Influences of a Wilderness Experience on Individual Health and Wellbeing: A Case Study on Fraser Island

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Abstract

The relationship between people and nature as a positive health intervention has been largely intuitive. Much research regarding environmental sustainability is focused on very specific, local environmental issues, such as energy use, littering, and the re-use of materials with research usually focussed on adverse effects of environmental degradation on human health. Yet in recent times, there have been efforts to broaden our conceptualisation of and relationship to our environment and to nature as a whole. Exposure to particular environments may in fact be beneficial to health. The Biophilia Hypothesis proposed by Edward O. Wilson in 1984 states that humans have an evolutionary biological need to associate themselves with nature as an essential part of human physical and mental wellbeing development.

The main aim of this research was to characterise the influences of a wilderness experience on the individual health and wellbeing of tour guests on Fraser Island. The study utilised a fieldwork survey that involved both quantitative and qualitative methods of inquiry and assessed the wilderness experience of two tour groups on Fraser Island. Guided by a series of specific research questions, a survey instrument was designed to measure some of the constructs identified in the literature. The research produced a large range of results from 216 participants. A range of analyses supported the exploration of some interesting associations.

This exploratory research provides evidence that people gain the most health and wellbeing benefits from their wilderness experience on Fraser Island when they experience social connectedness. The length of the wilderness tour on the island was not associated with differential health and wellbeing outcomes. The physical health status of respondents did correlate with constructs measuring how comfortable and compatible they felt in that environment, which is consistent with the Biophilia Hypothesis. Mental health scores were negatively correlated with the same outcome, which is consistent with the Attention Restoration Theory. It was also found that people who rated highly on the Personal Wellbeing Index felt less negative emotion while on the island and indicated more positive change in their health and wellbeing. From here, it is suggested that further research utilising the types of scales used in the

present study, be combined with substantially more qualitative research in order to gain a deeper understanding of the dimensions of a wilderness experience. Tourist populations, particularly in Australia, and tour groups who stay a longer time in natural settings remain an understudied subpopulation in this regard.

Keywords: wilderness, health, nature, wellbeing, Fraser Island, Biophilia, SF-8, Perceived Restorativeness Scale, PANAS, Personal Wellbeing Index.

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Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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Belinda Warren
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1.0 Introduction

Humans have maintained an affiliation with nature for a long time. They have been compelled to immerse themselves in our natural environments and surround themselves with living plants and animals. Much research regarding environmental sustainability is focused on very specific, local environmental issues, such as energy use, littering, and the re-use of materials (Mayer & Frantz, 2004). Research usually focussed on adverse effects of health. Yet in recent times, there have been efforts to broaden our conceptualisation and relationship to nature. Exposure to particular environments may in fact be beneficial to health.

The unique qualities provided by natural environments have often been defined as those relating to ecological aspects, with a great deal of research occurring on the impact, and loss of, these ecological qualities (Borrie & Birzell, 2000). These findings have elucidated a management response from governing bodies, such as governments, social organisations, and environmental management agencies, who are attempting to address our unsustainable practices (Brown, Grootjans, Ritchie, Townsend, & Verrinder, 2005). However, the loss of experiential quality has been less noticeable and less urgent (Borrie & Birzell, 2000). Few researchers, therefore, have taken the opportunity to define, measure, and monitor the quality of a wilderness experience (Borrie & Birzell, 2000). A wilderness experience is one where visitors can 'enter' the natural landscape and experience the awe and wonder of its surrounding sights. "In essence, the wilderness experience can be characterised as whatever we are experiencing when we feel we are in wilderness" (Stankey & Schreyer, 1987, p. 258). It has only been recently that researchers have acknowledged and expanded their research "to address the values people hold" for natural environments and the "factors that influence those experiences" (Glaspell & Puttkammer, 2001, p. 2). The literature on the relationship between people and nature as a positive health intervention has been largely intuitive (Pretty, Griffin, Sellens, & Pretty, 2003; Thompson, 2001). The potential for certain environments in our societies to enhance our health is substantial, and quite possibly an untapped resource. The role of natural environments in upholding and maintaining human health and wellbeing is essential, yet an often forgotten aspect of healthcare, with many medical healthcare settings neither nurturing nor healing (Irvine & Warber, 2002).

After conducting a thorough review of the literature, Section 2.0 provides a summary of the concepts introduced in this research while identifying the gaps in the research. The significant research problem identified was that there is limited information regarding how the benefits derived from a wilderness experience among tourists are influenced by pre-existing health status, length of stay or the social connectedness among group members.

Fraser Island, which is the largest sand island in the world and holds World Heritage Status, was chosen as the research setting. After considering the existing literature and the above deficit in the current knowledge, the main aim of this research was to characterise the influences of a wilderness experience on the individual health and wellbeing among tour guests on Fraser Island. Within this aim, the influence of the length of tour became the central focus of the research. Together, these aims have driven the direction of this research project. This type of research has not been conducted previously on the island.

The methodology section of this thesis (Section 3.0) includes a discussion of the epistemology and theoretical perspectives of the study and justification and explanation of the chosen methodological techniques. The study utilised a fieldwork survey that involved both quantitative and qualitative methods and assessed the wilderness experience of two tour groups on Fraser Island. The sampling procedures and ethical considerations are presented, along with the methods of data analysis. This section is then followed by the presentation of the results of the analysis. This begins by describing the demographic profile of the sample and the characteristics of the tours. Pre-existing health and wellbeing status are assessed, followed by an analysis of the self-reported influences of a wilderness experience. Results of further analysis of the data to assess the associations between specific variables relating to health outcomes is then presented.

The discussion section (Section 5.0) is then presented, which is used to apply meaning to the results obtained and their application to the Fraser Island context. The final section begins with the recommendations obtained from the study that are applicable to both Fraser Island and other natural settings. A conclusion to the study's findings is made along with an assessment of how this study has achieved its aim of characterising the influences of a wilderness experience among tour guests on Fraser Island.

2.0 Literature Review

"One of the challenges for us mortals is to grasp those things that we know intuitively to be real and vital for our wholeness, but that we cannot see or touch or measure"
(Pan American Health Association, 2001, p. xii).

The intricate facets of our life and our environment can be elusive and difficult to capture, with both beneficial and hazardous exposures all contributing to one's health. The field of research that attempts to determine how beneficial and hazardous exposures influence our bodies both physically and mentally is environmental health, which mostly has expanded our knowledge extensively on a range of human health hazards (Frumkin, 2001; Morris, 2003). Numerous studies have found that smoking causes cancer (Baum, 1999), that air pollution is one of the most serious environmental problems that we are facing in the twenty-first century (Yassi, Kjellstrom, de Kok, & Guidotti, 2001), and that our increasing population is doing irreversible environmental damage (Shearman & Sauer-Thompsom, 1998). As our impact on the planet increases, so does its impact on us, with many environmental exposures documented to be harmful to health. Over the past few decades, it has become clear that there is an abundant quantity of research and discussion of the environmental hazards of one's environment, however the recognition of how the environment can be linked to positive health benefits is only just gaining momentum (Borrie & Birzell, 2000; Brown et al., 2005). Exposure to particular environments may in fact be beneficial to health.

The central themes to be considered and researched here are the ways in which a natural environment can influence the health and wellbeing of individuals (as opposed to households and communities, a more usual focus of health promotion research). In this review of the literature, the biophilia hypothesis will be introduced, followed by a discussion on natural environments and how the constructs of health and wellbeing are utilised in the context of this field of work. As support for the affiliation of humans to nature is gathered, numerous possible benefits to health and wellbeing will be explored. As with any interaction, there are limiting factors that affect the experience that an individual has with nature and how that experience relates to their health. A number of theories and models will then be discussed. Following on from the identification of the

gaps in the research, the research challenges will be identified, along with the possible use and application of the biophila framework of research to the real world (Figure 1).

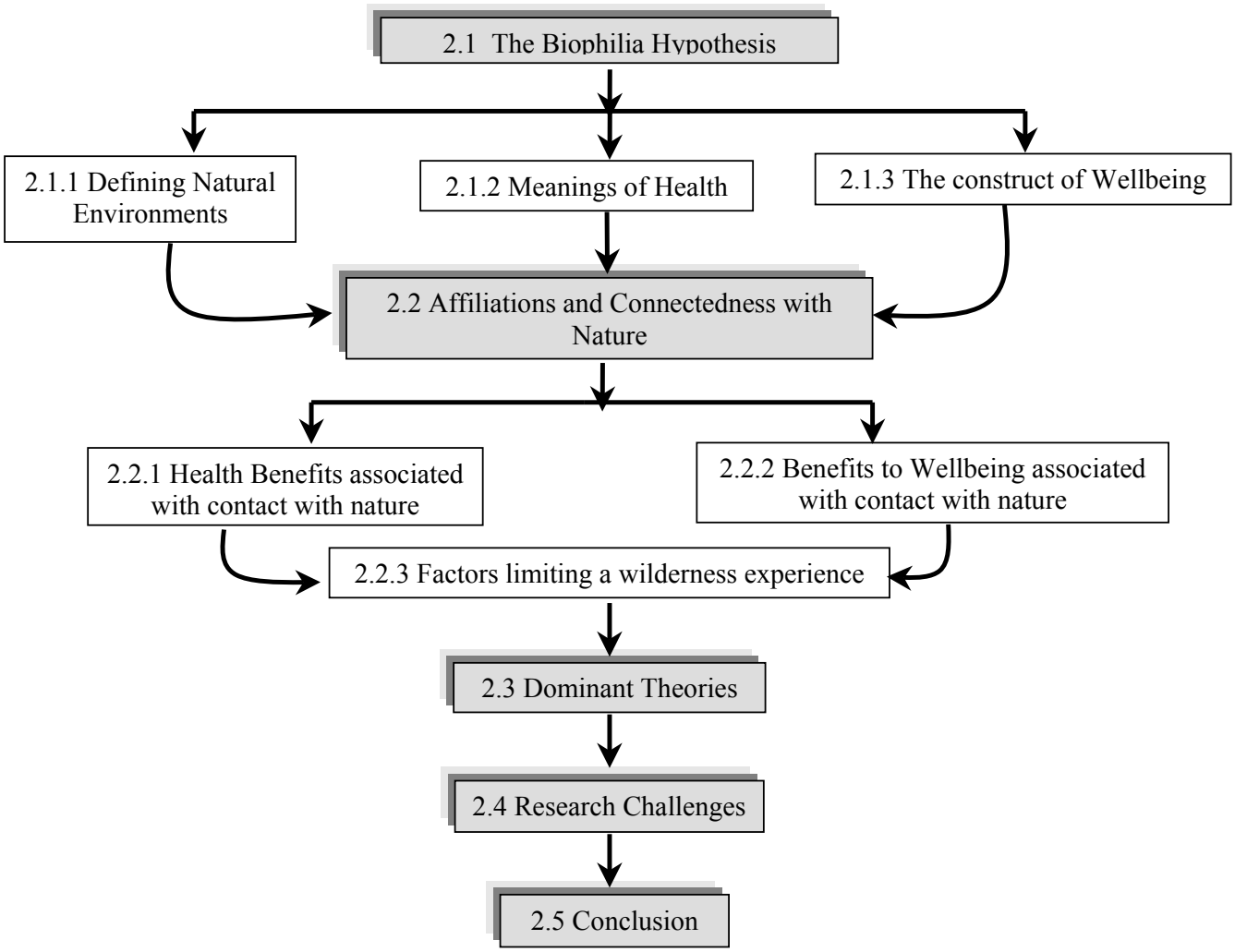


Figure 1: Outline of Literature Review

2.1 The Biophilia Hypothesis

Throughout history there have been many indications that humans have tried to maintain their contact with nature. Settlements such as those in ancient Greece, medieval China and even today in suburban Japan, are infiltrated with sophisticated and extensive gardens which clearly demonstrate that a wide range of people go to extraordinary effort to maintain their contact with nature (Ulrich, 1993). Many prime areas of real estate are close to a water body or nestled in bushland and are highly sought after by the rich

(Gullone, 2000). In the twentieth and twenty-first centuries, governments have gazetted more and more parks and nature reserves for preservation in the future and actively encouraged their use in the present (Gullone, 2000). Another particularly powerful indication that humans also have an affiliation with animals is that in the United States and Canada, more people visit zoos than attend all major professional sporting events combined (Edward. O. Wilson, 1993). As technology abounds us and our societies become even more westernised and 'cultivated', one has to wonder if our desire to be around other living things and 'in' nature will be able to be upheld, both for our grandchildren's grandchildren and ourselves.

It was in 1984 that Edward O. Wilson published a book titled *Biophilia.* As a Harvard biologist, he proposed the biophilia theory that humans have an evolutionary biological need to associate themselves with nature as an essential part of human physical and mental wellbeing development (E.O. Wilson, 1984; Edward. O. Wilson, 1993). He claims that through the sequence of evolution, humans focus on their innate tendencies towards life and lifelike processes (E.O. Wilson, 1984; Edward. O. Wilson, 1993). This theory stipulates that those who had knowledge of nature and an attraction to and respect for nature were more equipped for survival (E.O. Wilson, 1984; Edward. O. Wilson, 1993). Through natural selection, enhanced survival and reproductive fitness, those with high biophilic tendencies possessed specific genotypes that spread through the population over many generations (Edward. O. Wilson, 1993). This gene-culture coevolution is where a genotype increases the likelihood of a specific behavioural response (Edward. O. Wilson, 1993); in this case our sense of connection to nature and other forms of life and our emotional experiences of a positive and negative kind towards living things (Edward. O. Wilson, 1993).

There are four main domains of the natural world existing in our societies and culture that form the elements of the biophilia hypothesis. These are animals, plants, landscapes and wilderness (Frumkin, 2001). Our contact with animals encompasses our household pets, visits to zoos and aquariums, characters in story books, and native wildlife around our homes (Frumkin, 2001; Ulrich, 1993). There is a great deal of evidence, including Australian research, that relates animals to human health (Frumkin, 2001). Plants also play a significant role in our lives (Frumkin, 2001; Hartig, Evans, Jamner, Davis, & Garling, 2003; Irvine & Warber, 2002), as people place them in their homes, nurture and

care for gardens, visit botanic gardens, surround themselves in flowers in times of grief or elation, and immerse themselves in the smells of particular scents. Even plants in specific settings, such as an office, can increase work production and make employees more relaxed and calmer (Frumkin, 2001; Irvine & Warber, 2002; Ulrich, 1993). "Natural landscapes may have a similar effect" (Frumkin, 2001, p. 5). This domain of the natural world is when we prefer to be visualising landscapes, either from our window, on paintings on the wall, on our computer desktops and screensavers, or in films (Frumkin, 2001). A wilderness experience is where people physically enter the landscape rather than viewing it from afar.

From the above discussion, it can be seen that people gain some health benefit from being in the presence of animals and plants. The benefits of viewing particular landscapes and entering a landscape for a wilderness experience will be defined in depth in Section 2.2. Before proceeding further it is important to consider the types of natural environments that can be explored and how the constructs of health and wellbeing can be defined in this context.

2.1.1 Defining Natural Environments

A natural environment, and particularly a wilderness area, has rarely been stated explicitly (Borrie & Birzell, 2000; Mausner, 1996). An exploratory project to determine the underlying themes that aid in the conceptualisation of natural environments has revealed that environments range between totally natural, civilised natural, quasi-natural, semi-natural and nonnatural environments (Mausner, 1996). Researchers have explored the experience of nature in personal lives through a picture sorting exercise. Respondent's were asked to sort the pictures according to the level of human impact depicted (Mausner, 1996).

From the data, Mausner was able to propose four themes which were used to identify each setting as natural or nonnatural, as no single set of attributes and dimensions appears to describe all environments (1996). Assessment of the natural elements was a major theme, which focused on the attributes and dimensions of the sky, Earth, and water, while in the second theme, the "separation of people from nature" was where people viewed nature as an 'other' or apart from themselves (Mausner, 1996). The third theme regarding the level of human impact had two components; the process of interventions (such as

logging, mining, littering) and the dimension of the intervention (such as its scope, level of reversibility, intentionality) (Mausner, 1996).

The forth theme was the experience of being-in-nature, which is a specific phenomenon particularly related to the concept of natural environments (Mausner, 1996). Mausner (1996) found that this experience of being-in-nature was the most crucial for differentiating between natural and nonnatural environments, where humans placed themselves within nature even though they saw themselves as apart from nature. "They seemed compelled to re-insert themselves before completing the conceptualisation process" (Mausner, 1996). In a way this was rather strange, as in one instant they were defining themselves as separate from nature, then in the next reintegrating themselves into it. Mausner (1996) postulates that this yearning for reintegration is a reaction to being separated from nature, which is now a significant part of western culture.

Even though the respondents identified emotional, cognitive, and spiritual components of experiencing nature (Mausner, 1996), there was no explicit connection made with individual health. Dimensions such as feeling more relaxed, a slower pace, a feeling of freedom, and having no social constraints (Mausner, 1996), were not conceived as a benefit to health. Respondents indicated that the experience involved physical, emotional, cognitive, and spiritual components, and often described the experience of being-in-nature as peaceful, calm, relaxing, free, anonymous and serene (Mausner, 1996). Mausner (1996) then went on to explain how natural environments provided opportunities for visitors to 'reminisce', 'contemplate' and 'dream', which gave them cognitive rest and respite from everyday activities, yet there was still no reference to the possible personal benefits to health.

Mausner used these four themes to generate hypotheses regarding the concept of nature and developed categories to define these concepts (1996). The categories from being totally natural to nonnatural environments are set out as a hierarchical framework, although they are not linear and do share many of the same attributes and dimensions (Mausner, 1996). According to this hierarchy there are five different types of environments that display varying characteristics. The impacts of humans in these areas are taken into account along with the types of activities that take place in that setting and the natural characteristics of the area. An example of this is the Civilised Natural

Environment, which is mostly unaffected by human interventions, has a high level of protection yet allows for hikers and swimmers to utilise the area (Table 1).

Table 1: Definition of different types of natural environments

Environment Type	*Definition*	*Examples*
Totally Natural	Prominent geological features and abundant natural elements; have no visible evidence of man's presence in terms of people and human-made artefacts; untouched; unspoiled; human access is severely limited; 'dangerous' environment; experience obtained vicariously through movies, fantasy, explorer's adventures.	"Places that are not natural of us, but are natural otherwise." Forested Wilderness, the desert, in the ocean, outer space.
Civilised Natural	Predominance of natural elements unaffected by human interventions; accessible to human presence; protection from life-threatening dangers; greater proximity to human-made structures/amenities such as telephones and stores; recreational activities without making impact on environment; high protection of existing natural elements and surroundings.	Forest with hiking trails; secluded open beach frequented by swimmers. "Affords the greatest opportunity for experiencing the various dimensions of 'being-in-nature.'"
Quasi-natural	Human impact is readily apparent; composed of natural elements intended to make the environment 'appear natural'; high human control; designed to enhance aesthetic qualities.	Small landscaped park; cultivated flower garden; a lawn.
Semi-natural	Natural and nonnatural elements coexist; humans control elements of naturalness; close to densely populated areas; people involved in nature-appropriate activities.	Farm; open space within or adjacent to a city or suburb; dining out-of-doors at a riverside restaurant.
Nonnatural	Nature is affected a lot by man; human laws completely override natural laws; building, roadways, bridges predominate; people feel anonymous; extensive alteration of the natural topography or large scale destruction;	Urban settings without open, undeveloped' land.; mined or logged areas;

(Adapted from Mausner, 1996)

Much of the previous empirical research on the psychological and physical benefits of contact with nature fails to define how altered the environment in question actually is (Mausner, 1996). Without this differentiation between natural environments, it can be difficult to determine if the findings can be generalized to other environments which also include nature (Mausner, 1996). Much previous research has actually focused on wilderness settings (Mausner, 1996), but are labelled as 'natural environments'. However,

not all natural 'types' of environments can be conceptualised as wilderness areas, as we have seen from the above discussion, and not all sites labelled as wilderness areas in existing research are actually located in a defined wilderness area. An example of this is Ewert's study (1998) where they defined two parks located within two hours drive from Los Angeles, which has a population of over 12 million people, as a wilderness area. So it is obvious that this concept of wilderness varies widely. It could perhaps be better identified in terms of how individual people view the area and what type of experience they have while there.

- *Deconstructing Wilderness*

'Wilderness' is a challenging concept in that it implies both a state of mind created and held by individuals and groups, and a political definition of a protected area within a government jurisdiction (Shultis, 1999). These notions can be "frustratingly elusive" (Shultis, 1999), although it is possible to separate the two entities. According to Frumkin (2001) there are four aspects of the natural world, namely animals, plants, landscapes, and wilderness. As described above, the categories of animals and plants are intuitive, however the other two are not. Landscapes are defined on the basis of their aesthetic values, in terms of the level of openness, the type of vegetation or ground surface, and the proximity of water (Frumkin, 2001). Often certain features of a landscape offered higher chances of survival and reproductive success, both for the individual and for the group (Kahn Jr., 2001). It has long been hypothesised that people prefer savannah-like settings, which are fairly open, have smooth or uniform-length grassy coverage, scattered trees for protection, and a water source (Frumkin, 2001; Kahn Jr., 2001; Edward. O. Wilson, 2002). There is much evidence that viewing such settings either through photos, pictures, or window scenes, is associated with feelings of peacefulness, tranquillity, relaxation, enhanced mental alertness, and better attention and cognitive performance (Tennessen & Cimprich, 1995).

But these experiences may be enhanced when one enters the landscape rather than just viewing it. This is how Frumkin (2001) defines a wilderness experience. Including the above sensations of viewing landscapes, are the benefits of being *in* the environment. The way a person perceives this environment is based on their life history, and cultural and social forces (Stankey & Schreyer, 1987). The wilderness experience represents a feeling allegedly unique to wilderness areas, yet our perception of a natural environment is

relative to previous experience, with added cultural and personal meaning (Stankey & Schreyer, 1987). "In essence, the wilderness experience can be characterised as whatever we are experiencing when we feel we are in wilderness" (Stankey & Schreyer, 1987, p. 258). The benefits, values, and feelings that are created include that of awe, wonder, humility, a sense of connection and comfort with nature (Mayer & Frantz, 2004; Thompson, 2001), a sense of place and community (Townsend & Marsh, 2004), lower levels of stress (Orsega-Smith, Mowen, Payne, & Godbey, 2004), decreased anxiety (Hull IV & Michael, 1995), better perceptions of subjective wellbeing (Mayer & Frantz, 2004), and overall improved health (G. Godbey, Graefe, & James, 1992; Levitt, 1988; Townsend & Marsh, 2004). These studies were conducted in environments ranging from local parks, wildlife reserves, and national parks to wilderness areas.

Wilderness areas are closely aligned with the 'totally natural' environment type as defined above in Table 1 and are considered to be extraordinarily rare (Ole Nielsen, 2001). Wilson (2002) sees wilderness areas as spaces that can sustain themselves, that were there before humanity, where the Earth and its community of life are unaltered by humans, and where humans remain a visitor to the area (McDonald, Williams, & Hamilton, 2000; Scott, 1974). "Wilderness (is) viewed as a refuge from human-caused change" (Cole, McCool, Parsons, & Brown, 2000, p. 1). This popular definition of 'wilderness' paints the picture that these alleged pristine areas have been untouched and protected from human impact, even though they have been inhabited and used by indigenous people for thousands of years (Langton, 1996; Rose, 1996). Wilderness areas are also a fundamental representation of our national, biological, and evolutionary heritage (D. R. Williams, Haggard, & Schreyer, 1988), and thus may have world heritage significance.

The great wilderness areas of the world today include the rainforests of the Amazon and the Congo; the coniferous forests of Europe, Asia, and North America; the deserts of Africa and Australia; and the Earth's polar regions and ocean worlds, all of which have been occupied by indigenous communities during some time in the past. (Some even debate if these places are true wilderness in that they too have been trodden on by modern human feet and, for example, subjected to rising global temperatures as a result of human activity.) Smaller wilderness areas include national parks and state forests and other areas such as deserts or remote locations where people find unique and profound experiences

(Borrie & Birzell, 2000). In contemporary Australia, wilderness areas are gazetted under the institution of National Parks, which governs and commodifies 'nature' to culturally construct an imagined wilderness among visitors (Langton, 1996; McDonald et al., 2000). From the above discussion, it is evident that wilderness experiences take place in localities that may not be officially gazetted as wilderness areas, and if they are officially labelled as wilderness areas, then this definition has remained elusive and open to interpretation.

2.1.2 Meanings of Health

The construct of 'health' is one that posses a range of meanings for specific applications, is commonly used in many societies, and is interpreted in many ways in different cultures and communities (Brown et al., 2005). It is also a word that is entangled around our cultural, social and professional idiosyncrasies and is used to convey important ideas and personal beliefs and values (R. Williams, 1988). Since 1946 the World Health Organisation (WHO) describes health as "a complete state of physical, mental, and social wellbeing and not merely the absence of disease or infirmity" (World Health Organization, 1946). This implies that health is a combination of biological, psychological and social factors that determine health. Although this definition is widely used and accepted in the health arena, it has come under close scrutiny from health professionals and academics alike.

The WHO definition of health stated above has only partly relieved the debate about the underlying values of health (Brown et al., 2005). This definition has been considered utopian and a vague conception of 'complete wellbeing' (Capra, 1983; Germov, 2002; Horwitz, 2004; Nutbeam, 1986; Pan American Health Association, 2001). Some have even declared this definition as not useful, as the utopian stance it conveys is that all humans are able to attain eternal happiness and that the definition is hard to quantify and difficult to promote (Brown et al., 2005; Capra, 1983; Pan American Health Association, 2001). It has also been noted that not all contributing factors to health and wellbeing (to be defined in section 2.1.3) are covered in the statement. Originally 'spiritual wellbeing' was not included in the definition (it now has been recommended for inclusion at a recent World Health Assembly), which caused an outcry among formal religions, health professionals and governments (Brown et al., 2005). The wellbeing of the surrounding environment was also not considered as a precursor for health (Brown et al., 2005).

"In our predominantly western culture, we tend to think automatically of health as an individual phenomenon and an individual responsibility" (Wass, 2000, p. 45). However, one's health is strongly influenced by the social, cultural, environmental, political, and economic conditions around them (Wass, 2000). In western society, including Australia, the bio-medical model of health care is often considered to be the 'traditional' and most mainstream approach to health care (Germov, 2002). It is committed to scientific methods and empirical evidence (Barry & Yuill, 2002). The primary focus is the treatment of the individual and analysis of health as being the absence of disease (Baum, 1999). As such this approach ignores the social, economic and environmental impacts upon the individual or public health processes (Germov, 2002). By focusing primarily on the individual, the bio-medical approach considers the individual as being solely responsible for their state of health and that illness is a malfunction of the body's biological mechanisms (Germov, 2002). However, this is not always the case. Even though the WHO definition of health has been criticised, it does provide an understanding and vision of health that conveys the need for a broader approach than what the biomedical model can deliver (Baum, 1999; Germov, 2002).

In contrast to the biomedical view of health, the new public health approach highlights the social determinants of health at the population and community level, rather than just the individual (Baum, 1999; Germov, 2002; Palmer & Short, 2000). This approach views a community's physical location and environmental situation as being an important determinant of health, for it specifies that health and illness have social origins (Germov, 2002). Through a focus on health promotion and disease prevention, the public health model seeks to reduce the prevalence of disease, premature death, and discomfort and disability resulting from illness within the population (Baum, 1999; Palmer & Short, 2000). Public health practitioners also attempt to achieve this by improving sanitation and hygiene facilities, whilst also modifying the behavioural activities that can influence the health of communities, through education, economic, and political interventions (Germov, 2002; Palmer & Short, 2000).

Public health professionals have been quite successful in reducing mortality rates and improved living standards, water supply, sanitation, nutrition and is economically inclusive (Germov, 2002; Palmer & Short, 2000). There are, however, some draw backs

to the public health approach. Public health fails to recognise that there are various factors other than the individual and social determinants of a person's or community's health. This model tends to exclude cultural impacts on health and excludes gender, emotional, and spiritual dimentions to health, and has an "over-emphasis on the harmful side effects of medical approaches" (Germov, 2002 , p. 17). What is required is a more balanced model of health that combines the bio-medical and public health models (Wass, 2000). This is known as the primary health care approach.

Like the public health model, the primary health care approach is based on a social model of health and challenges the narrow view of the bio-medical model (Wass, 2000). The primary health care approach emphasises social justice, equitable distribution of services, community participation and involvement, prevention, use of appropriate technology, and the use of a range of sectors to respond to the needs of local populations (Baum, 1999; Wass, 2000). The primary health care approach identifies structures that support health, principles for advancing health and a set of claims about the effectiveness of a policy model to improve health (The Centre for Primary Health Care, 2004). In Australia, the primary health care providers include community health centres, domiciliary nursing care, and general medical practitioners (Wass, 2000). These can extend as far as local government, the non-government sector and other public and private sector organisations (Baum, 1999; Wass, 2000) whose policies and activities influence health and wellbeing yet may not be recognized as health promoting organizations (The Centre for Primary Health Care, 2004). The principles involved in promoting health include collaborative local networking (across all primary health care services, local government, consumers and community groups), partnerships between sectors and intersectional cooperation (The Centre for Primary Health Care, 2004). In order to achieve this, WHO states that "primary health care should be a philosophy permeating the entire health system, a strategy for organising health care, a level of health care and a set of activities" (World Health Organization, 1978, p. 16).

