent travellers	3.7	5.0	4.5	4.4	4.3	5.0	3.7	3.0	5.0	5.0	5.0
Liveaboard travellers	1.5	1.3	2.0	3.3	1.0	5.0	2.3	3.0	1.0	5.0	1.0
Package tour travellers	2.5	2.2	1.5	1.6	1.7	1.0	3.7	3.0	1.0	1.0	1.0
Pre-arranged accom	1.1	1.3	1.0	1.0	2.3	1.0	2.3	1.0	1.0	1.0	1.0
SCUBA divers .snorkellers	4.9	1.9	1.5	2.1	1.7	5.0	1.0	1.0	5.0	1.0	5.0
Snorkel only (No SCUBA)	1.1	2.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Volunteer tourists	4.5	5.0	4.5	3.9	5.0	1.0	3.7	3.0	5.0	1.0	5.0

Note: Red is relatively low mean value of MRT criteria and blue is a relatively high mean value of MRT criteria

Table 22-10: Previous table continued

No.	1	1	1	1	1	1	1
MRT tourist type	Open ocean (e.g. Reef and cetaceans)	Island marsupials	Deep sea ship wreck	American crocodiles	Penguins	Sea otters	Conch shells
Attracts family	1.0	1.0	5.0	1.0	1.0	1.0	1.0
Attracts older travellers	5.0	5.0	5.0	5.0	1.0	1.0	1.0
Attracts scientists	5.0	5.0	5.0	5.0	1.0	5.0	5.0
Backpackers	1.0	1.0	1.0	5.0	5.0	5.0	5.0
Cultural focus MRT tourists	1.0	1.0	1.0	1.0	1.0	1.0	5.0
Gap year travellers	1.0	1.0	1.0	1.0	5.0	5.0	1.0
Independent travellers	5.0	5.0	5.0	5.0	1.0	5.0	5.0
Liveaboard travellers	5.0	5.0	5.0	1.0	1.0	1.0	1.0
Package tour travellers	1.0	1.0	1.0	1.0	5.0	1.0	1.0
Pre-arranged accom	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SCUBA divers .snorkellers	5.0	1.0	1.0	5.0	1.0	1.0	1.0
Snorkel only (No SCUBA)	1.0	1.0	1.0	1.0	1.0	1.0	5.0
Volunteer tourists	5.0	5.0	1.0	5.0	5.0	5.0	5.0

Note: Red is relatively low mean value of MRT criteria and blue is a relatively high mean value of MRT criteria

Appendix 23. Analysis used to identify main differences between MRT products and tourists in Australia and elsewhere

Key MRT criteria and MRT tourist type differences

Table 23-1: Differences between Australian located MRT products (n=30) and elsewhere (n=55)

	No.	30	55	
Prob.	**MRT tourist type or criteria**	**Australian MRT products**	**MRT products elsewhere**	**MDBV**
0.000	Backpackers	2.1	4.1	50%
0.000	Gap year travellers	1.8	3.7	47%
0.000	Attracts older travellers	4.1	2.5	40%
0.000	Liveaboard	2.9	1.4	36%
0.000	Attracts family	2.7	1.4	34%
0.000	Skill or qualifications offered on trip	2.2	3.4	33%
0.003	Cultural focus	1.4	2.6	30%
0.002	Volunteers	3.7	4.7	26%
0.000	Activity level (Orams, 1999)	4.0	3.0	25%
0.032	Cost per day ($USD)	253	178	19%
0.090	Close local association	1.9	2.7	18%
0.001	Tourist supervision	4.3	4.6	17%
0.002	Reliability of tourist's research	2.8	3.5	17%
0.002	Pre-arranged accom	3.3	4.0	17%
0.023	Independent travellers	4.7	3.9	16%
0.014	Environmental remoteness (Orams, 1999)	3.9	3.3	15%
0.020	Level of active involvement in research	3.1	3.6	14%
0.021	Experience level (Orams, 1999)	3.8	3.3	14%
0.013	Max duration (days)	19	43	13%
0.099	Locations level (Orams, 1999)	3.7	3.3	11%
0.047	Longer term conservation contribution	3.4	3.6	10%
0.124	Skill pre-requisite to participate	2.1	2.4	10%
0.321	Level of SCUBA diving	2.4	2.8	10%
0.205	Level of scientific tourism	2.8	2.5	9%
0.068	Volunteer mindedness	3.1	3.4	9%
0.082	Marine research reliability	3.6	3.9	9%
0.073	Research significance	3.7	3.9	8%
0.212	Level of adventure challenge	3.1	3.3	7%
0.282	Level of comfort for tourist	2.9	2.7	6%
0.648	Attracts scientists	3.5	3.3	5%
0.440	Snorkel only (No SCUBA)	1.4	1.2	5%
0.643	Dependency on wildlife migration	2.7	2.6	4%
0.391	Level of educational tourism	3.5	3.6	3%
0.813	Wildlife popularity	4.2	4.3	1%
0.839	Level of hospitality for tourist	2.6	2.6	1%
0.953	Package tour travellers	2.1	2.1	1%

Note 1: For the prob. column, green indicates a significant linear relationship between Australia MRT and elsewhere
Note 2: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Table 23-2: Associations between various MRT tourist attraction criteria - significant differences (Pearson r) between Australia and elsewhere

MRT criteria - 1	MRT criteria - 2	Australian MRT products (r)	MRT products elsewhere (r)	Difference (r)
Level of adventure challenge	Activity level (Orams, 1999)	0.67	0.34	0.33
Level of SCUBA diving	Environmental remoteness level (Orams, 1999)	0.55	0.20	0.35
Level of SCUBA diving	Locations level (Orams, 1999)	0.59	0.27	0.33
Level of hospitality for tourist	Environmental remoteness level (Orams, 1999)	0.70	0.37	0.33
Cost per day ($USD)	Locations level (Orams, 1999)	0.60	0.39	0.2
Level of hospitality for tourist	Cultural focus	-0.28	-0.51	0.24

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange.

Note 2: difference is only shown if $r > 0.2$ or $r < -0.2$ and the difference between MRT products in Australia and elsewhere are > 0.3

Table 23-3: MRT stakeholder benefits and concerns with MRT tourist attraction criteria - significant differences between Australia and elsewhere

MRT criteria - 1	MRT criteria - 2	Australian MRT products (r)	MRT products elsewhere (r)	Difference (r)
Level of SCUBA diving	Skill or qualifications offered	-0.20	0.21	-0.41
Skill pre-requisite to participate	Reliability of tourist's research	0.22	0.43	-0.2
Level of skilled scientific tourism	Marine research reliability	0.60	0.40	0.2
Level of hospitality for tourist	Dependency on wildlife migration	0.42	0.20	0.21
Cost per day ($USD)	Dependency on wildlife migration	0.45	0.23	0.22

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange.
Note 2: difference is only shown if r > 0.2 or r < -0.2 and the difference between MRT products in Australia and elsewhere are > 0.3

Table 23-4: Correlation (Pearson) of MRT tourist types with key MRT criteria - significant differences between Australia and elsewhere

MRT Tourist type	Key MRT criteria	Australian MRT products (r)	MRT products elsewhere (r)	Difference (r)
SCUBA divers/ snorkeller	Max duration (days)	-0.20	0.25	-0.45
Live-aboard travellers	Level of adventure challenge	0.53	0.30	0.23
Cultural focus	Level of hospitality for tourist	-0.28	-0.51	0.24
Attracts older travellers	Max duration (days)	0.23	0.46	-0.23
Back- packers	Volunteer mindedness	0.23	0.48	-0.25
Can attract skilled scientific tourists	Activity level (Orams, 1999)	0.46	0.25	0.21
Can attract skilled scientific tourists	Locations level (Orams, 1999)	0.60	0.40	0.2
SCUBA divers/ snorkeller	Skill or qualifications offered on trip	-0.22	0.25	-0.47

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange.
Note 2: difference is only shown if r > 0.2 or r < -0.2 and the difference between MRT products in Australia and elsewhere are > 0.3

Table 23-5: Combined factor and correlation analysis of MRT tourist types - significant differences between Australia and elsewhere

MRT tourist type - 1	MRT tourist type - 2	Australian MRT products (r)	MRT products elsewhere (r)	Difference (r)
Attracts older travellers	Backpackers	-0.40	-0.70	0.3
Package tour travellers	Attracts family	0.50	0.30	0.27
Package tour travellers	Liveaboard travellers	-0.60	-0.30	-0.23
Independent travellers	Attracts scientists	0.40	0.60	-0.26
Independent travellers	Package tour travellers	-0.40	-0.80	0.38

Note 1: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange.

Note 2: difference is only shown if r > 0.2 or r < -0.2 and the difference between MRT products in Australia and elsewhere are > 0.3

Contextual indicator differences

Table 23-6: Contextual indicator differences between Australian located MRT products and elsewhere

	No.	30	55	30	55	
No.		Australia	Outside Australia	% of Australia MRT (n=30)	% of MRT products elsewhere (n=55)	% Diff
	Region of operation					
53	Tropics	17	36	57%	65%	-9%
32	Temperate	13	19	43%	35%	9%
	Type of marine tourism					
33	Coastal and marine	7	26	23%	47%	-24%
22	Mainly marine	11	11	37%	20%	17%
24	Mainland coastal	10	14	33%	25%	8%
6	Island based	2	4	7%	7%	1%
	Mode of marine research					
21	Coastal based	12	9	40%	16%	24%
38	SCUBA/snorkel	11	27	37%	49%	-12%
4	Coastal and boat	0	4	0%	7%	7%
19	Boat only	7	12	23%	22%	2%
	SO or LO					
66	LO	11	55	37%	100%	-63%
19	SO	19	0	63%	0%	63%

Note: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Table 23-7: Main marine research topic differences between Australian located MRT products and elsewhere

	No.	30	55	30	55	
No.	**Main research topic**	**Australia**	**Outside Australia**	**% of Australia MRT (n=30)**	**% of MRT products elsewhere (n=55)**	**% Diff**
13	Turtles	8	5	27%	9%	18%
33	Coral reef	9	24	30%	44%	-14%
3	Sea birds	3	0	10%	0%	10%
15	Whales (and/or dolphins)	4	11	13%	20%	-7%
3	Sharks	2	1	7%	2%	5%
1	Island marsupials	1	0	3%	0%	3%
2	Great white shark	1	1	3%	2%	2%
1	American crocodiles	0	1	0%	2%	-2%
1	Conch shells	0	1	0%	2%	-2%
1	Deep ocean and undersea volcano	0	1	0%	2%	-2%
1	Deep sea ship wreck	0	1	0%	2%	-2%
1	Mangroves	0	1	0%	2%	-2%
1	Open ocean (e.g. Reef and cetaceans)	0	1	0%	2%	-2%
1	Penguins	0	1	0%	2%	-2%
1	Sea Otters	0	1	0%	2%	-2%
1	Whale shark	0	1	0%	2%	-2%
6	Dolphins only	2	4	7%	7%	0%

Note: For other columns, red is relatively low mean value of a MRT criteria and blue is a relatively high mean value of MRT criteria

Appendix 24. Marine research and conservation experience that could add to a marine tourism experience

Table 24-1: Examples of a marine research and conservation experience that could add to a marine tourism experience – Part A

ID	Example
1	Eye on the Reef, photos being supplied, Interpretation by researchers for free access to sites
2	Whale watching tour recording sightings of whales, stingrays, dolphins and even seabirds during the trip.
3	Recording sightings of less common species e.g. whale watching is focused on only a few species, yet researchers are often more interested in the less common species.
4	Species surveys whilst snorkelling - our organisation is beginning to record species seen by volunteers onto a database for use by a wide range of groups with volunteers using digital underwater cameras and GPS for recording.
5	It would be difficult to develop meaningful & genuine research involvement for tourists on short duration trips and in large group sizes (e.g. Quicksilver, Great Adventures). Some training & preparation of participants will be required for even the simplest tasks - more complex research tasks will require smaller groups and more time invested in training. Example of very simple involvement: In June & July, tourists on some GBR dive trips are encouraged to take and donate copies of photos of minke whales to a photo-ID study. The tourists need to know what to photograph & how to take a picture that is of sufficient quality and information content, and record relevant contextual information (such as date, time & location) before such data are of any use to the research.
6	Collecting data on animals seen on a rock pool walk, 'reef watch' during a snorkel.
7	Reef Check training
8	Working with or watching marine scientists doing research. It opens a whole new world for people.
9	Coral reef monitoring, e.g. reef check whilst undertaking a casual dive for fun.
10	Fish tagging and release; bird counts;
11	Monitoring of turtle numbers
12	Tourists could record what they see along a permanent transect. Needs some instruction and knowledge of operator error.
13	Tourist vessels travel each day to the reef from Cairns. During Humpback whale season, request each tourist onboard to keep a look-out for whales and behaviour. Write up whale sighting reports and reward the observer with a copy of the report or other benefits.
14	The ability to directly handle a charismatic animal or get much closer than you could as a tourist
15	Whale shark marine research tourism

Table 24-2: Examples of a marine research and conservation experience that could add to a marine tourism experience – Part B

ID	Example
16	Monitoring of turtle tracks and presence of nests/predators rather than direct monitoring of turtles and tagging
17	Having marine researchers on board talking to marine tourists; tour guides sharing marine research findings with marine tourists.
18	Water sampling, filling in log books with marine animal observations
19	UQ's Coral Watch is easy to do involve tourists learning something about coral reefs, and enables them to feel that they are doing something to help. For example, this could be done easily by snorkellers on day trips to tourist pontoons.
20	Reef Check program underwater guide: snorkelers / scuba divers can use the underwater guide to collect observations on the abundance of fish and invertebrate species that would normally be found on healthy coral reefs. The guide is sold by marine tourism operators as an identification guide for their customers who can learn about the reef then use the same guide to collect valuable research information that can then be submitted to a global database to show comparisons across the world.
21	Reef Check, seeing a reef in its best and worst! Leaves an impression that will last forever.
22	Tourist counts COTS and notes numbers have increased consistently for this site.
23	photographing to ID species and individuals - whale sharks, dolphins, whales etc
24	Turtle research on Bare Sand Island
25	Simple involvement in observation recordings of reef species, dolphins, whales etc.
26	Interested tourists helping with measurements of existing research
27	SCUBA divers on holidays monitoring a specific reef, take pictures of keystone species, or crown-of-thorns, etc.
28	Creel census; population counting (e.g. sea lions)

Appendix 25. Key stakeholder views (n=90) arranged by key stakeholder group and tourism system component.

Table 25-1: Marine manager views (n=9) that are classified as desired MRT product characteristic

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that their marine research is high quality.	Scientific tourism	Proposed business aspirations	Marine research	Shared
To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that their research knowledge will be shared with the tourist and marine research community.	Marine research	Proposed business aspirations	Marine research	Shared
Such a trail would be closely linked with Australian museums, zoos, aquaria, marine discovery centres, marine volunteer networks, marine research and management agencies, and the SCUBA industry.	Marine research tourism	MRT broker and/or trail	Pro MRT Industry	Shared
There is a need for real research and real data quality and analysis from MRT ventures. However, public education, awareness and other benefits are also significant.	Marine research	Research quality	Pro MRT Industry	Shared
In most cases, research activity should be useful to existing marine research programs and research interests. For example, data must go to research, management agency or be published.	Marine research	Research quality	Quality marine research	Shared
Data from marine programs from MRT ventures needs to be converted into knowledge, wisdom and understanding.	Marine research	Research quality	Quality marine research	Shared
Negative impacts from climate change will play a significant role in increased consumer and Government demand for MRT.	Environmental conservation	The MRT attraction	Pro MRT Industry	Shared
When on marine research tourism ventures, marine researchers should seek to recognise that it is a privilege to have people pay to be involved with them and to support their research.	Marine research	The MRT tourist	Business approach	Shared
Hence, marine researchers should recognise this important role of tourists by always treating them in a professional manner, communicating effectively and frequently, providing quality information about the marine research project, and thanking them for their contributions.	Marine research	The MRT tourist	Quality tourist experience	Shared

Table 25-2: Marine manager views (n=9) that are classified as MRT product constraint

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
In most cases (except with highly trained tourists and marine tour operators), marine researchers are essential for coordinating and quality assuring the research, monitoring and survey activity	Marine research	Research quality	Pro MRT Industry	Shared
On a marine research tourism venture, the marine researcher should always be formally responsible for the quality and use of the marine research.	Marine research	Research quality	Pro MRT Industry	Shared
Due to government funding constraints, one can assume that suitable financial or human resources for marine research tourism will not be available from existing marine research and management agencies.	Marine research	Marine researcher involvement	Pro MRT Industry	Highly
Australia marine research tourism needs to protect its reputation. If marine research tourists go home and say the diving was OK, the food and the company were OK, but they were 'spare wheels' as far as the project was concerned, neither they nor their friends will be back for a repeat experience. They will just go diving instead or join a marine conservation project where they can make a real contribution.	Marine research tourism	Key stakeholder concerns	Quality tourist experience	Shared
1 To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that they are a best practice, ecologically sustainable tourism venture.	Ecotourism	Proposed business aspirations	Pro environment	Shared
Hence, in many cases, resources for employment of extra marine researchers on marine research tourism ventures will need to come from the private market.	Marine research	Marine researcher involvement	Pro MRT Industry	Somewhat
'People want to do many things but, often they do not know what they can do. So, if you give them the choice of MRT, then they may well be interested and then do it.	Marine research tourism	Good business principles	Quality marine research	Shared
Research type can be full research (needs permit) or limited research (no permit needed) as demonstrated by GBRMPA guidelines in this area. Some full research may well be for private purposes, however Government may not recognise this as valid research and hence provide a research permit. Research without a research permit cannot occur by law.	Marine research	The role of marine research in MRT	Business approach	Shared
Research type can be full research (needs permit) or limited research (no permit needed) as demonstrated by GBRMPA guidelines in this area, Some limited research may well be for private purposes (i.e. not shared with research agency or published), and hence government does not need to provide research permit. In fact, it is conceivable, that some limited research tour operations may not have an emphasis on research output but rather concentrate on satisfying needs of tourist.	Marine research	The role of marine research in MRT	Business approach	Shared

Table 25-3: Marine researcher views (n=12) that are classified as desired MRT product characteristic

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
All marine research tourism ventures need to have clear, honest and achievable scientific goals.	Scientific tourism	Research quality	Marine research	Shared
The long term development of marine research tourism in Australia should involve a broad network of marine research tourism ventures, marine discovery centres, community groups, volunteer groups, SCUBA groups, conservation agencies, marine research, and management agencies.	Marine research tourism	Support infrastructure	Pro community	Shared
In the future, a marine research tourism venture should add to the prestige and scientific reputation of the project among scientific peers of the researcher.	Marine research	The role of marine research in MRT	Pro MRT Industry	Somewhat
To expand marine research tourism in Australia, there would need to be a peer review system by the scientific community, of the research undertaken, the data collected, occupational health and safety, and education standards.	Marine research	Proposed business aspirations	Marine research	Highly
MRT will support more marine parks around Australia as this desirable for conservation of Australia's marine environment.	Environmental conservation	The environment	Pro environment	Shared
MRT must be strongly supported by the researcher's host organisations in terms of logistics and requirements for occupational health, safety and environment.	Marine research	The role of marine research in MRT	Business approach	Shared
MRT ventures need useful data and effective links with researchers	Marine research	Research quality	Quality marine research	Shared
MRT must contribute data of uncompromised quality to the research project	Marine research	Research quality	Quality marine research	Shared
A MRT venture should add to the prestige and scientific reputation of the project among scientific peers of the researcher	Marine research	The role of marine research in MRT	Quality marine research	Shared
Marine bird watching around Tasmania is a great MRT opportunity.	Wildlife tourism	The MRT attraction	Role of environmental attractions	Shared
A combination of satellite tagging, ultra sonic tagging and conventional observation methods may appeal to many MRT tourists	Wildlife tourism	The MRT attraction	Quality tourist experience	Shared
The use of popular marine research technology such as remotely operated vehicles, drop cameras and global positioning systems interests MRT tourists. With appropriate training and supervision, MRT tourists may also have the opportunity to use them.	Wildlife tourism	The role of marine research in MRT	Quality tourist experience	Shared

Table 25-4: Marine researcher views (n=8) that are classified as MRT product constraints

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
It is somewhat surprising that there are not more marine research tourism ventures in Australia's southern temperate waters.	Marine research tourism	The environment	Pro MRT Industry	Highly
The diversion of Government funds from pure research to research tourism will divide the academic and the tourism industry and this will reduce the possibility of collaboration between marine researchers and marine research tourism industry.	Marine research	Key stakeholder concerns	Close relationship with marine research organisations	Highly
Much of the coastline off southern Australia is cliff like, quite inaccessible and unsafe. Seasonality and wave conditions also play a part in safe access to those coastal areas.	Marine tourism	The MRT attraction	Business approach	Shared
A relatively highly skilled person is required to operate a MRT venture.	Marine research tourism	A MRT guide role	Pro MRT Industry	Shared
Most professional researchers do not want tourists watching them while they work.	Marine research	Key stakeholder concerns	Pro MRT Industry	Shared
Professional marine research work can be repetitive and hard work	Scientific tourism	Key stakeholder concerns	Marine research	Shared
Asking a general tourist to be actively involved in advanced marine research is like asking an airplane passenger to be a steward or even a pilot.	Volunteer tourism	Key stakeholder concerns	Marine research	Shared
Marine research facilities are not enthusiastic about general tourists watching some of the more intrusive marine research procedures such as; handling wildlife.	Wildlife tourism	Key stakeholder concerns	Pro MRT Industry	Shared

Table 0-5: Marine researcher views (n=3) that are classified as MRT tourist characteristic

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
The 'I always wanted to be a marine biologist' dream of many people is an important driver for marine research tourism. Marine research tourism should tap into that market.	Scientific tourism	The MRT tourist	Business approach	Shared
Without a clear link to a conservation goal, many marine biological studies will not appeal to tourists.	Environmental conservation	The MRT tourist	Quality tourist experience	Highly
MRT should provide the tourist with a challenging and rewarding experience	Marine research tourism	The MRT tourist	Change tourist's outlook	Shared

Table 25-6: Marine conservation organisation views (n=11) that are classified as desired MRT product characteristic

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
Where possible, marine research tourism in Australia should seek to 'open the doors' to the lay person and always make them feel welcome.	Scientific tourism	The MRT tourist	Quality tourist experience	Shared
When possible, it is important that marine research tourism in Australia actively engage with indigenous Australians in the development of Indigenous focused marine research tourism businesses	Community involvement	Community involvement	Involvement of Australian indigenous peoples	Somewhat
When possible, it is important that marine research tourism actively involve indigenous Australians within the direction, development, operation and benefits of Australian marine research tourism.	Community involvement	Community involvement	Involvement of Australian indigenous peoples	Shared
To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that they have advanced NEAP Eco Certification (i.e. advanced ecotourism accreditation).	Ecotourism	Proposed business aspirations	Pro MRT Industry	Highly
For a marine research tourism venture, there needs to be a method to capture, assess and use the tourists' own thoughts on future research directions and what they believe the key issues are for conservation.	Scientific tourism	Research quality	Quality marine research	Somewhat
A marine research tourism guide's formal career path could progress to a marine tour operator, marine manager, marine researcher or similar role. A marine research tourism guide role is envisioned to be a paid role that ensures that the many needs of marine researchers, managers, tour operators and tourists are met.	Marine research tourism	A MRT guide role	Role of MRT staff	Somewhat
MRT is real sustainable alternative to consumptive marine resource use such as fisheries, unsustainable tourism, mining, petroleum, etc.	Ecotourism	The Environment	Pro MRT Industry	Shared
MRT is a likely way to diversify marine tourism	Marine tourism	Good business principles	Pro MRT Industry	Shared
MRT can be devised as an opportunity for the tourist to be inspired and train to become a marine researcher, manager, or conservationist	Marine research tourism	A MRT guide role	Quality tourist experience	Shared
Marine managers may prefer MRT over other forms of marine tourism because it is a 'tread light' version of tourism that aims for increased public awareness and research/monitoring benefits	Marine research	Support infrastructure	Pro MRT Industry	Shared
As pristine quality of marine areas decrease across the world, these areas will become more important and valuable. This may results in an increased demand for MRT by marine managers, marine researchers, marine conservation agencies and tourists.	Ecotourism	The Environment	Pro MRT Industry	Shared

Table 25-7: Marine conservation organisation views that are classified as MRT product constraints (n=4) or MRT tourist characteristic (n=1)

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
To develop marine research tourism in Australia, the first step is to convince the marine research community that; the involvement of research tourists is a good thing, that it is valuable in terms of data, that it won't sap their time and financial resources, and that most importantly it won't devalue their research and their sources of funding.	Marine research	Proposed business aspirations	Quality marine research	Shared
It is satisfactory for some marine research tourism ventures to have quality educational outcomes but relatively poor marine research outcomes.	Educational tourism	Education and Interpretation	Pro MRT Industry	Highly
Some sizeable public demographics behave as if they are not in favour of marine conservation.	Environmental conservation	Key stakeholder concerns	Pro environment	Shared
Some Government departments behave as if they are not in favour of marine conservation and sometimes do not share marine research data with marine conservation projects	Environmental conservation	Key stakeholder concerns	Pro environment	Shared
Due to the negative effects of climate change, the public's increased awareness and concern for the marine environment will be a major driver for demand for MRT experiences.	Environmental conservation	The MRT attraction	Pro MRT Industry	Shared

Note: Green interview statement was classified as a MRT tourist characteristic. All other statements were classified as MRT product constraint

Table 25-8: Marine educational group views (n=10) that are classified as desired MRT product characteristics – part A

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
MRT should seek to change the way people look and feel about the marine environment	Ecotourism	The environment	Change tourist's outlook	Shared
Communication of marine research programs and their knowledge outcomes should form 10% of the budget for all marine research programs. MRT can be used to support the education of the public about marine research, conservation and their related issues.	Educational tourism	Education and interpretation	Pro environment	Shared
MRT should aim to interpret the science that underpins marine management	Educational tourism	Education and interpretation	Pro MRT Industry	Shared
In terms of effective interpretation, there is no more effective interpretation device than a live human being.	Educational tourism	Education and interpretation	Pro MRT Industry	Shared
Marine researchers and marine tour operators can provide tourists with a more quality assured marine education and research experience and story.	Educational tourism	Education and interpretation	Quality tourist experience	Shared
One of the core elements of sustainable MRT is that the research and tourism industry takes into account the latest approaches to environmental education.	Educational tourism	Education and interpretation	Business approach	Shared
Often marine researchers do not make good communicators to the public, marine tour guides, or entrepreneurs for MRT ventures. However, there are some very good examples of marine researchers being both good communicators and entrepreneurs.	Educational tourism	Education and interpretation	Pro MRT Industry	Shared
Environmental education for sustainability involves a vision and a mission of personal and social change.	Educational tourism	The environment	Pro environment	Shared
MRT can support management of marine parks by providing marine research and monitoring information to key stakeholders such as marine managers, marine managers, and marine conservation groups.	Environmental conservation	Research quality	Pro MRT Industry	Shared
Climate change and its impact is an interesting research topic for potential MRT tourists	Environmental conservation	The role of marine research in MRT	Pro MRT Industry	Shared

Table 25-9: Marine educational group views that are classified as desired MRT product characteristic (n=10) or MRT tourist characteristic (n=1) – part B

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
In appropriate situations, marine research tourism ventures should act to promote philanthropic donations from travellers and organisations.	Marine research tourism	Support infrastructure	Business approach	Shared
Any development of such a trail would act to develop, link and co-promote a network of marine research tourism attractions across Australia.	Marine research tourism	MRT broker and/or trail	Growth	Shared
Given Australia's sizable coastal and ocean territory, and relatively well developed marine research and tourism sectors; it is somewhat surprising that marine research tourism industry is not well developed in Australia.	Marine research tourism	MRT broker and/or trail	Growth	Highly
Many MRT ventures can take a low interference approach, whereby tourists have limited interaction with a marine research facility or people, but the marine research facility provides and authentic setting for the marine research attraction, and also can provide some expertise or resources	Marine research tourism	A MRT guide role	Business approach	Shared
Marine discovery centres can act to provide educated and trained people to support MRT ventures	Marine research tourism	Support infrastructure	Pro MRT Industry	Shared
Development of MRT ventures can result in university funded marine discovery centres and public outreach programs that encourage marine research careers.	Marine research tourism	Support infrastructure	Business approach	Shared
Development of MRT can result in a broad network of MRT ventures, discovery centres, community groups, conservation agencies. marine research and management agencies	Marine research tourism	Support infrastructure	Business approach	Shared
There should be ongoing and increasing tourist participation in MRT	Marine research tourism	The MRT tourist	Growth	Shared
Compared to ocean based MRT vessels, marine discovery centres are a lower cost way to bring the wonders of marine research and the environment to the public.	Marine tourism	Good business principles	Pro environment	Shared
A marine research tourism venture must be strongly supported by the researcher's host organisations in terms of logistics and requirements for occupational health, safety and environment.	Marine research	The role of marine research in MRT	Pro MRT Industry	Shared
In general, deep sea marine research is a fascinating topic for the general public.	Marine tourism	The MRT attraction	Pro MRT Industry	Shared

Note: Green interview statement was classified as a MRT tourist characteristic. All other statements were classified as desired MRT product characteristic

Table 25-10: Marine tour operator views (n=10) that are classified as desired MRT product characteristic

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
Marine research tourism across Australia should have widespread and ongoing community involvement.	Community involvement	Community involvement	Pro community	Somewhat
Development of such a trail could be facilitated by a national organisation (comprised of representatives from Federal, State and Local organisations) that supports a number of marine research tourism broker organisations, which in turn support individual marine research tourism business.	Marine research tourism	MRT broker and/or trail	Pro MRT Industry	Highly
It has been suggested by key stakeholders that to notably develop marine research tourism across Australia, there is an opportunity for a number of collaborating yet competing marine research tourism broker roles across Australia. Such broker roles would act to support the interests of all key stakeholders by undertaking tasks such as the identification and development of marine research tourism, and facilitate permits, certification and training.	Marine research tourism	MRT broker and/or trail	Pro MRT Industry	Somewhat
These days, many prospective marine research tourists have Discovery Channel expectations. To satisfy these tourists, they should receive an experience that satisfies those expectations.	Scientific tourism	Proposed business aspirations	Business approach	Highly
MRT can contribute to making a marine park a far more economically sound alternative to a local fishing industry.	Environmental conservation	Good business principles	Pro MRT Industry	Shared
A MRT tour must have conservation, research or other educational message that leads to increased awareness and action by the traveller.	Educational tourism	Education and interpretation	Change tourist's outlook	Shared
There should be a MRT trail across Australia that is facilitated by a national body (comprised of Federal, State and Local bodies) that supports a number of cooperating yet competing MRT broker organisations, that in turn support individual MRT business.	Marine research tourism	MRT broker and/or trail	Pro MRT Industry	Shared
Marine tour operators should provide proceeds, data and/or research capabilities to marine researchers.	Marine research	Research quality	Close relationship with marine research organisations	Shared
MRT can encourage critical thinking skills by its tourists.	Scientific tourism	Education and interpretation	Pro MRT Industry	Shared
Conservation and marine discovery media (e.g. documentaries, news articles, holiday TV) is part of a process that drives demand in marine ecotourism including marine research tourism.	Ecotourism	The role of the media	Role of documentaries and other media	Shared

Table 25-11: Marine tour operator views that are classified as MRT product constraints (n=6) or MRT tourist characteristic (n=1)

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
There must be minimal impact on ecosystems, visitor numbers may be restricted for the benefit of the ecosystem, seasonality will provide opportunities and restrictions on MRT ventures, must minimise negative impacts of bringing large number of people (tourists) to any area.	Environmental conservation	The environment	Pro environment	Shared
MRT should always aim to clearly explain the marine research to the tourist. That is, there is no point in baffling the tourist.	Educational tourism	Education and interpretation	Quality tourist experience	Shared
Fundamentally, the development and ongoing operation of a MRT ventures depends on suitable benefits to the MRT venture operators.	Marine research tourism	Good business principles	Pro MRT Industry	Shared
The greater good factors such as public awareness, benefits to marine research and conservation are important but a secondary factor to economic viability	Marine research tourism	Good business principles	Pro MRT Industry	Shared
On MRT ventures, often marine researchers and marine tour operators have different priorities and perceptions of their roles.	Marine research tourism	Key stakeholder concerns	Close relationship with marine research organisations	Shared
Sometimes, on MRT ventures, marine researchers have been known to be disorganised, self interested, not interact well with tourists, and/or not collaborate well with marine tour operators.	Marine research	Key stakeholder concerns	Marine tour operator	Shared
Within the previous ten years, tourists have changed, they are more environmentally conscious. Children are also demanding an environmentally conscious environment.	Ecotourism	The MRT tourist	Pro MRT Industry	Shared

Note: Green interview statement was classified as a MRT tourist characteristic. All other statements were classified as MRT product constraint

Table 25-12: SCUBA diving organisation and or tourism destination manager views (n=5) that are classified as MRT product constraints

Survey or interview statement	Key MRT element	Main topic	Agenda for change	Contest-ability
SCUBA divers and the SCUBA diver industry can be an important part of the MRT infrastructure and services in Australia. For example, it is probable that many SCUBA divers can be MRT tourists, and the SCUBA industry can provide personnel to assist with developing and maintaining a MRT venture.	Marine tourism	Support infrastructure	Role of MRT staff	Shared
Many SCUBA instructors have marine research and marine research training skills and they could train people to recognise and respect species, and habitats.	Marine tourism	Support infrastructure	Role of MRT staff	Shared
Any notable development of marine research tourism in Australia should be based on sound assessments of market/consumer demand. This would include assessments of affordability and perceived value for money.	General tourism	Good business principles	Business approach	Shared
MRT should be culturally and environmentally sensitive with minimal carbon footprint	Environmental conservation	The environment	Pro environment	Shared
MRT should aim to be financially self-sustaining over the longer term (i.e. No or minimal ongoing financial support from Government/s)	Marine research tourism	Good business principles	Business approach	Shared

Note: Green colour indicates SCUBA diving organisation statements and light blue indicates tourism destination manager statements

Appendix 26. Frequency of interview statements by four categories and their related key stakeholder group

Interview statements were classified according to their key stakeholder group and the four categories shown in Table 26-. The frequency of interview statements by these four categories and their related stakeholder group are presented as in the below tables.

Table 26-1: Thematic categories used to classify interview statements

Thematic category	Description
Tourism-system model	What component of the Moscardo et al. (2004) tourism system model does the interview statement best match? (Check other lists)
Key MRT element	What key element (e.g. Ecotourism, volunteer tourism, and marine research) is most relevant to this statement? See the revised conceptual model for MRT in Chapter 1
Main topic	Another word or phrase that describes the main meaning of the statement
Agenda for change	This category broadly represents the agenda for change that may be represented in the interviewee's statement

Table 0-2: No. of key stakeholder group statements by tourism-system (Moscardo et al., 2003) component

	Tourism system component			
Key stakeholder group	**Desired product characteristic**	**Product constraint**	**Tourist characteristic**	**Total**
Conservation organisation	8	4	1	13
Marine educator	20		1	21
Marine manager	6	7	1	14
Marine researcher	9	7	1	17
Marine tour operator	10	6	1	17
MRT operator	64	36	15	115
Need to complete	2	1		3
SCUBA diving organisation	2			2
Tourism destination manager	3			3
Total	**124**	**61**	**20**	**205**

Table 26-3: No. of key stakeholder group statements by key MRT element (Figure 1.4.1)

Key stakeholder group and key MRT element	Total		Key stakeholder group and key MRT element	Total
Conservation organisation	**13**		**Marine tour operator**	**17**
Community	1		Community	1
Conservation	3		Conservation	2
Ecotourism	3		Ecotourism	2
Education	1		Education	2
Marine	1		MRT	6
MRT	2		Research	2
Research	2		Scientific	2
Marine educator	**21**		**MRT operator**	**115**
Conservation	2		Adventure	1
Ecotourism	1		Alternative	1
Education	7		Community	4
Marine	2		Conservation	8
MRT	8		Ecotourism	10
Research	1		Education	9
Marine manager	**15**		General tourism	1
Conservation	1		Marine	1
Ecotourism	1		MRT	33
MRT	2		Research	31
Research	10		Scientific	10
Scientific	1		Volunteer	2
Marine researcher	**19**		Wildlife	4
Conservation	1		**SCUBA diving organisation**	**2**
Marine	1		Marine	2
MRT	4		**Tourism destination manager**	**3**
Research	6		Conservation	1
Scientific	2		General tourism	1
Volunteer	1		MRT	1
Wildlife	4		Scientific	1

Table 26-4: No. of key stakeholder group statements by main interview topic (n=16)

	Key stakeholder group								
Main topic	**Conservation organisation**	**Marine educator**	**Marine manager**	**Marine researcher**	**Marine tour operator**	**MRT operator**	**SCUBA diving organisation**	**Tourism destination manager**	**Total**
Key stakeholder concerns	2			4	2	15			23
Education and Interpretation	1	6			3	10			20
Research quality		1	5	3	1	12			22
The MRT attraction	1	1	1	3		13			19
Good business principles	1	1	1		3	9		2	17
The environment	2	2		2	1	8		1	16
The role of marine research in MRT		2	2	4		8			16
Proposed business aspirations	2		3		1	6			12
Support infrastructure	1	4		1		5	2		13
The MRT tourist		1		1	1	6			9
MRT broker and/or trail		2	1		3	2			8
A MRT guide role	2	1		1		3			7
Marine researcher involvement			2			5			7
Community involvement	1				1	4			6
The MRT attraction - Marine research stations						5			5
Marketing concerns						4			4
The role of the media					1				1
Total	**13**	**21**	**15**	**19**	**17**	**115**	**2**	**3**	**205**

Table26-5: No. of key stakeholder group statements by possible agenda for change (n=15) class

	Key stakeholder group								
Main topic	**Conservation organisation**	**Marine educator**	**Marine manager**	**Marine researcher**	**Marine tour operator**	**MRT operator**	**SCUBA diving organisation**	**Tourism destination manager**	**Total**
Pro MRT Industry	7	8	7	5	8	35			70
Business approach		5	2	2	1	16		2	28
Pro environment	2	3	1	1	1	11		1	20
Quality marine research	1		3	3		8			15
Quality tourist experience	1	1		2	1	9			14
Marine research			2	3		8			13
Growth		3				8			11
Close relationship with marine research organisations					2	6			8
Role of MRT staff	1					5	2		8
Change tourist's outlook		1		1	1	2			5
Pro community				1	1	2			4
Role of documentaries and other media					1	2			3
Role of environmental attractions				1		2			3
Ethics						1			1
Marine tour operator					1				1
Proactive involvement of Australian indigenous peoples	1								1
Total	**13**	**21**	**15**	**19**	**17**	**115**	**2**	**3**	**205**

Appendix 27. MRT operator views (n=115) arranged by main topic, tourism system component, and key MRT element

Table 271: MRT operator views (n=4) that are classified as local community involvement

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
Marine research tourism in Australia should aim to link, learn from and support marine research tourism in developed and less developed countries across the World.	Desired product characteristic	Community involvement	Pro MRT Industry	Shared
MRT must have widespread and ongoing community involvement. Networking and mutual benefits will ensure an active, creative and developing MRT venture	Desired product characteristic	Community involvement	Pro community	Shared
MRT can be used to rebuild and diversify regional communities	Desired product characteristic	Community involvement	Pro community	Shared
MRT can act as a catalyst for regional development through the diversification of tourism, new tourism ventures, investment in local marine research, the benefit of localised marine research, and the involvement of skilled marine research people within the local community.	Desired product characteristic	Community involvement	Business approach	Shared

Table 27-2: MRT operator views (n=8) that are classified as marine conservation concerns

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
Marine research tourism should always act to promote and create the most environmentally responsible tourism.	Desired product characteristic	Ecotourism	Pro environment	Shared
MRT should always act to promote and create the most environmentally responsible tourism; low impact in ecosystems, longer term benefit and empowerment of flora and fauna; not just sustainability and protection but empowerment and restoration of nature	Desired product characteristic	Ecotourism	Pro environment	Shared
MRT should be ecologically sustainable.	Desired product characteristic	Ecotourism	Pro environment	Shared
MRT ventures promote environmental and nature conservation through increased awareness.	Desired product characteristic	Ecotourism	Pro environment	Shared
There is great public awareness about marine research and conservation to be gained from MRT including marine discovery centres	Desired product characteristic	Marine conservation	Pro environment	Shared
MRT can be described as cashing in on conservation and earning from the marine environment. Conservation and the MRT environment becomes a commercial advantage for research and tourism. One example is that estimates of the dollar value of a shark at osprey reef at the Great Barrier Reef to marine tourism is $250 000 over its life span compared to $150 and non reusable as an edible product (WWF, 200 http://www.wwf.org.au/news/plunder-or-protection-wwf-calls-for-safeguard-of-coral-sea/).	Desired product characteristic	Marine conservation	Role of environmental attractions	Shared
Marine research tourism should not only act to promote environmental sustainability and protection, but should act to promote the empowerment and restoration of nature.	Desired product characteristic	Marine research	Pro environment	Shared
The future health and productivity of the sea will depend on us encouraging only sustainable and non-damaging developments such as MRT ventures	Product constraint	Marine conservation	Pro environment	Shared

Table 27-3: MRT operator views (n=9) that are classified as education and interpretation

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
The marine research program of any marine research tourism venture should always seek to effectively analyse, develop and communicate the resulting knowledge to marine researchers, tourists and other key stakeholders.	Desired product characteristic	Educational tourism	Pro MRT Industry	Shared
By adding a marine research narrative to their interpretative program, marine tour operators can enhance the tourist's experience and add to the tourist attraction.	Desired product characteristic	Educational tourism	Quality tourist experience	Shared
All marine research tourism operators should reach a high level of competence in the interpretation of the marine research.	Desired product characteristic	Educational tourism	Role of MRT staff	Shared
MRT should seek to enable the gap between (for want of better terms) the top and the bottom levels of knowledge passed on within marine tourism to be reduced. The objective of this is so more participants are exposed to better marine environmental interpretation	Desired product characteristic	Educational tourism	Quality tourist experience	Shared
MRT ventures should have a high-quality interpretive and educational component	Desired product characteristic	Educational tourism	Business approach	Shared
Many marine tourism interpretation programs act out the antithesis of suitable environmental principles (e.g. appropriate interactions with wildlife)	Product constraint	Ecotourism	Pro environment	Shared
The MRT operator and marine researcher need to be aware of not passing on undesirable messages and behaviour to the traveller	Product constraint	Educational tourism	Pro MRT Industry	Shared
Key sectors of marine tourism are not placing importance on training that will either improve the interpretative delivery skills associated with such specific MRT products or assist in supporting the desires of travellers to become involved in marine research and conservation projects at the basic levels.	Product constraint	Educational tourism	Pro MRT Industry	Shared
Marine research is a long term endeavour that is frequently set within a broad scientific context and this context needs to be carefully interpreted to tourists.	Product constraint	Scientific tourism	Marine research	Shared
MRT tourists are looking for a marine research story that they can be involved with.	Tourist characteristic	Educational tourism	Quality tourist experience	Shared

Table 27-4: MRT operator views (n=8) that are classified as research quality related – part A

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
MRT data can provide more evidence and facts for the research and conservation of habitats, species and ecosystems. For example, in many cases, the resulting marine research from MRT has aided shark, turtle, whale, and coral reef research and conservation.	Desired product characteristic	Marine conservation	Quality marine research	Shared
The marine research on marine research tourism ventures should fit the following criteria: the data is acquired in an ethical manner, the data can be relied upon, the data is actually needed, the data is used, there is (or is credibly likely to be) a useful result, and when possible, the results should be shared and published.	Desired product characteristic	Marine research	Marine research	Shared
If done properly, marine research tourism can provide a cost effective option for marine research institutions to conduct effective marine research.	Desired product characteristic	Marine research	Pro MRT Industry	Shared
The research community needs to recognise the value of long term data and observations from MRT	Desired product characteristic	Marine research	Pro MRT Industry	Shared
Data quality, analysis and use must be good.	Desired product characteristic	Marine research	Quality marine research	Shared
Researchers must share the results of MRT research projects with stakeholders	Desired product characteristic	Marine research	Close relationship with marine research organisations	Shared
MRT can provide regular access to a research area and hence provide ongoing data collection that can lead to more reliable and complete research findings	Desired product characteristic	Marine research	Quality marine research	Shared
MRT can provide funding, research vessels, volunteers and scientific data.	Desired product characteristic	Marine research	Marine research	Shared

Table 27-5: MRT operator views (n=4) that are classified as research quality related – part A

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
MRT can have a logistical advantage over much many marine research programs because the data collection can be more numerous and frequently ongoing where marine research programs are often not. Also, many MRT research programs can revisit the same (or thereabouts) locations and hence carry out successful longitudinal studies.	Desired product characteristic	Marine research	Marine research	Shared
Due to MRT, more marine research projects are viable and possible.	Desired product characteristic	Marine research	Business approach	Shared
Until research from marine research tourism reliably meets the above conditions, many so-called marine research tourism ventures will continue to be nothing more than glorified holiday packages jumping on the "eco" bandwagon, conning their customers and devaluing the efforts of genuine marine research tourism ventures.	Product constraint	Marine research	Quality marine research	Highly
Sections of the research community still do not recognise the value of data obtained from volunteers with limited training.	Product constraint	Volunteer tourism	Marine research	Shared

Table 27-6: MRT operator views (n=5) that are classified as marine researcher involvement

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
The willingness of many marine researchers to participate in marine research tourism will be dependent on their recognition and acceptance of the benefits of marine research tourism.	Product constraint	Marine research	Close relationship with marine research organisations	Shared
Hence, the development of marine research tourism in Australia will be limited by the availability of willing and skilled marine researchers.	Product constraint	Marine research	Pro MRT Industry	Highly
When appropriate, to expand marine research tourism in Australia, there should be contractual agreements between key stakeholders that that outlines the roles and commitments of key stakeholders.	Product constraint	Marine research tourism	Pro MRT Industry	Highly
MRT must meet both marine researcher and tourist needs	Product constraint	Marine research tourism	Close relationship with marine research organisations	Shared
Willing, skilled and available marine researchers can be considered as among the rarest essential commodities for marine research tourism.	Product constraint	Scientific tourism	Role of MRT staff	Highly

Table 27-7: MRT operator views (n=7) that are classified as the MRT attraction – part A

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
This combination of media and marine research tourism can act to assist in changing public awareness and increasing the public's interest in marine research, conservation and management.	Desired product characteristic	Ecotourism	Role of documentaries and other media	Shared
This in turn can act to affect government policy and action with regard to marine research, conservation and management.	Desired product characteristic	Marine research tourism	Role of documentaries and other media	Shared
Perhaps bona fide research organisations (e.g. AIMS, CSIRO might benefit from having tourists participate in research expeditions; but a lot of their core research (e.g. water quality sampling, coral/fish stock surveys) might not be very appealing to tourists.	Product constraint	Marine research tourism	Pro MRT Industry	Shared
Tourists and volunteers like to feel that they are part of something such as discovery marine research phenomena and conserving the environment.	Tourist characteristic	Adventure tourism	Pro MRT Industry	Shared
MRT has the potential to provide mutual benefit to travellers interested in undertaking more in-depth and worthwhile tourism experiences.	Tourist characteristic	Alternative tourism	Quality tourist experience	Shared
There appears to be a vogue like demand for green products, including green tourism	Tourist characteristic	Ecotourism	Role of MRT staff	Shared
When appropriate, marine research tourism should have strong supporting links with non government conservation organisations such as the Australian Marine Conservation Society and the World Wildlife Fund.	Tourist characteristic	Marine conservation	Quality tourist experience	Shared
As part of marine research tourism, marine researchers and the marine research environment are central parts of the tourist attraction.	Tourist characteristic	Scientific tourism	Pro MRT Industry	Shared

Table 27-8: MRT operator views (n=5) that are classified as the MRT attraction – part A