As health is not solely the absence of disease (World Health Organization, 1946) and that a good approach to health has the elements as outlined in the primary health care approach (Baum, 1999; Wass, 2000), it is a challenge to adequately define health within the framework of the primary health care approach and in the context of the biophilia framework. Although various people have tried to define health, one explanation that is

particularly interesting and brings these two areas together is by Fritjof Capra (1983), who has written extensively about the philosophical implications of modern science. His perception is quite in contrast to the reductionist, bio-medical approach that has dominated the thinking of western cultures for centuries. He states:

> Although everybody knows what it feels like to be healthy, it is impossible to give a precise definition; health is a subjective experience whose quality can be known intuitively, but can never be exhaustively described or quantified. Nevertheless, we may begin our definition by saying that health is a state of well-being that arises when the organism functions in a certain way (Capra, 1983, p. 351).

This 'certain way' involves the complex interaction and balance between the physical and psychological aspects of the organism and the influence of the natural and social environments around them (Capra, 1983). This definition of health acknowledges that there are many differing factors that influence health and that the way individuals perceive their own health can be very different between different people. A further interpretation of health that draws on the WHO definition is the ecosystem approach to health. This has been described as "the integration of natural and social sciences with human values and extends in its application from individuals and populations to multiple populations of species, namely ecosystems" (Ole Nielsen, 2001, p. 60). Current models of health have failed to adopt these emerging concepts of ecosystems (VanLeeuwen, Waltner-Toews, Abernathy, & Smitt, 1999). One that does is that decscribed by VanLeeuwen et al. (1999); the Butterfly Model of health incorporates salient characteristics of ecosystems, while recognising the importance of socioeconomic and biophysical environments, and biological and behavioural filters. Ole Neilson points out that society will lose support services if ecosystems are disturbed and lose their capacity for renewal (2001). This approach emphasises transdisciplinarity action and the active participation of stakeholders (similar to the primary health care approach). As can be seen from the above review, health and wellbeing are complementary constructs.

2.1.3 The construct of Wellbeing

Subjective wellbeing is taken to be the evaluation of one's personal circumstances in life from their own perspective (Bowling, 2005; Diener, Suh, & Oishi, 1997; Trewin, 2001).

It's an idea that has intrigued people for a long time, yet only in recent times has an attempt been made to measure and study it in a systematic way (Diener et al., 1997). It is not just about how 'happy' a person is (Eckersley, 2004). It is also more than just the absence of psychological or mental health problems and is considered to be a positive notion comprising many different dimensions (Bowling, 2005).

Subjective wellbeing is how a person evaluates their own life and satisfaction with life, often in terms of marital satisfaction, level of depression or anxiety, positive moods or happiness, morale, self-esteem, level of health and overall satisfaction with life (Bowling, 2005; Diener et al., 1997; Matlin, 1999). These factors are primarily psychological variables (Diener et al., 1997; Matlin, 1999) and are subjective representations of one's wellbeing. An individuals' mood at a specific moment is also known to be an indication of ones subjective wellbeing (Matlin, 1999), especially within a specific context. All people routinely evaluate themselves in relation to these areas and how relevant and important each area is to themselves (Bowling, 2005). This evaluation is based on past experiences and an estimation of future experiences (Bowling, 2005). These factors can be defined by three distinct parts – a cognitive aspect (life satisfaction); pleasant moods and emotions (positive affect); and unpleasant moods and emotions (negative affect) (Diener et al., 1997; Eckersley, 2004). Thus, a person is considered to have high subjective wellbeing if they are satisfied with their life and experience frequent positive moods and emotions such as enthusiasm and inspiration, and infrequent unpleasant emotions such as sadness and anger.

The field of subjective wellbeing doesn't solely focus on the undesirable states of one's life that are often treated by clinical psychologists, but is also used to determine the differences between slightly happy people, moderately happy people and very happy people (Diener et al., 1997; Eckersley, 2004). There is an attempt made to document the entire range of wellbeing components from agony to ecstasy (Diener et al., 1997). These emotions, and all those in between, are an experience that occurs inside someone and are subsequently difficult for others to determine (Diener et al., 1997; Trewin, 2001). When measuring subjective wellbeing, it is desirable that an external frame of reference not be used because it is an individuals personal beliefs and how they respond to particular life events that influences their perceived wellbeing (Diener et al., 1997).

2.2 Affiliations and Connectedness with Nature

Humans have maintained an affiliation with nature that has drawn many curious minds for centuries. Not only do people feel compelled to immerse themselves in our natural environments and surround themselves with living plants and animals, there are many studies that provide evidence that we obtain some benefit in terms of our health and wellbeing from these situations. Kahn (2001, p. 9) states that "research across many disciplines has been brought together to support the hypothesis that there exists a fundamental, genetically based human need and propensity to affiliate with life."

Kaplan (1995) has found, in general, that people prefer natural environments over built environments and if offered a choice of a built environment, they prefer the one with water, trees and other vegetation more than a built environment without these features. For example, after viewing a frightening movie then either a video about a natural or built environment, participants mood ratings were assessed, where it was found that there was great improvement in mood, slight improvement in concentration, with a substantial preference for the natural scenes over the built environment (van den Berg, Koole, & van der Wulp, 2003). Much research has also found that people prefer to be close to low action water bodies and landscapes that are open, but still defined (Kaplan, 1995) such as parks, woodlands, and savanna's. These preferences are in contrast to landscapes that have thick understory vegetation dominating the area or areas that are blocked or perhaps enclosing (Kaplan, 1995). There are however, other attributes of an environment that influence one's affiliation for nature that are not related to the physical environment itself. For example, Kaplan (1995) has found that when people judge a specific landscape, they assess the potential for functioning in that setting, such as their likelihood of entering that setting, and the level of information that can be obtained from that setting. The feeling of freedom when visiting natural environments is indicative of the need for emotional relaxation (Mausner, 1996).

In the modern world and within our current societies humans have a decreased contact with nature and living things compared to their ancestors. According to the biophilia

hypothesis, this innate connection does not become over-ridden by other behaviours (Edward. O. Wilson, 1993). Wilson (1993) proposes that this tendency towards nature persists from generation to generation even in a technology-driven world. However, Orr (1993) suggests that when we are surrounded by technology and other human artefacts, this innate connection to the natural world reverts to a *choice* we now make, rather than an outright urge. Biophobia, a state where one is reluctant to visit or enter natural settings, could be becoming more prevalent (Orr, 1993).

Ecologists, environmental psychologists and ecopsychologists, who study the interactions and relationships between people and their environments (Proshansky, 1990) have been theorizing for a long time about human's psychological relationship to the natural world (Mayer & Frantz, 2004). They, including natural and social scientists, have argued that this affiliation with nature is a key factor in influencing ecological behaviour, however this work is largely theoretical and lacking empirical support (Glaspell & Puttkammer, 2001; Mayer & Frantz, 2004). Wilson's 'Biophilia Hypothesis' which encompasses this innate connection to nature, also suggests that one's likelihood of understanding and care for nature increases when we have increased contact with nature (E.O. Wilson, 1984). Ecological behaviour, such as recycling, environmental restoration or reduced driving, is significantly correlated with people who see greater potential for restorative experiences in natural environments (Hartig, Kaiser, & Bowler, 2001). There are several studies that support this contention that connection to nature is a significant predictor in determining both ecological behaviour and subjective wellbeing (Hartig et al., 2001; Mayer & Frantz, 2004).

Although Mayer and Frantz (2004) have established a positive link between ones' connection to nature and eco-friendly acts, there is only an association. It has been postulated that this relationship could be a bi-directional one, where a feeling of connection to nature leads to eco-friendly acts, and that eco-friendly acts may lead people to feel more connected to nature (Mayer & Frantz, 2004). Another causal path that is yet to be explored is that between connectedness to nature and life satisfaction and the idea that this connection can greatly enhance subjective well-being (Mayer & Frantz, 2004).

Apart from the above benefits to nature when humans have contact with the environment around them, there are a wide range of benefits to the health and wellbeing of the

individual. Some studies have attempted to characterise these benefits and the influential factors that affect these benefits (Table 2). Following will be a more detailed discussion of the benefits to health and wellbeing for the individual as a result of their affiliation with nature.

Table 2: Summary of benefits to Health and Wellbeing associated with humans' Affiliation for Nature

Association found: ✓ = Yes ✗ = No	Key Papers								
	Hartig, Mang and Evans (1991)	Godbey, Graefe and James (1992)	Newell (1997)	Ewert (1998)	Cordell, Tarrant, McDonals, and Bergstrom (1998)	Bagot and Gullone (2000)	Korpela, Hartig, Kaiser & Fuhrer (2001)	Australian Bureau of Statistics (2004)	Townsend & Marsh (2004)
Health Benefits									
Exercise		✓	✓						✓
Spiritual Inspiration				✓	✓				✓
Recreation Opportunity		✓	✓		✓				✓
Fatigue Restoration	✓								
Attention Restoration	✓						✓		
Social Contact		✓							✓
Relaxation		✓	✓	✓			✓		✓
Personal Achievement				✓					
Learning									✓
Escape		✓		✓			✓		✓
Wellbeing Benefits									
Positive affect	✓					✓	✓		
Life Satisfaction	✓					✓			
Influencing Factors									
Distance to site				✓					
Health								✓	
Age		✓	✗	✗	✗	✗		✓	
Gender		✓		✗	✗	✓			
Cost				✓				✓	
Lack of Time		✓						✓	
Lack of Interest								✓	
Accessibility				✓				✓	
Safety				✓					✓
Place of residence		✗			✗	✗			
Income			✗	✓	✗				
Language			✗	✗					
Ethnicity		✗	✗	✓					
Education		✓		✓					✓

Note: Not all studies listed above are directly comparable. Use as a guide only.

2.2.1 Health Benefits associated with contact with nature

"Along with the expected leisure amenities, parks can…provide measurable health benefits, from providing direct contact with nature and a cleaner environment, to opportunities for physical interaction" (Frumkin & Eysenbach, 2003, p. 1). Godbey, Graefe and James (1992) conducted 1300 telephone interviews to determine the benefits of local recreation and park use. They found that the majority of benefits were personal and social for the individual, with environment and economic benefits generally not being associated with such recreation. Exercise, relaxation, and social interaction were among the most frequently mentioned individual health benefits of park use (G. Godbey et al., 1992). The opportunity for physical recreation in natural environments is great and many studies have shown its significance in terms of increased health potential (Frumkin & Eysenbach, 2003; G. Godbey et al., 1992; Newell, 1997; Townsend & Marsh, 2004).

There are also restorative influences of environments that are known to manifest themselves in emotional, physiological and cognitive responses and particularly facilitate the reduction of stress (Han, 2003). Hartig, Mang and Evans (1991) have conducted a few studies that provide strong evidence that restorative outcomes are prominent in natural settings, with a more complete recovery from mental fatigue than other settings. Another study where 101 university students were asked to describe their favourite places and experiences in them, natural settings were over represented, with restorative qualities being particularly typical of these natural settings (K. M. Korpela, Hartig, Kaiser, & Fuhrer, 2001). In addition to using the Perceived Restorativeness Scale which measures the restorative potential in a given environment, this study has also assessed open-ended accounts of favourite places, where there was "frequent mention of being relaxed, being away from everyday life, forgetting worries, and reflecting on personal matters" (K. M. Korpela et al., 2001, p. 572). However, these results were in contrast to a university student's regular urban study environment and may have been influenced by the respondents age.

Social benefits and positive aspects of group behaviour have also been documented when visiting natural environments. It is known that open spaces, or natural environments,

increase opportunity for social interaction, thereby enhancing health (Cordell & Stokes, 2000; Morris, 2003). Some components of social contact involve getting to know other people, group participation, interaction between young and old, community awareness and a feeling of team spirit (G. Godbey et al., 1992). "It seems likely that human interactions with nature through parks may have significant capacity for building social capital" (Maller, Townsend, Brown, & St Leger, 2002a, p. 14). Recent work conducted by Mayer and Frantz (2004) supports Leopald's (1987) contentions that when people feel a connection to nature, it leads to their concern for nature. This feeling includes a shared sense of community, kinship, egalitatianism and belonging to nature, which may also suggest that personal wellbeing is linked to a sense of feeling connected with nature (Mayer & Frantz, 2004).

A study conducted in South East Queensland, Australia determined if a coastal ecosystem could impact on aspects of the social and community relations of the local residents (Cox, Johnstone, & Robinson, 2004). The results showed that recreation in this ecosystem enhanced social interaction and networks, the resident's sense of place, and their psychological health. Spiritual inspiration is also known to be experienced while in the wilderness, as the awareness and the sheer powers of nature combine to provide an empowering experience (Fredrickson & Anderson, 1999).

There have been reports of medical benefits associated with visiting natural environments as well. This can involve a reduction in heart rate, muscle tension, and blood pressure (Maller et al., 2002a). One hundred and twelve young adults were randomly assigned to a natural or urban setting where stress recovery and directed attention restoration were monitored (Hartig et al., 2003). Those who were "walking in a natural reserve initially fostered blood pressure change that indicated greater stress reduction than the group walking in the urban setting" (Hartig et al., 2003, p. 1). Employees, with views to nature, report fewer headaches than those who cannot observe the natural environment (Kaplan, 1995), while depression among specific groups can be significantly decreased after spending time in a natural setting (Frumkin, 2001; Maller et al., 2002a), however this could be more due to the increase in physical exercise, rather than the environment itself (Ulrich, 1999). Korpela and Hartig (1996) even state that physical environments are often used by people to regulate pleasure and/or pain and self-experience such as through exposure to better air quality.

Considering all the above health benefits that people can derive from visiting natural areas, it is important to note that users of these areas are generally more healthier than non-users (G. Godbey et al., 1992; Ho, Payne, Orsega-Smith, & Godbey, 2003). While this could throw doubt on the notion that natural environments do enhance the health of individuals, there is substantial evidence that this is clearly not the case.

2.2.2 Benefits to Wellbeing associated with contact with nature

As stated above in section 2.1.3, subjective wellbeing is a combination of life satisfaction, positive affect, and negative affect (Diener et al., 1997; Eckersley, 2004). A research study involving 379 people hypothesised that individual preferences for a natural and restorative setting were significantly associated with quality of life (Ogunseitan, 2005). They found that all four domains of the natural environment were significantly associated with the respondent's quality of life (or subjective wellbeing), so much so that the appreciation of ecologic diversity (appreciation of flowers and water bodies) was most strongly correlated with high quality of life (Ogunseitan, 2005).

A study conducted with 32 bushwalkers and two control groups to determine whether bushwalking and self-reported connectedness to nature can counter the effects of real life stressors and thus deliver more wellbeing, found that a person's subjective view of their connection with nature was a significant predictor of well-being (Thompson, 2001). This suggests that benefits to wellbeing may be the subjective sense of connectedness to nature rather than the frank reality of spending time in the bush (Thompson, 2001). It should be noted however, that the bushwalkers in this study did not report high positive affect or more satisfaction with life (after adjusting for stress level) than either of the control groups. This may be due to the small sample size, or that the participants were only those in a bushwalking club, where they may have other motives, such as friendship, for joining. The author also noted that it is difficult to compare studies that were carried out in a more controlled environment (Thompson, 2001). Even though many studies have found that 'happiness' or positive affect are increased after visiting a natural environment, this can be reduced as people experience negative emotions about returning to their usual

setting and situation (Hartig et al., 1991). It should also be noted that subjective wellbeing is not correlated with demographic variables (Matlin, 1999), which enhances the argument that natural settings can influence one's wellbeing as the effect of, for example, age, language, and gender, are not contributing factors.

2.2.3 Factors limiting a wilderness experience

As with all potential relationships, there are factors that influence the eventual outcomes. Some of these have been documented here and are considered to be factors that change how people perceive the environment around them. These could be considered effect modifiers, in that they modify the general relationship between humans and the natural setting and impact on the overall wilderness experience. There are also factors that are known not to impact on our relationship with natural settings.

It would be intuitive for example, to suspect that a longer stay in a natural setting would result in greater benefits to ones health and wellbeing. However, short-term exposure still has a salutary effect on the individual (Hartig et al., 1991), so a comparison between a short stay and a long stay within a particular setting would be interesting. The issue of safety in natural environments, particularly wilderness areas, has been raised in a number of studies (Mausner, 1996; Townsend & Marsh, 2004). Mausner (1996) found that those respondents who had grown up in an urban or industrial area were concerned about personal safety when visiting such areas, which could be a factor which limits the value visitors derive from natural settings. However, many studies have found that the majority of visitors to natural areas currently reside in urban or suburban localities (Ewert, 1998; Shin & Jaakson, 1997), which could support the notion that people living in metropolitan areas are more deprived of natural environment contact. Further support for this notion is that Australia's national parks and protected areas receive around 80 million visitors a year, with over 70% of these visitors residing in cities (Australian Bureau of Statistics, 2004).

A case study conducted in Southern California was designed to determine if visitors to wilderness areas in close proximity to urban locations differed on a range of selected variables when compared to visitors to a more remote wilderness location (Ewert, 1998). It was found that visitors to remote wilderness locations were more likely to have grown

up in large, heavily populated urban environments and currently live in large metropolitan areas (Ewert, 1998). This could suggest that these visitors are seeking an experience where they are as far away as possible from their hectic urban centres. If this is the case, then ones childhood circumstances may be a significant factor in determining ones felt need and subconscious requirement of connecting with nature. This raises the question whether its an innate or learnt behaviour, and enters into the nature-nurture debate (Shearman & Sauer-Thompsom, 1998), which is beyond the scope of this review.

Participants in a study who were asked to describe their experiences while in a wilderness setting stated that in order for one to continue to derive the same experience from an environment, visitor numbers needed to be restricted (McDonald et al., 2000). This study found that 65% of visitors to wilderness areas preferred that more visitor facilities, such as picnic tables and toilets, were not required. This suggests that those visiting the area were seeking to remove themselves from as many urban 'mod-cons' as possible. The size of the group the traveller is travelling with also impacts on their experience. A study conducted in southern California, found that those visitors to a natural setting that was close to a residential area tended to travel in larger groups than those visitors to a remote setting (Ewert, 1998). These groups preferred their wilderness experience to be less crowded so that they could gain the maximum benefit (Ewert, 1998), however this was not a significant result.

Ewert (1998) states that when in a wilderness area, a maximum of eight groups seen each day would be the limit before people thought the area was crowded. However, depending on someone's frame of reference, the same area could be considered crowded or not crowded (Stankey & Schreyer, 1987). It is interesting to note that users of wilderness areas in close proximity to urban centres report higher anthropogenic scores (as opposed to biocentric scores) regarding their wilderness preferences (Ewert, 1998). These preferences, such as the importance of solitude, preservation, and restricting users, are on a continuum ranging between biocentric responses and anthropogenic responses (Ewert, 1998). Other types of encounters, impacts, or actions not identified in this study, may be viewed by an individual visitor as more important (Ewert, 1998). In addition, this study only examined visitors to the most heavily used access points. There may be a systematic bias in the sample based on the method of data collection (Ewert, 1998).

Some demographic variables are also considered effect modifiers when determining the influence of a natural setting, however others are not. In a survey conducted by the Australian Bureau of Statistics (2004) assessing environmental behaviour and practices, they found that after lack of time; peoples age, health and inability were the next most significant reasons preventing people from visiting a World Heritage Area, National or State Park in the previous 12 months. It is also interesting to note that approximately 53% of those aged 65 years and older nominated this as their primary reason (Australian Bureau of Statistics, 2004). In a survey of more than 1900 people in the United States regarding public views of wilderness, there were no relationships between various values associated with wilderness and demographic characteristics (Cordell, Tarrant, McDonald, & Bergstrom, 1998). Bagot and Gullone (2000) used a range of instruments to ask 320 children about the relationship between stimuli that generate positive affect and the natural environment. They found that gender yielded significant differences, however age and location variables did not reveal associations. This is conflicting, as Kahn Jr. (2001) states that based on statistical analyses, there are no differences concerning gender and affiliation for nature.

It should also be noted here that culture and ethnicity do not affect how one views nature or ones affiliation towards it (J. Davis, 2004; Newell, 1997). Cross cultural studies continue to support this notion (Kahn Jr., 2001; Newell, 1997). Ulrich (1993) summarised a number of study findings to conclude that different countries and cultures all preferred similar elements of a natural landscape. Even when examining the findings of studies comparing the preferences for urban and natural areas, the findings were consistent across culture and demographic variables, with significantly higher preference for natural scenes over urban ones (Gullone, 2000). Kahn (2001) furthermore affirms that the knowledge one holds about the environment, one's upbringing in a rural or urban environment, and again one's race are not attributing factors to one's affiliation for nature.

However, a study assessing wilderness perceptions of international visitors to New Zealand found that perceptions did vary according to nationality and previous experience, with North American, British and Australian visitors seeking the least humanised wilderness settings (Higham, 1997). These results could be due to the researcher only sampling tourists in New Zealand, as New Zealand itself may attract more North American, British or Australian visitors who are seeking remote locations to visit, with

for example, Asian tourists venturing to other parts of the world they feel more comfortable in. So it is clear from the above examples that there is not a consensus regarding which specific variables most significantly influence one's experience in a natural environment.

The following section reviews the dominant theories and models pertinent to this field of study that have been previously described by both academics and ecopsychologists alike.

2.3 Dominant Theories

There are two main theories that dominate the literature regarding humans affiliation for nature and natural settings (Irvine & Warber, 2002; Kaplan, 1995). These are the Attention Restoration Theory and another theory emphasising stress reduction. A theoretical understanding of how contact with nature can enhance one's health is essential in grasping this area of work.

Attention Restoration Theory (ART) is grounded in cognitive psychology and focuses on how "the interaction with nature is important for effective mental functioning" (Irvine & Warber, 2002, p. 78). It was originally proposed by Kaplan and Kaplan in 1989 (Kaplan, 1995; Lauman, Garling, & Stormark, 2001) and draws on the work of William James (1892) (Irvine & Warber, 2002; Kaplan, 1995) and his discussion of involuntary and voluntary attention, also known as directed attention and is understood as the brain's ability to concentrate (Irvine & Warber, 2002). According to this theory, nature has an abundant array of restorative potential (Kaplan, 1995).

Directed attention is when something in our surroundings does not in itself attract attention, but we feel it is important to attend to (Kaplan, 1995). This type of mechanism requires effort, can be brought under voluntary control, and relies on inhibition where one suppresses focus towards a competing, more interesting activity (Kaplan, 1995). An example of this is when students must direct their attention on completing an assignment, instead of heading out to the beach with their friends. Another key component of directed attention is that it is susceptible to fatigue (Kaplan, 1995). This unwelcome experience occurs after one has worked intensely on a project and consequently ends up mentally exhausted (Kaplan, 1995), which, for example, is common among students at the end of

the semester. “More formally, any prolonged mental effort leads to directed attention fatigue” (Kaplan, 1995). This has become more common in the modern world as we divide our focus between the important and the interesting aspects of our lives (Kaplan, 1995); attending to more work and study commitments while resisting interesting distractions.

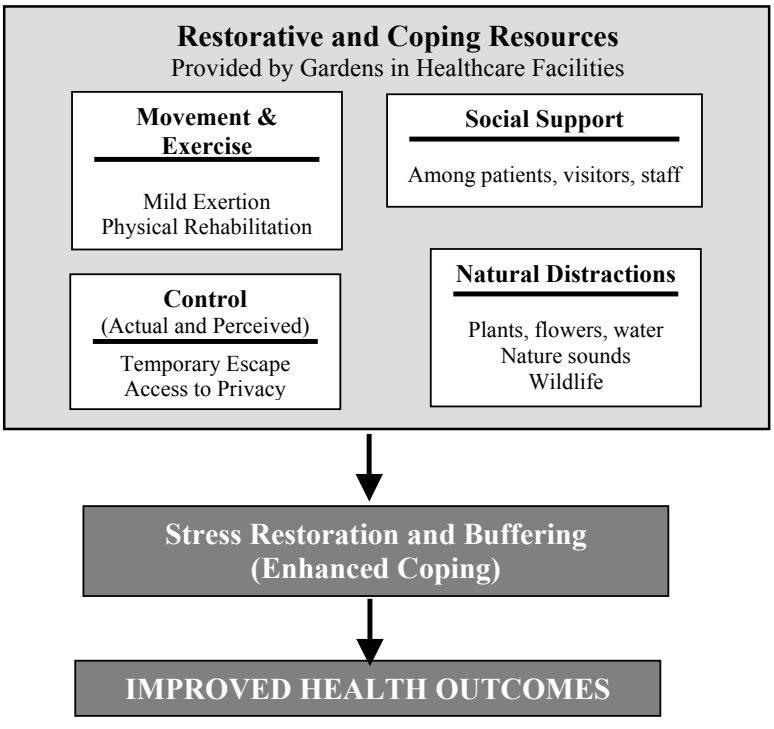
This fatigue can have devastating impacts (Kaplan, 1995). The ability to solve problems becomes impaired, people spend more time carrying out unpleasant but necessary activities, the effectiveness of those activities diminishes, perceptions become impaired, its hard to plan and follow a plan regarding an activity, people become less patient and have little endurance, and end up becoming highly irritable (Kaplan, 1995). It is therefore obvious that directed attention is a key factor in human effectiveness (Kaplan, 1995). When this attention ‘resource’ is depleted, it often leads to higher levels of stress (Kaplan, 1995). Other stress-orientated theories that have been proposed emphasise this fatigue as a consequence of stress, yet a stress response, either physiological or psychological, is an organisms adaptive mechanism to deal with difficult situations that are threatening or challenging (Huffman, 2004; Kaplan, 1995). Considering all this, there are some ways that people use to recover from such fatigue. Sleep is one approach, yet this is often insufficient (Kaplan, 1995). One common way is that people find some other basis or activity for maintaining focus (Kaplan, 1995). They will substitute their voluntary attention for involuntary attention, which is also known as fascination (Kaplan, 1995).

Fascination forms one of four components of the ART that account for the restorative effects of other activities and environments, along with being away, extent, and compatibility (Kaplan, 1995). Each of these refers to the properties of environments, which trigger mental processes or states of minds that are a factor in restorative processes. This involuntary attention can come from many sources and is divided between two categories. ‘Hard’ fascination can be likened to watching auto racing (Kaplan, 1995) or cheering for your favourite football team, while ‘soft’ fascination can provide an opportunity for reflection, which is characteristic of certain natural settings (Kaplan, 1995). Many qualities of a natural setting, such as flowing water, tall rainforests or cloud formations, engross people effortlessly and hold their attention in an involuntary way. Due to nature’s fascinating qualities, it is assumed that involuntary attention is dominant in this context, as it does not demand mental effort and can be used to restore the ability

for directed attention (Lauman et al., 2001). These settings, including the seaside, the mountains, and meadows, are often the preferred destination for extended restorative opportunities, as they provide the feeling of being away (Kaplan, 1995). They also provide a feeling of extent (or coherence), where even a relatively small area can feel much larger and open than ones normal surroundings. As we are more familiar with our normal surroundings, many people still find that functioning in a natural setting requires less effort, and therefore yields a natural environment highly compatible with one's purpose and inclinations (Kaplan, 1995).

Natural environments are rich in the characteristics necessary for restoring attention, and an integrative framework rationalizes how natural scenes contribute to reducing stress (Kaplan, 1995). "Neurological work on brain damaged patients supports" this theory (Irvine & Warber, 2002, p. 78). Experiencing natural environments may not only help mitigate stress, but may also prevent it through aiding in the restoration of an essential resource – directed attention (Kaplan, 1995).

The second theory that is prominent in this field is one proposed by Roger Ulrich (1999) and is outlined in Figure 2 below.



Adapted from Ulrich, 1999

Figure 2: Conceptual model - effects of gardens on human health outcomes

This emphasises stress reduction and that natural environments facilitate stress coping and restoration (Ulrich, 1999). He suggests (Ulrich, 1999) that natural environments, particularly gardens, foster four different mechanisms:

(a) sense of control and access to privacy,
(b) social support,
(c) physical movement and exercise, and
(d) access to nature and other positive distractions

This theory further suggests that a garden or natural setting must convey a sense of security and little risk (Ulrich, 1999). A variety of evidence supporting each of these mechanisms has been found to reduce stress and improve other health outcomes (Ulrich, 1999).

However, a more recent theory attempts to explain both aspects of reducing stress and restoring fatigue. This theory provides an integrative framework that combines both directed attention and stress within the context of the relationship between humans and the environment (Kaplan, 1995). It stipulates that there is a need to focus on the various factors that lead to stress, and in particular, that insufficient attentional resources will often lead to stress (Kaplan, 1995). It also attempts to incorporate the anticipated attention resource insufficiencies and lack of resource issues as an additional attempt to determine the factors that lead to stress (Kaplan, 1995). Although extensive discussion of these theories are beyond the scope of this review, it is important to consider their use in the context of this review and how they can provide an explanation for the results obtained. Public health is a broad discipline that has the ability to incorporate these theories into practical application as a way of enhancing the health of individuals and our communities.

2.4 Research Challenges

Much of the previous empirical work on the benefits of contact with nature (Ewert, 1998; Kaplan & Talbot, 1983; Ulrich, 1993) does not explicitly state how the level of human-made changes within an environment impacts on the benefits derived from that environment. Additional research should be used to complement these existing studies and determine at what point the level of human impact no longer affords these positive benefits (Mausner, 1996). There is also a need for "further empirical evidence

demonstrating the health and wellbeing benefits of contact with nature" (Maller et al., 2002a, p. 61), particularly in Australia.