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
Given appropriate crew, marine research tourism ventures should promote their crew as respected and renowned professionals in marine research.	Tourist characteristic	Scientific tourism	Role of MRT staff	Shared
For MRT, marine researchers and the marine research environment are central parts of the tourist attraction.	Tourist characteristic	Scientific tourism	Pro MRT Industry	Highly
Similarly, MRT ventures should promote marine wildlife and environment as „œlebrity" marine wildlife and environment. Again, this is partly what the MRT tourist has travelled to see.	Tourist characteristic	Wildlife tourism	Role of environmental attractions	Shared
Reef tourists are clearly most interested in the iconic marine species (e.g. whales, sharks, turtles, and big fish). Tour operators know this and their marketing reflects it, so I guess these species would have the greatest potential for developing this sort of tourism.	Tourist characteristic	Wildlife tourism	Pro MRT Industry	Shared
To develop MRT ventures that are focused on lesser charismatic wildlife and habitats, MRT should attract more knowledgeable and experienced travellers	Tourist characteristic	Wildlife tourism	Pro MRT Industry	Shared

Table 27-9: MRT operator views (n=5) that are classified as the MRT attraction – marine research stations

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
Due to ongoing funding shortages, many remote marine research stations could financially benefit from appropriate involvement of marine research tourism.	Desired product characteristic	Marine research	Growth	Shared
Without interference in their marine research program, marine research stations could provide an authentic marine research backdrop for marine research tourism ventures to operate near.	Desired product characteristic	Marine research	Growth	Somewhat
Without interference in their marine research program, marine research stations could be involved in the logistical support for marine research tourism.	Desired product characteristic	Marine research	Growth	Shared
Without interference in their marine research program, some marine research stations could become suitable marine research tourism destinations.	Desired product characteristic	Marine research	Growth	Highly
The marine research activity that occurs at many marine research facilities can be of great interest to general members of the public including tourists.	Desired product characteristic	Scientific tourism	Growth	Shared

Table 27-10: MRT operator views (n=8) that are classified as the MRT attraction – the role of the marine researcher in MRT

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
MRT has the potential to provide mutual benefit to researchers in the pursuit of conservation goals	Desired product characteristic	Marine conservation	Quality marine research	Shared
A marine research tourism venture should be seen by marine research and management organisations as a highly desirable, reliable and cost-effective aspect of research operation.	Desired product characteristic	Marine research	Pro MRT Industry	Somewhat
A MRT venture should be viewed as a reliable and viable marine research platform for marine researchers and managers.	Desired product characteristic	Marine research	Pro MRT Industry	Shared
The presence of many geographically overlapping and ongoing marine research programs (with associated funding and stakeholder benefits) may be a viable reason for initiating and operating a MRT venture.	Desired product characteristic	Marine research	Pro MRT Industry	Shared
Research outcomes from MRT ventures can be significant.	Desired product characteristic	Marine research	Quality marine research	Shared
Marine tour operators should link more closely with marine researchers so that marine tour operators can assist with marine research (potentially decreases in cost and increases in numbers of people undertaking research).	Desired product characteristic	Marine research tourism	Close relationship with marine research organisations	Shared
The use of popular marine research technology such as remotely operated vehicles, drop cameras and global positioning systems increases the tourist's situational awareness, sets the scene for the tourist, and increased edutainment benefits for the tourist.	Desired product characteristic	Marine tourism	Quality tourist experience	Shared
For commercial reasons, some marine research tourism ventures may choose to have an emphasis on satisfying the needs of tourist rather than an emphasis on research outcomes.	Product constraint	Marine research tourism	Quality tourist experience	Shared

Table 27-11: MRT operator views (n=6) that are classified as the MRT tourist

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
MRT will improve the tourist‟s knowledge, understanding and stewardship of the marine environment.	Desired product characteristic	Marine conservation	Quality tourist experience	Shared
MRT must provide a satisfying experience for the tourists.	Desired product characteristic	Marine research tourism	Quality tourist experience	Shared
A marine research tourism experience can give the a tourist a „religious‟ experience and an emotional connection to the marine environment, that leads to greatly enhanced and long term environmental awareness, conservation values, conservation action and stewardship.	Tourist characteristic	Marine research tourism	Change tourist's outlook	Shared
Whether MRT venture has active or passive tourists will often depend on; the research tasks (e.g. simple tasks undertaken by many tourists compared with difficult tasks undertaken by a few), marine tourism operator preferences, and the tourist‟s, preferences, skills and abilities.	Tourist characteristic	Marine research tourism	Pro MRT Industry	Shared
In many cases, marine research is too complicated for the general public. To counter this, it is recommended that marine research tourism ventures undertake more popular and discovery - orientated marine research programs.	Tourist characteristic	Scientific tourism	Pro MRT Industry	Highly
Unless volunteers are needed, marine research that can be undertaken on marine research tourism ventures could also be done on normal marine tour ventures, by scientists and crew, and without the active involvement of tourists.	Tourist characteristic	Volunteer tourism	Pro MRT Industry	Highly

Table 27-12: MRT operator views (n=3) that are classified a MRT guide role

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
A marine research tourism guide could be a formalised role within an organised Australian marine research tourism industry. A marine research tourism guide role is envisioned to be a paid role that ensures that the many needs of marine researchers, managers, tour operators and tourists are met.	Desired product characteristic	Marine research tourism	Business approach	Somewhat
MRT + quality experience + suitable individual = a career in marine research, management, conservation and/or tourism.	Desired product characteristic	Marine research tourism	Change tourist's outlook	Shared
Many staff who work on existing MRT ventures are quite interested in marine research and possibly being a marine researcher.	Desired product characteristic	Scientific tourism	Role of MRT staff	Shared

Table 27-13: MRT operator views (n=4) that are classified as marketing concerns

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
Some ventures have unbelievable marketing and do not manage expectations of customers. There should be boundaries and guidelines for this	Product constraint	Ecotourism	Business approach	Shared
Often the marketing of MRT ventures is green washing, and does not accurately portray the low quality marine research outcomes of some MRT ventures.	Product constraint	Ecotourism	Quality marine research	Shared
MRT is being used solely as a marketing tool with no real research or environmental benefit is a concern	Product constraint	Marine conservation	Pro environment	Shared
There might be some marketing advantage for MRT, but the current reef tourism industry doesn't seem to reflect this. That said, more and more GBR tour operators are contributing to reef monitoring these days and some are promoting themselves as doing this. From my experience however, the tourists rarely see any of this research/monitoring. Times are a-changing however, so you never know what might happen over the next few years.	Product constraint	Marine research tourism	Pro MRT Industry	Shared

Table 27-14: MRT operator views (n=7) that are classified as proposed business aspirations

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
A possible marine research tourism venture with great potential is a complete terrestrial to marine tourism research package, where people get to see an overall picture of the links between the sea and land, and how the two are intertwined.	Desired product characteristic	Ecotourism	Business approach	Somewhat
To expand marine research tourism in Australia, there should be a memorandum of understanding of roles and commitments between key stakeholders.	Desired product characteristic	Marine research tourism	Business approach	Shared
Where possible, marine research tourism vessels should at least provide free space for marine researchers.	Desired product characteristic	Marine research tourism	Business approach	Shared
To expand marine research tourism in Australia and ensure desired quality, there would need to be a rigorous tender process that only grants operational licenses to quality assured marine research tourism operations.	Desired product characteristic	Marine research tourism	Pro MRT Industry	Highly
MRT should be expanded to all areas of and Australia and worldwide.	Desired product characteristic	Marine research tourism	Pro MRT Industry	Shared
MRT can diversify marine tour operations and assist with competing against lower cost and less regulated marine tourism	Desired product characteristic	Marine research tourism	Pro MRT Industry	Shared
The Undersea Explorer is often recognised as a good business model for marine research tourism. Is it reasonably to enquire why similar ventures have not been developed elsewhere, and also, how can similar ventures be developed elsewhere?	Product constraint	Marine research tourism	Pro MRT Industry	Somewhat

Table 27-15: MRT operator views (n=9) that are classified as good business principles

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
MRT should always adhere to quadruple (social, cultural, economic and environmental) bottom line sustainability principles	Desired product characteristic	Ecotourism	Pro environment	Shared
There is a need to integrate and expand into other tourism packages such as package holidays, adventure travel, responsible holidays and more	Desired product characteristic	General tourism	Business approach	Shared
There is a need to professionalise the marine research tourism industry in terms of industry guidelines and services to marine researchers and managers.	Desired product characteristic	Marine research	Business approach	Shared
The marine tour operator should be empowered so they are capable to undertake the high quality marine research support, interpretation and hospitality tasks that are required for a marine research tourism venture.	Desired product characteristic	Marine research tourism	Growth	Shared
There is a need to professionalise the marine research tourism industry in terms of staff, industry guidelines and services to tourists.	Desired product characteristic	Marine research tourism	Business approach	Shared
Marine discovery centres can be profitable through the commercialisation of conservation and marine research via undertaking marine research programs, tourism, volunteer programmes, selling souvenirs, and information services.	Desired product characteristic	Marine research tourism	Business approach	Shared
One important criterion for a stable marine research tourism venture is a long term government permit for access to and research in marine research areas.	Desired product characteristic	Scientific tourism	Business approach	Shared
It all comes down to supply and demand	Product constraint	Marine research tourism	Business approach	Shared
Very few operators would be willing to change their existing product/itineraries to incorporate a research focus unless their business benefited from it somehow (i.e. financially).	Product constraint	Marine research tourism	Business approach	Shared

Table 27-16: MRT operator views (n=5) that are classified as support infrastructure

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
Marine educators and marine education societies can play an important role in the provision of organisational and information services to marine research tourism in Australia.	Desired product characteristic	Educational tourism	Growth	Shared
MRT should have the opportunity to appropriately utilise existing and underused marine research equipment (from research agencies) in a regular and more efficient way	Desired product characteristic	Marine research	Close relationship with marine research organisations	Shared
In the future, universities can play a major role in supporting, operating and benefiting from marine research tourism in Australia.	Desired product characteristic	Marine research tourism	Growth	Shared
Many marine and coastal volunteer programs can be an important part of marine research tourism infrastructure and services in Australia.	Desired product characteristic	Marine research tourism	Business approach	Shared
Marine research tourism should seek to develop a marine research tourism trail across Australia. This trail could consist of an organised network of different marine research tourism ventures and attractions across Australia.	Desired product characteristic	Marine research tourism	Pro environment	Somewhat

Table 2717: MRT operator views (n=2) that are classified a MRT broker concept

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
A MRT broker would act to support the interests of all key stakeholders, identify research attractions, destinations, facilitate permits, certification and training	Desired product characteristic	Marine research tourism	Pro MRT Industry	Shared
MRT ventures and marine researchers should work collaboratively to obtain research grants that can be used to fund MRT ventures.	Product constraint	Marine research	Pro MRT Industry	Shared

Table 27-18: MRT operator views (n=7) that are classified as key stakeholder concerns – part A

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
MRT must be conducted in a moral, honest and professional manner that is mutually beneficial to operators, researchers and the environment.	Desired product characteristic	Marine research tourism	Ethics	Shared
A potential major barrier to developing marine research tourism in Australia is lower cost marine research tourism opportunities for tourists in other regions of the world.	Product constraint	General tourism	Pro MRT Industry	Highly
If marine research tourism is not officially considered as important by marine research and/or management agencies, then the advancement of marine research tourism is limited.	Product constraint	Marine research	Pro MRT Industry	Shared
So that marine research tourism can assist marine management agencies, those agencies should become clearer about their research questions and what data needs collecting.	Product constraint	Marine research	Marine research	Highly
A limiting factor for marine research tourism is the culture and psychology of key stakeholders such as marine managers, marine researchers and marine tour operators.	Product constraint	Marine research	Business approach	Highly
Supporting marine research tourism should become a mandated project area for government marine research and management programs.	Product constraint	Marine research	Pro MRT Industry	Highly
Australian government marine management and research organisations often act to hinder rather than help the marine research tourism industry.	Product constraint	Marine research	Pro MRT Industry	Highly
Often the above hindrance by Australian government marine management and research organisations is due to an institutional prejudice against marine research tourism.	Product constraint	Marine research	Pro MRT Industry	Highly

Table 27-19: MRT operator views (n=8) that are classified as key stakeholder concerns – part B

Survey or interview statement	Tourism system component	Key MRT element	Agenda for change	Contest-ability
Many marine tour operators state that they support marine research, but this is a misrepresentation, there is an absence of a real research program with real research outcomes.	Product constraint	Marine research	Pro MRT Industry	Shared
Many marine tour operators are unaware of the requirements to carry out quality marine research	Product constraint	Marine research tourism	Quality marine research	Shared
Sometime, marine tourism operators have different priorities to a marine researcher. This can lead to a reluctance of marine tourism operators to work with marine researchers.	Product constraint	Marine research tourism	Close relationship with marine research organisations	Shared
Governing agencies are unable to differentiate between scientific research and non-invasive observational research employed in basic MRT when determining permit requirements	Product constraint	Marine research tourism	Marine research	Shared
Research for many MRT ventures is still focused on short term specific question based studies instead of ensuring the lack of long term whole of ecosystem information is reversed.	Product constraint	Marine research tourism	Marine research	Shared
The value of MRT in both revenue and operational advantages has not been recognised by key sectors of the marine tourism industry.	Product constraint	Marine research tourism	Pro MRT Industry	Shared
Many potential MRT tourists are unaware of the hard work that is often associated with active participation with a marine research program	Product constraint	Scientific tourism	Pro MRT Industry	Shared
MRT tourists should not be associated with marine research that requires a high level of ethical clearance (e.g. biopsies, DNA tagging, etc)	Product constraint	Wildlife tourism	Pro MRT Industry	Shared

Appendix 28. Key stakeholder views (n=22) from research step one that are considered by the researcher to be contestable across two or more key stakeholder groups

Table 28-1: Contestable statements (n=12) from research step one

Stakeholder group	Open text statements from survey	Key MRT element
	Desired product characteristic	
Conservation organisation	When possible, it is important that marine research tourism in Australia actively engage with indigenous Australians in the development of Indigenous focused marine research tourism businesses	Community
MRT operator	A possible marine research tourism venture with great potential is a complete terrestrial to marine tourism research package, where people get to see an overall picture of the links between the sea and land, and how the two are intertwined.	Ecotourism
Marine researcher	To expand marine research tourism in Australia, there would need to be a peer review system by the scientific community, of the research undertaken, the data collected, occupational health and safety, and education standards.	Marine research
Marine manager	When on marine research tourism ventures, marine researchers should seek to recognise that it is a privilege to have people pay to be involved with them and to support their research.	Marine research
Marine manager	Hence, marine researchers should recognise this important role of tourists by always treating them in a professional manner, communicating effectively and frequently, providing quality information about the marine research project, and thanking them for their contributions.	Marine research
Conservation organisation	For a marine research tourism venture, there needs to be a method to capture, assess and use the tourists' own thoughts on future research directions and what they believe the key issues are for conservation.	Scientific tourism
Conservation organisation	Where possible, marine research tourism in Australia should seek to „open the doors" to the lay person and always make them feel welcome.	Scientific tourism
	Product constraint	
MRT operator	A potential major barrier to developing marine research tourism in Australia is lower cost marine research tourism opportunities for tourists in other regions of the world.	General tourism
Marine manager	Australia marine research tourism needs to protect its reputation. If marine research tourists go home and say the diving was OK, the food and the company were OK, but they were 'spare wheels' as far as the project was concerned, neither they nor their friends will be back for a repeat experience. They will just go diving instead or join a marine conservation project where they can make a real contribution.	MRT
Marine researcher	The diversion of Government funds from pure research to research tourism will divide the academic and the tourism industry and this will reduce the possibility of collaboration between marine researchers and marine research tourism industry.	Marine research
	Tourist characteristic or constraint	
Marine researcher	Without a clear link to a conservation goal, many marine biological studies will not appeal to tourists.	Marine conservation
Marine researcher	The 'I always wanted to be a marine biologist' dream of many people is an important driver for marine research tourism. Marine research tourism should tap into that market.	Scientific tourism

Table 282: Contestable statements (n=10) from research step two

Stakeholder group	Interview statement	Key MRT element
	Desired product characteristic	
Conservation organisation	MRT is real sustainable alternative to consumptive marine resource use such as fisheries, unsustainable tourism, mining, petroleum, etc.	Ecotourism
MRT operator	A MRT broker would act to support the interests of all key stakeholders, identify research attractions, destinations, facilitate permits, certification and training.	MRT
MRT operator	MRT should have the opportunity to appropriately utilise existing and underused marine research equipment (from research agencies) in a regular and more efficient way.	Marine research
Marine researcher	MRT must be strongly supported by the researcher"s host organisations in terms of logistics and requirements for occupational health, safety and environment.	Marine research
	Product constraint	
Conservation organisation	Some Government departments behave as if they are not in favour of marine conservation and sometimes do not share marine research data with marine conservation projects.	Marine conservation
MRT operator	Governing agencies are unable to differentiate between scientific research and non-invasive observational research employed in basic MRT when determining permit requirements.	MRT
MRT operator	Research for many MRT ventures is still focused on short term specific question based studies instead of ensuring the lack of long term whole of ecosystem information is reversed.	MRT
MRT operator	The value of MRT in both revenue and operational advantages has not been recognised by key sectors of the marine tourism industry.	MRT
MRT operator	Many marine tour operators state that they support marine research, but this is a misrepresentation, there is an absence of a real research program with real research outcomes.	Marine research
Marine manager	Research type can be full research (needs permit) or limited research (no permit needed) as demonstrated by GBRMPA guidelines in this area, Some limited research may well be for private purposes (i.e. not shared with research agency or published), and hence government does not need to provide research permit. In fact, it is conceivable, that some limited research tour operations may not have an emphasis on research output but rather concentrate on satisfying the tourist"s needs.	Marine research

Appendix 29. Key stakeholder views (n=87) from research step's one and two that considered to new, important and/or potentially contestable

Table 29-1: Stakeholder views (n=4) that are classified as local community involvement and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
When possible, it is important that marine research tourism in Australia actively engage with indigenous Australians in the development of Indigenous focused marine research tourism businesses	Conservation organisation	Community involvement	Proactive involvement of Australian indigenous peoples
When possible, it is important that marine research tourism actively involve indigenous Australians within the direction, development, operation and benefits of Australian marine research tourism.	Conservation organisation	Community involvement	Proactive involvement of Australian indigenous peoples
Marine research tourism across Australia should have widespread and ongoing community involvement.	Marine tour operator	Community involvement	Pro community
Marine research tourism in Australia should aim to link, learn from and support marine research tourism in developed and less developed countries across the World.	MRT operator	Community involvement	Pro MRT Industry

Table 29-2: Stakeholder views (n=3) that are classified as marine conservation concerns and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
It is somewhat surprising that there are not more marine research tourism ventures in Australia's southern temperate waters.	Marine researcher	Marine research tourism	Pro MRT Industry
Marine research tourism should always act to promote and create the most environmentally responsible tourism.	MRT operator	Ecotourism	Pro environment
Marine research tourism should not only act to promote environmental sustainability and protection, but should act to promote the empowerment and restoration of nature.	MRT operator	Marine research	Pro environment

Table 29-3: Stakeholder views (n=5) that are classified as education and interpretation and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
It is satisfactory for some marine research tourism ventures to have quality educational outcomes but relatively poor marine research outcomes.	Conservation organisation	Educational tourism	Pro MRT Industry
The marine research program of any marine research tourism venture should always seek to effectively analyse, develop and communicate the resulting knowledge to marine researchers, tourists and other key stakeholders.	MRT operator	Educational tourism	Pro MRT Industry
By adding a marine research narrative to their interpretative program, marine tour operators can enhance the tourist's experience and add to the tourist attraction.	MRT operator	Educational tourism	Quality tourist experience
All marine research tourism operators should reach a high level of competence in the interpretation of the marine research.	MRT operator	Educational tourism	Role of MRT staff
Marine research is a long term endeavour that is frequently set within a broad scientific context and this context needs to be carefully interpreted to tourists.	MRT operator	Scientific tourism	Marine research

Table 29-4: Stakeholder views (n=7) that are classified as marine research quality and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
For a marine research tourism venture, there needs to be a method to capture, assess and use the tourists' own thoughts on future research directions and what they believe the key issues are for conservation.	Conservation organisation	Scientific tourism	Quality marine research
In most cases (except with highly trained tourists and marine tour operators), marine researchers are essential for coordinating and quality assuring the research, monitoring and survey activity	Marine manager	Marine research	Pro MRT Industry
On a marine research tourism venture, the marine researcher should always be formally responsible for the quality and use of the marine research.	Marine manager	Marine research	Pro MRT Industry
All marine research tourism ventures need to have clear, honest and achievable scientific goals.	Marine researcher	Scientific tourism	Marine research
The marine research on marine research tourism ventures should fit the following criteria: the data is acquired in an ethical manner, the data can be relied upon, the data is actually needed, the data is used, there is (or is credibly likely to be) a useful result, and when possible, the results should be shared and published.	MRT operator	Marine research	Marine research
If done properly, marine research tourism can provide a cost effective option for marine research institutions to conduct effective marine research.	MRT operator	Marine research	Pro MRT Industry
Until research from marine research tourism reliably meets the above conditions, many so-called marine research tourism ventures will continue to be nothing more than glorified holiday packages jumping on the “eco” bandwagon, conning their customers and devaluing the efforts of genuine marine research tourism ventures.	MRT operator	Marine research	Quality marine research

Table 29-5: Stakeholder views (n=6) that are classified as marine researcher involvement and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
Due to government funding constraints, one can assume that suitable financial or human resources for marine research tourism will not be available from existing marine research and management agencies.	Marine manager	Marine research	Pro MRT Industry
Hence, in many cases, resources for employment of extra marine researchers on marine research tourism ventures will need to come from the private market.	Marine manager	Marine research	Pro MRT Industry
When appropriate, to expand marine research tourism in Australia, there should be contractual agreements between key stakeholders that that outlines the roles and commitments of key stakeholders.	MRT operator	Marine research tourism	Pro MRT Industry
The willingness of many marine researchers to participate in marine research tourism will be dependent on their recognition and acceptance of the benefits of marine research tourism.	MRT operator	Marine research	Close relationship with marine research organisations
Hence, the development of marine research tourism in Australia will be limited by the availability of willing and skilled marine researchers.	MRT operator	Marine research	Pro MRT Industry
Willing, skilled and available marine researchers can be considered as among the rarest essential commodities for marine research tourism.	MRT operator	Scientific tourism	Role of MRT staff

Table 29-6: Stakeholder views (n=5) that are classified MRT attraction and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
When appropriate, marine research tourism should have strong supporting links with non government conservation organisations such as the Australian Marine Conservation Society and the World Wildlife Fund.	MRT operator	Conservation	Quality tourist experience
This combination of media and marine research tourism can act to assist in changing public awareness and increasing the public's interest in marine research, conservation and management.	MRT operator	Ecotourism	Role of documentaries and other media
This in turn can act to affect government policy and action with regard to marine research, conservation and management.	MRT operator	Marine research tourism	Role of documentaries and other media
As part of marine research tourism, marine researchers and the marine research environment are central parts of the tourist attraction.	MRT operator	Scientific tourism	Pro MRT Industry
Given appropriate crew, marine research tourism ventures should promote their crew as respected and renowned professionals in marine research.	MRT operator	Scientific tourism	Role of MRT staff

Table 29-7: Stakeholder views (n=5) that are classified as MRT attraction - marine research station and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
Due to ongoing funding shortages, many remote marine research stations could financially benefit from appropriate involvement of marine research tourism.	MRT operator	Marine research	Growth
Without interference in their marine research program, marine research stations could provide an authentic marine research backdrop for marine research tourism ventures to operate near.	MRT operator	Marine research	Growth
Without interference in their marine research program, marine research stations could be involved in the logistical support for marine research tourism.	MRT operator	Marine research	Growth
Without interference in their marine research program, some marine research stations could become suitable marine research tourism destinations.	MRT operator	Marine research	Growth
The marine research activity that occurs at many marine research facilities can be of great interest to general members of the public including tourists.	MRT operator	Scientific tourism	Growth