There are a great number of wilderness therapy programs around, which aim to achieve rehabilitation, change delinquent behaviour, modify chemical and alcohol recovery, facilitate acceptance to disabilities and loss, provide spiritual renewal, facilitate team and character building, or provide physical challenge, however it is predominantly the use of the healing and inspirational elements and challenge opportunities within the wilderness experience that are used to accomplish these goals (Friese, Hendee, & Kinziger, 1998). These elements could also be influential among people who are travelling on a holiday and visiting a wilderness area for other reasons. There appears to be little research, if any, relating to average tourists and how their experiences in natural settings are characterised.

Some current techniques used to measure the benefits that humans expect to derive from an ecosystem are estimated via a monetary value, with the assumption that the monetary value is equivalent to that value placed on human welfare (Cox, in prep). Cox (in prep) believes that this is inappropriate in many situations as it fails to address the implications of human management on the wider aspects of human wellbeing. A better understanding of how a specific environment impacts on the health and wellbeing of visitors will help to better inform environmental management decisions. However, "given that the wilderness experience is a multifaceted phenomenon, it is not surprising that no single method (of measurement) will adequately serve the need of…" all stakeholders (Borrie & Birzell, 2000, p. 29).

There is an abundance of anecdotal evidence regarding the benefits from contact with nature, yet it is the empirical evidence and systematic collection of data that is lacking, especially within Australia (McDonald et al., 2000). The potential for health promoting environments in our societies is substantial, and quite possibly an untapped resource. The role of natural environments in upholding and maintaining human health and wellbeing is essential, yet an often forgotten aspect of healthcare, with many medical healthcare settings neither nurturing nor healing (Irvine & Warber, 2002). It has been suggested that this line of research could contribute to the Australian National Health Priority Areas, and specifically the areas of Cardiovascular Disease and Mental Health (Maller et al., 2002a). Maller and Townsend (2002a) suggest that there is a potential for health promotion

opportunities to be used as a preventative 'upstream' health measure, and the need of alliances between health promotion agencies, government departments, park management agencies and researchers. "Understanding the positive relationship between ecosystems and human wellbeing can potentially reduce the apparent conflict between environmental improvement and human interests, thus improving management of local ecosystems" (Cox et al., 2004, p. 1).

2.5 Conclusion

From the above discussion it is clear that there are a range of factors concerning the health and wellbeing benefits of contact with nature. A wilderness experience is one where visitors can 'enter' the natural landscape and experience the awe and wonder of its surrounding sights. For this context, health has been defined as a subjective experience that is difficult to measure and is intuitively known by the individual, while subjective wellbeing is how we evaluate our life circumstances. There is a wide range of physical, psychological, social and medical benefits that can be derived from contact with nature, as well as the potential for an increase in quality of life. Numerous factors, such as the number of visitors to an area and the demographics of the individual, all influence how a wilderness experience is perceived. Several theories have also been identified that are essential to understanding this area of work.

It is clear that there are a number of gaps in the current knowledge base that need to be filled in order for us to better understand and characterise the links between natural settings and human health and wellbeing. Tourists who visit natural areas appear to have not been studied from this perspective, along with comparisons between short and long stays. Social aspects of group interaction and the level of pre-existing health status are potential confounders and need to be incorporated into studies. Addressing these gaps will provide empirical evidence that could be used to encourage people to visit these areas, for example as an alternative to traditional health care, medication or psychiatric intervention. It is also significant to note that not all environmental exposures are harmful. Research of this type could have implications for the governing bodies of environmental and public recreation policy and management practices of natural areas in Australia. It may also influence the way we guard and manage natural resources (Stankey & Schreyer, 1987) and could lead to increased preservation.

3.0 Methodology

The previous section highlighted the gaps in the existing body of knowledge and identified that there is limited information regarding how the benefits derived from a wilderness experience among tourists are influenced by pre-existing health status, length of stay or the social connectedness among group members. This chapter presents the methodology to investigate these important relationships with the main aim to characterise the influences of a wilderness experience on the individual health and wellbeing among tour guests on Fraser Island.

Fraser Island is located off the south-central coast of Queensland, Australia. It is the largest sand island in the world (184 000 hectares) and was formed by the northward migration of siliceous sand from northern New South Wales (Environmental Protection Agency, 2005; F. Williams, 2002). World Heritage listed in 1992 (F. Williams, 2002), this island boasts more than 40 fresh water perched lakes (half the world's total), approximately 30 sandblows, brilliantly coloured sands, and a wide variety of vegetation, from tall rainforests and rich eucalypt forests to stunted heaths and foredune vegetation (Environmental Protection Agency, 2005; F. Williams, 2002).

Fraser Island and the nearby Cooloola National Park are the only places in the world where tall rainforest vegetation grows in sand (Environmental Protection Agency, 2005). It also has the purest dingo population known in Australia (Environmental Protection Agency, 2005). It is an "an outstanding global example of continuing biological and geological processes" (Environmental Protection Agency, 2005, p. 1). Aboriginal people, namely the Butchulla people, have occupied the island for at least 5000 years and have ranged in population of between 400 and 3000 people at any one time (Environmental Protection Agency, 2005). The island is a popular tourist destination and while it is proclaimed that 600,000 tourists visit the area (See Fraser Island, 2001), in actual fact it attracts about 350,000 tourists per annum and has been declining for a number of years (Fraser Island Management Committee, 2005). The only way to explore the island is via a four-wheel drive as all roads on the island are unsealed.

Fraser Island can be considered to be a 'Civilised Natural Environment' (Table 1 above on page 8), as it is accessible to human presence, allows for hikers and swimmers to utilise the area, and it has a high protection of existing natural elements and surroundings. However Fraser Island may not be a true wilderness area as it has been altered by humans. Even though it is listed on the World Heritage list, it most certainly has the characteristics to provide a wilderness experience to visitors. This is an environment where people are able to enter the landscape and visit areas of the island that are remote, isolated and have cultural significance. There is a sense of awe and wonder of the surrounding sights and the feeling that it's another world. All visitors to Fraser Island will bring their own values and social facets and derive an experience that is relative to their normal home or work experience.

Capra's perception of health will be employed for this research in combination with the WHO definition as they detail one's health as the wholeness of many facets, with the absence of disease while still being a subjective experience. The primary health care approach is the framework closest to this research in that it provides a framework for the identification of structures that support health while promoting community participation and involvement. There are holistic health benefits of park and recreations services, and the use of a proactive health promotion model will catalyse research into the links between the use of natural settings and personal health (Ho et al., 2003). As these links are subjective and unique for every individual, it is appropriate to leave the interpretation of these influences to each person, rather than the researcher.

Accordingly, the primary research questions for this research were:

1) What are the influences of a wilderness experience on the health and wellbeing of tour guests on Fraser Island?
2) Is the degree of health benefit derived from a wilderness experience on Fraser Island associated with:
    a. Level of pre-existing health and wellbeing status
    b. The length of the wilderness experience
    c. Level of social connectedness experienced among group members

The rest of the chapter explores the methodological processes that underpin this research. The research design process is discussed first, followed by the epistemology, theoretical

perspective, study boundaries, research family, research approach and actual research technique.

3.1 The Research Design Process

The research design seeks to explore these specific gaps and provide new insights into the factors that are influencing the individual health and wellbeing of tour guests who have visited Fraser Island. During the planning of this research project, a number of decision points were encountered where the option chosen had implications for decisions in other areas. As is typical of all research, decisions on one particular aspect of the research process will affect other facets of the project where this circular pattern of thinking links each step with all the others. This complex network of thinking, as outlined below in Figure 3, required several revisions of the original proposal outlines and clarification of the specific research questions.

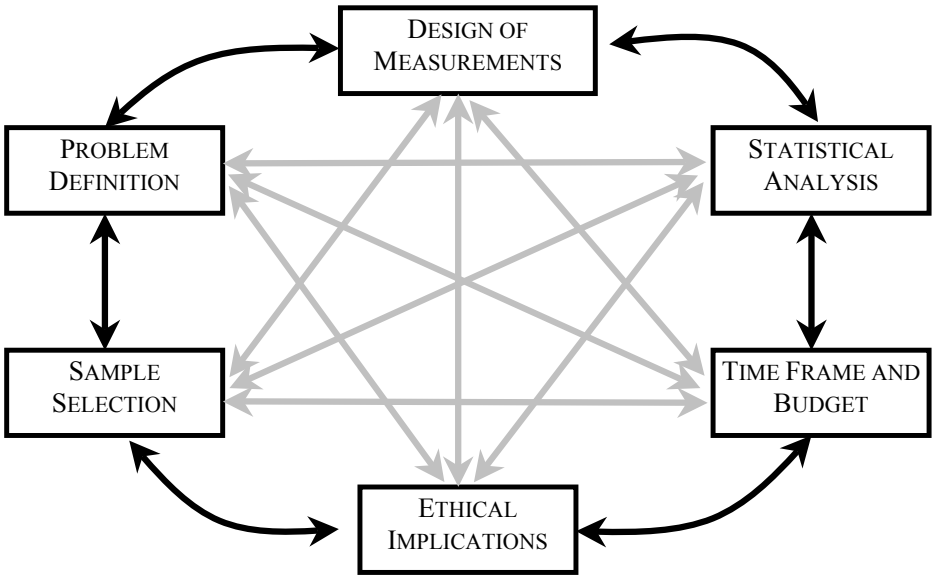


Figure 3: Research Planning Framework: adapted from Sapsford (1999).

3.2 Overview of methodology

"Different research perspectives make different kinds of knowledge claims, and the criteria as to what counts as significant knowledge vary from one to another" (DePoy & Gitlin, 1998, p. 7). Table 3 presents an overview of the research methodology utilised in this investigation. The following sections outline the rationales for the use of each of these research methods.

Table 3: Overview of Research Methods

Methodological Step	Outcome
Epistemology	Constructionism
Theoretical Perspective	Critical Theory, Grounded Theory
Study Boundaries	Time, money, availability of samples, access to situations, gaining co-operation, familiarity with topic, study location and target population.
Research Family	Qualitative and Quantitative: Mixed methods, Fieldwork
Research Approach	Survey with case study attributes
Research Technique	Questionnaire & face-to-face interviews

3.3 Epistemology

The epistemology behind an investigation provides the researchers with a basis to decide what knowledge is actually possible from their research and how they can determine if what they discover as a result of their research is "adequate and legitimate" (Crotty, 1998, p. 8; DePoy & Gitlin, 1998). The three main styles of epistemology are objectivism, constructionism, and subjectivism, which all have their own outlook on how knowledge is obtained.

This research is primarily looking at the links between the setting and the respondent and how that interaction is characterised in terms of health and wellbeing, therefore

constructionism is deemed the most appropriate epistemology for this research. Subjectivism is not appropriate, as this philosophical stance implies that meaning does not come out of an interaction between a subject and an object, "but is imposed on the object by the subject" (Crotty, 1998, p. 9). Similarly, an objectivist epistemology that states that meaning, and therefore meaningful reality, exist apart from the operation of any consciousness (Crotty, 1998) is clearly not suitable. In this view, respondent's understandings and values are said to be objectified, and if the research is conducted in the right manner, the objective truth can be discovered (Crotty, 1998). However, this is not appropriate in this research as respondents characterise their own influences of the wilderness experience on their health and wellbeing.

Crotty describes constructionism as how different people construct meaning in many different ways, even in relation to the same phenomenon that is being studied (1998). It is how respondents view an object or event and the personal meaning that they attribute to it that is important for the researcher to find out (Rubin & Rubin, 2005). For example, in this research it was expected that some respondents would see Fraser Island as a remote and isolated place. A greater insight as to how respondents would classify Fraser Island in terms of their own experience emerged from the data following their time on the island. "In this sense, multiple and even conflicting versions of the same event or object can be true at the same time" (Rubin & Rubin, 2005, p. 27).

In addition to understanding the epistemological underpinnings behind this research, which allows one to interpret and evaluate the quality of the research, the theoretical perspectives are also very important and are outlined below.

3.4 Theoretical perspective

The theoretical perspective of a research project is the philosophical stance that lies behind the chosen methodology (Crotty, 1998). Thus empirical research in a field such as psychology, sociology or economics that is based within an educational setting (Whitehurst, 2002), may use critical theory, grounded theory and interpretive approaches. This study has used elements of critical theory "to understand human experience as a means to change the world" (DePoy & Gitlin, 1998, p. 132). Much investigation using critical theory is to derive knowledge about human experience as a means to promote

social change and how social circumstances influence those thoughts and actions (DePoy & Gitlin, 1998; Miller & Brewer, 2003). Gathering data about how tour guests perceive their experience on Fraser Island with respect to their own health will provide knowledge to support programs and initiatives that can then be used as catalysts for promoting social change.

The second theoretical perspective employed here is grounded theory, which is defined as "the systematic discovery of theory from the data of social research" (DePoy & Gitlin, 1998, p. 137). This approach is structured and directed by the investigator and represents an integration of qualitative and quantitative thinking perspectives (DePoy & Gitlin, 1998) which is the essence of this research. "A query using a grounded theory approach begins with broad descriptive interests and through data collection and analysis moves to discover and verify relationships and principles" (DePoy & Gitlin, 1998, p. 138). The literature review has outlined a wide range of factors that may influence a persons experience in a natural environment and subsequently impact on their individual health and wellbeing. As data is collected and analysed, common trends and relationships between variables will become evident, which will be used to substantiate existing theories and principles and possibly inform the development of new theories for this research population.

Upon determining the epistemological view and theoretical perspectives behind this research, there was a range of limitations that had to be considered before further methodological steps could be developed. These are outlined below with reference to this project as a whole.

3.5 Study Boundaries

The frameworks discussed in the above sections 3.3 and 3.4 propose a study that involves respondents constructing their own meaning from the same phenomenon or wilderness experience and the researcher understanding the specific human experience by means of a highly specified research population. The aims of this study and the research questions were also used to guide the selection of the research methods. As the aim of the study is to characterise the influences of a wilderness experience on the individual health and

wellbeing among tour guests on Fraser Island, this limits the research population to only those visitors participating on tours of Fraser Island.

There are a number of practical considerations that must be considered before moving on. The foremost for this project is *time* (Blaxter, Hughes, & Tight, 2002), which is approximately nine months. This limits the study to one that can be quickly implemented to ensure sufficient time is left for analysis and reporting. The second important consideration is *money* (Blaxter et al., 2002). Although the total budget is $1500, this money is primarily for transport, production and material costs rather than labour.

The *availability of samples*, *access to situations* and *gaining co-operation* are other considerations that must be taken into account in the design of the research (Blaxter et al., 2002; DePoy & Gitlin, 1998). For this study, an existing relationship between the university and an ecotourism resort on the island, Kingfisher Bay Resort and Village (KBRV), was utilised. A relationship was also established with a second company, 'Sand Island Safaris', which is a tour company based in Hervey Bay (on the mainland near Fraser Island). They both allowed access to their tour guests. The reasons for choosing both of these groups are discussed below in section 3.5.1.

The final practical consideration is *familiarity with the subject under study* (Blaxter et al., 2002). Although the researcher began with minimal familiarity with both the research topic and target population, a substantial amount of literature had been consulted, as well as experts and academics in the field, to guide the research design. Previous research undertaken on the island regarding backpacker's interpretation of Fraser Island (Azzopardi, 2003) has also provided some valuable insights and aided in the selection of the methodology based on what has worked effectively in the past.

3.5.1 Research population

The research population is a group of people who share a set of common characteristics that are a well-defined collection of elements that the researcher uses to select a sample from (Arber, 2001; DePoy & Gitlin, 1998). The foremost criterion in this research was that people must have just immediately completed a guided tour of Fraser Island. As one of the research questions is to determine if the degree of health benefit derived from a

wilderness experience is associated with the length of that experience, it was necessary to choose two distinct groups to enable a comparison of results.

A basic criteria for comparison was that the tours were as similar as possible except for the length of the tour. One of the research partners offered three-day tours of the island with a maximum of 16 passengers. This small group number also allowed a comparison between large, impersonal groups and smaller, personal ones such as this. After reviewing the three-day itinerary, a comparison one-day tour group was selected from three possible choices which could carry a maximum of 40 passengers. This one-day group, the Discovery Tour, enabled passengers to depart the mainland in the morning and return in the evening. Both of these groups were not known to attract a specific demographic profile (such as backpackers or 18-35's), which enabled the research to be as broad as possible across the population. It was also a requirement for all respondent's to be 18 years or older to ensure ethical obligations were met. The Discovery Tour was chosen as a limiting boundary for this study as it most closely compared to the itinerary of the three-day group Table 4 below. It did not go to Lake McKenzie, which is the most popular lake on the island (F. Williams, 2002), while the other two one-day tours, Ultimate and Beauty Spots, did (see Table 4). The Beauty Spots Tour was also eliminated, as it was only available to Kingfisher Bay Resort and Village guests, which may have confounded the results.

Table 4: Comparison of Fraser Island Tour group types and destinations

Sites Visited	Three-day group	One-day Group - Discovery	One-day Group - Ultimate	One-day Group – Beauty Spots
Stonetool Sand Blow		✓		✓
Hammerstone Sand Blow	✓		✓	
75 mile beach	✓	✓	✓	✓
Eli Creek	✓	✓		✓
The Pinnacles	✓	✓		✓
Maheno Wreck	✓	✓		✓
Champagne Pools	✓			
Indian Head	✓			
Eurong Beach Resort	✓	✓	✓	
Central Station	✓	✓	✓	✓
Pile Valley	✓		✓	✓
Basin Lake		✓		
Lake Birrabeen	✓			
Lake Wabby	✓		✓	
Lake McKenzie			✓	✓

3.5.2 Research Setting

This research took place on the western side of Fraser Island on the barge and ferry routes. The one-day group arrive and depart the island on a large catamaran between Urangan Boat Harbour on the mainland and Kingfisher Bay Resort and Village. This trip takes between 30 and 50 minutes depending on the tide, and is approximately 15 kilometres. The three-day group arrive and depart the island on the vehicle barge between River Heads and Wanggoolba Creek, which takes about 25 to 40 minutes to cross and is approximately eight kilometres.

In line with constructionist epistemology, it was decided that the best time to implement this research project would be as the guests were leaving the island. The one-day group always left the island on the five o'clock catamaran from Kingfisher Bay Resort and Village and arrived at Urangan Boat Harbour between 5.30pm and 6pm. The three-day tour group always departed the island at Wanggoolba Creek at either 2.30pm or 4pm and arrived at River Heads either 3pm or 4.30pm respectively. This time and setting for implementation also meant that the researcher had a captive audience for a specified amount of time and ensured that the project impacted as little as possible on the respondents' actual tour of the island.

3.6 Research Family

Research families are the general strategies of inquiry that researchers use while conducting their research (Blaxter et al., 2002; Creswell, 2003). There are two alternative research dichotomies – quantitative/qualitative and deskwork/fieldwork. In a practical sense, qualitative and quantitative research are not isolated from each other; research operates on a continuum between the two with studies *tending* to be more one way than the other (Creswell, 2003). As the collection and analysis of both forms of data were combined in this study, it is known as the mixed methods approach (Creswell, 2003). In this particular case, it is felt that by combining methods from both the qualitative and quantitative realm, biases and pitfalls to any one method will neutralise or cancel the biases and pitfalls of the other method (Creswell, 2003). This means that the researcher

was able to seek this allowed convergence or triangulation between both methods (Creswell, 2003; DePoy & Gitlin, 1998).

According to Cresswell (2003), there are six major types of mixed methods strategies that involve whether the data collection occurs concurrently or sequentially, and whether it is exploratory, explanatory, nested or transformative. For this research, a concurrent nested strategy was chosen as there was only one data collection phase, both qualitative and quantitative data are collected simultaneously, information is sought from different levels of the participant, with the data collected being mixed during the analysis phase of the project. The strengths with using this approach include that both qualitative and quantitative data can be collected in an efficient manner and that the researcher can gain different and complimentary perspectives from the varying types of data (Creswell, 2003).

The second general family for doing research is the distinction between deskwork and fieldwork (Blaxter et al., 2002). Through the process of a literature review (as outlined in section 2.0 above), extensive deskwork was conducted to devise a suitable range of research questions and aid in the development of a useful research tool. However, this research involved the collection of data from the field (Blaxter et al., 2002). When a researcher conducts fieldwork, their aim is to enter the natural setting without altering or manipulating its conditions, with fieldwork often considered a significant component of naturalistic inquiry (DePoy & Gitlin, 1998). The purpose for the fieldwork in this research was to understand the phenomena occurring on Fraser Island between tour guests and the natural environment.

3.7 Research Approach

Based on the findings of the literature review in section 2.0 and after bearing in mind the practical considerations, the research aims and questions, and the research family as outlined above, a case study encompassing a survey (Yin, 2003) was selected as the most appropriate research approach for this project. A variety of research approaches were examined, for example, an action research approach was inappropriate as this project did not involve a change intervention (Blaxter et al., 2002), and an experimental approach was also inappropriate as this project did not involve the manipulation of an independent

variable (Blaxter et al., 2002). The project was considered a case study as it focused on just one setting (Fraser Island), the researcher had little control over the events, there were multiple data collection methods, the focus was on a real-life phenomena and the purpose was to describe the phenomena and examine the relationships (Blaxter et al., 2002; A. Davis, 1998; DePoy & Gitlin, 1998; Sarantakos, 1993; Yin, 2003). Triangulation, as stated above, is also a basic strategy in case study design (Yin, 2003).

While DePoy and Gitlin (1998) state that a case study is an excellent theory-generating tool; this research attempted to provide further evidence for already specified theories. In this sense, this deviates from the case study methods as described bye Sarantakos (1993), who also proposed that case studies have an element of openness where there is no restriction or standardisation in the methods of data collection. This was not applicable to this research as there were pre-determined research questions and standardised scales within the survey. Case studies are often used to collect information from subjects over a sustained period of time (Creswell, 2003), which was also not the case for this research. A common misconception regarding case studies is that they are based on a single 'case', however it is justifiable to use an approach with multiple cases (A. Davis, 1998; Yin, 2003), as in this project. Considering this, the context of the case study with respect to this project was that it was more of a research model than a method of data collection (Sarantakos, 1993), which was a survey in this instance.

One of the most common approaches used to carry out small-scale research is the use of the survey (Blaxter et al., 2002). Surveys are utilised to ask specific groups of people questions on either a range of topics or an explicit idea. It is a method of collecting information by asking a set of pre-formulated questions (Blaxter et al., 2002). The main strengths of using this approach for this research were:

(a) it gave an account of the extent as well as the nature of the wilderness experience phenomenon (Davies, 1994);
(b) the responses from each individual respondent were combined with the responses from other respondents to produce results which were applied to the whole sample (Blaxter et al., 2002; Davies, 1994);
(c) the questions were designed to be as non-leading and unbiased as possible, thus improving the validity of the results (Blaxter et al., 2002); and

(d) the survey can be used again on similar populations if replication of the results is necessary (Blaxter et al., 2002).

Following the above discussion, it is clear that this case study research encompassing a survey is the most appropriate approach for this research. This approach takes into consideration the constructivist stance of the research and the use of critical and grounded theory perspectives. The implementation of a survey with case study attributes ensures that restrictions on time, money and access to samples are not compromised.

3.8 Research Technique

3.8.1 Survey Type

There are three main types of surveys to consider: face-to-face interviews, telephone interviews, and self-administered questionnaires (Sarantakos, 1993). As there is a wide range of information to be collected from participants, face-to-face interviews as the primary survey method would be time consuming, along with the possibility that the researcher's presence could influence the responses (Creswell, 2003; Sarantakos, 1993). Due to the research taking place aboard large catamarans, lengthy face-to-face interviews would be difficult due to high background noise and the close proximity of other people, which could result in people being less articulate and perceptive (Creswell, 2003). Telephone interviews were also ruled out due to cost, the added work of chasing people up and the researcher's reluctance to collect personal information and remove the anonymity from the project (the ethical considerations will be discussed below in Section 3.10 on page 56). Both of these survey types were also rejected due to the nature of the project, that is, health data was to be collected and by talking to someone else about health issues could make some people uncomfortable and possibly upset them if the issue was sensitive (Blaxter et al., 2002).

A self-administered questionnaire was deemed to be the most appropriate primary survey method for this research. This type of administration is especially effective in obtaining potentially sensitive data as there is no researcher present during the completion of the questionnaire (Bradburn, Sudman, & Wansink, 2004). However, a limitation associated

with this method is the varying literacy and language skills among respondents (Davies, 1994). The population that was surveyed did include many international tourists; therefore the type of language used in the questionnaire would impact on respondent selection. Most surveys rely on self-reported data, which may have been a problem here if respondents were not entirely honest (Huffman, 2004), although self-completion does make over-reporting and under-reporting less likely (Bradburn et al., 2004). Also, another disadvantage is that respondents have limited control over asking questions, and cannot easily clarify their answers (Davies, 1994).

To address some of these limitations, the self-administered questionnaire were followed up with voluntary and brief face-to-face interviews in order to get a more detailed perspective on some of the issues raised (Blaxter et al., 2002; Hawe, Degeling, & Hall, 2002). These interviews were mostly conducted one-on-one, with some respondents preferring to participate in small groups. Triangulating these two methods helped to verify the validity of the information being collected (Blaxter et al., 2002; DePoy & Gitlin, 1998). The use of the two approaches also allowed for the development of a more comprehensive understanding of their wilderness experience (DePoy & Gitlin, 1998).

3.8.2 Questionnaire Design

To initiate the questionnaire design process, a table was devised to clearly outline the themes, categories and variables of interest. The basis of these was derived from a thorough review of the literature (Table 2 on page 18), with the development of the research questions arising from the gaps exposed in the literature. The research questions guided the themes; and the categories and variables were developed based on the findings of the literature review regarding factors influencing the individual health and wellbeing of people participating in a wilderness experience. The main themes in this research were motivations and purpose; perceptions of the experience; subjective wellbeing; self-reported health status; and the trip characteristics and personal demographics (Appendix A). Next, existing questionnaires on similar themes, categories and variables were consulted; some of which had been conducted with a similar target group or sample. A list of possible question formats and response categories were identified from these questionnaires, and were reviewed in conjunction with the themes table.

Many of the questions and entire scales or instruments chosen for inclusion have been used in similar research and/or have existing national data to aid comparisons. The final group of questions and instruments were narrowed down to be the most clear and concise, while ensuring that all variables identified in the themes table were included. The response types in this questionnaire mainly included Likert scales, open-ended writing areas, and 'complete the sentence' questions. These were all straight forward for the respondent with many questions using numerical rating scales.

Following is an outline of how each theme and category was considered and where the relevant questions were derived from. Here, the existing literature provided a range of likely influencing factors to include in the questionnaire, with the instrument being assembled from components of other instruments as well as additional questions. The sequencing of the questions was based on a logical progression of topics with demographic data at the end of the survey, and potentially sensitive health questions in the second half of the questionnaire to try and reduce the non-completion rate. For a more detailed account of the actual questions that were asked and the order that they were asked in, refer to Appendix B, which is a copy of the questionnaire.

- *Theme 1: Motivations and purpose*

Motivation is simply the reason people behave the way they do (Matlin, 1999). Whether it be intrinsic motivation (personal enjoyment of a task) or extrinsic motivation (obvious external reward or threat of punishment) (Huffman, 2004), managers of natural environments need to be able to identify the motivations driving visitors so that they can meet visitor's needs and enhance their satisfaction (Graefe, Thapa, Confer, & Absher, 2000). Some research has found that "leisure is often social and primarily characterised by feelings of enjoyment, relative freedom, and intrinsic motivation" (G. C. Godbey, Caldwell, Floyd, & Payne, 2005). In this research, it was considered a confounding factor, as the main reason a person visits Fraser Island will influence just what they derived from that experience.

This theme included the factors that people take into consideration when they choose to go to Fraser Island and was broken into two main questions. The first question on the questionnaire was to establish the main purpose or reason why people were going to Fraser Island in the first place. These response categories were derived from the

Framework for Australian Tourism Statistics (Australian Bureau of Statistics, 2003) who originally used 13 different variables. These were reduced to eight that were considered the most appropriate for the Fraser Island context, for example 'shopping' as a reason to visit the island was excluded.

The second part of this theme assessed the importance of a range of factors in respondents desire to visit Fraser Island, such as the importance of the natural aspects of the island and the activities and attractions that were offered; the importance of the personal factors and the social interaction with others; and the practical importance of venturing to Fraser Island. These categories and subsequent variables were developed with the help of the Visitor Survey Program for the Kakadu National Park (Department of the Environment and Heritage, 2002) and a study conducted in Canada comparing motivations of people visiting a wilderness area close to a city and against an area distant from a city (Ewert, 1998). There were a large number of motivational factors and these were reduced to a number that still covered the desired categories listed above.

- *Theme 2: Perceptions of the Experience*

This second theme of the questionnaire looked at how people perceived the environment around them and their experience on the island. Respondents were asked about the most positive and negative aspect of their visit to Fraser Island, which were modelled on two questions that were proposed for a study investigating the Benefits of Open Space Use in Melbourne (Townsend, 2004). As these questions were close to the beginning of the questionnaire, respondents were only able to draw on their own experiences and perceptions, rather then being prompted with previous questionnaire items. An assumption made here was that some respondents would state that their visit had impacted on their health, or impacted on an aspect of their life that is related to their health. These open-ended questions yielded qualitative data with responses being categorised for data analysis.

The next series of questions in this theme aimed to identify aspects of one's experience that were perceived to make them feel positive or negative. There were four questions relating to the direct impact of the environment, two for education, two for emotions, four for social and two for facilities. These latter groups were considered indirect aspects of the experience. They were developed using previous examples in the Benefits of Open

Space Use proposed study in Melbourne (Townsend, 2004) and a survey assessing the effects of coastal recreation on human health (Cox, in prep). Using these two studies as a guide, the questions were modified to ensure the response categories were centred around a neutral position.