Table 29-8: Stakeholder views (n=5) that are classified as the role of the marine researcher in MRT and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
A marine research tourism venture must be strongly supported by the researcher‟shost organisations in terms of logistics and requirements for occupational health, safety and environment.	Marine educator	Marine research	Pro MRT Industry
In the future, a marine research tourism venture should add to the prestige and scientific reputation of the project among scientific peers of the researcher.	Marine researcher	Marine research	Pro MRT Industry
Conservation and marine discovery media (e.g. documentaries, news articles, holiday TV) is part of a process that drives demand in marine ecotourism including marine research tourism.	Marine tour operator	Ecotourism	Role of documentaries and other media
For commercial reasons, some marine research tourism ventures may choose to have an emphasis on satisfying the needs of tourist rather than an emphasis on research outcomes.	MRT operator	Marine research tourism	Quality tourist experience
A marine research tourism venture should be seen by marine research and management organisations as a highly desirable, reliable and cost-effective aspect of research operation.	MRT operator	Marine research	Pro MRT Industry

Table 29-9: Stakeholder views (n=8) that are classified as the MRT tourist and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
Where possible, marine research tourism in Australia should seek to „open the doors" to the lay person and always make them feel welcome.	Conservation organisation	Scientific tourism	Quality tourist experience
Hence, marine researchers should recognise this important role of tourists by always treating them in a professional manner, communicating effectively and frequently, providing quality information about the marine research project, and thanking them for their contributions.	Marine manager	Marine research	Quality tourist experience
When on marine research tourism ventures, marine researchers should seek to recognise that it is a privilege to have people pay to be involved with them and to support their research.	Marine manager	Marine research	Business approach
Without a clear link to a conservation goal, many marine biological studies will not appeal to tourists.	Marine researcher	Conservation	Quality tourist experience
The 'I always wanted to be a marine biologist' dream of many people is an important driver for marine research tourism. Marine research tourism should tap into that market.	Marine researcher	Scientific tourism	Business approach
A marine research tourism experience can give the a tourist a „religious" experience and an emotional connection to the marine environment, that leads to greatly enhanced and long term environmental awareness, conservation values, conservation action and stewardship.	MRT operator	Marine research tourism	Change tourist's outlook
In many cases, marine research is too complicated for the general public. To counter this, it is recommended that marine research tourism ventures undertake more popular and discovery - orientated marine research programs.	MRT operator	Scientific tourism	Pro MRT Industry
Unless volunteers are needed, marine research that can be undertaken on marine research tourism ventures could also be done on normal marine tour ventures, by scientists and crew, and without the active involvement of tourists.	MRT operator	Volunteer tourism	Pro MRT Industry

Table 29-10: Stakeholder views (n=2) that are classified as a MRT guide role and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
A marine research tourism guide's formal career path could progress to a marine tour operator, marine manager, marine researcher or similar role. A marine research tourism guide role is envisioned to be a paid role that ensures that the many needs of marine researchers, managers, tour operators and tourists are met.	Conservation organisation	Marine research tourism	Role of MRT staff
A marine research tourism guide could be a formalised role within an organised Australian marine research tourism industry. A marine research tourism guide role is envisioned to be a paid role that ensures that the many needs of marine researchers, managers, tour operators and tourists are met.	MRT operator	Marine research tourism	Business approach

Table 29-11: Stakeholder views (n=12) that are classified as proposed business aspirations and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that they have advanced NEAP Eco Certification (i.e. advanced ecotourism accreditation).	Conservation organisation	Ecotourism	Pro MRT Industry
To develop marine research tourism in Australia, the first step is to convince the marine research community that; the involvement of research tourists is a good thing, that it is valuable in terms of data, that it won"t sap their time and financial resources, and that most importantly it won"t devalue their research and their sources of funding.	Conservation organisation	Marine research	Quality marine research
To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that they are a best practice, ecologically sustainable tourism venture.	Marine manager	Ecotourism	Pro environment
To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that their research knowledge will be shared with the tourist and marine research community.	Marine manager	Marine research	Marine research
To get permitted research access to government restricted research areas, a marine research tourism venture would need to demonstrate that their marine research is high quality.	Marine manager	Scientific tourism	Marine research
To expand marine research tourism in Australia, there would need to be a peer review system by the scientific community, of the research undertaken, the data collected, occupational health and safety, and education standards.	Marine researcher	Marine research	Marine research
These days, many prospective marine research tourists have Discovery Channel expectations. To satisfy these tourists, they should receive an experience that satisfies those expectations.	Marine tour operator	Scientific tourism	Business approach
A possible marine research tourism venture with great potential is a complete terrestrial to marine tourism research package, where people get to see an overall picture of the links between the sea and land, and how the two are intertwined.	MRT operator	Ecotourism	Business approach
To expand marine research tourism in Australia, there should be a memorandum of understanding of roles and commitments between key stakeholders.	MRT operator	Marine research tourism	Business approach
Where possible, marine research tourism vessels should at least provide free space for marine researchers.	MRT operator	Marine research tourism	Business approach
The Undersea Explorer is often recognised as a good business model for marine research tourism. Is it reasonably to enquire why similar ventures have not been developed elsewhere, and also, how can similar ventures be developed elsewhere?	MRT operator	Marine research tourism	Pro MRT Industry
To expand marine research tourism in Australia and ensure desired quality, there would need to be a rigorous tender process that only grants operational licenses to quality assured marine research tourism operations.	MRT operator	Marine research tourism	Pro MRT Industry

Table 29-12: Stakeholder views (n=5) that are classified as good business principles and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
The marine tour operator should be empowered so they are capable to undertake the high quality marine research support, interpretation and hospitality tasks that are required for a marine research tourism venture.	MRT operator	Marine research tourism	Growth
There is a need to professionalise the marine research tourism industry in terms of staff, industry guidelines and services to tourists.	MRT operator	Marine research tourism	Business approach
There is a need to professionalise the marine research tourism industry in terms of industry guidelines and services to marine researchers and managers.	MRT operator	Marine research	Business approach
One important criterion for a stable marine research tourism venture is a long term government permit for access to and research in marine research areas.	MRT operator	Scientific tourism	Business approach
Any notable development of marine research tourism in Australia should be based on sound assessments of market/consumer demand. This would include assessments of affordability and perceived value for money.	Tourism destination manager	General tourism	Business approach

Table 29-13: Stakeholder views (n=6) that are classified as support infrastructure and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
In appropriate situations, marine research tourism ventures should act to promote philanthropic donations from travellers and organisations.	Marine educator	Marine research tourism	Business approach
The long term development of marine research tourism in Australia should involve a broad network of marine research tourism ventures, marine discovery centres, community groups, volunteer groups, SCUBA groups, conservation agencies, marine research, and management agencies.	Marine researcher	Marine research tourism	Pro community
Marine educators and marine education societies can play an important role in the provision of organisational and information services to marine research tourism in Australia.	MRT operator	Educational tourism	Growth
In the future, universities can play a major role in supporting, operating and benefiting from marine research tourism in Australia.	MRT operator	Marine research tourism	Growth
Many marine and coastal volunteer programs can be an important part of marine research tourism infrastructure and services in Australia.	MRT operator	Marine research tourism	Business approach
Marine research tourism should seek to develop a marine research tourism trail across Australia. This trail could consist of an organised network of different marine research tourism ventures and attractions across Australia.	MRT operator	Marine research tourism	Pro environment

Table 29-14: Stakeholder views (n=5) that are classified as MRT broker and/or trail and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
Any development of such a trail would act to develop, link and co-promote a network of marine research tourism attractions across Australia.	Marine educator	Marine research tourism	Growth
Given Australia's sizable coastal and ocean territory, and relatively well developed marine research and tourism sectors; it is somewhat surprising that marine research tourism industry is not well developed in Australia.	Marine educator	Marine research tourism	Growth
Such a trail would be closely linked with Australian museums, zoos, aquaria, marine discovery centres, marine volunteer networks, marine research and management agencies, and the SCUBA industry.	Marine manager	Marine research tourism	Pro MRT Industry
Development of such a trail could be facilitated by a national organisation (comprised of representatives from Federal, State and Local organisations) that supports a number of marine research tourism broker organisations, which in turn support individual marine research tourism business.	Marine tour operator	Marine research tourism	Pro MRT Industry
It has been suggested by key stakeholders that to notably develop marine research tourism across Australia, there is an opportunity for a number of collaborating yet competing marine research tourism broker roles across Australia. Such broker roles would act to support the interests of all key stakeholders by undertaking tasks such as the identification and development of marine research tourism, and facilitate permits, certification and training.	Marine tour operator	Marine research tourism	Pro MRT Industry

Table 29-15: Stakeholder views (n=8) that are classified as key stakeholder concerns and used in study two, survey two (Source: survey and interviews of key stakeholders)

Survey or interview statement	Key stakeholder group	Key MRT element	Agenda for change
Australia marine research tourism needs to protect its reputation. If marine research tourists go home and say the diving was OK, the food and the company were OK, but they were 'spare wheels' as far as the project was concerned, neither they nor their friends will be back for a repeat experience. They will just go diving instead or join a marine conservation project where they can make a real contribution.	Marine manager	Marine research tourism	Quality tourist experience
The diversion of Government funds from pure research to research tourism will divide the academic and the tourism industry and this will reduce the possibility of collaboration between marine researchers and marine research tourism industry.	Marine researcher	Marine research	Close relationship with marine research organisations
A potential major barrier to developing marine research tourism in Australia is lower cost marine research tourism opportunities for tourists in other regions of the world.	MRT operator	General tourism	Pro MRT Industry
If marine research tourism is not officially considered as important by marine research and/or management agencies, then the advancement of marine research tourism is limited.	MRT operator	Marine research	Pro MRT Industry
So that marine research tourism can assist marine management agencies, those agencies should become clearer about their research questions and what data needs collecting.	MRT operator	Marine research	Marine research
A limiting factor for marine research tourism is the culture and psychology of key stakeholders such as marine managers, marine researchers and marine tour operators.	MRT operator	Marine research	Business approach
Supporting marine research tourism should become a mandated project area for government marine research and management programs.	MRT operator	Marine research	Pro MRT Industry
Australian government marine management and research organisations often act to hinder rather than help the marine research tourism industry	MRT operator	Marine research	Pro MRT Industry
Often the above hindrance by Australian government marine management and research organisations is due to an institutional prejudice against marine research tourism.	MRT operator	Marine research	Pro MRT Industry

Appendix 30. Open text statements from the research step three survey

Table 30-1: Open text statements from research step three

Open text survey comment from research step three
Topic 1. Marine environment
These are both motherhood statements. **(Marine researcher).** Even though I have said I agree to the first statement, the word always is a dangerous word and may rule out a type of valid research. (Marine research tour operator). A tourism activity should not place too much long-term responsibility on the individual (i.e. it is rather a short term experience, with perhaps longer-term reward) **(Marine manager)**. 'Empowerment of nature'? Sorry but so many 'hippy' sounding phrases in this survey so far, especially in the mission statements. Where does all this come from? Questions and angle of investigation did seem more business focused before, now appearing that marine research tourism and hugging trees is going hand in hand. Don't mean to come off like a grump but that's my honest feedback so far. **(Marine research tour operator)**.
Topic 2. Community involvement
Re: # - this would vary on a locally specific basis **(Postgraduate marine research student)**. Re: I take this to mean that IF a tourism operator is setting up a program based around indigenous issues, THEN indigenous people should be deeply involved. I DON'T take it to mean that tourism operators should necessarily set about targeting development of such programs **(Marine researcher)**. Although desirable, I think the chances of successfully involving indigenous persons in long term tourism research or tourism research businesses is very unlikely and I would hate to see resources wasted in this area (**Marine research tour operator**). When possible and applicable only. There is lots of marine research tourism that has nothing to do with Indigenous people. An example is water quality sampling, shark research off osprey reef, deep sea mount research, nautilus, and coral bleaching **(Marine research tour operator)**. Community involvement is too broad and generally has other groups/activities. These could be linked to marine tourism but not necessarily be part of it. Indigenous involvement needs careful consideration as to what are the objectives? **(Marine manager)**.

Table 30-2: Open text statements from research step three

Open text survey comment from research step three
Topic 3. Education and interpretation
Re: # - this scenario (i.e. poor research outcomes but high educational outcomes) would suggest a lack of scientific merit **(Postgraduate marine research student)**. There's no point promoting marine research tourism if you are not aiming for rigorous scientific outcomes and useful data, otherwise the tourist may as well just go to an 'eco tourism' place and just 'enjoy nature' without really learning anything about it **(Marine educator)**. Re: Some 'research' that could be conducted by MRTVs may not be of sufficient quality to disseminate widely. This does not necessarily undermine its educational value. Who are the 'marine research tourism operators'? They are usually companies. Presumably they should employ people who already have (not 'reach') a high level of relevant competence. You don't develop this skill by working in the tourism industry in my opinion **(Marine researcher)**. Never OK to end up with poor research outcomes. OK to simplify the project and end up with quality, simple data. Crap is always crap and not useful to anyone and certainly can never at the same time generate quality educational outcomes **(Environmental conservation organisation)**. Translation and interpretation of complex scientific information is a specialist field. The need to involve science communicators should be considered. It is important to provide summary and higher level outcomes back to the individuals in a form they can readily understand. Some sense of 'fruits of their labour' is a positive reinforcement to the experience **(Marine manager)**. Although it is possible to have poor marine research outcomes, it should not be considered satisfactory and the research should be redefined for better results (**Marine researcher**).
Topic 4. Research quality
Consistency in data collection would need to be addressed if different marine research tourism operators are participating in the same/similar marine research **(Marine educator)**. Research done for 'education' can be valuable but not necessarily scientifically useful or publishable. Re: Operators just need to be honest about the value and purpose of their research activities **(Marine researcher)**. Costs of MRT could in fact be more than using graduate students and less effective. Depends on the question. Science is not democratic or community driven -- You need a question and methods to answer the question. Feedback on participant's involvement to enrich that process is fine not science lead by consensus. **(Environmental conservation organisation)**. The principle that the data can be relied upon may be beyond the scope of the derived data. The researcher has responsibility for the quality of the data. I do not know which companies this is talking about **(Marine research tour operator)**. Tourism research activities need to be planned and strategised as part of the broader marine research planning (i.e. not done in isolation) and undergo prioritisation and guidance as to 'rigour' aspects etc. Feedback from participants is always useful but should not be mandatory or directive **(Marine manager)**.

Table 30-3: Open text statements from research step three

Open text survey comment from research step three
Topic 5. Stakeholder concerns
Too many statements on this page and lots of contentious statements. Re: - - tourism is a private sector industry. I am not aware that a 'marine research tourism industry' exists in Australia, so how could there be prejudice against it? **(Postgraduate marine research student)**. Re: Honesty with the tourists is important. If they are not led to believe that they will be crucial to the research, they won't be let down when they find that they are not. Re: MRTVs should employ scientists to design their research projects, not expect management agencies to prepare data templates for them. Re: I don't think you can expect across-the-board approval for MRTVs. Links between particular research/management agencies would be valuable to provide credibility for MRTVs. Re: Depends how it is handled. With the current, very low level of research funding available, researchers would not take kindly to having some carved off and applied to an industry that probably appears of pretty marginal relevance to them at present. If the industry develops incrementally and responsibly, it could work in future. Re 9 & 0: Given the difficulties involved in setting up credible MRTVs, I'm not at all surprised by their dearth. Rough sea conditions don't help **(Marine researcher)**. I suspect that tourists only need to feel like they are part of the research, so if it is DONE by grad students etc and interpreted well, most tourists would be just as happy. Lots of the above smack of people who are grumpy for not being taken seriously. I can assure you that if you deliver the goods and solve people's problems, you will be taken serious. But you need to be doing serious stuff to be taken seriously --- not just pointing the finger at people who don't take you seriously **(Environmental conservation organisation)**. What was the design of the project? For example, UE, which is a purposely designed venture where tourists are not directly involved in research as created a perpetually funded research platform, not an Earthwatch experience. UE has a huge return guest rate and has funded millions of $ of research such as water quality, coral bleaching, shark, manta ray, whales, etc Lack of development is often due to management and institutional prejudices. . Yes, but the lack of involvement of the tourist is a missed opportunity to educate and inspire the tourist. Also, please note that normal marine tourism ventures mostly stay of well visited locations and will often not go to locations where important and interesting marine research can take place. It is the demand of interested tourists for a interesting marine research experience in locations away from regularly visited areas that can fund marine research tourism tours and scientists (and documentary makers) to visit less regularly visited marine research **(Marine research tour operator)**. There probably is some 'stigma' about data collected by non-experts. However if data is collected according to credible guidelines and with appropriate oversight it can be extremely useful. Much data these days could also be in the form of photographs and digital images from the field that can be later processed by experts. Traditional marine research and tourism based research should be complementary, not mutually exclusive. **(Marine manager)**. I do not think government funds should be diverted from pure research to marine research tourism. The research tourism should be self-funded or supported from tourism/education sources **(Environmental conservation organisation)**.

Table 30-4: Open text statements from research step three

Open text survey comment from research step three
Topic 6. Marine researcher involvement
Marine researchers do not necessarily need to be employed by the marine research tour operators **(Marine research tour operator)**. It has taken me a long time to conclude that quality science requires strong links to somewhere where there is a critical mass of scientists, such as a Uni. Work in isolated pockets is too hard and at risk of failure **(Environmental conservation organisation)**. Not sure why government monies should be given to the research tourism ventures - they are a profit organisation getting monies from the tourists! **(Environmental conservation organisation)**. Marine researchers need to accept the concept of marine research tourism and its usefulness. This concept needs to also be recognised by their peers. Issues - the length of research project such as a PhD = # of weeks required to collect data. Lack of institutional support (i.e. 'the ivory tower'). Tax incentives, you are assuming that government is the driving the research, but it is directed through institutions with a big interest in protecting their territory. However, unskilled people can pick up equipment such as cameras, data loggers. At the very least, skilled people are needed for collecting observational data **(Marine research tour operator)**. Funding of such activities is complex. All types of support should be encouraged, i.e. philanthropic, industry and government support **(Marine manager)**.
Topic 7. The role of marine research in marine research tourism
Re: question - there is no point promoting a marine research tourism venture as such unless the first priority is rigorous scientific research, with the needs of the tourist secondary. Otherwise, the tourist may as well just go snorkelling on their own! **(Marine educator)**. Re: This idea would be very badly received by researchers. Too much regulation already! **(Marine researcher)**. Marine research and management organizations will likely have different opinions on this. To a researcher's organization, improvement of the research is the key criterion: to a management agency, the engagement with and education of the broader community would be the key criterion, even if it comes at a cost of less useful research data **(Marine researcher)**. Interesting!!! This smacks of 'I am important and everyone else should support me'. I think that MRT must earn its place by working hard and delivering outcomes and then it will get support. We need to be grown up about this **(Environmental conservation organisation)**. This approach may be the way to fund long term access. The research outcomes are dependent on the researcher and periodic cost effective access is still desirable **(Marine research tour operator)**. The cost-effective nature of marine research tourism should be valued by others. **(Marine manager)**.

Table 30-5: Open text statements from research step three

Open text survey comment from research step three
Topic 8: The marine research tourist
Re: quest - it is surprising how much the general public gain from 'real' and complicated marine research. We should never assume we are talking to uneducated idiots - the majority of tourists wanting to participate in this type of tourism activity will be ready for the complexities that come with it - or they will just ask and learn more! **(Marine educator)**. The last statements are patronising in the extreme! (Environmental conservation organisation). Re: It is professional and polite to do these things - essential. Re: Horses for courses. Some complicated things can be done effectively with (usually) small numbers of tourists. A general recommendation to dumb-down all research done by MRTVs is misplaced. Re: Understanding the behaviour of a single marine organism can be fascinating and would appeal to some tourists - but it is not going to save the world. Such topics are Discovery Channel fodder and they get an audience! **(Marine researcher)**. The issue here is that tourism is principally a business of delivering satisfying tourism experiences. This will always be the #1 focus of MRT --- think about it. I think in terms of 'telling stories' when I do anything with people and you need to tell stories that meet expectations and make people feel good. This depends on many factors -- being 'real' and honest is one of the most important **(Environmental conservation organisation)**. Especially if the researcher knows what is expected of them! E.g. an expectation that they are social able (e.g. glass of wine and a discussion with guests) **(Marine research tour operator)**. Appropriate market research should be conducted of tourists to find out what 'experience' they are after **(Marine manager).** Agree, however, lay person should be trained in area of research for valid data. # It is a privilege to have qualified people join your team, it is secondary that they should pay. Research costs money that is understood. **(Marine researcher)**.
Topic 9. The marine research attraction
Re: # -The marine environment is not a zoo. 'Discovery Channel' expectations can be completely unrealistic. **(Postgraduate marine research student)**. Re: It is almost impossible to meet Discovery Channel expectations on a regular basis. Tourists should be made aware of how long doco teams spend getting their footage. Re -: Marine research stations that are under-utilised may benefit from an association with marine research tourism. However, busy research stations could not be involved in logistical support or as destinations for MRT without it interfering with their own work **(Marine researcher**). It is crucial to be clear about why you exist and not get sidetracked into tourism b/c it sounds like a good idea at the time, or research b/c it sounds like a good idea. Tourism is often pushed at the panacea for encomium, social and now scientific issues. There are no silver bullets and I reckon a great risk of net loss by much of the above if people are not very careful **(Environmental conservation organisation)**. Case by case basis situation. Perhaps one or two research stations could have limited visits at specific times, but in general they should remain fit-for-purpose and dedicated to purpose **(Marine manager)**. The conditions and goals of the trip should be explained. And it should be up to the volunteer if they want to participate under those conditions **(Marine researcher)**.

Table 30-6: Open text statements from research step three

Open text survey comment from research step three
Topic 10. The role of the media
Again one must be clear of what you are trying to achieve. If it is larger scale social marketing outcomes you are seeking to achieve, then comparatively small-scale niche experiences with a handful of people is not the best way to go. Most of MRT won't achieve the above **(Environmental conservation organisation)**. Raising awareness always a positive **(Marine manager)**.
Topic 11. Support infrastructure
Re: I don't think that NGOs should or would support the whole industry unless it had an agreed, enforceable code. Re: depends on what the donations are for **(Marine researcher)**. Donations to who???? Successful tourism needs professionals. It's hard enough to get volunteers to fold newspapers well sometimes. Too much is at stake for volunteers to be a key part. I was a founder of MESA -- not sure of the role. Unis need to be involved to ensure quality tourism. I'm sceptical at the value of all these disparate groups working together. I've been involved in similar and there are too many agendas. Again -- what is the primary role of MRT and it must be tourism, tourism and tourism. The marine research is a layer not the cake **(Environmental conservation organisation).** There should be a natural evolution of relationships. That is, the relationship should not be forced and artificial **(Marine research tour operator)**. The more cross-institutional, cross-organisational engagement the better **(Marine manager)**.
Topic 12. A marine research tourism guide role
I believe there should definitely be a push to certify tour guides, especially with regards to their environmental practices **(Marine research tour operator)**.
Topic 13. Good business principles
Re: Like all researchers, MRTVs should have to apply for permits to enter or use any protected areas. The real research benefits should be weighed against the management objectives of the area in the same way as non-tourist research proposals. This would have to include the size of vessels and the number of people involved. Re: Empowered in what way? Re: Surely this is a business decision for individual operators**? (Marine researcher)**. Empowered' -- what does this mean? By whom, what for? **(Environmental conservation organisation)**. These assessments should be done by the marine tour operator and key associates rather than be dependent on assessments by government bureaucrats or economic modeling consultants that do not know about marine research tourism (**Marine research tour operator**).