A group of questions that appeared towards the end of the survey were about how respondents perceived any change in how they were feeling as a result of visiting Fraser Island. The ideal way to determine this change would have been to use a pre-test post-test research design, however this was not possible for this research. Considering this, respondents were asked to rate how positive or negative the change made them feel, such as "the change in my level of stress has been…". These questions were designed to be as non-leading as possible and allow the respondent to use entirely their own judgement when answering.

Another significant section of this theme was the use of the Perceived Restorativeness Scale (PRS). It was designed to measure the restorative potential in a given environment or setting (Hartig, Kaiser, & Bowler, 1997). Restorative environments are acknowledged to help people to renew their psychological resources, which are needed for effective functioning (Hartig et al., 1997). "The design and management of restorative environments can be aided with an instrument for measuring qualities of restorative person-environment transactions" (Hartig et al., 1997, p. 2). The scale is based on the constructs set out in the Attention Restoration Theory, which was described above in Section 2.3. These constructs are Being Away, Fascination, Coherence, and Compatibility. A whole range of studies have incorporated this scale into their research (Hartig, Korpela, Evans, & Garling, 1996; K. Korpela & Hartig, 1996; Lauman et al., 2001; Ogryzlo, 1998; Tenngart & Hagerhall, 2004) with many finding that the PRS sale was significantly and positively correlated with affect measures. This scale was reprinted as a standardised instrument and analysed according to the procedures specified by the authors.

The perception that a person has of the environment around them is also influenced by their person to person interactions, and are just as important as their person to place interactions (Pretty et al., 2003). Social capital is a complex phenomenon and has been described as an elusive concept (Stone & Hughes, 2002). There is much evidence that

social capital has clear relationships with other measures of wellbeing such as health, crime rates and economic production (Cox, Johnstone, & Robinson, 2003; Kawachi, Kennedy, & Lochner, 1997; Lomas, 1998). As there are numerous elements comprising social capital, it was not practical within the confines of this research to measure all aspects, such as common purpose, network structure and sense of efficacy (Edwards, 2004). Social interaction has been found to correlate well with health (Cox et al., 2003). It is also known that open spaces or natural environments increase opportunity for social interaction, therefore enhancing health (Morris, 2003). The following indicators of social connectedness were included in this questionnaire as they can be experienced in wilderness-like settings (Frumkin, 2001), and can be measured quite easily (Cox et al., 2003).

A significant aspect of social capital is trust, which is considered to be important for many social encounters (Edwards, 2004). The degree to which we trust each other in a particular setting is noted as one of the most important determinants of health (Lomas, 1998). It is necessary to measure this among travellers to Fraser Island because a lack of trust between people and communities results in higher incidence of coronary heart disease, stroke, and among others, unintentional injury (K. Lochner, Kawachi, & Kennedy, 2003) and could significantly impact on the wilderness experience as a whole. Lack of trust may also act as a barrier to any perceived benefits that travellers may gain while exploring the island.

Reciprocity, which is the law of 'doing unto others as they do to you', is a form of mutual attraction or giving and taking between two people (Edwards, 2004; Vaughan & Hogg, 2002). It has also been found to be significantly correlated with crime rates and health (Cox et al., 2003), and may possibly be higher among travellers to remote destinations such as visitors to Fraser Island. Diversity was also something that was measured in this questionnaire. The diversity of the social relations among a group of people, such as ethnic or educational diversity, or the tolerance of diversity within a group, is an element that can be measured effectively (Stone & Hughes, 2002). A total of three questions for trust, reciprocity and diversity were obtained from the *Families, Social Capital and Citizenship* project undertaken by the Australian Institute of Family Studies (Stone & Hughes, 2002). These questions were chosen over others, as they were simple to replicate and straight forward and the results could be compared to that obtained in the study.

The final two questions assessing social interaction were pertaining to the level of cooperation that visitors would feel with management (or their tour driver) while on Fraser Island. These questions and response categories were derived from an Australian Framework used by the Australian Bureau of Statistics to measure social capital (Edwards, 2004). One of the questions was specifically investigating how likely people are to *not* wear sun protection cream while swimming in the lakes on Fraser Island to ease pollution on the natural environment. This is a practice that is currently in place on the island, so the results may be a catalyst for future change in communicating this requirement.

Another area that was devised to determine the perceptions that people had of their experience and the influence on their health was two questions that were included to give people a chance to convey how they thought their visit had influenced their own health and general feelings in both a positive and negative way. This question was developed by the researcher where it was decided to use an open ended format, as this did not restrict the answers to prescribed categories (Bradburn et al., 2004).

- *Theme 3: Subjective Wellbeing*

There are three parts to subjective wellbeing (Diener et al., 1997; Eckersley, 2004). The first one is the satisfaction with life as a whole and satisfaction with specific domains of one's wellbeing. The second is pleasant or positive affect which looks at emotions such as joy, affection, and pride; while negative or unpleasant affect assesses emotions and moods such shame, guilt, anger, and anxiety (Diener et al., 1997; Eckersley, 2004). As each person is in a privileged position to report on their own experiences and their feeling of wellbeing, the self-report method is considered the most appropriate for this construct (Bowling, 2005; Diener et al., 1997; Matlin, 1999).

A scale assessing the satisfaction with specific domains of a persons life is the Personal Wellbeing Index (*Personal Wellbeing Index - Version 3*, 2005). This forms part of the Australian Unity Wellbeing Index, which is a national wellbeing index that aims to promote greater public and political awareness of the social factors underpinning wellbeing, as well as enhancing scientific understanding of subjective wellbeing (Cummins, 2005). It includes eight items on the instrument in which respondents rate

various aspects of their personal wellbeing between completely dissatisfied (0) and completely satisfied (10). An advantage of using this scale is that respondents can assess each domain however they like and weight each statement in a way applicable to them. The entire scale was designed to gauge people's life satisfaction over time and then compare across demographic groups. It was originally utilised for quarterly telephone surveys with around 2000 Australian adults, whereby they responded to two main sections: the Personal Wellbeing Index, and the National Wellbeing Index (Cummins, 2005). The former refers to eight aspects of people's personal lives and is what was used for this research, while the latter looks at the level of satisfaction with six aspects of national life (eg. economic situation, natural environment, government), which was not relevant to this research.

To measure positive and negative affects associated with subjective wellbeing, the Positive and Negative Affect Schedule (PANAS) was used. Developed by Watson and Clark (1988), this is a 20-item self-report scale that assesses positive and negative emotional responses by the individual to specific events (Watson & Clark, 1988). The two scales have good internal consistency ($\alpha = 0.88$) and test-retest reliability (Watson & Clark, 1988). This scale has been used previously in investigations between stimuli that generate positive affect (ie. good feelings) and the natural environment (Bagot & Gullone, 2000) and associations between stress and renewal associated with time spent bushwalking (Thompson, 2001).

- *Theme 4: Self-reported health status*

As this research was assessing health and how it is linked to one's experience on Fraser Island, it is only fitting that a health scale be included. As only one data collection could be undertaken, and considering that the respondents are only spending a limited time on the island, it was decided to assess generic health status in the previous four weeks before coming to the island. This was done using the SF-8 Health Survey which is a multipurpose survey of health status that was designed for both brevity and comprehensiveness (Ware, Kosinski, Dewey, & Gandek, 2001). It was originally developed from the SF-36, which is a 36-item scale, with the data obtained using the SF-8 being directly comparable to health data that is derived from the SF-36. As there were many different themes that were to be measured in this research, this eight-item scale was

ideal as it only takes 1-2 minutes to administer. This scale has also met a high degree of acceptability and has been shown to yield high quality data (Ware et al., 2001).

- *Theme 5: Demographics*

As with all social research, the personal demographics are important to collect and are usually asked at the end of a questionnaire (Bradburn et al., 2004), which was the case here. Gender, age category, description of home life (ie. single or family), educational qualifications, work status, Aboriginality or Torres Strait Islander status, ethnic background, language spoken at home and current country of residence were all used as stratifying variables as they could impact the results. These questions were developed from a combination of other surveys and questionnaire methodology texts such as Bradburn, Sudman and Wansink (2004), and for example, the country of residence question was an open-ended question that was categorised according to the Standard Australian Classification of Countries (SACC) developed by the Australian Bureau of Statistics (2003).

Also in this theme were trip characteristic questions. These included how many nights respondents were staying on the island (if any), the previous activity the respondent was involved in immediately prior to visiting Fraser Island, who they were travelling with, their level of satisfaction with the tour, their expectation of the number of visitors to the island, their familiarity with the island and how often they visit areas similar to Fraser Island. These were simply used to characterise the trip itself to better understand the type of trip respondents took. These questions were developed with the help of the Kakadu National Park Visitor Survey (Department of the Environment and Heritage, 2002); a survey characterising wilderness users (Ewert, 1998); a proposed study looking at the health, wellbeing and social capital benefits of open space use (Townsend, 2004); and National Health Survey for Australia (Australian Bureau of Statistics, 1997).

- *Standard items recorded during collection*

During the course of the data collection, it was necessary for the researcher to record specific items on the back of each survey. The date of the trip, and the amount of cloud cover and wind strength were assumed to influence people's experience on the island. It was also necessary to record the name of the tour driver as their level of experience and

commentary could also influence the outcomes of the day. This was also applicable to the number of passengers that were aboard each tour.

- *Name of the survey instrument*

After considering all the above elements that were to be included into the questionnaire, a name for the entire instrument had to be devised. Bearing in mind the audience to which would be completing the questionnaire and the type of information that would be required from them, *Visitor Experience and Health Survey* was chosen as the title of the questionnaire. These were designed to be non-threatening, however still convey the purpose of the questionnaire without pre-empting responses. It should also be noted that at the very end of the questionnaire there was a small message to each respondent, thanking them for their time and wishing them the best for the rest of their journey. Bradburn, Sudman and Wansink (2004) recommend that this is a great way to end a questionnaire. As much as possible, the wording for each question used was kept fairly basic in an attempt to ensure that it reflected the language of the user rather than the researcher. The questionnaire was also broken up into manageable sections with appropriate headings and clear instructions that gave respondents 'small chunks' to complete.

- *Format design of the questionnaire*

The overall format of the questionnaire was designed to provide a good first impression of the research to the potential respondents. An effective design was used to aid easy completion for the respondent's and for efficient data entry. A professional paper based booklet was used inline with that recommended by Bradburn et al (2004), and Sarantakos (1993) which comprised an A5 booklet (standard A4 paper folded in half), which made the survey look smaller, enabled printing on both sides (reducing printing costs), and was small and sturdy enough for respondents to fill in without using a table or other hard surface. Bradburn et al. (2004) established guidelines pertaining to colour, typeface, layout, style and overall impression of the survey, which aided in the development of this survey booklet.

- *Research Project Information Sheet*

The Research Project Information Sheet was handed out with the questionnaire to all respondents (Appendix C). This included the description and purpose of the research,

how the visitors could become involved, the few specific requirements for participation, the beneficiaries of the research, the ethical obligations to the respondents, and contact information for the research team. As this document was two A4 pages of writing, it was not expected that every respondent would read it word for word, so major important points were bolded. The components of the document were required to satisfy obligations to the Human Research Ethics Committee at the University of the Sunshine Coast, and were also endorsed as significant sections in Sarantakos (1993).

3.8.3 Questionnaire administration

There are four main methods of delivering self-administered questionnaires to consider: one-to-one, group, semi-supervised and unsupervised. Group self-administration is deemed most suitable for this research project, that is, where the questionnaire is administered in a group setting such as a classroom (Bradburn et al., 2004), or in this case, aboard the catamaran upon departure of the island where respondents completed an individual questionnaire. This method is relatively inexpensive (Davies, 1994; van Krieken et al., 2000), and although reasonably time-consuming for the researcher, it provides a greater ability to ensure the correct people complete and return the questionnaires (Bourque & Fielder, 2003). Furthermore, it means that all respondents completed the survey in a similar environment. Although different research assistants accompanied the primary researcher during each administration, the development and adherence to a set of formal administration procedures helped improve the consistency of verbal instructions and how questions and comments were handled (Bourque & Fielder, 2003).

The main aim of the questionnaire administration was to ensure a balance between maximum successful completion of the questionnaire and that the research impacted as least as possible on the respondents' trip to Fraser Island. The potential respondents who had just completed a one-day tour were all located on one (and occasionally two) large 4WD coach/es. As a number of different coaches were arriving each afternoon/evening into the resort, selecting the right bus was done by approaching each bus as it arrived and consulting with the driver. After conferring with the required driver, checking passenger numbers and that there were no untoward circumstances, the researcher and her assistant proceeded to the jetty, where the potential respondents were to depart the island.

As small groups of people passed the researcher and her assistant, they were initially asked if they were part of the Discovery Tour, then briefly introduced into the project. The time taken for completion of the survey, the anonymity of the respondent, and the fact the researchers were accompanying the respondent on the catamaran back to the mainland were all conveyed in less than 30 seconds. The respondents often had time to start or complete the questionnaire before boarding the catamaran. Once aboard, the researcher and assistant did not interrupt or 'hover' around people completing the questionnaire, but checked on them after about 10 minutes into the trip. From then on it was simply a matter of keeping an eye on respondents, especially if they had any questions, and ensuring that the questionnaire was collected with a minimum of fuss and that gratitude was expressed.

Implementation of the questionnaire with the three-day group was similar, except that the tour bus was easily identifiable. The driver did a small introductory chat quite often, which was followed by the researcher conducting a quick talk with all potential respondents. As these three-day groups were small, this was easy and effective to do. The researcher and her assistant then travelled on the vehicle barge back to the mainland while the respondents completed the questionnaire. During all times of the administration, both the researcher and her assistant were easily identifiable with nametags, making it easy for respondents to recognise them if the need arose.

3.8.4 Face-to-face interview design

In this study, the researcher used non-structured interviews as a way to get as close to the data as possible and explore the varying opinions and thoughts about the impact the Fraser Island environment has had on ones health and wellbeing (Appendix D). As time was short, the interviews had to be brief; usually only a few minutes. The first question was "has there been an particular times or events that you think influence your health?" The aim of this question was to be as non-leading as possible and to give the respondent an opportunity to verbalise specific influential moments in a way they felt most comfortable with (Rubin & Rubin, 2005). The second and final question was "do you have any suggestions for management or other visitors to Fraser Island that would

improve the impact on their health?" These open-ended questions were quite general and easily answerable after completing the questionnaire.

3.8.5 Face-to-face interview administration

It was the last question on all questionnaires that invited respondents for a three-minute interview with the researcher (as described above), if time permitted. The researcher wanted to make the interviews as informal as possible, taking the form of a discussion (Blaxter et al., 2002). Occasionally the one-on-one discussion would evolve into a group discussion as surrounding people 'tuned in'. When probing for suggestions or other comments, the researcher made sure that the respondent knew she was not associated with any party other than her own university. Initially it was thought the researcher would record the discussion using a pre-designed paper proforma, however the researcher felt this was intruding and broke up the flow of the discussion. To compensate for not recoding the discussions in this circumstance, the researcher spent the time at the mainland terminal and on the return catamaran journey to the island recalling the specifics of the discussion. This practice was considered to be the least threatening for the respondent and aided in the creation of a relaxed atmosphere.

3.8.6 Summary Table of Techniques

From the above discussion, Table 5 below outlines the characteristics of this research that are qualitative, quantitative and how the research was carried out. Although this research contains many qualitative concepts, much of this was quantified for ease of analysis.

Table 5: Qualitative and Quantitative aspects of this research

Qualitative	Quantitative
● Exploring a phenomenon in as much detail as possible	● Non-numeric answers will be categorised and coded in numeric form
● Constructivist philosophical assumptions	● Seeking the causes of social phenomena
● Aims to achieve 'depth' rather than 'breadth'	● Outcome-orientated
● Subjective experience of individuals	● Assumes a stable reality
● Opened-ended responses from questionnaire	● Identification of variables to study
● Concerned with understanding a respondents behaviour from their own perspective	● Qualitative data often includes quantification eg. excellent, very good, good, fair, poor, very poor.
● Grounded, exploratory, and descriptive	● Survey using questionnaire
● Multiple methods that are interactive and humanistic	● Predetermined instrument yields statistical data
● Emergent rather than tightly prefigured ie. data collection process evolves to gain greater understanding	● Closed-ended questions
● Mostly ungeneralisable: the data can only be applied to Fraser Island	
● Takes place in a natural setting ie. the researcher goes to the site	
● Researcher makes an interpretation of the data	
● Holistic, broad, panoramic view of phenomena	

Developed using: (Blaxter et al., 2002; Creswell, 2003)

3.9 Sampling Methods

The characteristics of the sampling in this study display probability and nonprobability theory principles. This research used *Cluster Sampling*, which involved the random selection of sampling units (DePoy & Gitlin, 1998), in this case Tour Buses. This

sampling method allowed the researcher to randomly select tour buses that contain the smaller sampling units of interest: the respondents, however it was not possible to randomly select the tour bus on the day (as there was often only one bus) - the day in the week was a random selection. Using cluster sampling does however increase the standard error of the sample because elements within the cluster tend to be alike (Arber, 2001), that is the people on each specific tour bus have almost identical tour experiences throughout the day.

As the researcher did not have a sampling frame, which is a complete list of all members of that tour group on that day, and the tour groups were a maximum of 40 people, it was decided that there were not enough potential participants for randomisation within each cluster (tour bus). For this part, nonprobability methods were implemented. This involved *Convenience Sampling*, which was where the researcher defined inclusion and exclusion criteria, then selected individuals who fit those criteria and who volunteered to participate in the study (DePoy & Gitlin, 1998). This method was particularly useful, and led onto some respondents volunteering to complete an interview.

3.10 Ethical Considerations

The range of ethical considerations were well thought-out before embarking on the research. The research proposal and questionnaire gained approval from the Human Research Ethics Committee at the University of the Sunshine Coast before implementation. The following is a more detailed account of the ethical considerations that were undertaken before and during the implementation of this research.

To make the research implementation simple and straightforward, it was decided that if respondents volunteered to participate after they were informed of the general nature of the research, then this was considered to be their *informed consent* (Bradburn et al., 2004). As no identifying information was collected, respondents had a strong feeling of *anonymity* (Bradburn et al., 2004), which was aimed at increasing the participation rate. The Research Project Information Sheet also invited the respondents to contact the researcher or the chairperson of the ethics committee with any matter of concern, which would have reassured some respondents that this research was *genuine* and its governing bodies were prepared to be accountable.

From the researchers point of view, it was essential that all respondents had the right to *full disclosure* of the purpose of the research and what was required of them (DePoy & Gitlin, 1998). The researcher and her assistants all had to ensure that a respondent knew that participation was totally voluntary, that it was anonymous, and the purpose of the research before they accepted to become involved. If for any reason a respondent decided not to complete the questionnaire or pull out for another reason, the researcher ensured both herself and her research assistants respected that decision and did not ask any further questions. As all research involving humans may have severe *consequences* for both the respondents and the researcher (Bulmer, 2001), utmost care was taken during the development of the questionnaire and during implementation to ensure no parties came to *harm* or were disadvantaged. Another minor ethical consideration for this research project was the selection of paper type for the printing of the questionnaires and Research Project Information Sheets. This paper is made by StoraEnso (2005) (a European Company) and was selected based on environmental and sustainable considerations. The researcher was not satisfied that paper made in Australia did not come from old growth forests.

3.11 The Pilot Study

The draft questionnaire was pilot-tested with the researchers' family and friends including a number of academics within the university environment. This was to ensure the content and format of the instrument was appropriate and understandable. As the researcher had been unable to explore the site where the implementation was to take place, the first trip to Fraser Island during data collection was also a time to gather information about the practices and environmental conditions of the area. This first data collection doubled as a pilot test, in that the researcher was looking at how respondents handled the questionnaire and if their responses were sensible. This first group of respondents did not know the questionnaire was not the final version (Bradburn et al., 2004), so their reaction would be comparable to those respondents in the main study. The questions posed in the face-to-face interviews were also closely monitored, with no alteration being necessary. During this first trip, the researcher also trialled the logistical operations of the implementation, such as coordinating catamaran and 4WD transfers.

Following the pilot run, only minor changes to the wording of some questionnaire items were done, such as in question 2.3 '…predominant/main mood/feeling…' became '…predominant/main feeling/mood…'. Considering these changes were small, the initial samples obtained in the pilot study were subsequently included in the remainder of the analysis. It was also noted that the researcher found it difficult to identify bus numbers prior to their arrival back at the resort. Attempting to introduce the project to potential respondents while they were still on the tour bus was not effective as they were anxious to disembark and visit amenities and the souvenir shop. This initial procedure resulted in up to 40 questionnaires being handed out at one time with often only 25-35% being returned. After the pilot run, the implementation was subsequently relocated to the jetty, where potential respondents were just waiting around, were not rushing, and had the opportunity to ask questions. This also meant that most respondents, who indicated they were happy to fill out a questionnaire, actually did so as they had made a verbal commitment to the researcher or her assistant. This practice also reduced the pressure on the researchers and enabled a stress free implementation.

3.12 Methods of Analysis

The selection of analytical methods used in this research project were guided by the research questions posed in this study, the scope of the inquiry, and the specific design of the data collection. The data collected in this project were both quantitative and qualitative and were derived from two separate tour groups; a one-day group and a three-day group. Following is an outline of the analysis procedures that were undertaken.

3.12.1 Quantitative Analysis

Analysis of quantitative data can only be done efficiently using statistical techniques to determine, among other things, differences between groups and the comparability of the data to the general population. The quantitative data and the qualitative data that could be coded as quantitative were analysed using the Statistical Package for the Social Science (SPSS), which was easily accessible to the researcher. The basic aim of the descriptive analyses was to summarise the data using frequencies, average, medians and a range of histograms, which then allowed for the examination of patterns. Pearson's Chi Square

was used to determine if there were significant associations between tour length on a number of variables. An assumption of Chi Square is that no more than 20% of the cells have a count less than five (Field, 2005; Quinn & Keough, 2002), however there is disagreement among writers (Daniel, 1999). It cells in the Chi Square analyses had cell counts of less than five, it was ensured that this represented no more than 20% of the categories. As most of the responses in the questionnaire were on Likert Scales, these ranked data were best suited to non-parametric tests. Considering this, Mann-Whitney Tests were used to determine if there were any differences between the two tour groups. This test is based on the ranks of the observations (Quinn & Keough, 2002).

As some questions contained numerous items (for example question 6 – motivation for going to Fraser Island), these data needed to become more manageable. One way of doing this was by using a data reduction method called factor analysis. This is designed to determine the correlation coefficients between pairs of each of the items. An orthogonal rotation called varimax was used, as it attempts to maximise the dispersion of factor loadings within factors while assuming the factors are independent (Field, 2005). The KMO (Kaiser-Meyer-Olkin measure of sampling adequacy) was used to determine how diffuse or compact the relative correlations were (Field, 2005). When clusters of large correlation coefficients were found, this suggested that those items could be measuring aspects of the same underlying dimension. For factor analysis to be effective and valid, the ratio of subjects to variables should be close to 10:1, and at a bare minimum 5:1 (Streiner & Norman, 1995), which is the case for this data. The items that loaded onto each factor were then given equal weighting regardless of the size of the loading coefficient (Gorsuch, 1974). Only items with a factor loading coefficient greater than or equal to 0.4 were used to identify the groups of items in each factor. The scores for each item within each factor were then calculated by simple addition. After different factors were established, these were given arbitrary names that most closely described the items that were included in that factor. Cronbach's alpha coefficients for each factor were also calculated to establish the internal consistency of the items within each factor, with the aim of attaining an alpha between 0.8 and 0.9 (Field, 2005).

The SF-8, which is a series of eight questions pertaining to self-reported health status, are directly comparable to the SF-36, which is a much larger instrument for measuring health. Both of these instruments can be reduced to two scales – the Physical Component Scale

(PCS) and the Mental Component Scale (MCS) (Australian Bureau of Statistics, 1997; Ware et al., 2001), which make it easier to interpret the data. To legally use the SF-8, a licence had to be obtained prior to implementation. The results for these data were obtained by following the implementation and scoring procedures for the SF-8 (Ware et al., 2001) and then comparing the results to that of the Australian National Health Survey SF-36 Population Norms (Australian Bureau of Statistics, 1997). Unpaired t-tests have been used to determine if any differences are present.

The eight items in the Personal Wellbeing Index (PWI) (*Personal Wellbeing Index - Version 3*, 2005) were summed and standardised to a 0-100 scale. A higher score indicates greater wellbeing for the person in general. Following this, Spearman Correlation was used as the non-parametric alternative to a Pearson Correlation or Regression. The use of the Spearman Correlations were to measure the strength of the relationships (Field, 2005) between health outcomes and both pre-existing health status and the variable relating to social connectedness. The majority of this data are ranked scores.

3.12.2 Analysis of Qualitative Data

Open-ended questions were included throughout the questionnaire. In addition open-ended questions formed part of the face-to-face interviews. The responses obtained were categorised into common, meaningful groups that were associated with the research questions. These were simply coded by the researcher accordingly in SPSS, which enabled the researcher to handle and analyse data that comes in words rather then numbers. The use of this program also enabled the researcher to efficiently correlate the responses with other factors. Qualitative software was ruled out, as it was too complex for the analysis that was required and the simplicity of the questions.

3.13 Issues that arose during the data collection process

During the course of the data collection for this project, there were a number of minor hurdles that the researcher and her assistants had to overcome, both regarding their own circumstances and that of the respondents. Due to the physical location of the research fieldwork, it was geographically isolated which meant the researcher and her assistant were working alone and had limited access to mobile phone reception. Blaxter (2002) describes a particular form of isolation whereby the researcher is simultaneously an insider and an outsider. This was when the researcher and her assistant were sometimes considered as staff members with the relevant institutions, yet on the other hand were tourists or just students, and never really belonging to one group or the other.

There were also hurdles that were prominent when collecting data from the respondents. The first one that was identified was that potential respondents who got seasick while travelling on the catamarans were unable to complete the questionnaire. The language of the respondents and proficiency of English did inhibit some willing tour guests from participating in the research. It was also difficult for the researcher and her assistant to collect completed questionnaires from the upper deck of the catamaran, or conduct interviews outside the main saloon due to a high noise factor and very strong winds. The type of weather during the data collection also impacted on the implementation. These issues that arose during the data collection process, however, were not considered to have an adverse effect on the results of the research.

3.14 Limitations of the Methodology

By utilising specific methodological lines of inquiry, there are often limitations that arise during the course of the project (DePoy & Gitlin, 1998). A number of these have also been discussed elsewhere in this methodology, however additional ones are covered here. Some limitations of utilising the survey approach include:

(e) the loss of linkage between the data and wider theories and issues, especially when the data become the main focus of the final report (Blaxter et al., 2002; Davies, 1994);

(f) the data derived from this survey will only provide a snapshot of the point in time and fail to capture any underlying processes and changes (Blaxter et al., 2002; Davies, 1994);
(g) the researchers have no way of ensuring that the respondents were understanding and interpreting the questions as expected, thus limiting the truthfulness and accuracy of the data (Blaxter et al., 2002);
(h) the survey may not deal adequately with complex, "real-life" issues (Davies, 1994); and
(i) relies on the researcher having sufficient knowledge and experience to ask relevant questions appropriately (Davies, 1994).

The above issues apply both to the questionnaire and the face-to-face interviews.

During the face-to-face interviews, other people were around during the interviewing, which could have resulted in the respondent being less honest or perhaps not voicing their concerns about something for fear of retribution for other travellers or nearby staff. The Hawthorne Effect may also have come into play, in that respondents felt better and/or portrayed themselves in a better light simply because there were being studied (DePoy & Gitlin, 1998; Sarantakos, 1993). As the study was voluntary, participation bias may also have been evident in that the group that was sampled were different to the group of people who declined to participate, however the sample size and the range of the respondents surveyed would have diminished these effects.

Another limitation to this research is that the effects that were found could be due to the respondent being on holiday, and not be entirely related to the Fraser Island context of a wilderness experience. These notions would have influenced the data, increasing the likelihood that the researcher obtains a more positive response from participants. The chosen administration procedures also did not cater for those one-day tour guests who were staying at Kingfisher Bay Resort and Village the night of their return from the tour. Although they were considered at the outset and they would have been possible to sample, it was abandoned due to the safety concerns of the researcher splitting up with her research assistant.

4.0 Results

This chapter presents the results from the data collected during the course of this research. Firstly, the demographic profile of the respondent's is presented, followed by tour characteristics. The pre-existing health and wellbeing status of the respondents will be determined along with the factors that are influencing their wilderness experience. The results then move onto analyses for the second research question. This part focuses on the research aims to determine the degree of health benefit derived from a wilderness experience on Fraser Island as an association with the level of pre-existing health, the length of the experience and the level of social connection experienced while on the island.

The data presented here are based on a sample size of 216, comprising 176 one-day tour respondents from 16 different tour groups and 40 three-day tour respondents from 6 different tour groups. There were a total of 13 brief interviews conducted that involved 22 people altogether. It was found that 7.9% of the respondents did not complete the survey, however no reasons were given.

4.1 Demographic Profile of Sample

4.1.1 Age distributions

The majority (29.3%) of respondents on the one-day tour group were in the 55-64 year age group, while over 40% of the respondents on the three-day tour group were aged between 25-34 years (Figure 4). It is interesting to note that the distribution of ages for the three-day group is skewed to the right yet the one-day tour group had a more even spread of ages. After performing a Chi Square test (n = 201), it was found that these two groups were statistically different according to age ($\chi^2 = 25.199$, df = 5, $p < 0.0001$).

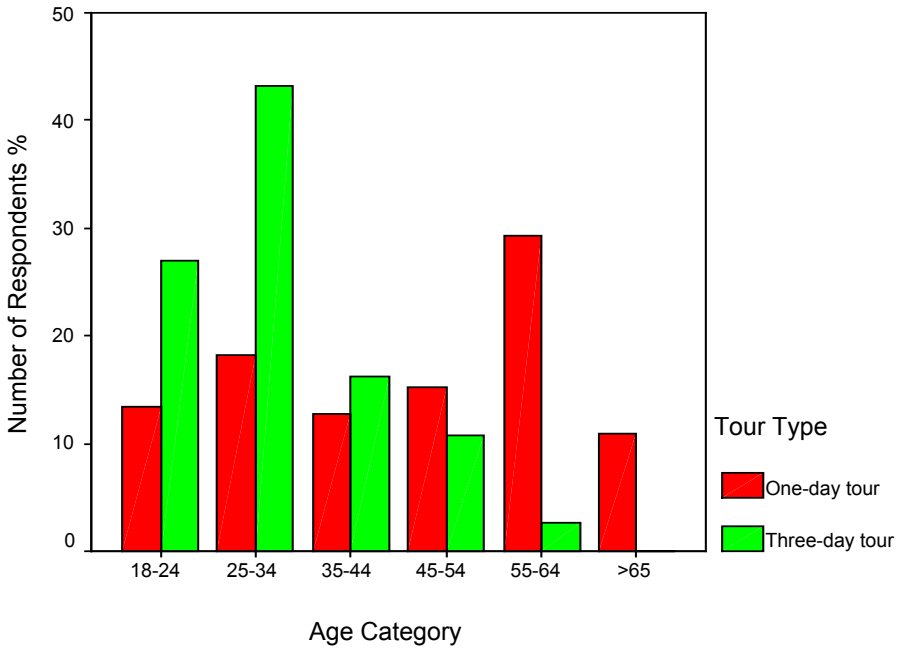


Figure 4: Ages of One-day and Three-day Fraser Island Tour Respondents

4.1.2 Gender

In this sample of respondents, there were slightly more females (54.3%) than males (45.7%) (n = 197) in both the one-day group and the three-day group (Figure 5). This difference was not significant (χ^2 = 0.161, df = 1, p = 0.688). Table 6 provides the distributions of age and gender for both groups combined (n = 195).

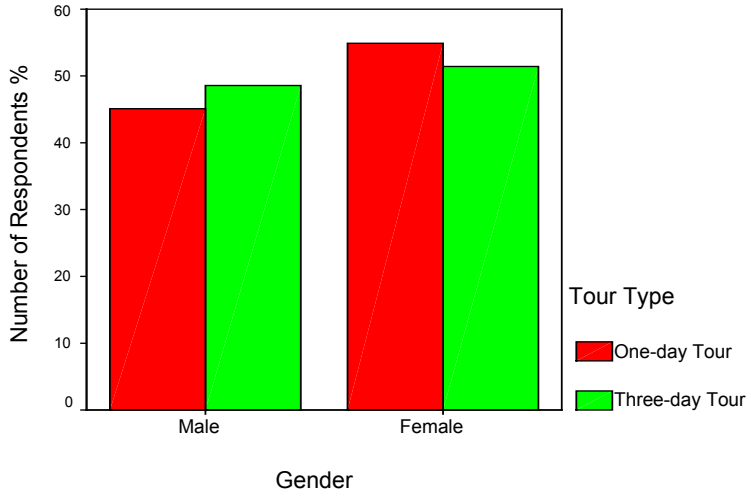
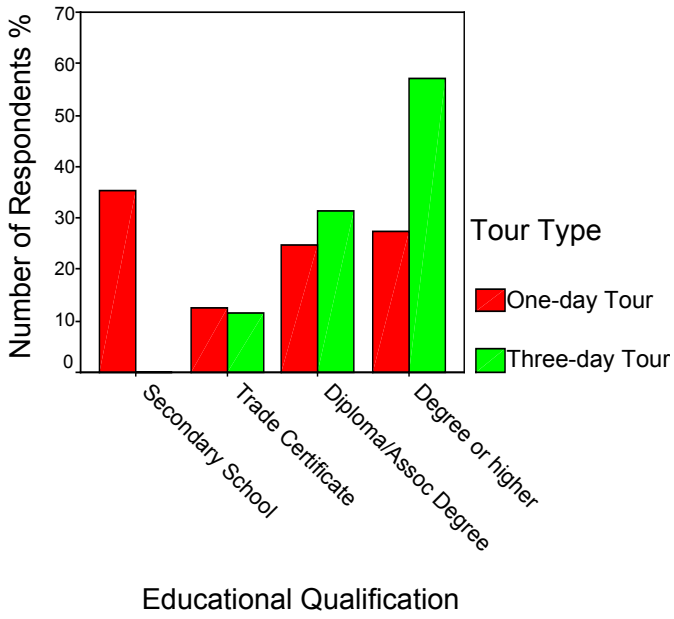


Figure 5: Gender of One-day and Three-day Fraser Island Tour Respondents

Table 6: Age and Gender of All Fraser Island Tour Respondents

		Age Category						
		18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65 years or older	Total
Gender	Male	14	22	15	8	22	9	90
	Female	18	24	9	21	25	8	105
Total		32	46	24	29	47	17	195

4.1.3 Educational Qualifications



Almost 60% of the respondents who were on a three-day tour of the island had completed a bachelor degree or higher (Figure 6) (n = 196). It is clear that the three-day tour group were substantially more educated than the one-day tour group. This difference was significant (χ^2 = 20.720, df = 3, $p < 0.0001$).

Figure 6: Educational Qualifications for One-day and Three-day Fraser Island Tour Respondents

4.1.4 Family type

The family situation at home for each respondent was captured in question 39 of the questionnaire (this is not a representation as to who they were travelling with). When looking at the entire sample a large proportion (41.2%) of them were couples that had no children at home (n = 216) while 29.2% were single (Figure 7). The category for couples could include young couples who had not had children and older couples who no longer

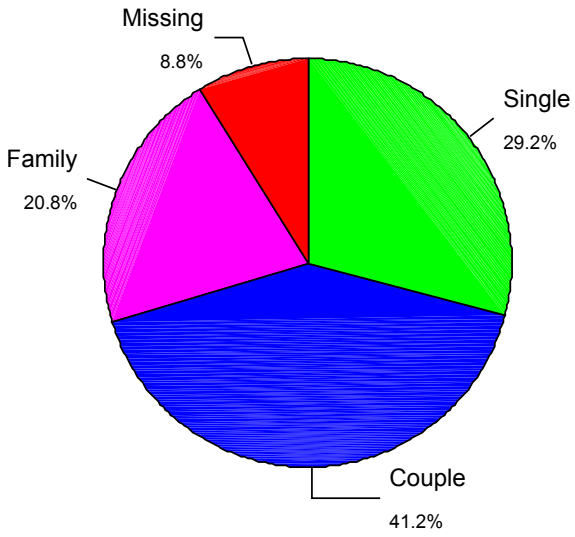


Figure 7: Family Type for All Fraser Island Tour Respondents

had children in their care. Families who were travelling together included four different types. A young family is when the youngest child is under the age of six years; a middle family is when the youngest child is between 6-15 years, and a mature family was classed as when the youngest child was 16 or over and still in the care of the parents. Only one person identified himself or herself as a single parent. However there are different results when the two groups were analysed separately.

Seventy-three percent of the respondents on the three-day tour were single, while only 22.5% on the one-day tour were (n = 197) (Figure 8). There was also a substantial difference in the percentage of couples (with no children at home) on each tour, with 51.9% of the respondents on the one-day tour and 16.2% of the respondents on the three-day tour being a couple. After combining the different types of families, these tour groups do differ significantly ($\chi^2 = 35.284$, df = 2, $p < 0.0001$).

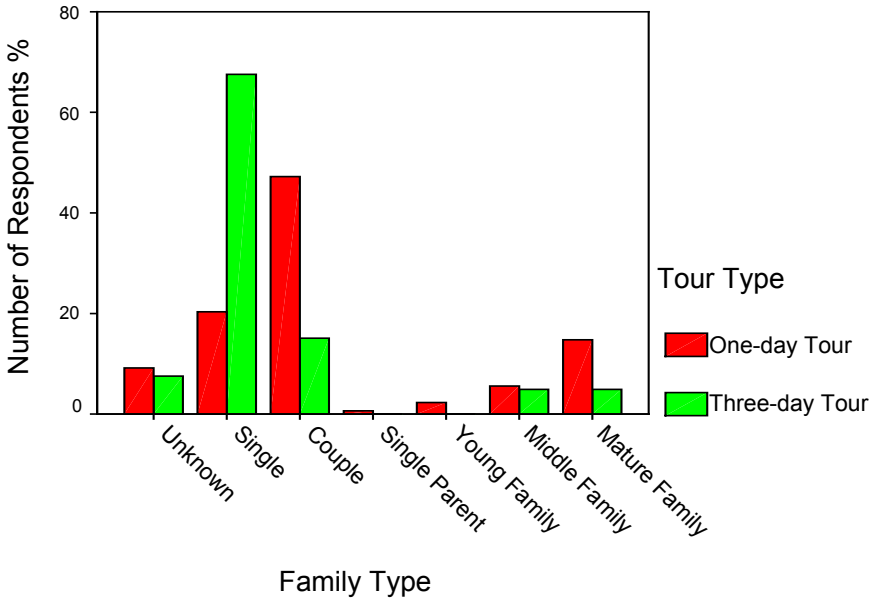


Figure 8: Family Type for One-day and Three-day Fraser Island Tour Respondents

4.1.5 Employment Status

It is apparent that 51.4% (n = 198) of the respondents on the three-day tour were employed full time. There were also 22.9% who stated they were students, yet only 8.6% were students in the one-day group. It is interesting to note that there were no people who considered themselves retired on the three-day tour, however 28.8% on the one-day tour were retired (Figure 9). After combining the categories into employed, unemployed, student, retired and other, these two groups were significantly different ($\chi^2 = 17.473$, df = 4, p = 0.002).

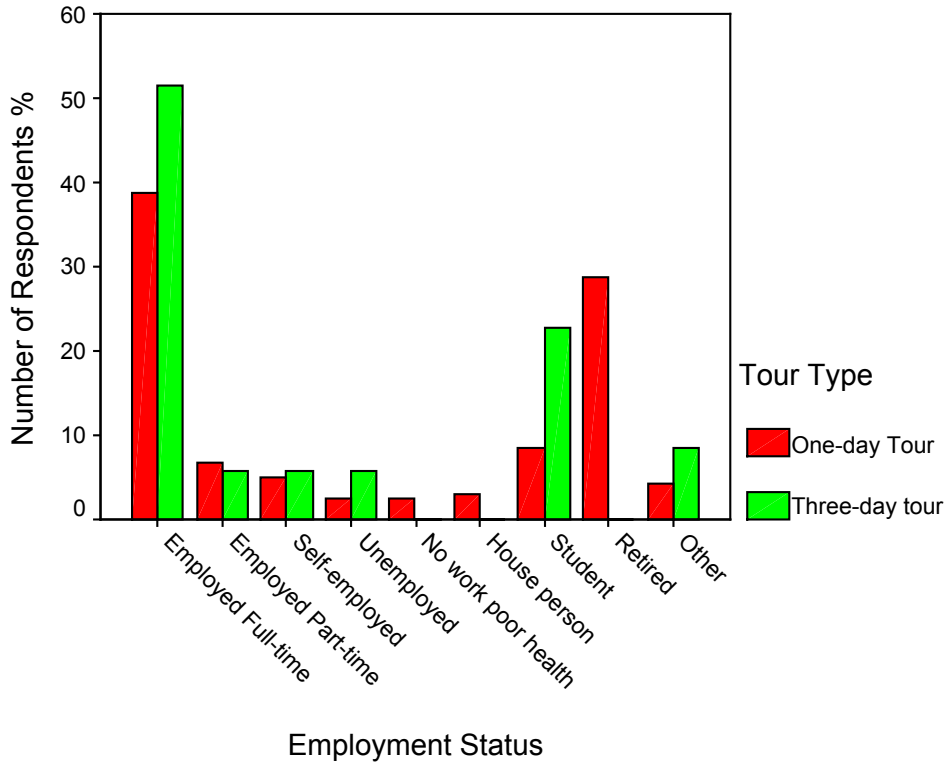


Figure 9: Employment Status of One-day and Three-day Fraser Island Tour Respondents

4.1.6 Country of Residence

Almost half (48.6%) of all the respondents (n = 216) were Australian with 17.1% from the United Kingdom and 16.2% from other countries in Europe (Figure 10). When comparing the two tour groups it appears that these two groups come from different parts

of the world. Fifty-eight percent of the one-day tour respondents were Australian, while 40% of the three-day tour respondents were from the United Kingdom (Figure 11). These two tour groups were significantly different ($\chi^2 = 54.320$, df = 6, $p < 0.0001$).

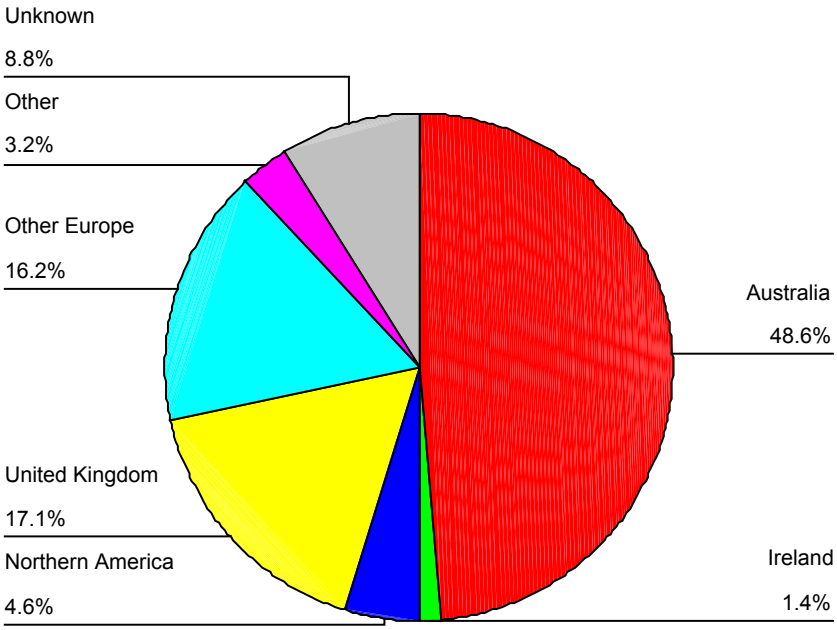


Figure 10: Country of Residence for all Fraser Island Tour Respondents

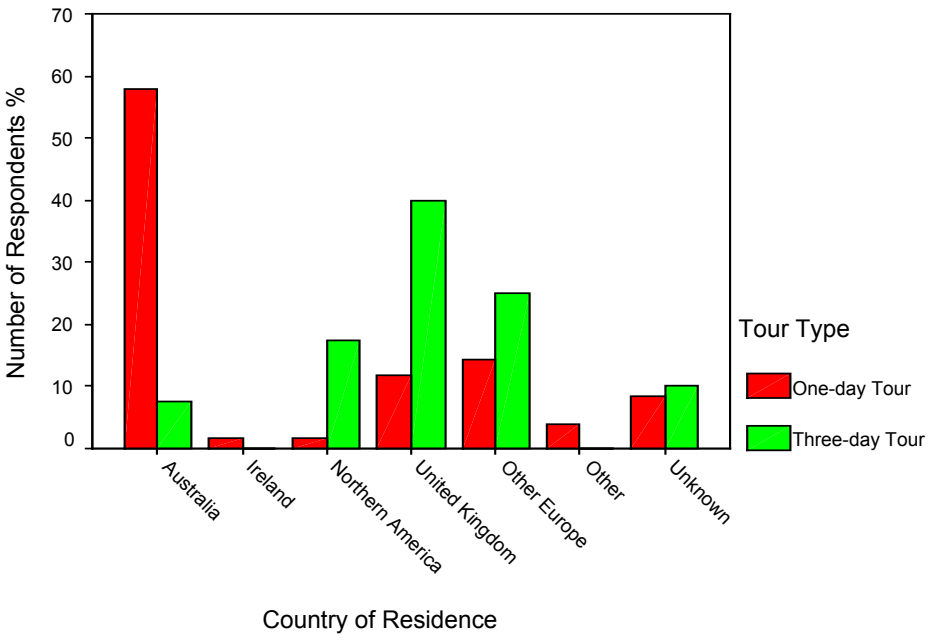


Figure 11: Country of Residence for One-day and Three-day Fraser Island Tour Respondents

4.1.7 Language spoken

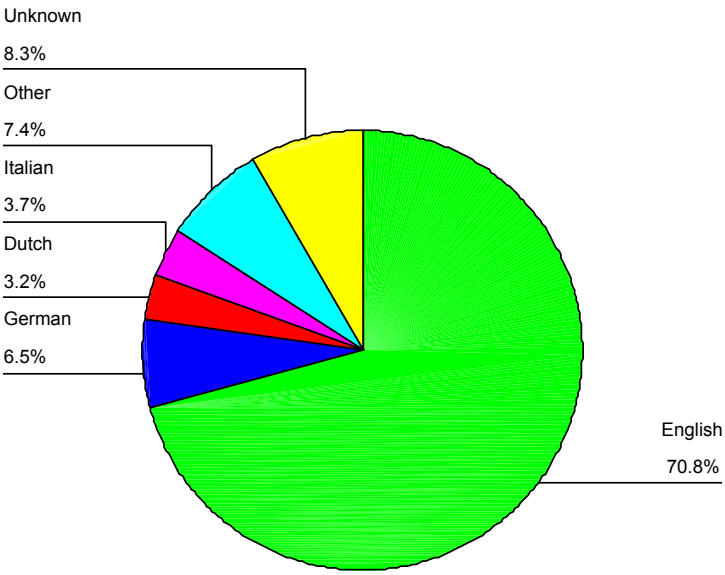


Figure 12: Language Spoken at Home for all Fraser Island Tour Respondents

In the sample (n = 216) almost three quarters were English speaking. The three other most common languages were German (6.5%), Italian (3.7%) and Dutch (3.2%) (Figure 12). When an analysis was run to determine if the two tour groups were different according to language spoken, it was not significant (χ^2 = 7.271, df = 5, p = 0.201).

4.1.8 Size of Residence

Of those who went on a one-day tour, 68.8% of respondents resided in a house or similar detached dwelling, however of those who had completed a three-day tour, 34.3% resided in a unit, flat, or apartment (n = 192) (Figure 13). When the two tour groups were compared, they were significantly different (χ^2 = 11.095, df = 2, p = 0.004). The type of household

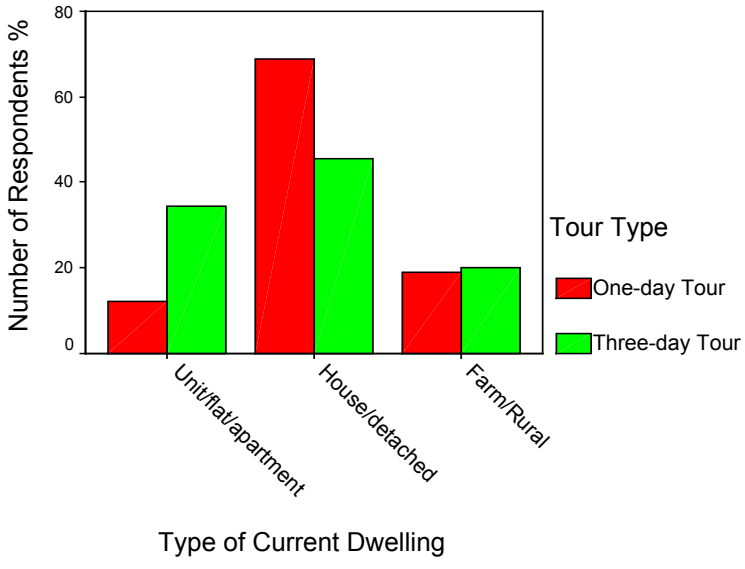


Figure 13: Type of Current Dwelling for One-day and Three-day Fraser Island Tour Groups

dwelling where the respondents grew up was very similar for both tour groups (n = 196) (Figure 14), hence it was not significantly different ($\chi^2 = 0.705$, df = 2, p = 0.703).

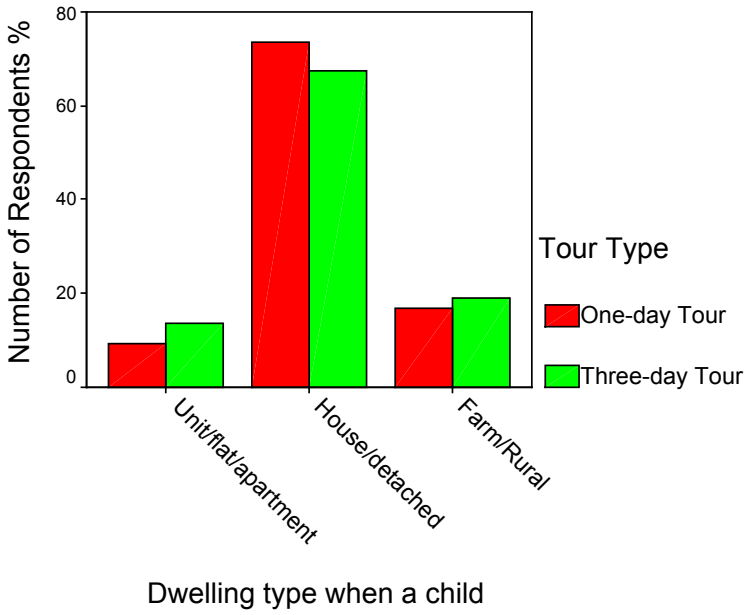


Figure 14: Type of Childhood Dwelling for One-day and Three-day Fraser Island Tour Respondents

From the above results there were some notable differences between the one-day tour group and the three-day tour group. Summary information is provided below (Table 7)

Table 7: Demographic Summary Information for One-day and Three-day Fraser Island Tour Respondents

Demographic	Outcome
Age	Three-day group significantly younger than the one-day group.
Gender	Approximately equal proportions of male and female in each group.
Educational Qualifications	Three-day group significantly more educated than one-day group.
Family type	Majority on three-day group were singles, where couples dominated the one-day group.
Employment Status	Students and full-time employees were on the three-day group, while full-time employees and retirees on the one-day.
Country of Residence	One-day group was predominantly domestic tourists, while the three-day group were from the UK and other European countries.
Language Spoken	Almost three quarters were English with no differences between the groups.
Size of Residence	More one-day tour respondents lived in a house or detached dwelling while three-day tour respondents resided in units/flats/apartments. Both groups had similar childhood dwelling types.

4.2 Tour Characteristics

4.2.1 Purpose for Visiting Fraser Island

The majority (91.1%) of the respondents considered their time away from home as a holiday and that their purpose to visit Fraser Island was for a holiday. Although there were eight possible response options here, only holiday, time with friends or relatives, and some other categories were selected (Table 8). Upon comparing the one-day and three-day tour groups, it was found that these were not significantly different ($\chi^2 = 3.793$, df = 3, p = 2.85).

Table 8: Purpose for Visiting Fraser Island Among One-day and Three-day Tour Groups

Purpose	One-day tour	Three-day tour
Holiday	89.6 %	97.5%
Time with Friends or Relatives	8.1%	0%
Education	0.6%	0%
Other	1.7%	2.5%

4.2.2 Motivations

There were significant differences between the tour groups in four of the 29 different motivational items on the decision to go to Fraser Island, which was question 6 on the questionnaire. It was more important for the one-day tour respondents than the three-day respondents to be with family and friends and to visit a World Heritage Area. The three-day tour respondents came to the island to experience adventure and to rest significantly more than the one-day tour respondents (Table 9). When assessing the responses with the two groups combined, the most noted motivations were, in order of importance, the scenery, to visit a pristine clean area, to be close to nature, to see wildlife, the learn about the island, to experience adventure, to visit a World Heritage Area, and to escape the normal routine.

Table 9: Median (and Mean) Scores of Motivational Factors for Visitation to Fraser Island for One-day and Three-day Tour Groups

Motivational Item	Median (mean)[a]		*U*	*P*
	One-day tour	Three-day tour		
Ease of getting to	3 (2.9)	2 (2.40	1378.5	.136
Driving distance from home	1 (2.0)	1 (1.70	1002.5	.298
Cost	3 (2.9)	3 (2.7)	1728.5	.486
To be with family & friends	4 (3.2)	1 (1.7)	479.5	.001*
To visit a pristine, clean area	5 (4.2)	5 (4.2)	2451	.958
The Scenery	5 (4.5)	5 (4.6)	2570.5	.776
To experience adventure	4 (3.7)	5 (4.3)	1713.5	.017*
To experience resort facilities	1 (1.9)	1 (1.9)	1519	.604
To be close to nature	5 (4.10	5 (4.2)	2543	.855
To Rest	2 (2.65)	4 (3.4)	1500.5	.011*
Its part of my job	1 (1.6)	1 (1.7)	260.5	.752
The fishing	1 (1.3)	1 (1.1)	543.5	.634
The solitude	3 (2.7)	3 (2.9)	1542.5	.568
Learn about Island	4 (4.0)	4 (3.6)	1986	.104
To see Wildlife	4 (3.9)	4 (4.0)	2147	.133
To take a risk	1 (1.8)	2 (2.1)	1237	.085
Aboriginal Culture	3 (2.9)	3 (3.0)	2183	.623
Spiritual experience	2 (2.40	2 (2.0)	1614.5	.207
Slows my mind down	3 (2.6)	2 (2.6)	2051.5	.887
To visit a World Heritage Area	4 (3.8)	3 (3.2)	1919	.034*
To escape the normal routine	4 (3.7)	4 (3.6)	2068	.679
It's school holidays	1 (2.0)	1 (2.2)	519.5	.664
To go bush walking	3 (2.8)	3 (3.2)	1556.5	.163
Do something with others	3 (2.90	3 (3.1)	1813	.329
To recharge my body	3 (2.8)	3 (2.8)	1865	.908
To challenge myself	1 (2.1)	2 (2.2)	1456.5	.694
Personal achievement	2 (2.3)	2 (2.3)	1543	.900
Preparation for future trips	1 (2.2)	1 (1.8)	1284	.514
To experience four-wheel Driving	2 (2.5)	1 (2.1)	1187.5	.348

[a] Based on a 1-5 scale, with 1 = 'not important' and 5 = 'very important'.
* Significant differences between groups

Factor analysis revealed a KMO (sampling adequacy) of 0.692 which means the data are suited to factor analysis. Output showed that no items needed to be removed. The Bartlett's Test of Sphericity was significant ($p < 0.001$). The factor analysis of these motivational items generated six factors explaining approximately 55% of the total variance (Table 10). The factors were labelled as personal, nature, relaxation, culture. practical, and away. Personal reasons explained 14.3% of the variance in one's motivation to visit Fraser Island, whilst 10.1% of the variation was because of the factor 'nature' - motivation to visit a natural area.

Table 10:Factor loadings for Motivations for Visiting Fraser Island for all Respondents

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Questionnaire statement*	Personal	Nature	Relaxation	Culture	Practical	Away
Personal achievement	0.858					
To challenge myself	0.841					
To recharge my body	0.698		.471			
To do something with others	0.697					
Preparation for future trips	0.620					
To experience four-wheel driving	0.551					
To go bush walking	0.552		.404			
The scenery		0.840				
To visit a pristine area		0.755				
To experience adventure		0.739				
To be close to nature		0.630				
To rest			.809			
The solitude			.569			
Slows my mind down			.555	.409		
Spiritual experience				.758		
Aboriginal Culture				.700		
To take a risk				.492		
Driving distance from home					.751	
Cost					.735	
Ease of getting to					.640	
To experience resort facilities					.471	
To visit a World Heritage Area						.750
To escape the normal routine						.624
To learn about the island						.596
Number of Items	7	4	6	4	4	4
Alpha	0.88	0.79	0.86	0.79	0.70	0.69
Eigenvalue	4.15	2.94	2.36	2.29	2.11	2.04
Mean Importance	2.36	4.13	2.97	2.33	2.48	3.36
% Variance explained	14.3	10.1	8.1	7.9	7.5	7.2

*Originally coded on a 5-point Likert scale where 1 = not important and 5 = very important.

It is also interesting to note that the nature, being away, and relaxation factors had high importance for the two groups combined. All scales had moderate to high internal consistency. After reanalysing these factors for the two groups, there were no differences between the two tour groups (Table 11). With 90% confidence there is one factor, away,

Table 11: Comparison of Motivational Factors for Visitation to Fraser Island between One-day and Three-day Tour Groups

	Mean				
Motivational Factor	**One-day tour**	**Three-day tour**	***t***	***df***	***p***
Personal	16.59	16.19	0.189	21	.852
Nature	16.41	17.33	-1.23	36	.227
Relaxation	17.70	18.45	-0.522	34	.605
Culture	9.34	9.33	0.010	33	.991
Practical	10.07	9.20	0.836	20	.413
Away	13.75	11.78	2.03	23	.053

that registered a difference between the two groups. This factor included items regarding four-wheel driving, to visit a World Heritage Area, to escape the normal routine, and to learn about the island.