Table 30-7: Open text statements from research step three

Open text survey comment from research step three
Topic 14. Proposed business aspirations
Re: # - UE is not a good business model as it is not a profitable business. It has always been completely dependent on a philanthropic owner. Re: #: such a peer review system is already in place for existing scientific journals. Why should a new one be developed especially for tourism operators? # and are much the same thing I think (at least according to the definition of ecotourism). (**Postgraduate marine research student**). Re: The research conducted by MRTVs should go through the same review processes as other marine research projects. Setting up a separate review process carried out by scientists will certainly sap their time and other resources (c.f. 0). Re: Maybe, because there are various levels of research involved in tourism ventures. If an operator wants to do something in the name of research that most tourism operators can't, then there must be a very rigorous process. Re 9, 0 and: Using highly protected zones in the GBR is necessary for some research. Some of these zones are incompatible with large vessels and large numbers of people. It is very important that there is strong regulation of all activities in those zones and that research done there is high quality and is intended for publication in the public domain. (**Marine researcher**). I'm a bit wary of accreditation empires. Don't have a solution though. The above talks about 'stakeholders' not sure that there are routine stakeholders but that they will vary from situation to situation. In most cases too, I suspect that existing research and tourism permit arrangements will cover almost everything. And indeed, there will be lots of situations where tourism under the guise of research to achieve perks for tourists will not and should not be allowed. Involvement of tourists with research will sometimes not be a good thing. These questions tend to have lots of underlying assumptions about MRT always being good. (**Environmental conservation organisation**). An issue with undersea Explorer is that it does not make a big profit, and the actual level of tourist participation is low - leading in some cases to a unsatisfactory experience if the tourist thought they we going to participate in a lot of the research. (**Environmental conservation organisation**). . Peer review could /may end up being done by people in marine research or management agencies that have a vested interested to not support marine research tourism ventures. This would be bad for the development of marine research tourism. Have too many conditions. An operator needs a proven responsible history of operation, not necessarily eco accreditation which is bullshit these days. (**Marine research tour operator**). Keep it simple. Don't overlay with too much red-tape and complexity. (**Marine manager**). # this depends on the volunteers area of interest. # even operators have costs that they have to meet. (**Marine researcher**).

Table 30-8: Open text statements from research step three

Open text survey comment from research step three
MRT broker
Re: #1 & 5: What is a MRT Broker? Why is there a need for this? Why should these things be their role? **(Postgraduate marine research student)**. Too hard! Better to develop quality niche products where possible and keep it all simple. The last thing we need is another industry group! **(Environmental conservation organisation)** Governance arrangements should be simplified and national **(Marine manager)**. Sounds like a good idea but I haven't thought a lot about it yet **(Environmental conservation organisation)**.
Last comments
Consistency in data collection would need to be addressed if different marine research tourism operators are participating in the same/similar marine research. Partnerships which recognise, trust, and truly work together could be a great asset to the marine research tourism operator **(Marine educator)**. Good luck! **(Postgraduate marine research student)**. I think that there still needs to be a regulatory body independent of the tourism industry (& marine research tourism industry) responsible for licensing and enforcing regulations and therefore government, parks and wildlife and federal DEH may play a different role as a key stakeholder in the move towards marine research tourism as more of an authority ensuring compliance and issuing licences, permits etc (**Postgraduate marine research student)**. I still feel the flavour is very idealistic. Commercial pressures will dominate the viability of tourism research and while there are small percentages of tourists that will pay to be actively involved it will be difficult in the extreme to set up multiple tourism research ventures and have them succeed **(Marine research tour operator)**. We need to take a deep breath and be honest with ourselves that MRT is really marine TOURISM FIRST with some real research added where it makes sense. We have a huge industry that has developed for the Ecotourism industry that yielded lots of fees, policy, etc and very little true ecotourism. Why will this be any different? It's harder and will be worse. It is better to look for smarter models that are also simpler. Starting point is to be honest and clear about the 'role' that operators and MRT actually plays and I would suggest that it is always at least 70%-99% tourism and 1-30% research (off the top of my head). So tourism must be the emphasis. Real research must also be achieved and this is best done with a partnership with a significant partner that has clear questions that can be answered in this manner. I cannot stress the importance of his last point. It is the equivalent of environmental educators who lose sight of their primary role -- that is environmental literacy -- not environ **(Environmental conservation organisation)**. Good luck! **(Marine research tour operator)**. I think that tourism operators do represent 'ships of opportunity' for the Australian marine research effort. We need all the help we can get given the size of our marine jurisdiction and the limited resources (people and funding and research vessels) available. Such a contribution would certainly lift our capability and build capacity for long term data collection (much needed in the face of climate change) and ongoing monitoring programs. Data could also be in terms of many different aspects, e.g. time-based digital imagery, water chemistry or samples, biological sampling, behavioural observations, other observations. If these activities conducted under appropriate guidance and quality assurance and with appropriate training or instruction, then will make excellent contribution to the national marine research effort **(Marine manager).** The industry must be more than financially self supporting; it must be profitable to ensure its future. Marine research tourism should not rely at all on government funding and should be able to contribute towards researchers and research **(Marine research tour operator).**

Appendix 31. 'Not clear' or 'cannot say' survey statements from research step three

There were a number of survey statements that were considered to be not clear by the survey respondent or for various reasons (Table 31-1). Also, there were other survey statements whereby the survey respondent could not comment on that statement (Table 31-2). While the reasons for any non comment weren't measured, it is considered that in many cases, those survey respondents did not consider themselves knowledgeable enough to do so. This was intended purpose of 'cannot say' option within each survey question.

Table 31-1: Stakeholder statements that were not clear to 2 or more survey respondents

Key stakeholder view	**Statement is not clear**
It has been suggested by key stakeholders that to notably develop marine research tourism across Australia, there is an opportunity for a number of collaborating yet competing marine research tourism broker roles across Australia. Such broker roles would act to support the interests of all key stakeholders by undertaking tasks such as the identification and development of marine research tourism, and facilitate permits, certification and training.	4
The marine tour operator should be empowered so they are capable to undertake the high quality marine research support, interpretation and hospitality tasks that are required for a marine research tourism venture.	4
The Undersea Explorer is often recognised as a good business model for marine research tourism. Is it reasonably to enquire why similar ventures have not been developed elsewhere, and also, how can similar ventures be developed elsewhere?	2
Willing, skilled and available marine researchers can be considered as among the rarest essential commodities for marine research tourism.	2
To develop marine research tourism in Australia, the first step is to convince the marine research community that; the involvement of research tourists is a good thing, that it is valuable in terms of data, that it won't sap their time and financial resources, and that most importantly it won't devalue their research and their sources of funding.	2

Table 31-2: Stakeholder statements where 4 or more survey respondents who could not comment on

Key stakeholder view	Cannot say
Australian government marine management and research organisations often act to hinder rather than help the marine research tourism industry.	13
Often the above hindrance by Australian government marine management and research organisations is due to an institutional prejudice against marine research tourism.	13
Due to government funding constraints, one can assume that suitable financial or human resources for marine research tourism will not be available from existing marine research and management agencies.	7
A potential major barrier to developing marine research tourism in Australia is lower cost marine research tourism opportunities for tourists in other regions of the world.	6
A limiting factor for marine research tourism is the culture and psychology of key stakeholders such as marine managers, marine researchers and marine tour operators.	5
The diversion of Government funds from pure research to research tourism will divide the academic and the tourism industry and this will reduce the possibility of collaboration between marine researchers and marine research tourism industry	5
The Undersea Explorer is often recognised as a good business model for marine research tourism. Is it reasonably to enquire why similar ventures have not been developed elsewhere, and also, how can similar ventures be developed elsewhere?	5
It is somewhat surprising that there are not more marine research tourism ventures in Australia's southern temperate waters.	4
The development of marine research tourism in Australia will be limited by the availability of willing and skilled marine researchers.	4
The willingness of many marine researchers to participate in marine research tourism will be dependent on their recognition and acceptance of the benefits of marine research tourism.	4

Appendix 32. Analysis of key stakeholder views (n=232) in terms of contestability and key MRT elements

Key MRT elements - intended MRT benefit statements

Table 32-1: Shared and contestable (significant or somewhat) views (n=20) across 3 tourism-system components, for interview statements that are related to the 3 intended MRT benefits

Tourism-system component	Shared	Somewhat contestable	Significantly contestable	Total	% contestable
Desired product characteristic	17	1	11	29	41%
Tourist characteristic	3	0	1	4	25%
Product constraint	48	5	2	55	13%
Total	**68**	**6**	**14**	**88**	**23%**

Note: Blue cells are relatively high numbers of stakeholder views, orange cells are moderate numbers, and red cells are low numbers

Table 32-2: Percentage of contestable stakeholder views (n=20) about the 3 intended MRT benefit statements across three tourism-system component and 8 key stakeholder groups

Key stakeholder group	Desired product characteristic	Product constraint	Tourist characteristic	Total
MRT operator	3/29 (10%)	7/13 (53%)	0/1 (0%)	10/43 (23%)
Marine researcher	2/7 (28%)	1/2 (50%)	1/1 (100%)	4/10 (40%)
Marine manager	0/6 (0%)	2/6 (33%)	0/1 (0%)	2/13 (15%)
N/A	0/3 (0%)	2/3 (66%)		2/6 (33%)
Conservation organisation	1/3 (33%)	0/3 (0%)	0/1 (0%)	1/7 (14%)
Marine tour operator	1/3 (33%)	0/2 (0%)		1/5 (20%)
Marine educator	0/3 (0%)			0/3 (0%)
Tourism destination manager	0/1 (0%)			0/1 (0%)
Contestable/all (%)	7/55 (12%)	12/29 (41%)	1/4 (25%)	20/88 (22%)

Note: Blue cells are shared views, yellow and orange cells are moderately contestable views, and red cells are contestable views of key stakeholders

Table 32-1: Percentage of contestable stakeholder views (n=20) about the 3 intended MRT benefit statements across three tourism-system component and 14 main MRT topics

Main MRT topic	Desired product characteristic	Product constraint	Tourist characteristic	Total
Key stakeholder concerns		7/14 (50%)		7/14 (50%)
Marine researcher involvement		3/4 (75%)		3/4 (75%)
The role of marine research in MRT	2/13 (15%)	1/3 (33%)		3/16 (18%)
Community involvement	2/7 (28%)			2/7 (28%)
The MRT attraction - Marine research stations	2/4 (50%)			2/4 (50%)
Proposed business aspirations	1/2 (50%)	0/1 (0%)		1/3 (33%)
Research quality	0/17 (0%)	1/3 (33%)		1/20 (5%)
The MRT tourist	0/3 (0%)		1/1 (100%)	1/4 (25%)
Good business principles	0/2 (0%)			0/2 (0%)
Marketing concerns		0/1 (0%)		0/1 (0%)
MRT broker concept		0/1 (0%)		0/1 (0%)
Support infrastructure	0/2 (0%)			0/2 (0%)
The environment	0/5 (0%)	0/2 (0%)		0/7 (0%)
The MRT attraction			0/3 (0%)	0/3 (0%)
Contestable/all (%)	7/55 (12%)	12/29 (41%)	1/4 (25%)	20/88 (22%)

Note: Blue cells indicate shared views, yellow and orange cells are moderately contestable views, and red cells are contestable views of key stakeholders

Table 32-3: Percentage of contestable stakeholder views (n=20) about the 3 intended MRT benefit statements across three tourism-system component and 12 'agenda for change' topics

Agenda for change topic	Desired product characteristic	Product constraint	Tourist characteristic	Total
Pro MRT Industry	2/13 (15%)	6/12 (50%)	0/2 (0%)	8/27 (29%)
Close relationship with marine research organisations	0/5 (0%)	2/4 (50%)		2/9 (22%)
Growth	2/4 (50%)			2/4 (50%)
Marine research	1/5 (20%)	1/1 (100%)		2/6 (33%)
Business approach	0/5 (0%)	1/3 (33%)		1/8 (12%)
Pro community	1/3 (33%)			1/3 (33%)
Proactive involvement of Australian indigenous peoples	1/2 (50%)			1/2 (50%)
Quality marine research	0/11 (0%)	1/2 (50%)		1/13 (7%)
Quality tourist experience	0/2 (0%)		1/2 (50%)	1/4 (25%)
Role of environmental attractions	0/1 (0%)	1/1 (100%)		1/2 (50%)
Marine tour operator		0/1 (0%)		0/1 (0%)
Pro environment	0/4 (0%)	0/5 (0%)		0/9 (0%)
Contestable/all (%)	7/55 (12%)	12/29 (41%)	1/4 (25%)	20/88 (22%)

Note: Blue cells indicate shared views, yellow and orange cells are moderately contestable views, and red cells are contestable views of key stakeholders

Key MRT elements – 10 better known tourism types interview statements

Table 32-4: Shared and contestable (significant or somewhat) views (n=24) across 3 tourism-system components, for the statements about the 10 better known tourism types

Tourism-system component	Shared	Somewhat contestable	Significantly contestable	Total	% contestable
Product constraint	32	1	6	39	18%
Desired product characteristic	72	9	6	87	17%
Tourist characteristic	16	0	2	18	11%
Total	**120**	**10**	**14**	**144**	**17%**

Note: Blue cells are relatively high numbers of stakeholder views, orange cells are moderate numbers, and red cells are low numbers

Table 32-5: Percentage of contestable stakeholder views (n=24) for the 10 tourism types across three tourism-system component and 8 key stakeholder groups

Key stakeholder group	Desired product characteristic	Product constraint	Tourist characteristic	Total
MRT operator	4/36 (11%)	4/24 (16%)	2/14 (14%)	10/74 (13%)
N/A	4/8 (50%)	1/1 (100%)		5/9 (55%)
Conservation organisation	3/8 (37%)	1/1 (100%)		4/9 (44%)
Marine tour operator	3/7 (42%)	0/4 (0%)	0/1 (0%)	3/12 (25%)
Marine educator	1/17 (5%)		0/1 (0%)	1/18 (5%)
Marine researcher	0/5 (0%)	1/6 (16%)	0/2 (0%)	1/13 (7%)
Marine manager	0/2 (0%)	0/3 (0%)		0/5 (0%)
SCUBA diving organisation	0/2 (0%)			0/2 (0%)
Tourism destination manager	0/2 (0%)			0/2 (0%)
Contestable/all (%)	15/87 (17%)	7/39 (17%)	2/18 (11%)	24/144 (16%)

Note: Blue cells are shared views, yellow and orange cells are moderately contestable views, and red cells are contestable views of key stakeholders

Table 32-6: Percentage of contestable stakeholder views (n=24) for the 10 tourism types across three tourism-system component and 16 main MRT topics

Main MRT topic	Desired product characteristic	Product constraint	Tourist characteristic	Total
Proposed business aspirations	7/14 (50%)	1/2 (50%)		8/16 (50%)
MRT broker concept	3/7 (42%)			3/7 (42%)
A MRT guide role	2/7 (28%)	0/1 (0%)		2/8 (25%)
Key stakeholder concerns	0/2 (0%)	2/14 (14%)		2/16 (12%)
Marine researcher involvement		2/3 (66%)		2/3 (66%)
Research quality	2/3 (66%)	0/1 (0%)		2/4 (50%)
The MRT tourist	0/3 (0%)		2/7 (28%)	2/10 (20%)
Education and Interpretation	0/13 (0%)	1/6 (16%)	0/1 (0%)	1/20 (5%)
Support infrastructure	1/11 (9%)			1/11 (9%)
The environment	0/8 (0%)	1/1 (100%)		1/9 (11%)
Good business principles	0/10 (0%)	0/5 (0%)		0/15 (0%)
Marketing concerns		0/3 (0%)		0/3 (0%)
The MRT attraction	0/4 (0%)	0/2 (0%)	0/10 (0%)	0/16 (0%)
The MRT attraction - Marine research stations	0/1 (0%)			0/1 (0%)
The role of marine research in MRT	0/3 (0%)	0/1 (0%)		0/4 (0%)
The role of the media	0/1 (0%)			0/1 (0%)
Contestable/all (%)	15/87 (17%)	7/39 (17%)	2/18 (11%)	24/144 (16%)

Note: Blue cells indicate shared views, yellow and orange cells are moderately contestable views, and red cells are contestable views of key stakeholders

Table 32-7: Percentage of contestable stakeholder views (n=24) for the 10 tourism types across three tourism-system component and 14 'agenda for change' topics

Agenda for change topic	Desired product characteristic	Product constraint	Tourist characteristic	Total
Pro MRT Industry	7/24 (29%)	5/16 (31%)	2/10 (20%)	14/50 (28%)
Business approach	3/18 (16%)	0/4 (0%)	0/1 (0%)	3/23 (13%)
Role of MRT staff	1/5 (20%)	2/2 (100%)	0/2 (0%)	3/9 (33%)
Quality marine research	2/2 (100%)	0/3 (0%)		2/5 (40%)
Growth	1/7 (14%)			1/7 (14%)
Pro environment	1/9 (11%)	0/2 (0%)		1/11 (9%)
Change tourist's outlook	0/3 (0%)		0/2 (0%)	0/5 (0%)
Close relationship with marine research organisations	0/2 (0%)	0/3 (0%)		0/5 (0%)
Ethics	0/1 (0%)			0/1 (0%)
Marine research	0/2 (0%)	0/6 (0%)		0/8 (0%)
Pro community	0/1 (0%)			0/1 (0%)
Quality tourist experience	0/9 (0%)	0/3 (0%)	0/2 (0%)	0/14 (0%)
Role of documentaries and other media	0/3 (0%)			0/3 (0%)
Role of environmental attractions	0/1 (0%)		0/1 (0%)	0/2 (0%)
Contestable/all (%)	15/87 (17%)	7/39 (17%)	2/18 (11%)	24/144 (16%)

Note: Blue cells indicate shared views, yellow and orange cells are moderately contestable views, and red cells are contestable views of key stakeholders

Appendix 33. Research study three survey respondent by country

Table 33-1: Survey respondent by country

Country	No.	Country	No.
Australia	199	Bermuda	1
USA	36	Curacao	1
United Kingdom	8	Democratic Republic of Congo	1
Brazil	4	Fiji Islands	1
Canada	4	Florida	1
Singapore	4	Grand Cayman	1
Aruba	2	Hong Kong	1
China	2	India	1
Costa Rica	2	Indonesia Bali	1
Denmark	2	Jamaica	1
Egypt	2	Jordan	1
Finland	2	Kingdom of Tonga	1
Germany	2	Maldives	1
Greece	2	Monaco	1
Malaysia	2	Norway	1
Mexico	2	Philippines	1
New Zealand	2	Puerto Rico (USA)	1
Not stated	2	Solomon Islands	1
South Africa	2	South Korea	1
Switzerland	2	Spain	1
Taiwan	2	Sweden	1
Thailand	2	Venezuela	1
Argentina	1		

Appendix 34. Factor and correlation analysis of MRT benefits sought by survey respondents - full results

		Factor Group	1								2				3					4				5			6			7		8			9
		Factor name	Marine research training and education								Importance of the marine research				The MRT Product					Higher levels of learning				Self sufficiency			Adventure			Comfort and hospitality		Social interaction			Discovery
		Explained variance (%)	20.8								3.9				9.9					5.6				5.0			4.7			4.4		3.4			3.0
Factor Group	ID	MRT benefit ID	1	2	3	4	5	6	7	8	26	27	28	29	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	30	31	32	34
1	1	Learning from the marine researchers	1.0	0.6	0.5	0.5		0.5	0.4		0.6	0.3	0.4	0.4																					
1	2	A high level of involvement in the marine research program	0.6	1.0	0.6	0.5	0.4	0.5	0.4	0.3	0.4	0.3	0.5	0.4																					0.3
1	3	The high level of marine research training that you can receive	0.5	0.6	1.0	0.6	0.4	0.6	0.4	0.5	0.4		0.4																						
1	4	The high number of training days you can be involved with	0.5	0.5	0.6	1.0	0.5	0.6	0.5	0.5	0.4		0.3							0.3															
1	5	The high level of skill and knowledge needed to participate		0.4	0.4	0.5	1.0	0.4	0.4	0.4																									
1	6	A high level of marine research education you can receive	0.5	0.5	0.6	0.6	0.4	1.0	0.5	0.4	0.4		0.4							0.3															0.3
1	7	The marine research technology or research facility that the tourist can be involved with	0.4	0.4	0.4	0.5	0.4	0.5	1.0	0.4	0.4	0.4		0.4																					
1	8	An opportunity to receive recognised marine research education and training		0.3	0.5	0.5	0.4	0.4	0.4	1.0																0.3									
2	26	The importance of marine research program to the marine research community	0.6	0.4	0.4	0.4		0.4	0.4		1.0	0.4	0.3	0.4																					
2	27	The experience of the marine researchers who are undertaking the research	0.3	0.3					0.4		0.4	1.0		0.6																					
2	28	Your high level of involvement in conservation of marine wildlife or habitat	0.4	0.5	0.4	0.3		0.4			0.3		1.0																						0.4
2	29	The high quality of the marine researchers who are undertaking the research	0.4	0.4					0.4		0.4	0.6		1.0																					
3	9	The destination (e.g. an island, a coral reef, a sailing trip, etc.)													1.0	0.4	0.5	0.4	0.4																
3	10	The opportunity to have fun													0.4	1.0	0.3		0.3																
3	11	The main vessel (e.g. ship or boat) that is used for travel and research (if applicable)													0.5	0.3	1.0	0.4	0.4																
3	12	The marine wildlife that is being researched													0.4		0.4	1.0																	
3	13	The duration of the trip (including any time on a boat)													0.4	0.3	0.4		1.0																
4	14	High levels of learning				0.3		0.3												1.0			0.3												
4	15	Experiencing new things																			1.0		0.4												
4	16	A small size of the tour group																				1.0													
4	17	A high level of interaction on the expedition																		0.3	0.4		1.0												0.6
5	18	A high level of solitude, tranquillity, and closeness																						1.0		0.3									
5	19	Avoiding sun burn, cold exposure and/or sea sickness																							1.0	0.4									
5	20	A high level of self sufficiency needed while on the venture								0.3														0.3	0.4	1.0									0.3
6	21	Max level of adventure																									1.0		0.4						
6	22	There is an offshore boating or sailing experience																										1.0	0.4						
6	23	The opportunity to SCUBA dive																									0.4	0.4	1.0						
7	24	High levels of hospitality																												1.0					
7	25	Basic level of comfort																													1.0				
8	30	A high level of adventure found on the venture																														1.0	0.4		
8	31	A high level of social interaction with others on the venture																														0.4	1.0	0.5	
8	32	A high level of interaction with the local people																		0.6						0.3						0.3	0.5	1.0	
9	34	The opportunity to explore marine phenomena and discover new things		0.3				0.3				0.4																							1.0

Note: Strong Pearson (r) correlation is blue, moderate (r) is yellow, and low (r) is orange. Chonbach Alpha = 0.85

Appendix 35. The preferences of different MRT tourist classes for different MRT benefits -full results

Table 35-1: The preferences of different MRT tourist classes for different MRT benefits -full results – part A

Factor group	Prob.	MRT benefit	Other tourist	Land based ecotourist	SCUBA diver	MRT tourist	%MDBV
1	0.000	The high level of marine research training that you can receive	2.55	2.59	2.80	3.37	27%
1	0.000	A high level of marine research education you can receive	2.53	2.76	2.83	3.24	24%
1	0.000	An opportunity to receive recognised marine research education and training	2.20	2.49	2.54	2.88	23%
1	0.000	The high number of training days you can be involved with	2.35	2.27	2.58	2.91	22%
1	0.000	A high level of involvement in the marine research program	2.76	2.98	3.19	3.37	20%
1	0.004	Learning from the marine researchers	3.11	3.16	3.40	3.45	11%
2	0.000	Your high level of involvement in conservation of marine wildlife or habitat	2.72	3.14	3.10	3.44	24%
3	0.002	The duration of the trip (including any time on a boat)	2.91	3.14	2.71	2.57	19%
4	0.001	High levels of learning	2.50	2.93	2.95	3.12	21%
5	0.001	Avoiding sun burn, cold exposure and/or sea sickness	2.38	2.37	1.79	1.96	20%
6	0.000	The opportunity to SCUBA dive	2.13	2.00	3.26	3.22	42%
6	0.000	Maximum level of adventure	3.26	3.20	3.84	3.89	23%
9	0.003	The opportunity to explore marine phenomena and discover new things	3.16	3.39	3.31	3.66	17%
4	0.010	A high level of interaction on the expedition	2.91	3.27	2.91	3.36	15%
1	0.013	The marine research technology or research facility that you can be involved with	2.44	2.59	2.73	2.88	15%
8	0.021	A high level of interaction with the local people	2.60	2.86	2.45	2.82	13%
2	0.023	The importance of marine research program to the marine research community	2.85	3.00	3.18	3.20	11%
3	0.033	The marine wildlife that is being researched	3.02	3.37	2.95	3.13	14%

Note. Interest levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important.

Table 35-1: The preferences of different MRT tourist classes for different MRT benefits -full results – part B

Factor group	Prob.	MRT benefit	Other tourist	Land based ecotourist	SCUBA diver	MRT tourist	%MDBV
4	0.041	A small size of the tour group	2.84	3.23	3.09	3.29	15%
1	0.049	The high level of skill and knowledge needed to participate	2.22	2.41	2.40	2.60	13%
5	0.057	A high level of solitude, tranquillity, and closeness to nature whilst on the venture	2.59	2.94	2.46	2.71	16%
2	0.058	The high quality of the marine researchers who are undertaking the research	3.07	3.18	3.27	3.38	10%
2	0.068	The experience of the marine researchers who are undertaking the research	3.05	3.06	3.30	3.30	8%
8	0.088	A high level of social interaction with others on the venture	2.60	2.35	2.32	2.38	9%
7	0.113	Basic level of comfort to be satisfied with	2.10	1.88	2.03	1.97	7%
5	0.127	A high level of self sufficiency needed while on the venture	2.31	2.45	2.10	2.30	12%
4	0.138	Experiencing new things	3.63	3.76	3.45	3.63	10%
7	0.152	High levels of hospitality	2.72	2.50	2.79	2.46	11%
3	0.333	The opportunity to have fun	3.13	3.33	3.13	3.06	9%
6	0.345	There is an offshore boating or sailing experience	2.19	2.22	2.11	2.38	9%
8	0.481	A high level of adventure found on the venture	2.58	2.61	2.65	2.78	7%
	0.659	Being with friends, family or partner	2.97	3.05	2.91	2.81	8%
3	0.694	The main vessel (e.g. ship or boat) that is used for travel and research (if applicable)	2.63	2.82	2.65	2.66	6%
3	0.711	The destination (e.g. an island, a coral reef, the southern ocean, a sailing trip, a resort, etc.)	3.05	3.20	3.02	3.10	6%

Note. Interest levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important.

Appendix 36. Different market segments and their preferences for different MRT benefits

Different marine tourist holiday types

Table 36-1: Benefit preference difference between ecotourists and not ecotourists

		No.	180	131	
Factor Group	**Prob.**	**MRT benefit**	**Not ecotourist**	**Ecotourist**	**% MDBV**
2	0.000	High level of involvement in conservation of marine wildlife or habitat	2.9	3.3	11%
1	0.000	The high level of marine research training that you can receive	2.7	3.1	10%
1	0.001	A high level of marine research education you can receive	2.7	3.1	10%
9	0.002	The opportunity to explore marine phenomena and discover new things	3.2	3.6	8%
1	0.002	An opportunity to receive recognised marine research education and training	2.4	2.7	9%
8	0.004	A high level of interaction with the local people	2.5	2.8	7%
4	0.005	High levels of learning	2.1	2.4	6%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-2: Benefit preference difference between educational tourists and not educational tourists

		No.	225	86	
Factor Group	**Prob.**	**MRT benefit**	**Not educational tourist**	**Educational tourist**	**% MDBV**
7	0.000	High levels of hospitality	2.2	1.9	8%
6	0.001	The opportunity to SCUBA dive	2.8	2.3	12%
8	0.002	A high level of social interaction with others on the venture	2.5	2.2	8%
4	0.005	High levels of learning	2.2	2.4	6%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-3: Benefit preference difference between SCUBA diver and not SCUBA divers

Factor Group	Prob.	MRT benefit	SCUBA diver	Not SCUBA diver	% MDBV
6	0.000	Maximum level of adventure	4.8	3.7	26%
6	0.000	The opportunity to SCUBA dive	3.2	2.1	29%
1	0.000	The high level of marine research training that you can receive	3.1	2.6	13%
1	0.000	A high level of involvement in the marine research program	3.3	2.8	11%
1	0.000	The high number of training days you can be involved with	2.7	2.3	11%
2	0.000	Your high level of involvement in conservation of marine wildlife or habitat	3.3	2.9	10%
1	0.000	A high level of marine research education you can receive	3.0	2.6	11%
1	0.001	An opportunity to receive recognised marine research education and training	2.7	2.3	10%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-4: Benefit preference difference between skilled and not skilled MRT tourists (i.e. skilled scientific tourists)

		No.	188	123	
Factor Group	Prob.	MRT benefit	Not skilled MRT tourist	Skilled MRT tourist	% MDBV
5	0.000	Avoiding sun burn, cold exposure and/or sea sickness	2.3	1.8	12%
9	0.000	The opportunity to explore marine phenomena and discover new things	3.2	3.6	10%
6	0.000	Maximum level of adventure	4.1	4.6	11%
1	0.000	The high level of marine research training that you can receive	2.7	3.1	10%
1	0.000	The high number of training days you can be involved with	2.4	2.8	10%
1	0.001	Learning from the marine researchers	3.2	3.5	7%
6	0.001	The opportunity to SCUBA dive	2.5	3.0	11%
1	0.002	A high level of marine research education you can receive	2.7	3.0	9%
1	0.003	An opportunity to receive recognised marine research education and training	2.4	2.7	9%
2	0.003	High level of involvement in conservation of marine wildlife or habitat	3.0	3.3	8%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-5: Benefit preference difference between repeat and not repeat MRT tourists

		No.	221	90	
Factor Group	**Prob.**	**MRT benefits**	**Not repeat MRT tourist**	**Repeat MRT tourist**	**% MDBV**
6	0.000	Maximum level of adventure	4.1	4.7	14%
6	0.001	The opportunity to SCUBA dive	2.6	3.0	12%
2	0.005	The importance of marine research program to the marine research community	3.0	3.3	7%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-6: Benefit preference difference between other marine tourism holiday type

Tourist type	**Factor Group**	**Prob.**	**MRT benefit**	**No**	**Yes**	**% MDBV**
Volunteer tourist	2	0.000	High levels of learning	2.2	2.6	11%
Backpacker	7	0.000	Basic level of comfort to be satisfied with	1.8	1.2	14%
Backpacker	7	0.002	Less levels of hospitality	2.1	1.8	9%
Free and independent	7	0.002	Less levels of hospitality	2.2	1.9	7%
Free and independent	6	0.004	Less opportunity to SCUBA dive	2.8	2.4	10%
Marine wildlife tourist	6	0.000	Maximum level of adventure	4.1	4.6	13%
Marine wildlife tourist	8	0.000	A high level of social interaction with others on the venture	2.6	2.2	9%
Marine wildlife tourist	1	0.009	The high level of marine research training that you can receive	2.7	3.0	7%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Demographic differences

Table 36-7: Benefit preference difference between different gender groups

		No.	152	156	
Factor Group	**Prob.**	**MRT benefit**	**Female**	**Male**	**% MDBV**
5	0.002	Avoiding sun burn, cold exposure and/or sea sickness	2.2	1.9	8%
5	0.006	A high level of solitude, tranquillity, and closeness to nature whilst on the venture	2.8	2.5	9%
6	0.018	Maximum level of adventure	4.1	4.4	8%
5	0.040	A high level of self sufficiency needed while on the venture	2.4	2.1	6%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-8: Benefit preference difference between different age groups

		No.	96	82	74	50	
Factor Group	**Prob.**	**MRT benefit**	**18 - 30**	**31 - 40**	**41 - 50**	**51 - 60**	**% MDBV**
6	0.003	Maximum level of adventure	4.1	4.2	4.3	**4.7**	17%
1	0.007	An opportunity to receive recognised marine research education and training	**2.8**	2.5	2.4	2.2	17%
7	0.002	Basic level of comfort that the tourist will be satisfied with	**1.4**	1.8	1.9	1.8	12%
5	0.001	Avoiding sun burn, cold exposure and/or sea sickness	**1.8**	2.2	2.2	2.3	12%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Key MRT market segment differences

Table 36-9: Benefit preference difference between different levels nature documentary watching per week

		No.	53	177	56	25	
Factor Group	**Prob.**	**MRT benefit**	**Not at all**	**Once or twice**	**3 to 5 times**	**More than 5 times**	**% MDBV**
6	0.002	The opportunity to SCUBA dive	2.5	2.6	3.2	3.0	17%
8	0.006	A high level of adventure found on the venture	2.4	2.6	2.9	2.9	13%
1	0.007	A high level of marine research education you can receive	2.5	2.8	3.2	3.0	16%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-10: Benefit preference difference between different levels of snorkelling experiences

		No.	24	17	59	57	150	
Factor Group	**Prob.**	**MRT benefit**	**None**	**Once**	**2 to 10 times**	**11 to 50 times**	**51 or more times**	**% MDBV**
6	0.000	Maximum level of adventure	2.8	2.9	3.6	4.3	5.0	56%
6	0.000	The opportunity to SCUBA dive	2.0	2.4	2.5	2.4	3.0	26%
5	0.000	Avoiding sun burn, cold exposure and/or sea sickness	2.8	2.7	2.3	2.1	1.9	25%
2	0.003	Your high level of involvement in conservation of marine wildlife or habitat	2.8	2.5	3.1	3.2	3.2	18%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-11: Benefit preference difference between different levels of SCUBA diving experiences

		No.	101	22	23	27	138	
Factor Group	**Prob.**	**MRT benefit**	**None**	**1–10**	**11 – 30**	**31 – 100**	**101 +**	**% MDBV**
6	0.000	Maximum level of adventure	3.4	3.9	4.1	4.5	5.0	40%
6	0.000	The opportunity to SCUBA dive	1.9	2.1	2.5	3.0	3.4	36%
2	0.000	Your high level of involvement in conservation of marine wildlife or habitat	2.8	2.9	3.4	3.0	3.3	17%
1	0.000	A high level of marine research education you can receive	2.6	2.7	3.1	2.5	3.1	14%
5	0.000	Avoiding sun burn, cold exposure and/or sea sickness	2.5	2.1	2.0	1.7	1.9	20%
1	0.001	A high level of involvement in the marine research program	2.8	3.0	3.3	3.0	3.3	13%
2	0.001	The importance of marine research program to the marine research community	2.9	2.5	3.3	2.9	3.2	18%
1	0.003	The high number of training days you can be involved with	2.3	2.4	2.4	2.4	2.8	11%
9	0.006	The opportunity to explore marine phenomena and discover new things	3.2	3.0	3.6	3.3	3.5	16%
1	0.006	The high level of marine research training that you can receive	2.5	2.8	3.1	3.0	3.0	15%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-12: Benefit preference difference between active volunteer membership and not active volunteer membership

		No.	201	110	
Factor Group	**Prob.**	**MRT benefit**	**No**	**Yes**	**% MDBV**
4	0.001	High levels of learning	3.2	3.4	5%
1	0.004	A high level of marine research education you can receive	2.2	1.9	7%
9	0.005	The opportunity to explore marine phenomena and discover new things	3.0	3.2	7%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-13: Benefit preference difference between support of an environmental conservation organisation or not

		No.	122	189	
Factor Group	**Prob.**	**MRT benefit**	**No**	**Yes**	**% MDBV**
6	0.000	Maximum level of adventure	4.0	4.5	0%
2	0.001	Your high level of involvement in conservation of marine wildlife or habitat	2.9	3.2	0%
6	0.002	The opportunity to SCUBA dive	2.5	2.9	0%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Table 36-14: Benefit preference difference for different nationalities (i.e. Australian and elsewhere)

		No.	200	111	
Factor Group	**MRT benefit**	**Prob.**	**Aust**	**International**	**% MDBV**
7	Basic level of comfort to be satisfied with	0.000	1.5	2.0	12%
6	The opportunity to SCUBA dive	0.000	2.5	3.1	14%
1	An opportunity to receive recognised marine research education and training	0.004	2.4	2.7	9%

Note: Importance levels range from 1 to 5. The midpoint is 3.0. A lower value such as 2 (red) indicates somewhat important in a specific MRT product and a higher value such as 4.8 (blue) indicates very important. MANOVA prob. =< 0.005. Factor group numbers are from Tables 6-24 and 6-25 in Chapter 6.

Appendix 37. Benefit preferences for different MRT products – full results

Table 37-1: Notable benefit preferences for survey respondents who were very interested in participating in one or more of the 12 products – full results

No. of survey respondents	162	126	100	135	161	107	116	137	164	136	170	176		
Benefit criteria **Product ID**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Diff**	**Ave**
The opportunity to SCUBA dive	2.8	3.0	2.7	2.9	3.1	2.7	2.8	2.8	2.9	2.9	3.0	3.0	0.4	2.9
There is an offshore boating or sailing experience	2.5	2.4	2.4	2.5	2.4	2.5	2.3	2.3	2.5	2.7	2.4	2.3	0.4	2.4
Avoiding sun burn, cold exposure and/or sea sickness	2.1	2.1	2.1	2.1	2.0	1.9	2.2	2.2	2.0	1.9	2.0	1.9	0.4	2.0
The destination (e.g. an island, a coral reef, the southern ocean, a sailing trip, a resort, etc.)	3.1	2.9	3.0	3.1	3.0	3.0	3.1	3.2	3.1	3.1	3.1	3.1	0.3	3.1
The main vessel (e.g. ship or boat) that is used for travel and research (if applicable)	2.7	2.7	2.6	2.7	2.6	2.5	2.7	2.8	2.6	2.6	2.7	2.7	0.3	2.7
The high number of training days you can be involved with	2.7	2.8	2.7	2.7	2.8	2.7	2.8	2.6	2.6	2.7	2.7	2.7	0.3	2.7
A high level of solitude, tranquillity, and closeness to nature whilst on the venture	2.8	2.7	2.9	2.7	2.6	2.8	2.8	2.7	2.7	2.7	2.6	2.7	0.3	2.7
The high level of marine research training that you can receive	3.0	3.1	3.0	3.1	3.1	3.1	2.9	2.9	3.0	3.0	3.1	3.0	0.2	3.0
The duration of the trip (including any time on a boat)	2.8	2.7	2.9	2.9	2.7	2.7	2.8	2.9	2.8	2.8	2.7	2.7	0.2	2.8
The marine wildlife that is being researched	3.2	3.2	3.2	3.2	3.1	3.0	3.2	3.2	3.2	3.1	3.2	3.2	0.2	3.2
An opportunity to receive recognised marine research education and training	2.7	2.8	2.7	2.8	2.7	2.6	2.7	2.7	2.6	2.6	2.7	2.6	0.2	2.7
A high level of involvement in the marine research program	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.1	3.3	3.2	3.3	3.2	0.2	3.2
A high level of social interaction with others on the venture	2.4	2.5	2.4	2.5	2.5	2.4	2.5	2.6	2.5	2.5	2.5	2.5	0.2	2.5
Your high level of involvement in conservation of marine wildlife or habitat	3.3	3.3	3.3	3.3	3.3	3.1	3.3	3.2	3.3	3.1	3.3	3.3	0.2	3.2
The importance of marine research program to the marine research community	3.2	3.2	3.2	3.2	3.3	3.3	3.2	3.1	3.1	3.1	3.2	3.2	0.2	3.2
The opportunity to have fun	3.2	3.2	3.2	3.3	3.1	3.1	3.2	3.2	3.1	3.2	3.2	3.2	0.2	3.2
The marine research technology or research facility	2.8	2.8	2.8	2.7	2.8	2.8	2.7	2.6	2.7	2.8	2.8	2.8	0.2	2.8
A high level of marine research education you can receive	3.0	3.1	3.1	3.1	3.1	3.0	3.0	2.9	3.0	3.0	3.0	3.0	0.2	3.0
A high level of interaction with the local people	2.8	2.8	2.8	2.8	2.8	2.7	2.8	2.7	2.8	2.7	2.8	2.7	0.2	2.8
The high level of skill and knowledge needed to participate	2.5	2.5	2.6	2.4	2.5	2.4	2.6	2.4	2.4	2.4	2.5	2.5	0.2	2.5
A high level of self sufficiency needed while on the venture	2.4	2.3	2.4	2.4	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.3	0.2	2.3
Learning from the marine researchers	3.4	3.4	3.5	3.4	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.4	0.2	3.4
A high level of adventure found on the venture	2.8	2.8	2.9	2.7	2.8	2.7	2.8	2.7	2.8	2.8	2.8	2.8	0.2	2.8
The experience of the marine researchers who are undertaking the research	3.3	3.2	3.2	3.2	3.2	3.3	3.2	3.1	3.2	3.2	3.2	3.3	0.1	3.2
The high quality of the marine researchers who are undertaking the research	3.3	3.3	3.3	3.2	3.4	3.3	3.3	3.3	3.3	3.2	3.4	3.4	0.1	3.3
The opportunity to explore marine phenomena and discover new things	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5	3.5	3.6	3.5	0.1	3.5

Note: A value of 2 (orange) is somewhat important, 3 are important, and 4 (blue) are very important. The bold values indicate highly notable outcomes.

Table 37-2: Notable benefit preferences for survey respondents who were not interested in participating in one or more of the 12 products – full results – Part A

No. of survey respondent that were not interested in the product	57	91	98	60	52	91	66	79	66	78	44	79		
Benefit criteria	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Diff**	**Ave**
The opportunity to SCUBA dive	2.4	2.4	2.7	2.6	2.1	2.7	2.4	2.5	2.4	2.4	2.0	2.3	0.6	2.4
The high level of marine research training that you can receive	2.6	2.5	2.6	2.6	2.4	2.5	2.8	2.8	2.6	2.6	2.3	2.6	0.5	2.6
The marine research technology or research facility that you can be involved with	2.4	2.5	2.5	2.7	2.4	2.5	2.6	2.7	2.5	2.4	2.2	2.4	0.5	2.5
A high level of involvement in the marine research program	2.8	2.7	2.8	3.0	2.6	2.9	3.0	3.1	2.8	2.8	2.6	2.8	0.5	2.8
Avoiding sun burn, cold exposure and/or sea sickness	2.1	2.2	2.1	2.0	2.4	2.4	2.0	2.0	2.4	2.5	2.3	2.4	0.5	2.2
The destination (e.g. an island, a coral reef, the southern ocean, a sailing trip, a resort, etc.)	3.1	3.4	3.3	3.0	3.1	3.1	3.2	3.1	3.3	3.1	3.2	3.2	0.4	3.2
There is an offshore boating or sailing experience	1.9	2.1	2.1	1.9	2.0	2.1	2.1	2.1	1.8	1.7	2.0	2.0	0.4	2.0
Your high level of involvement in conservation of marine wildlife or habitat	2.8	2.9	.8	3.0	2.6	3.0	2.9	2.9	2.9	3.0	2.6	2.8	0.4	2.8
The high number of training days you can be involved with	2.2	2.2	2.3	2.4	2.1	2.2	2.3	2.5	2.4	2.4	2.1	2.3	0.4	2.3
The high quality of the marine researchers who are undertaking the research	3.1	3.2	3.3	3.2	3.1	3.2	3.3	3.3	3.2	3.1	2.9	3.0	0.4	3.2
Basic level of comfort	2.0	1.9	1.8	1.9	1.9	1.8	1.7	1.6	2.0	1.8	1.8	1.8	0.4	1.8
Experiencing solitude, tranquillity, and closeness to nature	2.1	2.4	2.4	2.3	2.3	2.4	2.5	2.4	2.3	2.2	2.3	2.4	0.4	2.3
High levels of learning	2.0	2.0	2.0	2.1	1.8	2.1	2.2	2.2	2.1	2.1	1.9	2.2	0.4	2.1
A high level of interaction with the local people	2.3	2.4	2.5	2.6	2.5	2.6	2.4	2.7	2.5	2.6	2.6	2.6	0.4	2.5
A high level of solitude, tranquillity, and closeness to nature whilst on the venture	2.4	2.6	2.6	2.6	2.7	2.6	2.6	2.7	2.7	2.5	2.6	2.6	0.4	2.6
An opportunity to receive recognised marine research education and training	2.1	2.2	2.2	2.3	2.2	2.4	2.2	2.3	2.4	2.4	2.0	2.3	0.4	2.3

Note: A value of 2 (orange) is somewhat important, 3 are important, and 4 (blue) are very important. The bold values indicate highly notable outcomes.

Table 37-3: Notable benefit preferences for survey respondents who were not interested in participating in one or more of the 12 products – full results – Part B

No. of survey respondent that were not interested in the product	57	91	98	60	52	91	66	79	66	78	44	79		
Benefit criteria	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Diff**	**Ave**
High levels of hospitality	2.3	2.2	2.2	2.2	2.2	2.2	2.0	2.0	2.1	2.1	2.2	2.0	0.4	2.1
The duration of the trip (including any time on a boat)	2.7	2.9	2.9	2.8	2.9	2.9	2.7	2.8	2.9	2.9	3.0	3.0	0.3	2.9
The importance of marine research program to the marine research community	2.9	2.8	2.9	3.1	2.7	2.9	3.0	3.0	2.9	2.8	2.7	2.8	0.3	2.9
The opportunity to explore marine phenomena and discover new things	3.0	3.2	3.2	3.1	3.0	3.2	3.3	3.3	3.2	3.2	3.0	3.1	0.3	3.1
High levels of adventure	1.9	1.9	2.0	1.9	1.7	2.0	1.9	2.0	1.8	1.9	1.8	1.9	0.3	1.9
Being with friends, family or partner	2.4	2.3	2.4	2.3	2.4	2.3	2.3	2.2	2.3	2.3	2.4	2.5	0.3	2.3
The marine wildlife that is being researched	2.8	3.1	3.1	3.0	2.9	3.1	3.0	3.0	3.1	3.0	3.0	3.0	0.3	3.0
A high level of interaction	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.2	2.3	2.1	2.4	0.3	2.3
Learning from the marine researchers	3.2	3.0	3.2	3.1	3.0	3.1	3.3	3.2	3.0	3.1	3.0	3.1	0.3	3.1
A high level of adventure found on the venture	2.5	2.6	2.6	2.6	2.6	2.6	2.5	2.7	2.5	2.5	2.5	2.5	0.3	2.5
A high level of social interaction with others on the venture	2.4	2.4	2.4	2.4	2.5	2.4	2.3	2.5	2.3	2.4	2.4	2.4	0.3	2.4
The high level of skill and knowledge needed to participate	2.2	2.3	2.2	2.5	2.3	2.3	2.4	2.5	2.3	2.3	2.3	2.3	0.3	2.3
The main vessel (e.g. ship or boat) that is used for travel and research (if applicable)	2.6	2.8	2.8	2.7	2.8	2.8	2.6	2.7	2.8	2.7	2.8	2.7	0.3	2.7
Experiencing new things	2.7	2.7	2.7	2.6	2.8	2.7	2.7	2.7	2.7	2.7	2.8	2.7	0.2	2.7
A high level of marine research education you can receive	2.4	2.5	2.6	2.5	2.4	2.6	2.7	2.7	2.5	2.5	2.5	2.5	0.2	2.5
The experience of the marine researchers who are undertaking the research	3.1	3.2	3.2	3.3	3.1	3.1	3.3	3.3	3.2	3.1	3.1	3.1	0.2	3.2
A small size of the tour group	2.3	2.4	2.3	2.4	2.3	2.4	2.5	2.4	2.3	2.3	2.3	2.4	0.2	2.4
A high level of self sufficiency needed while on the venture	2.2	2.2	2.2	2.2	2.2	2.3	2.2	2.3	2.3	2.2	2.3	2.3	0.2	2.2
Social interaction with others	2.1	2.0	2.1	1.9	2.1	2.1	2.0	2.0	2.0	2.0	1.9	2.1	0.2	2.0
The opportunity to have fun	3.1	3.2	3.1	3.0	3.2	3.2	3.1	3.0	3.2	3.1	3.2	3.1	0.2	3.1
Having fun	2.8	2.7	2.7	2.7	2.7	2.8	2.7	2.7	2.7	2.7	2.7	2.7	0.1	2.7

Note: A value of 2 (orange) is somewhat important, 3 are important, and 4 (blue) are very important. The bold values indicate highly notable outcomes.