4.2.3 Previous Activity and main mood

All respondents (n = 209) were asked what their main activity was in the previous four weeks before arriving on Fraser Island. There was a reasonably even spread of one-day respondents who were working (35.8%), retired (26.7%) and on holidays or backpacking (30.1%). This was very different to the three-day tour group, where 62.5% of the respondents were on holidays or backpacking in the previous four weeks (Figure 15). It was found that these two tour groups did differ significantly (χ^2 = 28.983, df = 5, p < 0.0001).

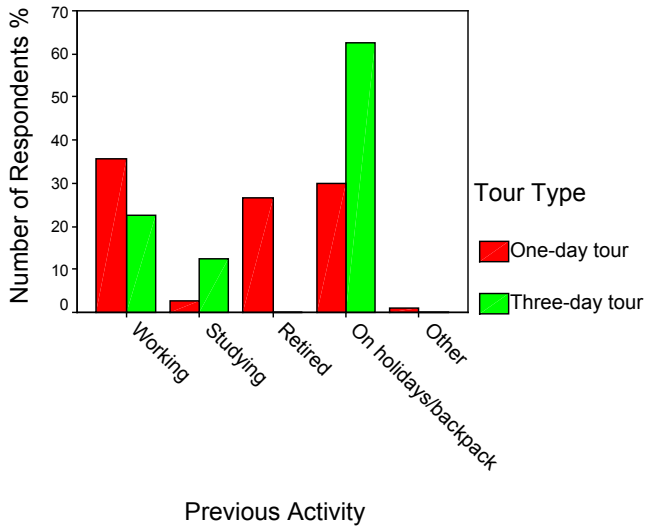


Figure 15: Previous Activity in Last Four Weeks for One-day and Three-day Fraser Island Tour Respondents

Respondents were asked to state how they were feeling in the previous four weeks before visiting the island. The majority of the respondents were feeling good, relaxed, or great in the previous four weeks before visiting the island (n = 181). Among the one-day tour respondents, 21.2% were feeling distressed, while 14.3%

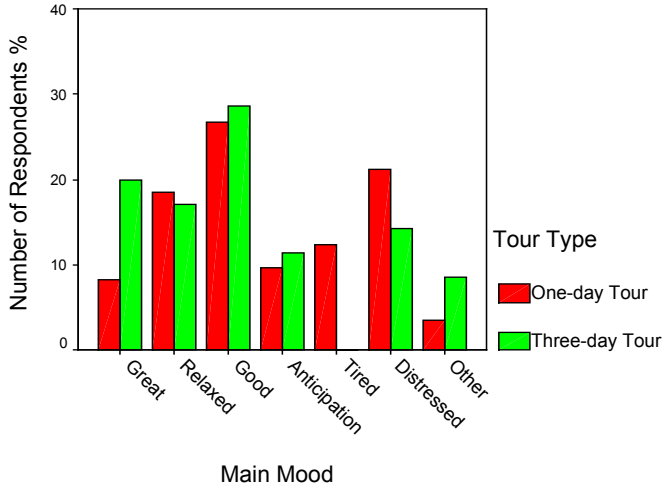


Figure 16: Main Mood of Fraser Island Tour Respondents in Previous Four Weeks

of the three-day tour respondents were distressed (Figure 16). There is no significant difference between the two tour groups ($\chi^2 = 10.585$, df = 6, p = 0.102).

4.2.4 Travelling companions

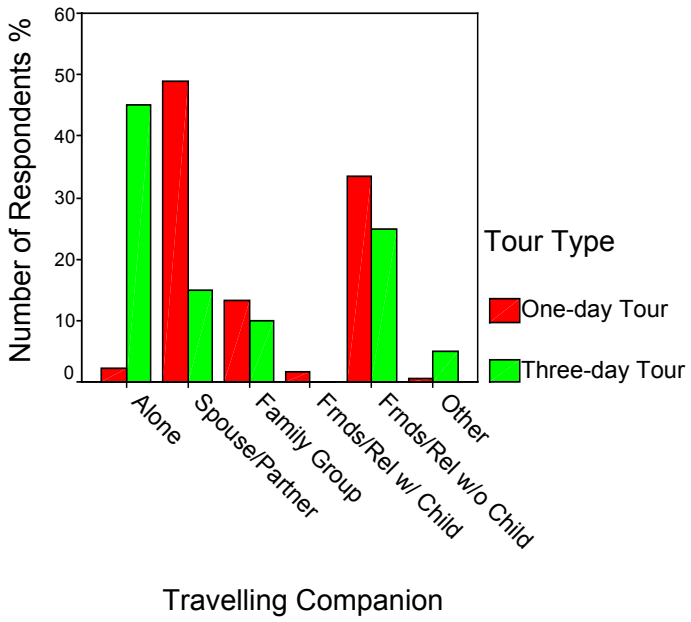


Figure 17: Travelling Companions for One-day and Three-day Fraser Island Tour Groups

The two tour groups differ significantly according to whom the respondents were travelling with ($\chi^2 = 72.66$, df = 5, p = 0.00). As an entire group, 10.3% were travelling alone, 42.5% were travelling with a spouse or partner, 12.6% were travelling as part of a family group, while 31.8% were travelling with friends and/or relatives without accompanying children (Figure 17).

4.2.5 Tour Satisfaction

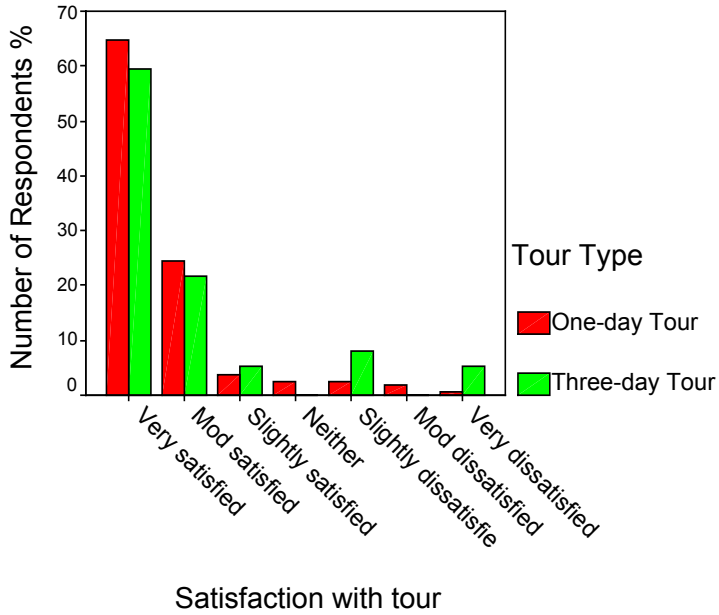


Figure 18: Satisfaction with Tour for One-day and Three-day Fraser Island Tour Groups

As can be seen from Figure 18 above, the vast majority of respondents (approximately 60% of each group) were more than satisfied with their tour (n = 201). The one-day and the three-day tour group did not differ significantly on this variable ($\chi^2 = 9.472$, df = 6, p = 0.149). It should also be

noted here that the tour driver may have been a confounding factor in determining how satisfied their passengers were with their experience, although after conducting a number of analyses there were no significant differences observed. Weather (wind strength and cloud cover) was significantly correlated with tour satisfaction ($F = 4.123$, $df = 2$, $p = 0.018$) however the weather patterns were typical for a winter/spring season and were not considered to impact the overall results.

4.2.6 Expectation of Visitor Numbers

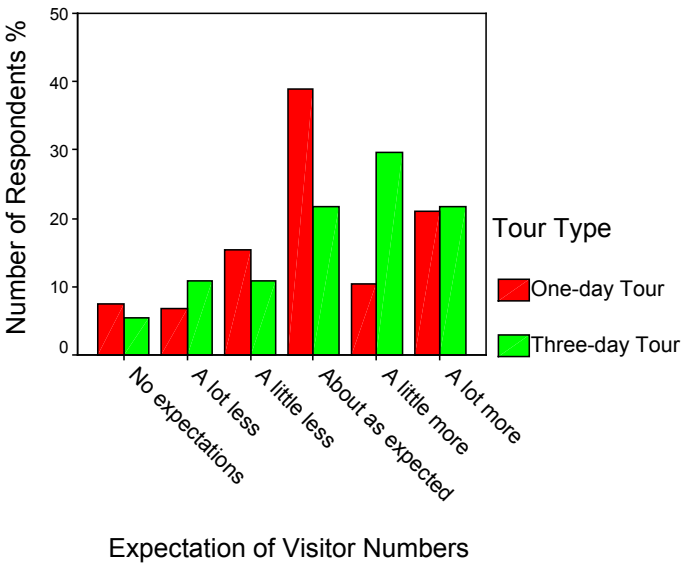


Figure 19: Expectation of Visitor Numbers for One-day and Three-day Fraser Island Tour Respondents

The expectation of visitor numbers ($n = 199$) did vary significantly between the two tour groups ($\chi^2 = 11.703$, $df = 5$, $p = 0.039$). Of the one-day respondents, 38.9% felt they had seen about as many people as expected, while only 21.6% of the three-day respondents felt that way. There was also a substantial difference between the two tour groups in their perception of seeing more people than expected. Just over thirty-one percent of the one-day tour group saw a little or a lot more people than expected, while 51.3% of the three-day tour did (Figure 19).

4.2.7 Experience in Natural Settings

The distribution of the number of prior visits to Fraser Island did not differ significantly between the one-day and the three-day tour group ($\chi^2 = 5.597$, $df = 3$, $p = 0.114$). For all respondents ($n = 200$), 83% were on their first trip to the island, 9% had been once before,

5.5% had been 2-6 times before, while only 2.5% had been more than six times before (Figure 20).

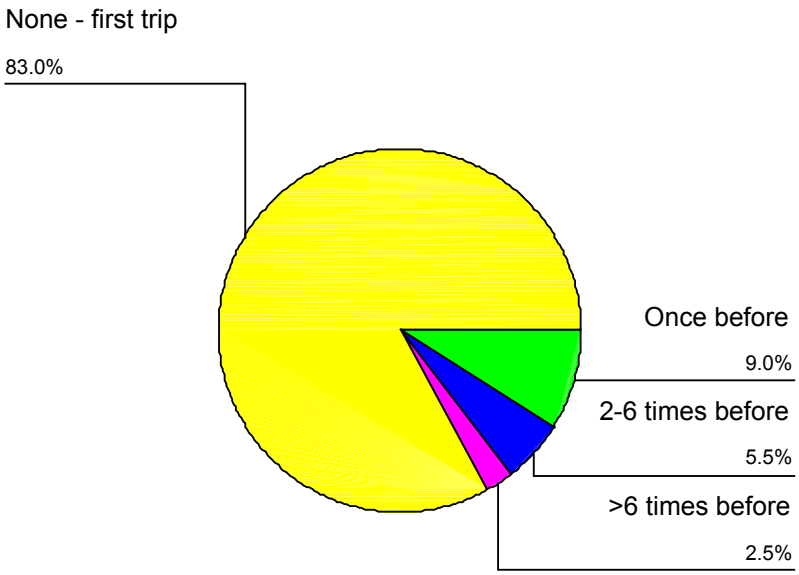


Figure 20: Number of Prior Visits to Fraser Island for all Tour Respondents

When respondents were questioned about how many times they had previously visited similar areas such as national parks, state forests and other natural areas, 65.5% had visited more than six times before, while 25% had visited similar areas 2-6 times before (n = 200). The two tour groups did not differ significantly ($\chi^2 = 1.071$, df = 3, p = 0.784).

4.3 Pre-existing health and wellbeing status

Pre-existing health and wellbeing status is considered a confounding variable that may influence what people derive from their wilderness experience. To determine if this sample is different to the national population, it is necessary to compare the results.

4.3.1 Pre-existing health status

The average scores for each of the physical and mental scales of the SF-8 were used to determine if there were differences between this population and the Australian

population. It was found that all but one of the results obtained from Fraser Island were not significantly different from the Australian norms, based on age and gender. Women aged between 55-64 years were significantly more likely to report that they were feeling physically well than their Australian counterparts ($t = 3.6$, $df = 23$ $p = 0.001$) (Figure 21). Regarding the females sampled on Fraser Island, all rated their mental health higher than that of the Australian female population, even though none of them were significantly different. What else was interesting was that women over between 35 and 54 years of age rated their physical health less favourably than Australian women of the same age, yet the other age groups rated theirs more favourably (Figure 22).

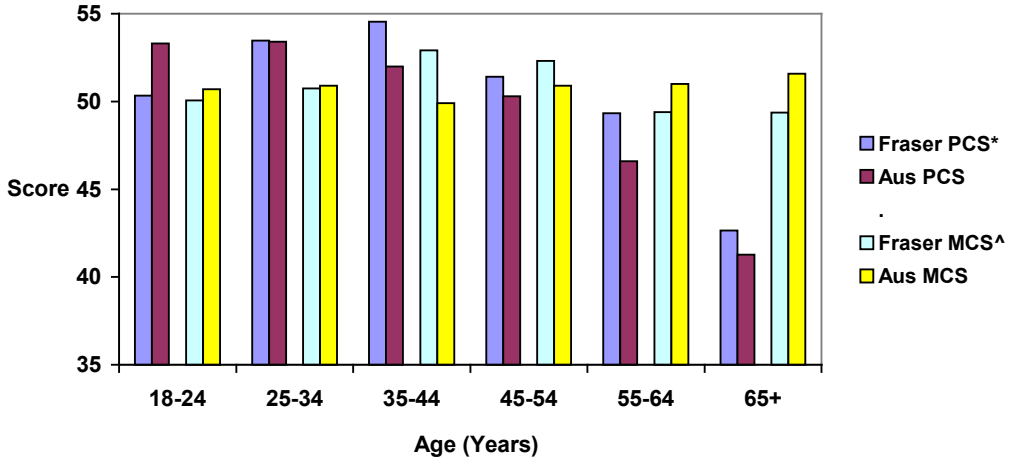


Figure 21: Fraser Island Tour SF-8 Scores with Australian Population SF-36 Norms for MALES

*Physical Component Scale (physical health) ^Mental Component Scale (mental health)
Note: Australian Population norms for 65-74 and 75+ have been combined for these purposes.

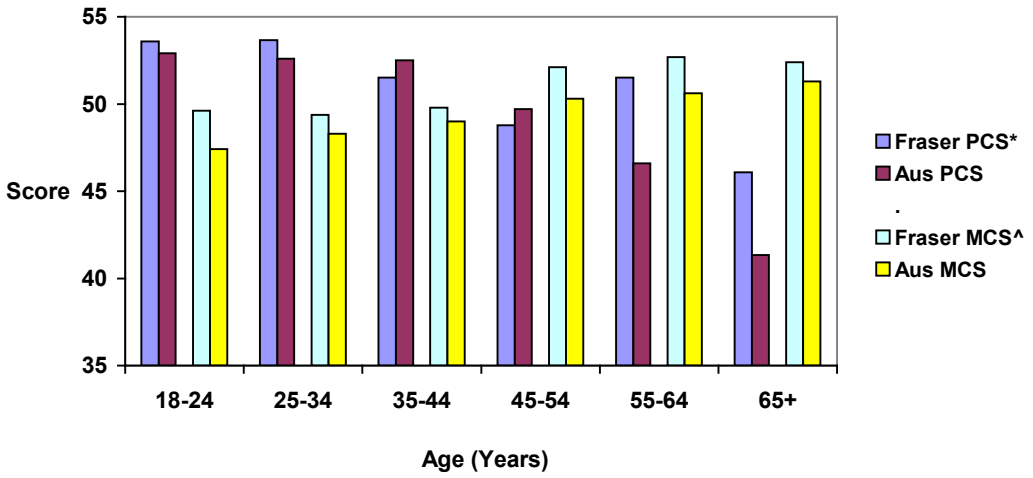


Figure 22: Fraser Island Tour SF-8 Scores with Australian Population SF-36 Norms for FEMALES

*Physical Component Scale (physical health) ^Mental Component Scale (mental health)
Note: Australian Population norms for 65-74 and 75+ have been combined for these purposes.

4.3.2 Subjective Wellbeing

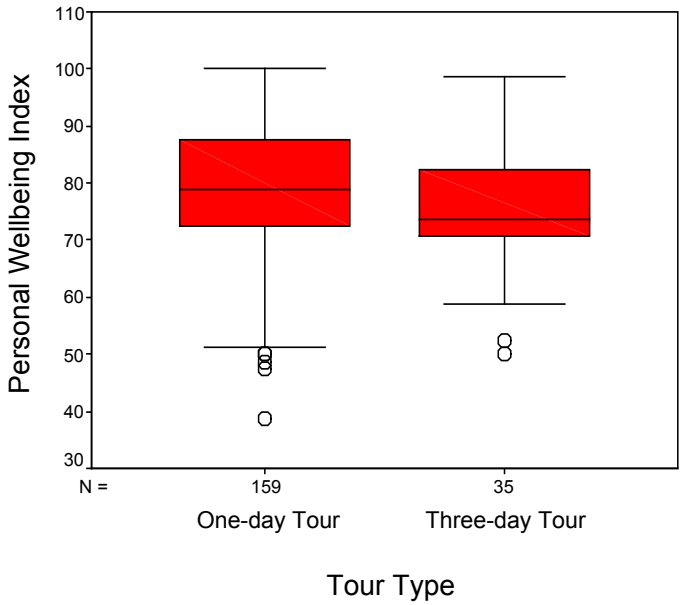


Figure 23: Personal Wellbeing Index Mean Scores for Fraser Island One-day and Three-day Tour Groups

The mean score for the Personal Wellbeing Index for one-day tour respondents was 79.04, while the three-day tour respondents scored a mean of 75.25 (Figure 23). These two groups are not considered significantly different ($t = 1.685$, $df = 192$, $p = 0.094$).

To measure positive and negative affects associated with subjective wellbeing, the Positive and Negative Affect Schedule (PANAS)

was used to gain the following results. Respondents were asked to indicate how they were feeling at the present moment, which was in the final stages of their tour of Fraser Island. For both the one-day tour and the three-day tour, the means for the positive scale were very similar, however not significantly different ($t = 1.092$, $df = 171$, $p = 0.276$). For the negative scale between the two groups, these were significantly different ($t = -2.149$, $df = 168$, $p = 0.033$) (Figure 24). When comparing these groups to normative data, the one-day group differed on the positive scale ($t = 2.69$, $df = 791$, $p = 0.0077$) and on the negative scale ($t = -6.53$, $df = 791$, $p < 0.0001$) (Table 12).

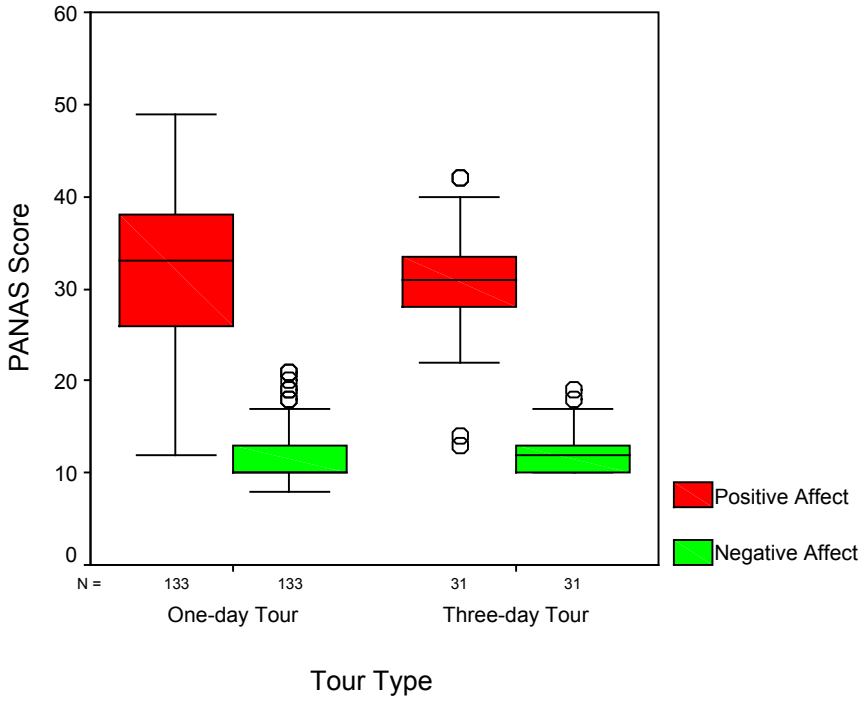


Figure 24: Positive and Negative Affect Schedule (PANAS) Scores for One-day and Three-day Tour Groups

Table 12: Positive and Negative Affect Schedule (PANAS) Scale Means and Standard Deviations of each Tour Group

		PANAS PA* Scale		PANAS NA^ Scale	
	n	M	SD	M	SD
One-day Tour	133	31.78	8.18	11.65	2.94
Three-day tour	31	30.14	6.79	13.03	4.37
Normative Data	660	29.7	7.9	14.8	5.4

* Positive Affect ^ Negative Affect

4.4 Influences of a Wilderness Experience

4.4.1 Perceptions of the Experience

This section of the results assesses the respondent's perception of their experience while on Fraser Island. Similar responses from the open-ended questions were collapsed into categories with the percentages of the valid responses determined (Table 13). These percentages represent the proportion of the respondents that mentioned that aspect. Some respondents stated up to four different aspects for either the positive or negative perceptions, hence the total percentage for each group does not equal 100% due to some overlap. Considering this, it is difficult to compare between groups.

Table 13: Perceptions of Best and Worst aspect of visit for One-day and Three-day Tour Groups

Perceptions of Experience	One-day tour	Three-day tour
Positive Perceptions	n = 164	n = 40
Awe and Wonder	16.5%	22.5%
Relaxation	10.3%	25.0%
Preservation/Conservation	18.9%	5.0%
Beaches	10.4%	12.5%
Lakes	6.7%	25.0%
Wildlife	3.0%	10.0%
Scenery	22.6%	25.0%
Other Environment	5.5%	5.0%
Organisation	11.0%	2.5%
Fun	4.9%	2.5%
Learning	17.0%	7.5%
Plane Flight	1.8%	n/a
Social	3.0%	7.5%
Health	1.2%	2.5%
Other	7.9%	-
Negative Perceptions	n = 111	n = 37
Lack of Time	39.6%	5.4%
Food	2.7%	2.7%
Weather	3.6%	18.9%
Urbanisation	4.5%	2.7%
Aboriginal History	4.5%	2.7%
Lack of Flora/Fauna	7.2%	8.1%
Tour – Size and Guide	6.3%	18.9%
Roads	10.8%	2.7%
Pollution	10.8%	13.5%
Other	18%	27%

For the positive perceptions of the one-day tour respondents, the scenery, the preservation and conservation of the island, their added learning, and the awe and wonder of the island were the most positive aspects of their visit. The three-day tour respondents also nominated the scenery and the feeling of awe and wonder, but also the opportunity for relaxation and the positive experiences at the lakes.

A higher proportion of the one-day respondents mentioned that they were glad of the preservation and conservation efforts on the island, the organisation of their tour, and what they had learnt while on the island than the three-day respondents. On the other

hand, the three-day respondents mentioned the awe and wonder of their surrounding, relaxation, the lakes, and the social aspects more often than the one-day respondents.

There were fewer negative perceptions than positive ones, along with fewer respondents completing the negative aspect question. Of the one-day tour respondents, 39.6% felt that the most negative aspect of their experience was the lack of time at the various locations. This was considerably different for the three-day group as only 5.4% of the respondents mentioned lack of time. The weather and the tour guide both played a larger role in the three-day tour respondents perception of the island, while the road conditions were notably mentioned more often by the one-day respondents.

Respondents were asked to think about how particular aspects of the island made them feel, using a scale from very negative to very positive. The data were standardised to a 0-100 scale, with 100 indicating more positive emotions. The 'natural' aspects of the island (Natural Place and Beauty of Nature) were ranked the highest (n = 200) (Figure 25). The 'remoteness' of the island, the 'air quality', to 'learn about nature', the opportunity to 'relax and unwind', company with 'friends and family' and to be 'physically active' have all scored mostly above a score of seventy. Only three significant differences were found: 'to learn about nature' (U = 2162.5, p = 0.015), to be with 'friends and family' (U = 815.5, p = 0.023), and to discover 'aboriginal history' (U = 2002.5, p = 0.022).

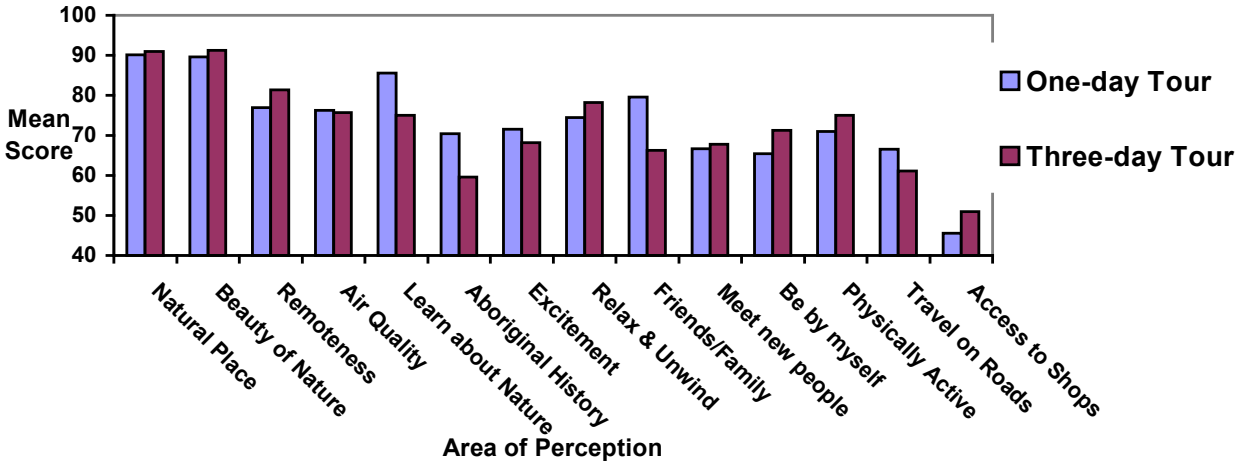


Figure 25: Perceptions of Experience for Fraser Island One-day and Three-day Tour Groups

As there are 14 areas of perception, it was difficult to analyse them all separately. One way to reducing this data set was by using factor analysis. However, the analysis found that the results for these 14 items did not vary sufficiently to enable sensible data reduction. Instead, for each respondent, a mean score for all these 14 items combined was calculated, which describes how positive or negative a respondent felt about visiting the island. These scores were still on the same 0-100 scale, with the one-day tour group's mean being 69.87 while the three-day tour group scored a mean of 67.85. These groups were not significantly different ($t = 0.414$, $df = 59$, $p = 0.680$).

4.4.2 Perceived Restorativeness

The Perceived Restorativeness Scale (PRS) was designed to measure the restorative potential in a given environment or setting (Hartig et al., 1997) and has yielded the following results (refer to Figure 26). It is very clear that the fascination and coherence

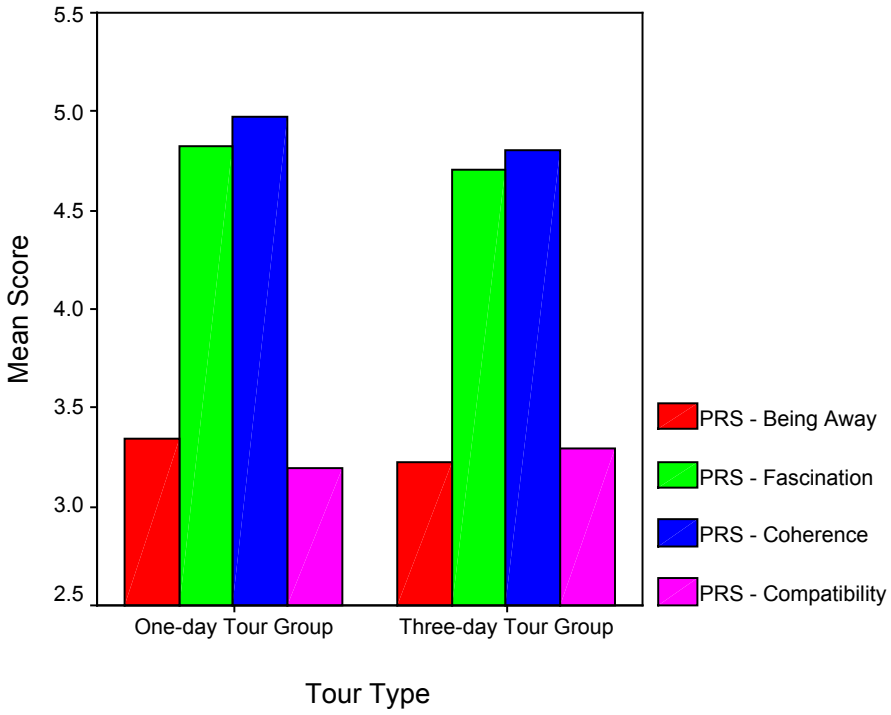


Figure 26: Perceived Restorativeness Scale (PRS) Means for Fraser Island One-day and Three-day Tour Groups

subscales were the most dominant in this analysis, while the being away and compatibility subscales were lower. There were no significant differences between the two tour groups on any of the four subscales; Being Away ($U = 2745.5$, $p = 0.662$),

Fascination (U = 2773.5, p = 0.646), Coherence (U = 2387, p = 0.115), Compatibility (U = 2763.5, p = 0.791).

4.4.3 Social Connectedness

Three questions for trust, reciprocity and diversity were used in this questionnaire that were relevant to the Fraser Island context and tourist groups. All the questions were on an eleven-point scale (0-10) from 'not at all' to 'completely'. The first one was relating to how much people trusted others on the island. The means were 7.41 for the one-day group and 7.69 for the three-day group, however, as these were very negatively skewed, transformation was difficult. Using a Mann-Whitney Test, these two tour groups were not significantly different for the element of trust (U = 2598.5, p = 0.411). Assessing reciprocity was the statement 'most of the time, people try to be helpful'. This yielded means of 8.19 and 7.89 for the one-day and three-day tour groups respectively and they were not significantly different (U = 2598, p = 0.344). The third part of this section was to determine if 'people around here share the same values', which was assessing diversity. The one-day and the three-day groups had a mean of 7.26 and 6.8 respectively, and they too were not significantly different (U = 2285, p = 0.154) (Figure 27).

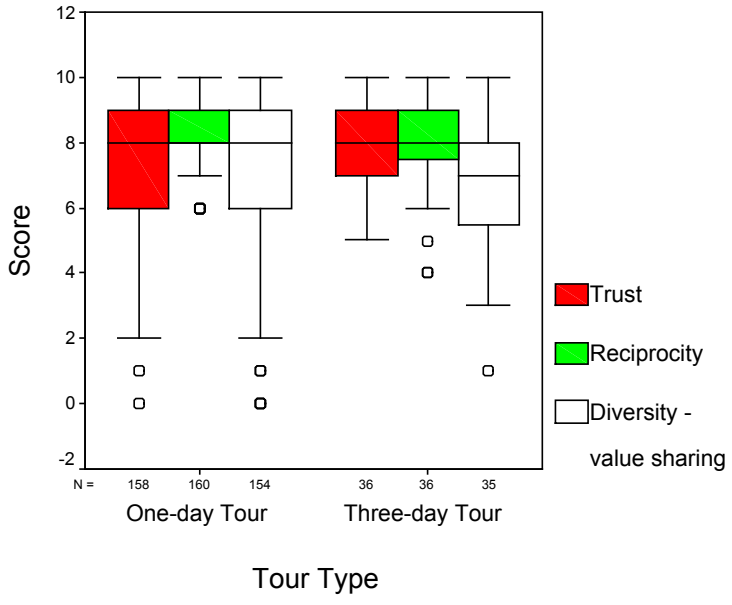


Figure 27: Social Connectedness Items for Fraser Island One-day and Three-day Tour Groups

To assess the level the level of potential cooperation between visitors and management, two issues were explored. The first issue was the request to conserve electricity; the one-day group had a mean of 3.84 which fell between 'neither/depends' and 'likely', while the three-day group scored 3.27, which is between the same two points but closer to 'neither/depends'. There is very little variation in the scores for the one-day group (Figure 28). This non-gaussian data were significantly different between the two tour groups ($U = 2035.5$, $p = 0.001$). The second question was used to determine the level of cooperation if tourists were asked not to wear sun protection cream in the lakes on Fraser Island. The one-day tour group had a mean of 3.07, very close to 'neither/depends, while the three-day group scored 2.08 which is very close to 'unlikely'. These two groups were also significantly different ($U = 1598$, $p < 0.0001$).

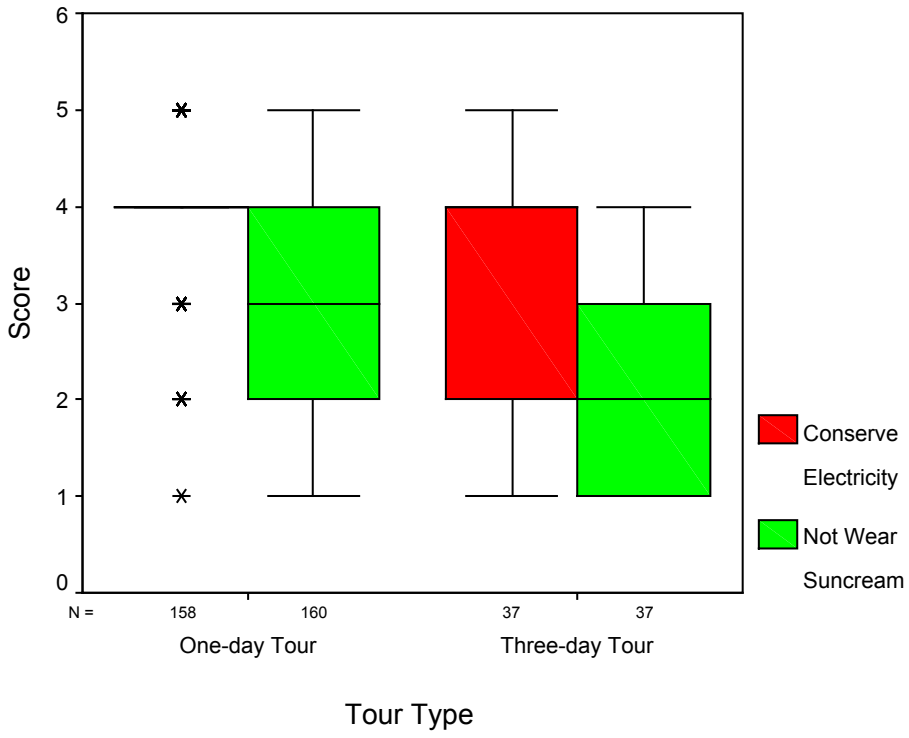


Figure 28: Levels of Cooperation for Fraser Island One-day and Three-day Tour Groups

4.4.4 Self-reported influence on health and wellbeing

Table 14: Self-reported Influences on Health for One-day and Three-day Tour Groups

Self-reported Health Influences	One-day tour	Three-day tour
Good Influences	n = 121	n = 34
Relaxation/De-stress	33.1%	41.2%
Food/water choices	4.1%	5.9%
Fresh Air	15.7%	26.5%
Physical Activity	21.4%	29.4%
Being Away	4.9%	2.9%
Reconnect with Nature	5.8%	5.9%
Social Time	8.3%	2.9%
Positive Emotions	23.1%	8.8%
Education	4.1%	-
Other	9.1%	20.6%
Don't know yet	1.7%	-
No Influence	13.2%	5.9%
Bad Influences	n = 97	n = 32
Tiredness	5.2%	18.8%
Body Pain	14.4%	12.5%
Sun Exposure	3.1%	6.3%
Insects	1.0%	9.4%
Food/Beverage Choices	3.1%	28.1%
Illness	4.1%	6.3%
Negative Emotion	4.1%	6.3%
Concern for Environment	2.1%	3.1%
Other	8.2%	18.8%
None	62.9%	9.4%

Towards the end of the questionnaire, the respondents were asked to write down how their visit to Fraser Island had influenced their health and general feelings, both in a positive way and a negative way. The open-ended responses were classified into pre-defined categories. Table 14 shows the main categories and how they were distributed between the two tour groups. These percentages represent the proportion of the valid responses that mentioned that influence. Some respondents stated up to four different aspects for either the good or bad influences, hence the total percentage for each group does not equal 100% as there is some overlap. Considering this, it is difficult to compare between the groups. Also, there was a decline in the number of one-day tour respondents who answered this question.

Both the one-day and the three-day group specified the time for relaxation and to de-stress, the access to fresh air, and the opportunity for physical activity as dominant positive influences on health. The one-day tour group also noted that they had felt a range of positive emotions while on the trip. It is interesting to note that 13.2% of the one-day tour group thought there were no good influences on health from visiting the island, while a 62.9% of people thought there were no bad influences on their health. When recording if there were any bad influences on one's health from visiting the island, a similar percentage of respondents from both groups mentioned body pain. Almost nineteen

percent of the one-day group nominated tiredness as a bad health outcome, along with the bad influence of food and beverage choices such as alcohol.

As this study was a not a pre and post design, the only way to measure self-reported change was to ask the respondents directly. It is clear that for all bar one of the areas of change, the one-day tour respondents felt more positive change than the three-day tour respondents (Figure 28). The highest self-reported changes were positive changes to the normal routine, happiness, stress and overall health and wellbeing. Only 'concentration' differed between the two tour groups ($U = 886.5$, $p = 0.033$). All this does need to be interpreted with caution, as the number of respondents for this series of questions dropped substantially from the overall sample size, with only 81 one-day respondents and 21 three-day respondents indicating some response (total $n = 102$). Factor analysis was attempted with these items as a possibility for reducing the data set, however only one factor was extracted. The researcher did consider combining the eight areas of change into one score, however it was felt that the best indication of the overall change in health and wellbeing was that reported by the respondents themselves.

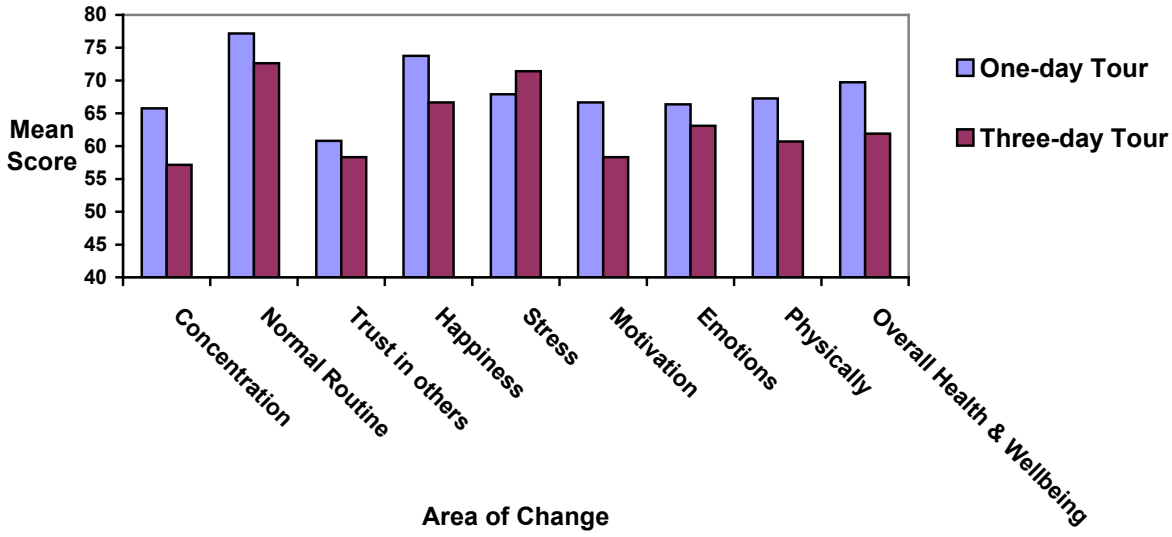


Figure 29: Self-reported changes for Fraser Island One-day and Three-day Tour Respondents

4.5 Factors Influencing Health Outcomes

This section aims to provide some insight into the second research question for this study, that is, is the degree of health benefit derived from a wilderness experience on Fraser Island associated with the level of pre-existing health status or the level of social connectedness experienced among the group members. Spearman's correlation coefficients were used to determine if the degree of the health and wellbeing benefit derived is associated to other factors. The correlation coefficients, the level of significance, and the sample size were determined for the analysis (Table 15). The associations that are significant are indicated.

Table 15: Spearman's Correlation Coefficients for Health and Wellbeing dimensions and Associated Variables for Visitors to Fraser Island

	Pre-existing health & wellbeing status			Social Connectedness			
Health and Wellbeing dimensions ↓	**SF-8 PCS-8[#] Physical**	**SF-8 MCS-8[#] Mental**	**PWI^**	**Trust**	**Recip.**	**Diversity**	**Overall**
PRS[%] – Being Away	r_s = .012 p = .872 n = 186	r_s = -.188* p = .010 n = 186	r_s =.061 p = .407 n =187	r_s = .088 p = .224 n = 192	r_s = .161* p = .025 n = 193	r_s = .188* p = .010 n = 186	r_s = .171* p = .020 n = 185
PRS – Fascination	r_s = .015 p = .838 n = 188	r_s = -.138 p = .059 n =188	r_s = -.056 p = .441 n = 188	r_s = .216** p = .003 n = 193	r_s = .213** p = .003 n = 195	r_s = .098 p = .183 n = 188	r_s = .208** p = .004 n = 186
PRS – Coherence	r_s = .059 p = .428 n = 185	r_s = .023 p = .758 n =185	r_s = .092 p = .212 n = 186	r_s = .158* p = .029 n = 191	r_s = .132 p = .068 n = 192	r_s = .183* p = .013 n = 185	r_s = .234** p = .001 n = 184
PRS - Compatibility	r_s = .210** p = .004 n = 185	r_s = -.231** p = .002 n = 185	r_s = .043 p = .556 n = 186	r_s = .157* p = .030 n = 191	r_s = .140 p = .053 n = 192	r_s = .123 p = .096 n = 185	r_s = .161* p = .029 n = 184
Perception – Neg/Pos	r_s = .126 p = .335 n = 61	r_s = -.117 p = .370 n = 61	r_s = .059 p = .657 n = 59	r_s = .178 p = .178 n = 59	r_s = .149 p = .259 n = 59	r_s = -.156 p = .237 n = 59	r_s = .080 p = .545 n = 59
PANAS[+] – Positive	r_s = .146 p = .057 n = 171	r_s = -.195* p = .011 n = 171	r_s = .074 p = .338 n = 168	r_s = .087 p = .259 n = 169	r_s = .165* p = .032 n = 169	r_s = .110 p = .157 n = 166	r_s = .148 p = .058 n = 165
PANAS - Negative	r_s = -.109 p = .161 n = 167	r_s = -.098 p = .206 n = 167	r_s = -.158* p = .042 n = 166	r_s = -.064 p = .411 n = 166	r_s = -.100 p = .200 n = 166	r_s = -.198* p = .011 n = 163	r_s = -.161* p = .041 n = 162
Overall self-reported change	r_s = .032 p = .696 n = 148	r_s = -.053 p = .521 n = 148	r_s = .199* p = .016 n = 147	r_s = .236** p = .004 n = 148	r_s = .185* p = .025 n = 147	r_s = .102 p = .221 n = 145	r_s = .217** p = .009 n = 145

^ PWI is the Personal Wellbeing Index
[#] PCS-8 is Physical Component Scale (physical health), MCS-8 is Mental Component Scale (mental health)
[%] Perceived Restorativeness Scale
[+] Positive and Negative Affect Scale
* Correlation is significant at the .05 level (2-tailed)
** Correlation is significant at the .01 level (2-tailed)

A number of significant associations exist between the variables, however these are all only small to medium effects without strong associations. The first part of the question to address is if the degree of health benefit derived from the wilderness experience is associated with the level of pre-existing health status. The pre-existing health status measures are the SF-8 physical and mental scales and the Personal Wellbeing Index. Only five out of a possible 21 combinations were significant, with r_s values ranging between –.158 and .210. The overall score for social connectedness was significantly correlated with five of the dimensions; two of these were significant at the .01 level – the fascination subscale (r_s = .208, p = .004, n = 186) and the coherence subscale (r_s = .234, p = .001, n = 184), both of the Perceived Restorativeness Scale.

4.6 Further probing of influence to health

For those who participated in the interviews, there were two main questions put to them. As all respondents had just completed a tour of the island and were on their way home, the experiences that they had just had were very clear and fresh in their minds. This first question was "Has there been any particular times or events that you think influenced your health?" and was deigned to be as non-leading as possible (ie. positive or negative responses were possible). Although there were differences in responses, all provided compatible and overlapping answers. Most, on either tour, mentioned a lake, the beach, or the rainforest where they felt they were relaxing, amazed and that they were glad to be away from their everyday life.

- A male (and his wife) aged between 55-64 years, stated *"Yes, visiting Basin Lake, Central Station and the rainforest was just awe-inspiring; helped me to relax from my job as a doctor, which is very stressful and tiring."*
- Another couple aged between 45-64 years noted that *"Basin Lake was just magical, so uplifting, my 'mental health' felt better….and it's made me really appreciate what nature has to offer."*

There were some respondents who were concerned for the welfare of others, in that older people had difficulty completing the walks and getting in and out of the bus. This seemed to upset them, with one irate lady informing the researcher that she was angry with being bumped around in a bus all day then expected to walk to the ferry in the afternoon. A few

also mentioned that they had been quite nervous/stressed about boarding the catamaran that morning, but that it was due to their lack of experience with boats.

The second part of the interview gave the respondents the chance to voice any suggestions for management of other visitors to Fraser Island that would improve the influence on their health. The dominant response was lack of time at each of the places of interest, especially for the one-day tour group. Concern was raised about the lack of wildlife seen on the island, and as one gentleman put it *"I am very concerned about not seeing dingoes, as 20 years ago there were heaps."* The researcher sensed that he was not sure if the island was being protected after all. Some suggested that the current level of protection and world heritage status should definitely remain. Both groups had concerns about the young backpackers in the 4WD's on the island, and suggested that an increased police presence and compulsory training for not only drivers but passengers as well may help alleviate the situation.

There were also some suggestions for the tour operators themselves. Some excited visitors on the one-day tour group were so impressed with their driver that they highly recommended that they *"keep him forever".* An older couple suggested that the one-day group could promote their tours as a much better option than fumbling around with a DIY 4WD, as they had felt they had made the right choice yet almost made the wrong one. The three-day group seemed to love the flexibility that they had when visiting scenic areas and that time was not under pressure, so this should continue, however there was a need for alternative activities in the evenings other than drinking. One older gentleman did recommend that a handout be given upon departure of the island with a brief version of the information he had learnt while on the tour. He told the researcher that as his memory was bad, he would still like to convey what he had learnt to his grandchildren and inspire them to visit similar areas to Fraser Island.

5.0 Discussion

This chapter presents a discussion of the results that have been reported in the previous chapter and is an exploration of the implications of this research. First, the biophilia hypothesis is recapped along with the theories that have underpinned this research. The demographic profile of the sample will be discussed with comparisons being made between one-day and three-day tour guests where relevant. Other characteristics of the tours themselves will also be explored in order to unravel the perceived influences of a wilderness experience one's health and wellbeing. Following this, the primary influences of a wilderness experience on one's health and wellbeing will be discussed, which is one of the main themes of this research. This section also reviews the information that emerged through the open-ended responses in the survey. Attempts are then made to shed some light on how the level of health benefit derived from a wilderness experience is associated with the level of pre-existing health and wellbeing status and the level of social connectedness experienced among group members.

The biophilia hypothesis stipulates that humans have an evolutionary biological need to associate themselves with nature as an essential part of physical and mental wellbeing development (E.O. Wilson, 1984; Edward. O. Wilson, 1993). Those people who have knowledge of nature and an attraction to and respect for nature are thought to be more equipped for survival (E.O. Wilson, 1984; Edward. O. Wilson, 1993). It is this underlying hypothesis that has been utilised as a framework for this research. Attention Restoration Theory has also been used a guide, in that it focuses on how "the interaction with nature is important for effective mental functioning" (Irvine & Warber, 2002, p. 78). A third theory also provides an integrative framework that combines both directed attention and stress within the context of the relationship between humans and the environment (Kaplan, 1995). Here it will be discovered how this research provides further evidence in support of these hypotheses and models, if any.

5.1 Demographic Findings of the Sample

The National Visitor Survey (Tourism Research Australia, 2004) has been consulted to determine if this sample population from this research is representative of the 'tourist' population of Australia (for this sample, the 'domestic overnight' statistics of the National Visitor Survey have been used opposed to 'domestic day' statistics, as even though one-day tour guests were sampled, it is assumed the majority were staying away from home for at least one night due to the location of Fraser Island). Where specific demographic data are not available for the tourist population, the latest Australian Census information has been used (Australian Bureau of Statistics, 2002). (Australian demographic statistics have been used here, as the majority of the sample was Australian tourists). According to the age distribution of the National Visitor Survey in 2003 (Tourism Research Australia, 2004), the age distributions for this research when the two groups are combined are comparable. The three-day tour group had a much greater number of respondents aged between 18 and 34 years, which could be due to their freedom to travel for longer periods of time. The one-day tour group consisted of more than a third being people aged over 55 years, which could be an indication that older people prefer to visit areas for a short amount of time. The age distribution of the sample is not typical of the general population of Australia (Australian Bureau of Statistics, 2002) however is comparable with other Australian travellers. While there were more females than males who responded, existing research indicates that males are slightly more likely to be travellers (Tourism Research Australia, 2004). In this study it was common for couples to complete the questionnaire together, with the female participant indicating their personal demographic data, which does not seem to have impacted the results.

The sample as a whole are much more highly educated than the general population as over thirty-two percent of this sample had a bachelor degree or higher, with 12.9% of the general population having the same qualifications (Australian Bureau of Statistics, 2002). It could be postulated that income derived from these qualifications would enable people to go on holiday, while the age distribution of the groups would account for some of this variation. Regarding family type, these travellers to Fraser Island are comparable to other travellers in Australia and the general population (Australian Bureau of Statistics, 2002; Tourism Research Australia, 2004), although fewer young families were sampled. The destination of Fraser Island and the participation in a bus tour could account for this

difference as younger children may find it difficult to sit still on a bus tour and remain quiet throughout the journey, along with the additional expense for accompanying children.

The employment status of this sample is very similar to that of domestic travellers in Australia (Tourism Research Australia, 2004). Even the number of students who were sampled was comparable to typical travellers (Tourism Research Australia, 2004). As there are no data sources combining both domestic and international tourists' country of residence, comparisons are difficult, however the countries indicated here are common for international tourists to Australia (Tourism Research Australia, 2004), which further validates that this sample are representative of the Australian tourist population. As the one-day and the three-day groups differed significantly on country of residence, with a greater percentage of Australian's on the one-day tour, this could be due to the ages of these two groups and perhaps the feeling among Australians that they already know a certain amount about Fraser Island and therefore do not need to spend too long on the island.

The proportion that spoke English at home was similar but a little lower than the national average (Australian Bureau of Statistics, 2002). As this study combines both domestic and international tourists together, these results are not surprising, however the difference may be even greater as language conflicts did prevent some tour guests from participating in the study. The results concerning the types of dwellings the respondents currently live in and when they were a child support the contentions made by Ewert (1998) that visitors to remote natural settings are more likely to be living in urban environments, suggesting these visitors are seeking an experience as far away as possible from their hectic urban centres.

It is evident that this sample is reasonably representative of the general tourist population in Australia. As there is little research pertaining to how average tourist perceives their wilderness experiences, this research clearly attempts to fill this gap and provide more insight into the processes that are occurring. To gain a better representation of the tourist population, it is suggested that larger sample sizes are achieved and the collection of data be done at different times during the year to account for seasonal variations. It is also

evident that these two tour groups in themselves do not attract representative proportions of both the tourist and the general populations.

5.2 Trip Characteristic Comparisons

The main purpose for people visiting Fraser Island was to have a holiday. Considering 91.1% of the respondents felt this way, this is not consistent with the profile of domestic (or international) travellers in Australia where 42% of travel is for holiday purposes and 37% is to visit family and friends (Tourism Research Australia, 2004). This finding would be due to the type of tourist that travels to Fraser Island and the fact that Fraser Island only has a small residential population (which is virtually impossible to mix with while on a bus tour).

Regarding the motivations that people reported for visiting the island, the importance of being with family and friends was significantly different between the two tour groups. This has consistent results with the type of travel companions for each of the two tour groups, as the one-day tour group appears to be more family orientated. More one-day tour respondents were going to the island to see a World Heritage Area, which indicates that visiting and seeing areas such as this is important for people to accomplish during their life time. A good proportion of the three-day tour group members were out for adventure, as well as relaxation, which could be attributed to their younger age and the type of tour that they had chosen. When the motivational factors were analysed for the group as a whole, many of the ones that rated highly were related to the physical natural aspects of the island, such as 'the scenery', 'to visit a pristine clean area', 'to be close to nature' and 'to see wildlife'. This is a clear indication that people have a strong desire to visit natural areas and experience what they have to offer, further supporting previous research both in Canada and the Kakadu National Park in Australia (Department of the Environment and Heritage, 2002; Ewert, 1998). Kaplan (1995) has found that when people judge a specific landscape, they assess the potential for functioning in that setting, such as their likelihood of entering that setting, and the level of information that can be obtained from that setting.

After condensing the motivational items down to six factors, it is clear that this sample of visitors to Fraser Island saw six basic dimensions that define their motivations for coming

to the island. The most prominent dimension was the personal one), which included seven of the items: 'personal achievement', 'to challenge myself', 'to recharge my body', 'to do something with others', 'preparation for future trips', 'to experience four wheel driving', and 'to go bush walking', which includes minor social and activity aspects. The relaxation factor incorporated six items, whilst the dimensions of nature, culture, practical, and away, incorporated four items each, suggesting that opportunities to relax and escape the normal routine encourage people to visit natural settings. All of these dimensions have previously been documented (Borrie & Birzell, 2000; Cordell et al., 1998; J. Davis, 2004; Ewert, 1998; Frumkin, 2001; Hartig et al., 2001; Kahn Jr., 2001; Maller, Townsend, Brown, & St Leger, 2002b; Ogryzlo, 1998; Ulrich, 1993), and again they appear to be noteworthy incentives to go to Fraser Island. This is also consistent with the theory proposed by Ulrich (1999) that natural environments can facilitate stress coping and restoration and improve health outcomes. Regarding health items other than the relaxation factor, the personal factor included minor health aspects (social, recharge body) while the away factor included the opportunity to escape from the normal routine of life. This confirms that some motivation to visit this natural area was related to the potential to improve ones health.

When assessing the previous activities of the respondents and considering the age distributions of both tour groups, it is not surprising that 62.5% of the three-day tour respondents were on holidays or backpacking in the previous four weeks. This age factor also accounts for the greater number of people studying and less working than the one-day respondents. There are no available pre-existing data for comparisons, so these results are explorative. This same age factor is most likely behind the differences (although insignificant) in the main moods that were reported for the previous four weeks before visiting the island. This is also an explorative variable, as the researcher is unable to obtain some current data.

The results regarding the travel companions of the respondents are not typical of the domestic travellers in Australia or with international travellers visiting Australia (Tourism Research Australia, 2004). This is most likely due to the age profile of the sample and the type of tourist these tours attract. The large proportion of respondents who were satisfied with their tour is a good indication that the respondents had the best opportunity to derive the most they could from the experience. The researcher assumes that if a respondent

were dissatisfied with the tour, then any possible positive benefit would be difficult to determine, however this has not been documented before. The expectations of visitor numbers did vary between the two tour groups, with the one-day group seeing about as many people as expected and the three-day group reporting more people than expected, however this was consistent with other findings from similar research overseas (Ewert, 1998). This still may not be a true representation of how many other visitors each of the respondents actually came in contact with as the one-day tour groups' itinerary is designed to travel the island without crossing paths with other tour buses. The three-day respondents also have the opportunity to spend more time at each of the scenic areas and therefore may encounter more visitors. These results are not consistent with that obtained by the Visitor Survey Program for the Kakadu National Park (Department of the Environment and Heritage, 2002) which found that a higher proportion of respondents saw less people than expected, which could be due to the remoteness of the Kakadu National Park compared to Fraser Island.

The results showed that the large majority of respondents were on their first visit to Fraser Island and was almost exactly the same as the results for the Kakadu National Park Visitor Survey (Department of the Environment and Heritage, 2002) as both are fairly remote destinations. This Kakadu survey also sampled people on tours, however they note that seasonal variation can alter the findings, which may be evident in the Fraser Island results. Considering around 65% of the respondents also reported that they had previously visited similar areas such as national parks, state forests and other natural areas at least six times prior to coming to Fraser Island, it can be postulated that these people may feel comfortable in visiting natural settings and are more familiar with the processes that take place there.

5.3 Effects of Pre-existing Health and Wellbeing Status on an Individual's Wilderness Experience

As it was beyond the scope of this research to physically measure clinical health parameters, the research relied on a validated health survey, the SF-8, to obtain some comparable measure of the health status of the participants prior to their trip. This

instrument consists of two scales – the Physical Component Scale (PCS) and the Mental Component Scale (MCS) (Australian Bureau of Statistics, 1997; Ware et al., 2001). From the results it is clear that the measures of self-reported physical and mental health of this population are not very different to that of the Australian population when adjusted according to age and gender (only 55-64 year old females differed significantly). This indicates that the sample population self-report that they are no more or no less healthy than the general population of Australia.

Although there are no large significant differences between the scores for the SF-8 physical and mental scales obtained from the respondents and the national data, there were some interesting observations. The males over 35 years who rated their physical health more favourably than the Australian population may have been more physically prepared to participate in a tour of Fraser Island than someone who had poor physical health. The young 18-24 year old males who were feeling less physically fit may have been on the island because they had been studying or working and not been able to stay physically healthy. As all females sampled on Fraser Island rated their mental health higher than that of the Australian female population, this could be because prior to visiting the island, they felt optimistic about their coping mechanisms for being away from their normal environment (and perhaps normal support systems) and that emotionally they had the resources to organise a holiday and possibly children/partners as well. Women aged between 35 and 54 years sampled on the island did not rate their physical health well, which could be an indication that they are not satisfied about how they feel physically or that their physical health expectations are higher than necessary.

Although the SF-8 health instrument was referring to 'the past four weeks' prior to coming to the island, the participants responses may have been unduly influenced by the tour experience, for better or worse. This may act as a confounding mechanism for these results to be used as a background health measure. The only way to minimise this would have been to measure pre-existing health status actually before the tour guests arrived on the island and then again after completion of the tour to measure the impact of the tour itself on one's health. This was not done here as the confines of this research, such as time, were not adequate, and there are no known instruments that would be suitable.