Appendix 38. Other market segments and their preferences for twelve MRT products

Age of survey respondents

Table 38-1: Age group of survey respondents and their interest in the 12 products

No. of survey respondents	**95**	**82**	**74**	**50**	
Product name	18-40	31-40	41 – 50	51 – 60	MDBV
3. Volunteer at a penguin rescue centre	2.1	2.2	2.0	1.7	0.49
10. A continuous sailing expedition	2.4	2.1	2.2	1.9	0.49
9. Sail, volunteer and track blue whales	2.6	2.3	2.2	2.1	0.46
2. An Australian whale and dolphin research institute	2.2	2.2	2.1	1.8	0.41
4. Research, education and adventure	2.4	2.3	2.2	2.0	0.40
1. Work with marine turtles and indigenous rangers	2.5	2.3	2.3	2.2	0.30
11. A coral spawning research and adventure trip	2.5	2.4	2.2	2.5	0.28
8. Day trip to the reef	2.3	2.3	2.1	2.0	0.27
5. Survey coral reefs and climate change	2.5	2.4	2.2	2.3	0.23
12. A submersible research expedition	2.5	2.3	2.2	2.2	0.22
7. A bottlenose dolphin education holiday	2.1	2.2	2.2	2.1	0.15
6. Biodiversity and habitat mapping	2.1	2.1	2.1	2.0	0.10
Average	2.34	2.24	2.18	2.07	0.32

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

Outdoors work frequency

Table 38-2: Outdoor work frequency of survey respondents and their interest in the 12 products

No. of survey respondents	**122**	**103**	**83**	
Product name	Not often	Sometimes	A lot	MDBV
12. A submersible research expedition	2.05	2.43	2.54	0.49
2. An Australian whale and dolphin research institute	1.97	2.03	2.40	0.43
10. A continuous sailing expedition	2.03	2.38	2.19	0.35
11. A coral spawning research and adventure trip	2.25	2.43	2.59	0.34
7. A bottlenose dolphin education holiday	2.11	2.04	2.35	0.31
6. Biodiversity and habitat mapping	1.90	2.13	2.17	0.27
9. Sail, volunteer and track blue whales	2.17	2.39	2.43	0.26
1. Work with marine turtles and indigenous rangers	2.24	2.31	2.49	0.26
5. Survey coral reefs and climate change	2.24	2.36	2.49	0.26
8. Day trip to the reef	2.18	2.09	2.30	0.21
3. Volunteer at a penguin rescue centre	1.97	1.93	2.14	0.21
4. Research, education and adventure	2.20	2.22	2.33	0.13
Average	2.11	2.23	2.37	0.29

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

Whale and dolphin watching

Table 38-3: Whale and/or dolphin watching experience of survey respondents and their interest in the 12 products

No. of survey respondents	**95**	**73**	**83**	**16**	**36**	**303**
Product Name	None	Once	2 to 4	5 to 10	> 10	**MBDV**
5. Survey coral reefs and climate change	2.3	2.3	2.3	2.3	2.7	0.42
2. An Australian whale and dolphin research institute	2.0	2.1	2.1	2.2	2.4	0.22
12. A submersible research expedition	2.3	2.1	2.4	2.4	2.4	0.05
7. A bottlenose dolphin education holiday	2.1	2.2	2.1	2.4	2.3	0.23
9. Sail, volunteer and track blue whales	2.2	2.3	2.3	2.5	2.4	0.17
4. Research, education and adventure	2.2	2.3	2.3	2.1	2.3	0.24
11. A coral spawning research and adventure trip	2.3	2.4	2.5	2.4	2.5	0.13
6. Biodiversity and habitat mapping	2.0	2.1	2.0	2.2	2.1	0.20
10. A continuous sailing expedition	2.2	2.1	2.3	2.1	2.2	0.14
8. Day trip to the reef	2.1	2.3	2.1	2.1	2.3	0.15
3. Volunteer at a penguin rescue centre	1.9	2.1	2.1	1.9	2.0	0.13
1. Work with marine turtles and indigenous rangers	2.3	2.3	2.4	2.3	2.3	0.12
Average	2.2	2.2	2.3	2.2	2.3	

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

Education

Table 38-4: Education level of survey respondents and their interest in the 12 products

No. of survey respondents	**21**	**25**	**265**	**311**
Product Name	**Technical college**	**High school**	**University**	**MBDV**
11. A coral spawning research and adventure trip	2.10	2.20	2.45	0.35
10. A continuous sailing expedition	1.90	2.20	2.21	0.30
5. Survey coral reefs and climate change	2.19	2.16	2.38	0.22
2. An Australian whale and dolphin research institute	2.29	2.40	2.07	0.33
12. A submersible research expedition	2.14	2.24	2.33	0.19
7. A bottlenose dolphin education holiday	2.19	2.52	2.12	0.40
8. Day trip to the reef	2.10	2.40	2.17	0.30
3. Volunteer at a penguin rescue centre	1.81	2.08	2.02	0.27
4. Research, education and adventure	1.90	2.32	2.26	0.42
1. Work with marine turtles and indigenous rangers	2.19	2.40	2.34	0.21
6. Biodiversity and habitat mapping	1.86	1.92	2.08	0.22
9. Sail, volunteer and track blue whales	2.29	2.20	2.33	0.13
Average	2.08	2.25	2.23	0.28

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.
Note: Sample size of technical college and high school are too small for statistical analysis

Table 38-5: Marine research related occupation (or not) of survey respondents and their interest in the 12 products

No. of survey respondents	188	123	
Product name	No marine research occupation	marine research occupation	MDBV
1. Work with marine turtles and indigenous rangers	2.28	2.39	0.12
10. A continuous sailing expedition	2.08	2.28	0.19
11. A coral spawning research and adventure trip	2.34	2.46	0.13
12. A submersible research expedition	2.14	2.46	0.33
2. An Australian whale and dolphin research institute	2.10	2.13	0.03
3. Volunteer at a penguin rescue centre	2.02	1.99	0.03
4. Research, education and adventure	2.15	2.32	0.17
5. Survey coral reefs and climate change	2.30	2.39	0.09
6. Biodiversity and habitat mapping	1.99	2.11	0.12
7. A bottlenose dolphin education holiday	2.19	2.13	0.06
8. Day trip to the reef	2.14	2.23	0.09
9. Sail, volunteer and track blue whales	2.21	2.40	0.19
Average	2.16	2.28	0.13

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

Natural sciences background

Table 38-6: Natural science background of survey respondents and their interest in the 12 products

No. of survey respondents	**134**	**175**	
Product Name	**No**	**Yes**	**MBDV**
12. A submersible research expedition	2.10	2.46	0.36
6. Biodiversity and habitat mapping	1.90	2.17	0.26
5. Survey coral reefs and climate change	2.22	2.45	0.24
11. A coral spawning research and adventure trip	2.28	2.50	0.23
10. A continuous sailing expedition	2.07	2.28	0.21
7. A bottlenose dolphin education holiday	2.24	2.10	0.14
1. Work with marine turtles and indigenous rangers	2.27	2.38	0.11
9. Sail, volunteer and track blue whales	2.27	2.35	0.09
8. Day trip to the reef	2.16	2.21	0.05
3. Volunteer at a penguin rescue centre	2.04	1.99	0.05
2. An Australian whale and dolphin research institute	2.13	2.09	0.04
4. Research, education and adventure	2.22	2.26	0.04
Average	2.2	2.3	0.2

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

Conservation organisation support

Table 38-7: Conservation organisation support of survey respondents and their interest in the 12 products

No. of survey respondents	122	189	
Product Name	**No**	**Yes**	**MBDV**
5. Survey coral reefs and climate change	2.16	2.48	0.32
12. A submersible research expedition	2.13	2.43	0.30
11. A coral spawning research and adventure trip	2.24	2.51	0.28
2. An Australian whale and dolphin research institute	1.95	2.22	0.27
1. Work with marine turtles and indigenous rangers	2.19	2.43	0.25
3. Volunteer at a penguin rescue centre	1.91	2.07	0.16
10. A continuous sailing expedition	2.11	2.24	0.13
7. A bottlenose dolphin education holiday	2.09	2.21	0.12
9. Sail, volunteer and track blue whales	2.25	2.36	0.11
6. Biodiversity and habitat mapping	2.00	2.08	0.08
4. Research, education and adventure	2.20	2.27	0.07
8. Day trip to the reef	2.18	2.19	0.01
Average	2.12	2.29	0.17

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

Active volunteer membership

Table 38-8: Active volunteer membership of survey respondents and their interest in the 12 products

No. of survey respondents	201	110	
Product Name	**No**	**Yes**	**MBDV**
11. A coral spawning research and adventure trip	2.32	2.61	0.29
5. Survey coral reefs and climate change	2.27	2.51	0.24
12. A submersible research expedition	2.25	2.45	0.20
3. Volunteer at a penguin rescue centre	1.94	2.13	0.19
9. Sail, volunteer and track blue whales	2.27	2.45	0.19
10. A continuous sailing expedition	2.14	2.30	0.16
2. An Australian whale and dolphin research institute	2.06	2.21	0.15
6. Biodiversity and habitat mapping	1.99	2.12	0.12
7. A bottlenose dolphin education holiday	2.12	2.22	0.10
1. Work with marine turtles and indigenous rangers	2.31	2.38	0.07
8. Day trip to the reef	2.17	2.23	0.06
4. Research, education and adventure	2.23	2.26	0.03
Average	2.2	2.3	0.15

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

Nationality

Table 38-9: Nationality of survey respondents and their interest in the 12 products

No. of survey respondents	200	111	
Product Name	**Australia**	**International**	**MBDV**
11. A coral spawning research and adventure trip	2.3	2.6	0.29
5. Survey coral reefs and climate change	2.3	2.5	0.28
7. A bottlenose dolphin education holiday	2.1	2.3	0.27
2. An Australian whale and dolphin research institute	2.0	2.3	0.23
12. A submersible research expedition	2.2	2.4	0.19
3. Volunteer at a penguin rescue centre	1.9	2.1	0.17
8. Day trip to the reef	2.1	2.3	0.14
1. Work with marine turtles and indigenous rangers	2.3	2.4	0.13
4. Research, education and adventure	2.2	2.3	0.09
10. A continuous sailing expedition	2.2	2.2	0.05
9. Sail, volunteer and track blue whales	2.3	2.3	0.04
6. Biodiversity and habitat mapping	2.1	2.0	0.04
Average	2.2	2.3	0.16

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

Repeat MRT tourist

Table 38-10: Repeat MRT tourist experience of survey respondents and their interest in the 12 products

No. of survey respondents	221	90	
Product Name	**No repeat MRT**	**Repeat MRT**	**MBDV**
5. Survey coral reefs and climate change	2.27	2.56	0.29
12. A submersible research expedition	2.23	2.51	0.28
1. Work with marine turtles and indigenous rangers	2.26	2.52	0.26
2. An Australian whale and dolphin research institute	2.04	2.29	0.25
11. A coral spawning research and adventure trip	2.33	2.58	0.24
9. Sail, volunteer and track blue whales	2.25	2.47	0.21
10. A continuous sailing expedition	2.13	2.33	0.21
7. A bottlenose dolphin education holiday	2.11	2.28	0.16
3. Volunteer at a penguin rescue centre	1.96	2.12	0.16
6. Biodiversity and habitat mapping	2.01	2.16	0.15
4. Research, education and adventure	2.22	2.29	0.07
8. Day trip to the reef	2.18	2.21	0.03
Average	2.17	2.36	0.19

Note: A value of 2 (i.e. orange) is possibly interested and 3 (i.e. darker blue) is very interested in a MRT product.

Appendix 39. Outstanding MRT market segments, benefits, and other MRT criteria for the twelve MRT products

These next twelve tables should be reviewed with the twelve MRT product brochures (Appendix 4) that were created for study three.

Table 39-1: MRT product 1, benefits and market segments (Source: analysis of Study three results)

MRT product 1 - Work with marine turtles and indigenous rangers in remote northern Australia
VERY INTERESTED (n=162 52%)
Benefits sought by those who are very interested in the product
The destination
A high level of solitude, tranquillity, and closeness to nature whilst on the venture
Market segments that are relatively more interested in the product
MRT tourist, SCUBA diver, land based ecotourist, and other tourist classes
Females
One or more snorkel experiences
101 or more SCUBA diving experiences
Marine wildlife tourist
Marine resort tourist
Marine research related occupation
NOT INTERESTED (n= 57, 18%)
Benefits sought by those who are not interested in the product
Basic level of comfort to be satisfied with is higher
Higher levels of hospitality

Table 39-2: MRT product 1, MRT criteria and market segments (Source: analysis of Study one results)

MRT product 1 - Work with marine turtles and indigenous rangers in remote northern Australia
Outstanding product criteria from Chapter four
Low skill pre-requisites
Low relative levels of comfort and hospitality
Volunteer minded
Located in a coastal and inter-tidal zone
Close local association and cultural focus with Australian indigenous people
Small and independent organisation (SIO)
Higher cost per day (USD$312 per day)
Shorter duration (6 days)
Marine turtles are the main attraction
Type of MRT tourist from Chapter four
Backpackers
Volunteers
Paying scientific tourists
Independent travellers
NO SCUBA or snorkelling

Table 39-3: MRT product 2, benefits and market segments (Source: analysis of Study three results)

MRT Product 2 - Volunteer and train at an Australian whale and dolphin research institute
Outstanding market segments and benefits
VERY INTERESTED (n=126, 41%)
Benefits sought by those who are very interested in the product
The opportunity to SCUBA dive
The high number of training days you can be involved with
Market segments that are relatively more interested in the product
MRT tourist and SCUBA diver classes
18 to 30 years
Work outdoors a lot
Repeat MRT tourists
Watch documentaries more than 3 times per week
Active membership of volunteer organisations
Support of an environmental conservation organisation
Females
International
11 or more whale or dolphin watching experiences
One or more snorkel experiences
11 or more SCUBA diving experiences
Backpacker
NOT INTERESTED (n= 91, 29%)
Benefits sought by those who are not interested in the product
The destination

Table 39-4: MRT product 2, MRT criteria and market segments (Source: analysis of Study one results)

MRT Product 2 - Volunteer and train at an Australian whale and dolphin research institute
Outstanding product criteria from chapter 4
Higher level of active involvement in research
Higher skill pre-requisite to participate
Volunteer minded
Closer association with the local community
Higher research significance and quality
Higher quality of tourist's research
Skill or qualifications offered on trip
Higher levels of educational tourism
Longer term conservation contribution
Whales and dolphins as the main attraction
Lower levels of adventure challenge
Relatively less supervision of tourists marine research
Dependency on wildlife migration
Lower cost per day (Estimated 20 $USD)
Longer maximum duration (e.g. 60 days)
Type of MRT tourist from chapter 4
Gap year travellers
Volunteers
Backpackers
Attracts scientists
Independent travellers

Table 39-5: MRT product 3, benefits and market segments (Source: analysis of Study three results)

MRT product 3 - Volunteer at a penguin rescue centre in southern Australia
Outstanding market segments and benefits
VERY INTERESTED (n=100, 32%)
Benefits sought by those who are very interested in the product
A high level of solitude, tranquillity, and closeness to nature whilst on the venture
Market segments that are relatively more interested in the product
MRT tourist class
Females
One or more snorkel experiences
Watch documentaries more than 5 times per week
Adventure tourist
Volunteer tourist
Experienced MRT tourist
Backpacker
Free and independent
NOT INTERESTED (n= 98, 32%)
Benefits sought by those who are not interested in the product
The opportunity to SCUBA dive
The high quality of the marine researcherswho are undertaking the research
The destination

Table 39-6: MRT product 3, MRT criteria and market segments. (Source: analysis of Study one results)

MRT product 3 - Volunteer at a penguin rescue centre in southern Australia
Outstanding product criteria from chapter 4
Longer term conservation contribution
Longer maximum duration (e.g. 42 days)
Less cost per day (e.g. 62 $USD)
Lower activity (Orams, 1999) level (e.g. People watching, sightseeing, sunbathing)
Located in a coastal and inter-tidal zone (Orams, 1999)
Lower levels of active involvement in research
Lower levels of adventure challenge
Lower levels of hospitality for tourist
Lower levels of skilled scientific tourism
Less research significance
Less skill pre-requisite to participate
Relative lower levels of wildlife popularity (e.g. penguins when compared to turtles or whales)
Type of MRT tourist from chapter 4
Backpackers
Gap year travellers
Package tour travellers
Volunteers

Table 39-7: MRT product 4, benefits and market segments (Source: analysis of Study three results)

MRT product 4 - Research, education and adventure across the Whitsundays
Outstanding market segments and benefits
VERY INTERESTED (n=135, 43%)
Benefits sought by those who are very interested in the product
The opportunity to SCUBA dive
The destination
Market segments that are relatively more interested in the product
MRT tourist, SCUBA diver, land based ecotourist, and other tourist classes
Marine research related occupation
18 to 40 years
Watch nature documentaries more than once per week
One or more snorkel experiences
Both SCUBA divers and not SCUBA divers
Marine wildlife tourist
Adventure tourist
Ecotourist
Marine resort tourist
Experienced MRT tourist
Volunteer tourist
Backpacker
Educational tourist
Not free and independent
Snorkellers
NOT INTERESTED (n= 60, 19%)
Benefits sought by those who are not interested in the product
The marine research technology or research facility that you can be involved with
A high level of involvement in the marine research program
High level of involvement in conservation of marine wildlife or habitat

Table 39-8: MRT product 4, MRT criteria and market segments (Source: analysis of Study one results)

MRT product 4 - Research, education and adventure across the Whitsundays
Outstanding product criteria from chapter 4
More skills and/or qualifications offered on trip
Higher quality of tourist's research
Higher level of tourist's active involvement in research
Higher cost per day (e.g. 206 $USD)
Less research significance and quality
Less long term conservation contribution
Lower levels of hospitality
Type of MRT tourist from chapter 4
Gap year travellers
Backpackers
SCUBA divers/snorkel
Volunteers
Package tour travellers
Less skilled scientific tourists

Table 39-9: MRT product 5, benefits and market segments (Source: analysis of Study three results)

MRT product 5 - Survey coral reefs and help assess the impacts of climate change on coral reefs
Outstanding market segments and benefits
VERY INTERESTED (n=161, 52%)
Benefits sought by those who are very interested in the product
The opportunity to SCUBA dive
The high number of training days you can be involved with
The destination
Market segments that are relatively more interested in the product
MRT tourist and SCUBA diver classes
Support of an environmental conservation organisation
Two or more snorkel experiences
One or more SCUBA diving experiences
Marine wildlife tourist
Adventure tourist
Ecotourist
Volunteer tourist
Experienced MRT tourist
Educational tourist
Not free and independent
Backpacker
Marine research related occupation
NOT INTERESTED (n= 52, 17%)
Benefits sought by those who are not interested in the product
A high level of solitude, tranquillity, and closeness to nature whilst on the venture

Table 39-10: MRT product 5, MRT criteria and market segments (Source: analysis of Study one results)

MRT product 5 - Survey coral reefs and help assess the impacts of climate change on coral reefs
Outstanding product criteria from chapter 4
Higher marine research quality
Higher quality of tourist's research
Longer term conservation contribution
Higher level of SCUBA diving
Higher level of educational tourism
Volunteer minded
Higher skill pre-requisite to participate
More skill or qualifications offered on trip
Coral reef and island focus
Type of MRT tourist from chapter 4
Independent travellers
Gap year travellers
Backpackers
Attracts skilled scientific tourists
SCUBA divers and snorkellers
Volunteers

Table 39-11: MRT product 6, benefits and market segments (Source: analysis of Study three results)

MRT product 6 - Biodiversity and habitat mapping in north Western Australia
Outstanding market segments and benefits
VERY INTERESTED (n=107, 34%)
Benefits sought by those who are very interested in the product
A high level of solitude, tranquillity, and closeness to nature whilst on the venture
Market segments that are relatively more interested in the product
MRT tourist class and not the land-based ecotourist group
Watch documentaries more than five times per week
Eleven or more SCUBA diving experiences
Adventure tourist
Volunteer tourist
Backpacker
An opportunity to receive recognised marine research education and training
NOT INTERESTED (n= 91, 29%)
Benefits sought by those who are not interested in the product
The opportunity to SCUBA dive

Table 39-12: MRT product 6, MRT criteria and market segments (Source: analysis of Study one results)

MRT product 6 - Biodiversity and habitat mapping in north Western Australia
Outstanding product criteria from chapter 4
Close local association and cultural focus with Australian indigenous people
Volunteer minded
More skill or qualifications offered on trip
Higher research significance and quality
Higher quality of tourist's research
Longer maximum duration (e.g. 105 days)
Higher level of educational tourism
Higher level of adventure challenge
Higher level of active involvement in research
Lower levels of hospitality and comfort
Located in a coastal and inter-tidal zone (Orams, 1999)
Rugged coastal trip
Type of MRT tourist from chapter 4
Gap year travellers
Backpackers
Attracts skilled scientific tourists
Volunteers
Independent travellers

Table 39-13: MRT product 7, benefits and market segments (Source: analysis of Study three results)

MRT product 8 - A bottlenose dolphin education holiday on the southern Australian coastline
Outstanding market segments and benefits
VERY INTERESTED (n=116, 37%)
Benefits sought by those who are very interested in the product
Avoiding sun burn, cold exposure and/or sea sickness
The destination
The high number of training days you can be involved with
A high level of solitude, tranquillity, and closeness to nature whilst on the venture
Market segments that are relatively more interested in the product
MRT tourist, SCUBA diver, land based ecotourist, and other tourist classes
Age 31 to 50
Outdoors working background
Repeat MRT tourist
Watch documentaries more than three times per week
Active membership of volunteer organisations
Support of an environmental conservation organisation
Female
International
5 or more whale or dolphin watching experiences
No working background in natural science or the environment
None or little (i.e. one) snorkelling experiences
Adventure tourist
Volunteer tourist
Not a marine resort tourist
Ecotourist
Experienced MRT tourist
Backpacker
Educational tourist
Free and independent
NOT INTERESTED (n= 66, 21%)
Benefits sought by those who are not interested in the product
The high level of marine research training that you can receive
A high level of involvement in the marine research program
The high quality of the marine researchers who are undertaking the research

Table 39-14: MRT product 7, MRT criteria and market segments (Source: analysis of Study one results)

MRT product 8 - A bottlenose dolphin education holiday on the southern Australian coastline
Outstanding product criteria from chapter 4
Vacation minded
Higher level of hospitality for tourist
Lower levels of educational tourism
Lower levels of adventure challenge
Lower activity (Orams, 1999) level (e.g. People watching, sightseeing, sunbathing)
Located in a coastal and inter-tidal zone (Orams, 1999)
Less duration (e.g. 4 days)
Less levels of scientific tourism
More dependent on wildlife migration
Less long term conservation benefits
Dolphin focus
Type of MRT tourist from chapter 4
Volunteers
Independent travellers
Attracts older travellers
Attracts families

Table 39-15: MRT product 8, benefits and market segments (Source: analysis of Study three results)

MRT product 8 - Day trip to the reef with some marine research as part of the attraction
Outstanding market segments and benefits
VERY INTERESTED (n=137, 44%)
Benefits sought by those who are very interested in the product
Avoiding sun burn, cold exposure and/or sea sickness
The destination
The main vessel (e.g. ship or boat) that is used for travel and research (if applicable)
Market segments that are relatively more interested in the product
Land based ecotourist, and other tourist classes
Marine research related occupation
Age 18 - 40
Outdoors working background
Repeat MRT tourist
Active membership of volunteer organisations
Support of an environmental conservation organisation
One snorkelling experience
One to thirty SCUBA dives
Adventure tourist
Ecotourist
Volunteer tourist
Experienced MRT tourist
Backpacker
Educational tourist
NOT INTERESTED (n= 79, 25%)
Benefits sought by those who are not interested in the product
A high level of interaction with the local people
A high level of involvement in the marine research program
High levels of learning
The high number of training days you can be involved with
The high level of marine research training that you can receive
The marine research technology or research facility that you can be involved with
The opportunity to SCUBA dive
The high quality of the marine researchers who are undertaking the research

Table 39-16: MRT product 8, MRT criteria and market segments (Source: analysis of Study one results)

MRT product 8 - Day trip to the reef with some marine research as part of the attraction
Outstanding product criteria from chapter 4
Higher levels of SCUBA diving
Higher level of comfort for the tourist
Higher level of active involvement in research
Small and independent organisation (SIO)
Vacation minded
Relatively higher levels of tourist supervision
Less skills or qualification offered on the trip
Less marine research significance and quality
Less long term conservation contribution
Less levels of scientific tourism
Lower levels of educational tourism
Lower levels of adventure challenge
Little close association with the local community and/or cultural exchange
Lower levels of experience level (Orams, 1999) (e.g. Higher social interaction, often crowded, high degree of services and support)
Short duration (i.e. One day)
Type of MRT tourist from chapter 4
Independent travellers
Independent accom
Backpackers
Attracts older travellers
Attracts families
Attracts snorkel only tourists

Table 39-17: MRT product 9, benefits and market segments (Source: analysis of Study three results)

MRT product 9 - Sail, volunteer and track blue whales in the Southern Ocean
Outstanding market segments and benefits
VERY INTERESTED (n=164, 94%)
Benefits sought by those who are very interested in the product
The destination
The opportunity to SCUBA dive
Market segments that are relatively more interested in the product
MRT tourist, SCUBA diver, and land based ecotourist classes
Marine research related occupation
Age 18-40
Outdoors working background
Repeat MRT tourist
Watch nature documentaries more than once per week
Active membership of volunteer organisations
Marine wildlife tourist
Adventure tourist
Not marine resort tourist
Ecotourist
Volunteer tourist
Experienced MRT tourist
NOT INTERESTED (n= 66, 21%)
Benefits sought by those who are not interested in the product
The high number of training days you can be involved with
Higher basic level of comfort to be satisfied with
An opportunity to receive recognised marine research education and training
The destination

Table 39-18: MRT product 9, MRT criteria and market segments ((Source: analysis of Study one results)

MRT product 9 - Sail, volunteer and track blue whales in the Southern Ocean
Outstanding product criteria from chapter 4
Higher levels of research significance
Higher levels of adventure challenge
Small and independent organisation (SIO)
Close interaction with the local community
Liveaboard experience
Higher levels of Orams' (1999) spectrum of marine recreational opportunities such as:
High levels of solitude, tranquillity, closeness to nature, and self sufficiency;
Isolated and un-inhabited coastlines;
Few human structures;
Offshore sailing.
Lower skill pre-requisite to participate
Less skills and/or qualifications offered on the trip
Lower levels of comfort
Lower levels of active involvement in the research
Lower cost per day (Est. 20 $USD)
Focus on blue whales
Type of MRT tourist from chapter 4
Attracts skilled scientific tourists
Attracts older travellers
Independent travellers
Volunteers

Table 39-19: MRT product 10, benefits and market segments (Source: analysis of Study three results)

MRT product 10 - A continuous sailing expedition to explore and help research the oceans of Australia
Outstanding market segments and benefits
VERY INTERESTED (n=136, 44%)
Benefits sought by those who are very interested in the product
There is an offshore boating or sailing experience
The opportunity to SCUBA dive
Market segments that are relatively more interested in the product
MRT tourist class
Marine research related occupation
Age 18 - 30
Sometime work in the outdoors
Repeat MRT tourist
Active membership of volunteer organisations
11 or more SCUBA dives
Marine wildlife tourist
Volunteer tourist
NOT INTERESTED (n= 78, 25%)
Benefits sought by those who are not interested in the product
Avoiding sun burn, cold exposure and/or sea sickness
The high number of training days you can be involved with
An opportunity to receive recognised marine research education and training

Table 39-20: MRT product 10, MRT criteria and market segments (Source: analysis of Study one results)

MRT product 10 - A continuous sailing expedition to explore and help research the oceans of Australia
Outstanding product criteria from chapter 4
Higher skill pre-requisite to participate
Higher levels of SCUBA diving
Higher levels of hospitality and comfort
Higher levels of adventure challenge
Liveaboard experience
Higher levels of Orams' (1999) spectrum of marine recreational opportunities such as:
High levels of solitude, tranquillity, closeness to nature, and self sufficiency;
Isolated and un-inhabited coastlines;
Few human structures;
Offshore sailing.
Lower cost per day (Estimated 40 $USD)
Less skills and/or qualifications offered on the trip
Longer maximum duration (e.g. 70 days)
Continuous sailing expedition
Type of MRT tourist from chapter 4
Attracts skill scientific tourists
Attracts older travellers
Independent travellers
Volunteers
SCUBA divers/snorkel

Table 39-21: MRT product 11, benefits and market segments (Source: analysis of Study three results)

MRT product 11 - A coral spawning research and adventure trip on a tropical coral reef
Outstanding market segments and benefits
VERY INTERESTED (n=176, 57%)
Benefits sought by those who are very interested in the product
The opportunity to SCUBA dive
Market segments that are relatively more interested in the product
MRT tourist and SCUBA diver classes
All ages, especially 18-30 and 51 - 60
Repeat MRT tourists
Watch documentaries more than once per week
Active membership of volunteer organisations
Support of an environmental conservation organisation
Working background in natural science or the environment
One or more whale or dolphin watching experiences
11 or more snorkelling experiences
One or more SCUBA dives
Marine wildlife tourist
Adventure tourist
Marine resort tourist
Snorkellers
NOT INTERESTED (n= 44, 14%)
Benefits sought by those who are not interested in the product
Nil

Table 39-22: MRT product 11, MRT criteria and market segments (Source: analysis of Study one results)

MRT product 11 - A coral spawning research and adventure trip on a tropical coral reef
Outstanding product criteria from chapter 4
Vacation minded
Higher levels of hospitality and comfort
Liveaboard experience
Higher levels of SCUBA diving
Higher skill pre-requisite to participate (i.e. SCUBA skills)
Small and independent organisation (SIO)
Higher levels of Orams' (1999) spectrum of marine recreational opportunities such as:
High levels of solitude, tranquillity, closeness to nature, and self sufficiency;
Isolated and un-inhabited coastlines;
Few human structures;
Offshore sailing.
Less skills and/or qualifications offered on the trip
Less active involvement in the marine research
Less duration (e.g. 9 days)
Lower quality of tourist's marine research
Higher cost per day (USD$333 per day)
Dependent on wildlife migration (e.g. Whales and sharks) and seasonality of coral spawning
Type of MRT tourist from chapter 4
Attracts skilled scientific tourists
Attracts older travellers
Attracts family
Independent travellers
SCUBA divers and snorkellers

Table 39-23: MRT product 12, benefits and market segments (Source: analysis of Study three results)

MRT product 12 - A submersible research expedition to Australia's Bon Hommey undersea ridge
Outstanding market segments and benefits
VERY INTERESTED (n=176, 57%)
Benefits sought by those who are very interested in the product
The opportunity to SCUBA dive
Market segments that are relatively more interested in the product
MRT tourist and SCUBA diver classes
Marine research related occupation
All ages, especially 18-30
Work in the outdoors sometimes or often
Repeat MRT tourists
Watch documentaries more than once per week
Active membership of volunteer organisations
Support of an environmental conservation organisation
Working background in natural science or the environment
Two or more whale or dolphin watching experiences
11 or more snorkelling experiences
11 or more SCUBA dives
Marine wildlife tourist
Marine resort tourist
Backpacker
NOT INTERESTED (n= 79, 25%)
Benefits sought by those who are not interested in the product
High levels of learning

Table 39-24: MRT product twelve, MRT criteria and market segments (Source: analysis of Chapter four results)

MRT product 12 - A submersible research expedition to Australia's Bon Hommey undersea ridge
Outstanding product criteria from chapter 4
Vacation minded
Higher levels of hospitality and comfort
Liveaboard experience
Higher levels of adventure challenge
Higher levels of tourist supervision
Higher levels of research significance
Higher costs per day (e.g. 2,100 $USD)
Higher levels of Orams' (1999) spectrum of marine recreational opportunities such as:
High levels of solitude, tranquillity, closeness to nature, and self sufficiency;
Isolated and un-inhabited coastlines;
Few human structures;
Offshore sailing.
Less active involvement in the marine research
Less long term conservation contribution
Lower quality of tourist's marine research
Submersible expedition
Type of MRT tourist from chapter 4
Attracts family
Attracts older travellers
Independent travellers
Attracts skilled scientific tourists

Appendix 40. Future research opportunities

Based on the relevant academic literature and this thesis's findings, 58 opportunities to study MRT and research tourism are identified. Those opportunities are:

- Found in the academic literature and not addressed in this thesis (Table 40-1) and Table 40-2) ;
- Intended to clarify outcomes from this thesis (Table 40-3);
- Intended to further investigate the supply and demand of MRT in Australia and elsewhere (Table 40-4 and Table 40-5);
- Intended to further the theoretical advancement of MRT (Table 40-6);
- Intended to apply this thesis's outcomes to any growth of MRT in Australia and elsewhere (Table 40-7).

Table 40-1: Future MRT research opportunities (n=15) found in the academic literature and not addressed in this thesis – part A (Source: this thesis)

Research opportunity warrant	Research opportunity	Literature
This thesis's literature review	The literature review identified a major gap in the literature that describes research tourism that is based in USA but operate inside and outside the USA.	Ellis, 2003b
This thesis's literature review	How to manage research tourists and their safety?	Ellis, 2003b
This thesis's literature review	How to better provide the necessary skills and training to tourists?	Ellis, 2003b
This thesis's literature review	How to better deal with logistical factors such as remoteness and weather?	Ellis, 2003b
This thesis's literature review	How to deal with the episodic nature of many research tourism ventures?	Ellis, 2003b
This thesis's literature review	How to improve the commercial viability of research tourism businesses?	Ellis, 2003b
This thesis's literature review	Undertake a detailed investigation into marketing strategies and techniques used by the research tourism industry.	Cousins, 2007
This thesis's literature review	What is the most suitable organisational structure for operating within the research tourism sector?	Ellis, 2003b

Table 40-2: Future MRT research opportunities (n=15) found in the academic literature and not addressed in this thesis - part B (Source: this thesis)

Research opportunity warrant	Research opportunity	Literature
This thesis studied MRT in Australia, but other regional studies of research tourism are recommended.	There are many further opportunities to understand the regional variation of MRT worldwide (e.g. SE Asia, New Zealand, Canada, The Pacific Ocean)	Ellis, 2003b; Cousins, 2007; Whatmore, 2008; Lorimer, 2009
This study did not investigate the role of gap year travellers and backpackers in MRT in any depth.	Hence, specifically study the role of gap year travellers and backpackers in MRT is recommended?	Clifton & Benson, 2006
Weaver (2001) asked why do females and the unattached have such a high disposition to engage in ecotourism research field.	This thesis did not investigate this topic in any detail.	Weaver, 2001
Weaver (2001) asked; do strong biocentric motivations result from high levels of university qualifications and professional occupations, or do those with such attitudes tend to seek education and professional careers.	While this thesis affirmed that females have a high disposition towards MRT as previously identified by Weiler and Richins (1995), This thesis did not investigate this topic in any real depth.	Weaver, 2001
Weaver (2001) asked; what is the potential to recruit other well paid professionals into the research tourism segment.	This thesis did not investigate this topic in any detail.	Weaver, 2001
Cassie and Halpenny (2003) identified the _escape' and _attachment or loyalty to a favourite place' as important motivations in nature based volunteer tourism. This topic is not well described in the relevant research tourism literature (e.g. Coghlan; Campbell & Smith, 2006).	This thesis did not investigate this topic in any detail.	Cassie & Halpenny, 2003
Cousins (2007) recommended a detailed investigation into marketing strategies and techniques used by the research tourism industry.	While this study applied the image of MRT destinations to its tourist preferences study, it did not assess the marketing strategies and techniques used by the research tourism industry at all	Cousins, 2007

Table 40-3: Future research opportunities (n=8) to clarify outcomes from this thesis (Source: this thesis)

Research opportunity warrant	**Research opportunity**
This thesis identified and subsequently proposes that this thesis's identification this non-ecotourism focused MRT tourists (i.e. The SCUBA diver class) is a fairly unique contribution to the body of knowledge about research tourists	Validation (or otherwise) of the presence and investigation of this new class of likely MRT tourist is recommended.
This research found that there appears to be likely relationships between 1) the marine research focus of various MRT products; and 2) the various MRT criteria or tourist types that describe those products.	As these outcomes are based on web site analysis, it is recommended that more field and/or interview related data be collected to further explore the likely relationships between 1) the marine research focus (e.g. wildlife) of various MRT products; and 2) the various MRT criteria or tourist types that describe those products.
Thesis outcomes suggests that certain marine habitats may have a higher appeal to MRT tourists and those habitats may act as a way to focus the interest of potential MRT tourists on the less charismatic species that live within those habitats. This was discussed by Lorimer (2009).	While this is a possibility, it is not clear if this is the case, so further study is recommended on this topic?
Many key stakeholders contested the proposition that _marine research is too complicated for the general public, and to counter this, MRT ventures should undertake more popular and discovery orientated marine research programs'.	It is not clear why different key stakeholder groups contested this statement like they did. To better resolve this answer, it is recommended that this topic be assessed over larger sample of key stakeholders such as 64 key stakeholders from 8 key stakeholder groups.
Many key stakeholders contested the view that _unless volunteers are needed, marine research that can be undertaken on MRT ventures could also be done on normal marine tour ventures, by scientists and crew, and without the active involvement of tourists'.	It is not clear why different key stakeholder groups contested this statement like they did. To resolve this better, it is recommended that this topic be assessed over larger sample of key stakeholders such as 64 key stakeholders from 8 key stakeholder groups.
Outcomes from this thesis indicate that popularity of certain species on MRT products is more likely to be demand driven. This was raised by Ellis (2003b).	To what extent is the popularity of certain species or groups of species within research tourism supply or demand driven?
This thesis identified that the SCUBA diving sector is likely to be a significant player in MRT worldwide, however this role has not be studied in any great detail.	There is an opportunity to study the role of the SCUBA diving sector in MRT worldwide.
Study two findings indicate that some environmental conservation organisations have an interest in contributing and maybe influencing government marine research and management programs through MRT	However, this is speculation only and more study would be needed to verify if this is the case, and what the implications for the future of MRT in Australia may be.

Table 40-4: Future research opportunities (n=17) to investigate the supply and demand of MRT – part A (Source: this thesis)

Research opportunity warrant	Research opportunity
This thesis found that the level of nature documentary watching is driving force behind a traveller‘s interest in MRT. It also found that meeting the ―discovery channel expectations" of the MRT tourist can be a logistical challenge for MRT operators. Hence there is a tension between the demand for discovery channel experience and the supply of those experiences.	Study the role of nature documentaries (i.e. Discovery Channel) in MRT demand and the affect that this demand on how MRT operators meet the expectations and/or otherwise satisfy MRT tourists.
This thesis found that some key supply-side stakeholders view MRT as an experience that regularly delivers a rich tourist experience that _exceeds of the expectations‘ of the tourist.	Test if and further understand how MRT regularly delivers a rich tourist experience that _exceeds of the expectations‘ of the tourist.
This thesis found that some marine researchers and managers may have difficulty with the suggestion that a MRT guide role may play a central role in any marine research on a MRT venture.	Further research is recommended to understand if this is the case and if so, to work out if this is issue for MRT, and subsequently, how such an issues can be addressed?
This study found that snorkelling experiences are a key influence on a potential MRT tourist interest in MRT products.	Further research on the affect that snorkelling has on a consumers interest in MRT.
Study outcomes indicate that there is likely be notable difference between the preferences men and women for different MRT products and associated benefits.	Further research on this topic and other gender related criteria is recommended. Such research could identify unique aspects of different MRT products that appeal to females and/or males and why
This study found that the level of regular outdoor employment that a potential MRT tourist is likely to influence their interest in MRT products.	Further research on the affect that a potential MRT tourist's employment has on their interest in MRT, particularly with a focus on the role of regular outdoors employments.
This study found that the age of a potential MRT tourist is likely to be a key influence on their interest in different MRT products.	Further research on the affect that a potential MRT tourist's age has on their interest in different MRT products.
Study three identified a range of likely MRT product, tourists, and intended benefits such as marine research, conservation, education, and better community involvement.	These outcomes could be applied to obtain better marine research, conservation, community, and educational outcomes from different MRT products. How this would actually be done is a worthwhile topic for future applied research.
Study three identified a range of likely relationships between various MRT products, benefit and tourist relationships.	These outcomes could also be applied to develop effective and appropriate promotional campaigns that better match their marketing images with their research tourists‘ expectations. How this would actually be done is a worthwhile topic for future applied research.
Research outcomes suggest that many marine researchers and managers would also be sceptical about the 1) commercial viability of including a MRT experience in a marine tour; 2) the commercial training potentially MRT tourists; and 3) whether MRT can be used to successfully diversify marine tourism or not.	Why would these views be contested across stakeholder groups and how can they be satisfactorily addressed?
This thesis's literature review	The literature review identified a gap in the literature that describes deep sea focused research tourism that occurs worldwide.
This thesis identified a range of contested views about the supply of MRT in Australia.	These findings may be applicable to the study of other MRT regions such as the Caribbean, South Africa, South East Asia and/or Canada.

Table 40-5: Future research opportunities (n=17) to investigate the supply and demand of MRT – part B (Source: this thesis)

Research opportunity warrant	**Research opportunity**
This thesis reports that SCUBA diving is an important aspect of MRT however it does not explore this topic in any great detail.	Therefore, the study of the role SCUBA diving in MRT worldwide, regionally and locally is a worthy topic for the future study of MRT. This topic was only touched on by Clifton (2003) and Hughes (2008).
Outcomes from this thesis suggest that some or many marine researchers and managers across Australia could see an effective marine research capability from Australian MRT as an unwanted competition for government marine research funding.	Given the potential implications of this issue for Australian MRT, this thesis recommends further study to understand if this is the case, why it is so, and how it might be addressed.
This thesis's literature review	The literature review identified a major gap in the literature that describes land-based research tourism that occurs within Australia.
It is also possible that many marine research students (unlike many professional marine researchers) may be positive about MRT because it may offer them 1) increased access to the marine environment for their field work; and 2) employment in marine research (albeit often episodic).	However this study does not establish this. To assess the interest of marine research students to participate in MRT, further research is recommended. It is suggested that this study compare the views of professional marine researcher.
Study three findings indicate that tourist‘s preference for higher levels of comfort does not affect their preference for 1) marine exploration and discovery; 2) higher conservation outcomes, 3) a smaller expedition group; or 4) the marine wildlife that is being researched.	This thesis contends that this finding is not conclusive and a more in-depth study between comfort and hospitality and MRT factors such as marine research, conservation and educational outcomes is recommended.

Table 40-6: Future research opportunities (n=9) to further the theoretical advancement of MRT (Source: this thesis)

Research opportunity warrant	**Research opportunity**
Research tourism is described as a form of niche tourism (Benson, 2005).	It is quite possible that MRT and research tourism in general can be studied as a niche tourism system with all the inherent properties of a form of niche tourism system such as that one described by Robinson and Novelli (2005)
Many of key MRT elements such as SCUBA diving, ecotourism, wildlife tourism, adventure tourism, and whale watching have been described in terms of recreational specialisation.	Therefore, it is proposed that MRT and research tourism in general be studied with a recreational specialisation framework (Malcolm & Duffus, 2008). Such a study could investigate changes in the density of tourists at a destination and other destination characteristics as the recreational specialisation of different MRT tourists varies.
This study demonstrated that a tourism phenomenon (i.e. MRT) can be measured and modelled using criteria from different MRT elements (e.g. volunteer tourism, marine conservation) and a tourism system approach.	Therefore, it is recommended that other tourism phenomena (e.g. musical festivals or cultural pilgrimages) be studied using such an approach. Benefits of this approach would include 1) new and interesting insights into the phenomena; 2) testing and progressing of well-known tourism type models; 3) possible integration of such typology into a new and innovative typology about that tourism phenomenon; and 4) a supply and demand system analysis that links to well-known tourism models and criteria.
This research developed twelve summary tables (or models) (Appendix 40) that partially explains and may predict the likely preferences of potential MRT tourists for twelve different MRT products, locations and associated activities in Australia.	To test and then refine these models, it is recommended that interviews occur with the owners of MRT companies that operate similar MRT products in Australia and elsewhere.
Study three surveyed just 33 key stakeholder groups from eight key stakeholder groups about the notable stakeholder views. As a result, some of the survey's outcomes are not clear as to what stakeholder groups contest the view and why.	Therefore, while this study's results are a clear indication of contestability across different key stakeholder groups, further testing of those stakeholder views across a larger and more representative sample of supply-side stakeholders is recommended.
Research tourism may be described as a form of special interest tourism whereby the traveller‘s motivation is primarily determined by a special interest in marine research and conservation activities (Based on Weiler, 1992).	Therefore, there is potential for MRT and research tourism in general to be studies with a special tourism system context (e.g. Trauer, 2006; Derrett, 2001).
This thesis derived a range of information that describes different well-known tourism models (Appendix 8) (e.g. A conceptual framework for volunteer tourists (Callanan & Thomas 2005) and The ecotourism spectrum (Weaver & Lawton, 2001)).	It is recommended that many this study's outcomes be applied to test and then advance those conceptual models.
Study one generated empirically based benchmark source of knowledge to understand and further rate MRT product web sites according to different MRT criteria.	There is a research opportunity to further triangulate and then refine this benchmarked table through field measurements of many of the measured criteria.
This thesis empirically derived a range of conceptual, supply and demand related models of MRT.	Use this thesis's conceptual, supply and demand models from chapter seven as a basis for the future study of MRT in Australia and elsewhere.

Table 40-7: Future research opportunities (n=9) to apply this thesis's outcomes to any future growth of MRT in Australia and/or elsewhere (Source: this thesis)

Research opportunity warrant	**Research opportunity**
This thesis indicates that marine research quality, conservation and educational outcomes for MRT worldwide are relatively high but this is based on web site data only. That is, those claimed benefits have not evaluated in any further depth in this thesis.	A widespread field-based and hence more accurate assessment of the marine research, conservation, educational and tourist supervision aspects of many MRT products. Outcomes could be used to further interest marine research and management agencies to be more involved in MRT.
This thesis found that Australian indigenous people are key stakeholder groups that could readily contribute to and benefit from Australian MRT.	The direct collection of the views of Indigenous Australians about the future of and their role in future Australian marine research tourism is a research opportunity for another study.
This thesis found that marine conservation organisations and marine education societies are key stakeholder groups that could readily contribute to and benefit from Australian MRT.	Further investigate the present and potential roles of marine conservation and education organisations in Australian MRT.
Research outcomes found a number of contested suggestions to regulate MRT that are likely to be contestable across key stakeholder groups.	Further research is recommended to understand if this is the case and if so, to work out if this is issue for MRT, and subsequently, how such an issues can be addressed?
This study identified a range of potential MRT activities, issues and related marine research and conservation programs that are likely to be suitable for Australian MRT.	The application of these thesis outcomes to specifically identify where and what types of MRT products are possible across Australia.
As it was outside this study's intended scope, this thesis did not study the practical implications of this thesis's outcomes to Australian MRT policy and practice in any depth.	Hence, it is recommended that this thesis's outcomes be applied to better understand the possible future of Australian MRT. This includes stakeholder involvement in and market demand for that future.
Chapter Four of his thesis found that Australian MRT mainly (79%) consists of smaller MRT organisations.	Investigate why Australian MRT has limited involvement of larger multi-national MRT organisations and consider if their increase participation in Australian MRT should be actively encouraged.
Research outcomes found a number of suggestion to create MRT trail with an associated broker agency (s) that are likely to be contestable across key stakeholder groups.	Further research is recommended to understand if this is the case and if so, to work out if this is issue for MRT, and subsequently, how such issues can be addressed?
This study identified arrange of likely features, relationships, driving forces, issues, constraints, opportunities and benefits.	This information can be readily applied with a scenario planning approach (Boaventura & Fischmann, 2008; Ogilvy & Schwartz, 2004) to derive possible supply and demand models of the future of Australian MRT.

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