As the Personal Wellbeing Index found that the one-day tour respondents had a mean of 79.04, while the three-day tour respondents scored a mean of 75.25, these results are very similar to the Australian Normative Data for this index (*Personal Wellbeing Index - Version 3*, 2005). Although the differences between these groups were insignificant, the one-day group had slightly higher scores, which may be due to the age distribution of the samples being older in this group. The three-day tour group did have a greater proportion of younger people, suggesting that younger people rate their own wellbeing lower than that of older people. Although Ogunseitan (2005) found that those who visited a natural and restorative setting had higher reports of quality of life, this was not supported here. However, Ogunseitan's research (2005) sampled university populations, whereas the Fraser Island tours attract people from the general population.

The second measure determining momentary subjective wellbeing was the Positive and Negative Affect Schedule (PANAS) which indicates the positive and negative emotional responses by the individual (Watson & Clark, 1988) in response to their wilderness experience. This showed there is not a great deal of variation between the two tour groups. For both the one-day and the three-day tour, both means for the positive scale were slightly higher than norm values. These higher values could indicate an effect of the nature experience. The one-day tour group did differ significantly, which suggests that when the one-day tour group people experienced a positive emotion, they really felt a good feeling. At the same time, however, their negative affect score was significantly lower than the norm value, suggesting that any negative experiences they had had an impact on the scores. This could be reflecting the discomfort that some of the one-day tour respondents reported. On the basis of these results, their emotions while on tour fluctuate considerably, however upon comparison with the norm values, they have to be interpreted with caution due to the low sample size. The researcher only knows of one other nature and health study that utilised the PANAS. This was designed to determine the effects of the contact with nature among children (Bagot & Gullone, 2000), however no results were available at the time of writing this thesis.

5.4 Influences of a Wilderness Experience on Health Outcomes

A significant component of this research is characterising the factors that influence people's experience on Fraser Island and how this, in turn, relates to their health and wellbeing. One of the first things that had to be identified are what people viewed as positive and negative aspects of their experience, how these varied, and how aspects of heath and wellbeing were incorporated into their experiences. When respondents were asked to describe in their own words the primary most positive and the most negative aspect of their visit to Fraser Island, it became clear that very few people specifically mentioned either improved or poorer health as a positive or negative aspect of their visit. This is an indication that few people have consciously made a link between a natural environment and their health as this is an innate tendency (Frumkin, 2001; Gullone, 2000; Pretty et al., 2003; Edward. O. Wilson, 1993, 2002). However, other indirect aspects of health and wellbeing were mentioned.

The positive perceptions of the island that were related to health and wellbeing included the element of relaxation, and awe and wonderment (fascination) at the surroundings. Both of these perceptions help to relieve people from their everyday stresses and give them a feeling of calmness and admiration for their surroundings. These elements are directly incorporated in the theory of Attention Restoration in that "the interaction with nature is important for effective mental functioning" (Irvine & Warber, 2002, p. 78; Kaplan, 1995). Similar research has also found comparable results (Ewert, 1998; G. Godbey et al., 1992; Newell, 1997). It could be postulated that the people that mentioned these aspects had lower blood pressure and/or slower heart rate (Hartig et al., 2003; Maller et al., 2002a) as a result of their visit to Fraser Island. Many respondents also noted how satisfied they were that Fraser Island is being preserved and on a World Heritage List. This gives an indication that people feel connected to the area and that it would cause great distress if this environment were in jeopardy, which has also been noted in other natural settings (Ewert, 1998; Hartig et al., 2001; Mayer & Frantz, 2004). Other respondents described the educational qualities of visiting the island as a positive, and how this has inspired them to learn more about the environment, motivate them to look after their gardens and become conscious of their own environmental actions. Mayer

and Frantz (2004) noted that there is an association between one's connection to nature and eco-friendly acts, and this appears to be supported here.

Although there were no specific health and wellbeing aspects that were reported amongst the negative perceptions, there were some indirect negative influences on health. The lack of time, for the one-day respondents especially, would have caused some distress and frustration. This may have had the opposite effect of the positive experiences and increased heart rate and blood pressure (Hartig et al., 2003; Maller et al., 2002a). The condition of the roads did cause some people significant discomfort, with many people mentioning they now had sore backs and aching shoulders. This issue, also applicable to other four wheel drive destinations, is difficult to reduce, with some respondents stating that this was all part of the island experience, however they suggested that they should have been informed prior to coming to the island. The other indirect impact on health and wellbeing was that people noticed pollution and some rubbish on the island and expressed that this created a sense of disgust, sadness and possibly helplessness, thus resulting in a minor depressive state. As it has been documented that ecological behaviour, such as recycling, environmental restoration, and pollution control, is significantly correlated with people who see greater potential for restorative experiences in natural environments (Hartig et al., 2001), these people on Fraser Island may have received less restoration while on the tour.

When respondents were asked to state how specific constructs of the island made them feel (from very negative to very positive), some interesting interpretations can be made. As both of the 'natural' aspects of the island (Natural Place and Beauty of Nature) ranked the highest, this indicates that people really enjoyed seeing, touching and hearing the rainforest, lakes, and other 'beauty spots' of the island. Other environmental factors, such as the 'remoteness' of the island, and the 'air quality', also ranked ahead of other factors, again suggesting that the physical location and attributes of the island compared to one's normal environment are greatly appreciated. The opportunity for education, to 'relax and unwind', spend time with 'friends and family', and to be 'physically active' were prominent also. Other researchers have discovered that open spaces or natural environments increase opportunity for social interaction, thereby enhancing health (Cordell & Stokes, 2000; G. Godbey et al., 1992; Maller et al., 2002a; Morris, 2003). As physical activity also rated highly, this further supports that natural environments also

provide opportunity for exercise therefore increasing health potential (Frumkin & Eysenbach, 2003; G. Godbey et al., 1992; Newell, 1997; Townsend & Marsh, 2004). All of these factors above were identified in the literature review as playing a significant role in what people derive from a wilderness experience and are all known health benefits.

Only three significant differences were found between the two tour groups with regard to how specific constructs of the island tour made them feel. The first one, 'to learn about nature' was much higher for the one-day group, which may be due to the tour itself, as the one-day tours are designed to be educational and also hold national Advanced Ecotourism Accreditation. This may in fact attract a different type of tour guest; one who is seeking a educational value rather than a restorative experience. Another difference between the two groups was relating to the company of 'friends and family'. The one-day tour group scored significantly higher on this one, and is most likely due to the fact of who the respondents were travelling with – approximately 45% of the respondents on the three-day tour group were travelling alone. When the respondents were asked how they felt about discovering the aboriginal history of the island, the one-day group found this experience more positive than the three-day group which could imply that the three-day group had a greater opportunity and longer time to read of the hardship endured by the aboriginal people on the island, yet the one-day tour group did not have enough time. These questions were developed for this research hence no comparisons are possible, however, the history of aboriginal people in Australia can be distressing (Langton, 1996), hence this would be interesting to pursue further.

The use of the Perceived Restorativeness Scale (PRS) found that the fascination and coherence subscales were the most dominant in this analysis, which is a sign that Fraser Island easily holds the involuntary attention of visitors while providing an opportunity for reflection (Kaplan, 1995). The high coherence scores imply that the visitors experienced a sense of connectedness to the environmental elements and features of the island and to one another and this wilderness experience is relative to their normal frame of reference (Hartig et al., 1997). With the being away and compatibility subscales scoring lower, there may be a few simple reasons for this. The being away subscale could be lower due to the close proximity of other groups of people, the man made structures that are evident on the island, or the feeling that the urban centres are not really that far away. As compatibility refers to how familiar one feels with the surrounding environment, it is

clear that the visitors to Fraser Island do not feel as comfortable as they could in this natural setting. The fact that there were no significant differences between the two tour groups on any of the four subscales, indicates that time on the island, as contrasted between the one and three-day tours in this research, does not play a role in the potential restorativeness of the individual. Further research should contrast a one-day tour with say a one-week tour. The values obtained in this study are quite similar to the favourite place results found in a study comparing the restorative potential of university students' favourite and unpleasant place (K. M. Korpela et al., 2001) and are consistent with the scores obtained for natural environments as opposed to city environments (Lauman et al., 2001), providing further support that natural environments have restorative potential and for the Attention Restoration Theory.

Assessing social capital or social connectedness can be very difficult in just a few questions, which means the results for these questions in this study need to be interpreted with caution. Even though trust, reciprocity and diversity did not differ between each of the groups, there were some variations. Trust was slightly higher for the three-day group, however more variable. These tour guests would have had a longer time to assess other people in their group and make a judgment on the level of trust they could put in them. It is also possible that among the three-day group, there were a greater number of circumstances that could sway a person one way or another, hence the greater variation.

Reciprocal help between visitors to Fraser Island was a little higher for the one-day group than the three-day group, though not significantly different. One reason for this may be that as the people on the one-day group did not know each other long, everyone was entitled to help when they needed it, yet on the three-day group, some people may have been less willing to help others after they got to know them a bit better, particularly if they did not get along well. This may also be the case for the results in response to the statement 'people around here share the same values', where the one-day group scored slightly higher than the three-day group. The *Families, Social Capital and Citizenship* project (Stone & Hughes, 2002) involved a random national survey of Australian adults using these three same questions. It is interesting to note that on trust, reciprocity and diversity, participants in this research irrespective of whether it was a one or three day tour, rated higher than the Australian norms (Stone & Hughes, 2002). The researcher speculates that the remoteness of the location, and the possibility for group bonding

(however minor) may have contributed to these higher scores. It is also possible that the natural setting itself has played a role here. After searching the literature extensively, there is no research assessing these aspects within natural settings, even though anecdotal evidence from the researcher and family and friends suggests experiences higher levels of trust, reciprocity and diversity in values, both towards other people and from others, when camping and four wheel driving in natural settings.

The exploratory questions assessing the perception of the level of cooperation regarding electricity use and the wearing of suncream in the lakes showed significant differences between the two groups, which may simply be due to the differences in age and tour style. The request to refrain from using suncream in the lakes on Fraser Island is a current request from National Parks and Wildlife Service, however it is evident that the respondents suppose others will put themselves first before the protection of the environment. The three-day tour groups' response of the 'unlikely' chance that people would refrain from wearing suncream in the lakes, may be due to the lower age of the respondents and, as they had longer time at some of the lakes, they feel the need to protect their skin from UV rays, along with their lack of understanding that suncream is considered a pollutant in this environment. This is a finding that would be of great interest to the National Parks and Wildlife Service on the island, and it could be a catalyst to increase the promotion of this request and the reasons behind the request. This type of finding does contradict that of Mayer and Frantz (2004) in that a lack of connection to nature here may be an underlying reason why people think others will pollute the lakes with suncream.

Towards the end of the questionnaire, all respondents were asked up front if Fraser Island had influenced their health and general feelings either in a good way or a bad way. The respondents had completed the health and wellbeing sections prior in the questionnaire, so should have had a good idea as to what was required of them. As some responses appeared more often than others, such as a substantial number of people felt that they were more relaxed and less stressed as a result of their visit, this clearly shows that visiting this natural environment helps alleviate stress and create a feeling of rest. However, it is unclear if this is to do with the environment itself or the fact these people are out of their normal environment and away on holiday. Access to fresh air and opportunities for physical activity also rated highly, though more so in the three-day

group. This could be due to the younger age range of this group and that they spent more time on the island. If this is the case, then increased time in a natural environment increases the level of exercise one receives and may help relieve respiratory symptoms from urbanisation, however illnesses such as asthma may be exacerbated by exercise. Positive emotions were also noted numerous times by the one-day respondents. Some said that they 'felt more at ease with the world', it was a 'rewarding, uplifting experience', and 'I feel fresh and invigorated'. This again provides more confirmation that physical environments are often used by people to regulate pleasure and/or pain and self-experience (K. Korpela & Hartig, 1996).

The differences between the two groups regarding the negative influences are mostly likely the result of the different activities while on the island and the type of people each of them attract. Body pain from travelling around the island was a prominent negative influence. Many older people on the one-day tour group mentioned this frequently, particularly back and joint pain. Some also complained about the level of fitness required to complete some of the walks in the time provided. The Australian Bureau of Statistics (2004) also reported this trend in that those aged over 65 years report age, health and inability as significant reasons preventing them from visiting and enjoying natural settings. Due to the younger ages in the three-day group, the consumption of alcohol and snack/junk food were noted as bad influences on one's health, which was not a major concern for the one-day tour respondents, which may contribute to how energy levels and how active one is the following day. The large proportion of the one-day respondents that felt as though there were no bad influences on health or wellbeing may be a factor of the time spent on the island or each persons' age and gender. These people were not on the island long enough to notice or experience discomforts, and if they did, may have ignored them as they knew they were going home (or to a hotel) very soon. As this was a question that was designed for this research, there are no comparable studies; hence it is used for exploratory purposes only.

When the respondents indicated if they had experienced change during their time on the island, the one-day tour group scored higher on all but one of the statements, which after conducting the literature review (Frumkin, 2001; Maller et al., 2002a; McDonald et al., 2000; Pretty et al., 2003), was not intuitive. However, the younger age group on the three-day tour may be more familiar with these types of natural settings and hence experience

little change relative to their normal environment. The highest self-reported changes for both tour groups combined were positive changes to the normal routine, happiness, stress and overall health and wellbeing, which are all elements that were found in the literature review to be the result of spending time in a natural setting (Bagot & Gullone, 2000; Ewert, 1998; G. Godbey et al., 1992; Hartig et al., 1991; K. M. Korpela et al., 2001; Townsend & Marsh, 2004). The other options for concentration, trust, motivation and how one feels physically, may be difficult for someone to make an accurate assessment of himself or herself. Considering the lower response rate for this series of questions, the researcher notes that some respondents felt as though these questions were irrelevant and not applicable to their experience on the island, which again flags that not everyone consciously makes a link between a natural environment and their personal health and wellbeing (Frumkin, 2001; Gullone, 2000; Ogunseitan, 2005; Edward. O. Wilson, 1993, 2002). The researcher did get the impression that some people had never before made a connection between a wilderness experience and benefits to health and wellbeing, and that some people felt as though no connection was possible.

A key research question in this study is to determine how the level of health benefit derived from a wilderness experience is associated with three factors – the level of pre-existing health and wellbeing status, the length of the wilderness experience, and the level of social connectedness experienced among group members. From the above discussion it is clear that there are few differences in the average scores between the two tour groups with regard to the health and wellbeing outcome measures, such as the PANAS, the positive and negative perceptions, and the Perceived Restorativeness Scale. Moving on, however, there are a number of associations that were discovered between other variables.

There was a small positive relationship between a person's physical health and how compatible and familiar they felt with the surrounding environment (Perceived Restorativeness Scale (PRS) compatibility subscale). This result suggests that those who are more physically able to explore a natural setting feel more comfortable being there and gained the most restorative value out of their experience. This may be associated with the perceived danger of being in a natural setting and the ability to look after oneself. This is consistent with the Biophilia Hypothesis in that Wilson (1984; 1993) stipulates that those who were more equipped for survival often feel more compelled to associate themselves with nature and acquire health benefits. Ulrich (1999) also notes that a garden

or natural setting must convey a sense of security and little risk if stress reduction and restoration is to take place, which is supportive of this finding.

The compatibility one felt for the environment was correlated negatively to one's mental health score, in that those who were feeling down and struggling emotionally felt more comfortable in this environment than those who self-reported that their mental health status was high. It can be postulated that those who scored lower on this scale were happier to be out of their normal environment and on Fraser Island. The scale was also negatively correlated with the 'being away' subscale of the PRS with the same reasons also applicable here. The third outcome that the SF-8 mental subscale was significantly negatively associated with was the positive subscale of the PANAS, which indicates that those who were experiencing a lower state of mental health seem to feel more positive emotional responses towards the natural environment. Perhaps it was this greater change in emotion that was ultimately recorded, yet other minor changes in the rest of the population were missed. These findings are consistent with the Attention Restoration Theory (Kaplan, 1995), in that those people who are fatigued will seek out experiences for involuntary attention or fascination in natural environments. Also depression among specific groups can be significantly decreased after spending time in a natural setting (Frumkin, 2001; Maller et al., 2002a), those with lower mental health scores may be the ones who can gain the most out of visiting natural environments.

The Personal Wellbeing Index (PWI) was negatively associated with the negative PANAS subscale, which suggests that the people who had a high PWI felt less negative emotion while on Fraser Island than those who had a lower PWI. These people rated their wellbeing higher and therefore may be more inclined to feel more positive about the experience. When people rated their overall change that they experienced while on the island (very positive to very negative), this had a positive association with the PWI. The people that rated their wellbeing status highly reported more positive change in their health and wellbeing. For some reason, these people thought they had gained a lot from their visit, and may have been more optimistic about life and their circumstances and the experience they had on Fraser Island. Although this is not consistent with the above result or with other research (Thompson, 2001), it does provide invaluable insight into how these two factors may be linked.

The overall social connectedness score was significantly correlated with all subscales of the Perceived Restorativeness Scale (PRS), indicating that the more trust people put in others; the more people feel others are willing to help them out; and the more people feel that others on the island share the same values, the more likely they are to derive restorative benefits from the natural setting and renew their psychological resources. As the degree to which we trust each other in a particular setting is noted as one of the most important determinants of health (Lomas, 1998), this finding appears to have some meaning beyond the statistical inference. A lack of trust between people and communities results in higher incidence of coronary heart disease, stroke, and among others, unintentional injury (K. Lochner et al., 2003) and could significantly impact on the wilderness experience as a whole. This relationship is intuitive, in that the better people feel about the social processes happening around them, the more time and energy that is left over for enjoying the environment around them and experiencing its benefits. Ulrich's theory (1999) also mentions that social support is an important mechanism in facilitating stress reduction and restoration within natural environments, thus supporting this finding.

It was interesting to note that the negative association between the overall social connectedness score and the negative subscale of the PANAS. Basically, those people who felt less trust, reciprocity and diversity for the people around them also felt more negative emotion towards their time on the island. This is another intuitive relationship and probably holds true for many other settings, not just natural environments. The overall health and wellbeing change reported by the respondents was positively associated with overall social connectedness. For much the same reasons as just above, this relationship is not surprising and eludes to the notion that when groups are working well together and people feel comfortable among others, then the greatest positive change in health and wellbeing is possible (K. A. Lochner, Kawachi, Brennan, & Buka, 2003; Lomas, 1998).

Following on from the discussion of the main findings from the questionnaire, the insights discovered from the face-to-face interview also warrant debate. As there were only 13 interviews (involving 22 people) conducted, the results that were obtained were exploratory and used to verify the findings of the questionnaire. Although the interviewees could not considered a representative selection of the tour group participants, this was unavoidable as the interviews were voluntary and time was limited.

Those interviewed clearly felt as though they were better off in terms of their health and wellbeing, and justified this by saying how their mood had changed and described particular areas of the island that facilitated this change. This type of information supports those findings of the questionnaire that found that some people do experience benefits to health and wellbeing while on the island, and also helps to substantiate the findings from other research (Cordell & Stokes, 2000; J. Davis, 2004; Ewert, 1998; G. Godbey et al., 1992; Gullone, 2000; Hartig et al., 2003; Kaplan, 1995; K. M. Korpela et al., 2001; Maller et al., 2002a; Morris, 2003; Ogryzlo, 1998; Tenngart & Hagerhall, 2004; Edward. O. Wilson, 1993). These interviews also unearthed how minor inconsistencies and annoyances can prevent people from enjoying the environment around them and experiencing its benefits.

When the interviewees had the chance to provide suggestions for management or to other visitors to Fraser Island, it was their choice if they chose the management of their tour or the managing organisations of the island. The suggestions were diverse and indicated that people are very aware of how the island is managed and the ramifications of the policy decisions made by managing bodies. Regarding health and wellbeing, it is evident that when people feel that others are not looking after that environment or that other people may be in danger (ie. young 4WD drivers) they too don't gain the most out of their experience on the island (Hartig et al., 2001; Mayer & Frantz, 2004). This sense of a connection to the area also arose in the findings of the questionnaire.

Considering the above methods that were used to explore the links between a wilderness experience and an individuals' health outcomes, there is a need for further qualitative inquiry of this phenomena. Some of the richest and most insightful information came from the face-to-face interviews where respondents were given an opportunity to express what they were feeling in their own words and with emotion. The use of standardised instruments that were designed for the general population and contained blunt representations of constructs may have hindered the respondent in fully answering some questions.

6.0 Recommendations and Conclusions

This study has provided a comprehensive overview of the literature surrounding the health and wellbeing benefits that people may obtain from participating in a wilderness experience. After designing a research project to address some of the gaps in the knowledge base - that tourists have not been studied in this context, nor has length of time away, social aspects and pre-existing health status, as identified in the literature, a developed survey instrument was implemented on Fraser Island with a one-day tour group and a three-day tour group. This instrument incorporated a selection of established scales designed to measure some of the constructs identified in the literature with the research providing a vast range of results that supported the exploration of some interesting associations. Following here are the final concluding remarks from the study and some recommendations regarding future wilderness experiences research.

6.1 Concluding Remarks

This study intended to characterise the influences of a wilderness experience on the individual health and wellbeing of tour guests on Fraser Island. It was also used to determine if the degree of health benefit derived from the wilderness experience on Fraser Island was associated with levels of pre-existing health status, the length of the experience on the island, and the level of social connectedness experienced by group members. In order to achieve these aims, fieldwork utilising survey methodology with a mixed methods approach was used. Both qualitative and quantitative research methods were utilised involving a questionnaire and face-to-face interviews.

An analysis of the results confirmed that the tour groups differed substantially across distributions of age, educational qualifications, family type, employment status, country of residence and size of current dwelling. Participants in both groups were predominantly on the island for a holiday, with the main reasons for visiting the island being to see the scenery, to visit a pristine clean area, to be close to nature, to see wildlife, the learn about the island, to experience nature, to visit a World Heritage Area and to escape the normal

routine. Personal reasons for visiting the island were the most prevalent. This was consistent with the theory proposed by Ulrich (1999) that natural environments can facilitate stress coping and restoration and improve health outcomes. The majority of the people on the tours were feeling great, relaxed or good before coming to the island, with the majority of the three-day group travelling alone and the one-day group travelling with their spouse or partner. Most were completing their first trip to the island and the three-day group saw more people than expected whilst the one-day group saw about as many people as expected on the island. Regarding the respondent's pre-existing health status, they matched very closely to the norm values for the Australian population, suggesting this group are no more or no less healthy than the rest of the population. The Personal Wellbeing Index scores were also very similar to Australian normative data. The one-day and three-day groups experienced similar positive emotions yet different negative emotions during their trip and this finding was discussed in relation to the unique features of each tour.

A considerable part of this research involved characterising the influences of a wilderness experience and distinguishing them from other experiences during the trip. Respondents were asked to state the most positive and negative aspect of their visit. For the positive perceptions of the one-day tour group, the scenery, the preservation and conservation of the island, their added learning, and the awe and wonder of the island were the most positive aspects of their visit. The three-day tour group also nominated the scenery and the feeling of awe and wonder, but also the opportunity for relaxation and the positive experiences at the lakes. Although no specific health aspects were mentioned directly, aspects of health and wellbeing such as feelings of increased relaxation and feelings of awe and wonderment were mentioned. This is an indication that few people have consciously made a link between a natural environment and their health as this is an innate tendency (Frumkin, 2001; Gullone, 2000; Pretty et al., 2003; Edward. O. Wilson, 1993, 2002). When respondents were asked to state how specific constructs of the island made them feel, the 'natural' aspects of the island ranked the most positive, followed by other environmental factors such as 'air quality'. These elements are directly incorporated in the theory of Attention Restoration in that "the interaction with nature is important for effective mental functioning" (Irvine & Warber, 2002, p. 78; Kaplan, 1995). Similar research has also found comparable results (Ewert, 1998; G. Godbey et al., 1992; Newell, 1997).

The Perceived Restorativeness Scale (PRS) showed that these visitors to Fraser Island had similar scores to those obtained in a study assessing peoples' perceived restorativeness of their favourite places (K. M. Korpela et al., 2001). The measures of trust, reciprocity, and diversity did not differ between the two tour groups, however it was interesting to note that irrespective of length of tour, these rated higher than the Australian norms (Stone & Hughes, 2002). It was found that if people were requested to conserve electricity or refrain from using suncream in the lakes, respondents expected people to put their personal needs before the protection of the environment. When respondents were asked how they thought their visit had influenced their health and wellbeing, a substantial number of people felt more relaxed and less stressed, however it was unclear if this was to do with the wilderness experience or the fact these people were out of their normal environment and on holiday. An unexpected result was that the one-day tour group reported the most amount of change in their health and wellbeing, especially positive changes to their normal routine, happiness, stress and overall health and wellbeing. After conducting the literature review (Frumkin, 2001; Maller et al., 2002a; McDonald et al., 2000; Pretty et al., 2003), this was not intuitive. It was postulated that this could be related in some way to the older demographic profile of the one-day tour guests.

The second part of this research was looking at the associations between the health outcomes and pre-existing health status, tour length, and social connectedness. The physical health status of someone does correlate with how comfortable and compatible one feels in that environment, which is consistent with the Biophilia Hypothesis (E.O. Wilson, 1984; Edward. O. Wilson, 1993). One's mental health score was negatively correlated with the same outcome, suggesting that these findings are consistent with the Attention Restoration Theory (Kaplan, 1995), and as depression among specific groups can be significantly decreased after spending time in a natural setting (Frumkin, 2001; Maller et al., 2002a), those with lower mental health scores may be the ones who can gain the most out of visiting natural environments. It was also found that people who rated highly on the Personal Wellbeing Index felt less negative emotion while on the island and indicated more positive change in their health and wellbeing.

The length of stay on the island did not seem to correlate well with any of the health and wellbeing outcome measures, which is not intuitive of the literature. Whilst this research

was designed to assess two different time periods, it was in fact two unique wilderness experiences as the tours did differ on aspects such as education and hurriedness. However the time gradient of just two days between the two tour groups may not have been sufficient to test this hypothesis adequately. If further research was to incorporate tours of a longer length, caution would have to be used as it may be difficult to increase the tour length without altering other variables, such as itineraries.

The most interesting part of this research is that it provides evidence that when people feel trust for the people around them, that other people are willing to help them out in times of need, and comfortable that everyone shares similar values, they gain the most health and wellbeing benefits from their time on Fraser Island. As the degree to which we trust each other in a particular setting is noted as one of the most important determinants of health (Lomas, 1998), this eludes to the notion that when groups are working well together and people feel comfortable among others, then the greatest positive change in health and wellbeing is possible while participating in a wilderness experience. Ulrich's theory (1999) also mentions that social support is an important mechanism facilitating stress reduction and restoration within natural environments.

The data derived from the interviews were used to support the results from the questionnaire. People clearly felt as though they were better off in terms of their health and wellbeing, and justified this by saying how positively their mood had changed since being on the island. The respondents also provided some valuable suggestions for management as to how to improve the influence of the tours on one's health and wellbeing.

6.2 Recommendations for Future Research

The primary recommendation from this research is that further investigation needs to be undertaken with the tourist population, both in Australia and overseas. This would support or refute the findings of this study and add new insights to the empirical base of knowledge in this field. Increasing the sample size and utilising comparative tours that are much longer in length would also provide more solid evidence if associations between health and contact with nature are to be further substantiated.

From a health promotion perspective on a community level, it has been suggested that contact with parks and nature can be an affordable, non-elitist and highly accessible means of promoting and improving the health of the community (Maller et al., 2002a). These ecosystems are structures that can support health, be equally distributed as a service in the community, involve communities and individuals, and possibly aid in the prevention of chronic illness. These features form part of the primary health care model, and if utilised in conjunction with an ecosystem perspective, communities and individuals will be better able to derive benefits from their surrounding natural environments.

The evidence provided here could encourage key stakeholders to promote these health and wellbeing benefits alongside the ecological benefits of the Fraser Island region; that is, combine the biophysical and socio-economic environments into their policy decisions to ensure a balance between the two paradigms. It is through this understanding that managerial bodies may be able to influence individuals and encourage them to visit natural areas as a preventative measure for health. "Understanding the positive relationship between ecosystems and human wellbeing can potentially reduce the apparent conflict between environmental improvement and human interests, thus improving management of local ecosystems" (Cox et al., 2004, p. 1). However, some academics in this field feel that because the health benefits of contact with nature span many different disciplines, there is a lack of integration that inhibits the uptake and use of theories and empirical evidence to promote nature-based activities as a health promotion approach (Townsend, Maller, St Leger, & Brown, 2003).

Considering this, there are some organisations that are leading the way. For example, collaboration between Parks Victoria, the International Park Strategic Partners Group and Deakin University in Melbourne, Australia, have initiated the 'Health Parks Healthy People' program, which aims to promote activities within natural settings in Victoria. If more states in Australia and other countries adopt strategies similar to those being implemented in Victoria, natural environments would have a greater positive influence on their surrounding communities. VicHealth is also exploring the links between human and ecosystem health and their significance for the future of health promotion.

This study has achieved its primary aim of characterising the influences of a wilderness experience among tour guests on Fraser Island, and has provided some valuable

discussion points regarding how pre-existing health status, tour length, and social connectedness influence a wilderness experience. If the knowledge derived from this research is "applied broadly to society…it may change the way we approach public health, guard and manage natural resources, and design environments for human use" (Irvine & Warber, 2002, p. 76). From here, further research qualitative research is needed with the tourist population, particularly in Australia, and with tour groups who stay a longer time in natural settings.

7.0 List of References

This reference list follows the guidelines of the American Psychological Association, also known as the APA 5th style.

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Appendix A: Themes of questions in questionnaire

Table 16: Questionnaire Themes, categories and variables

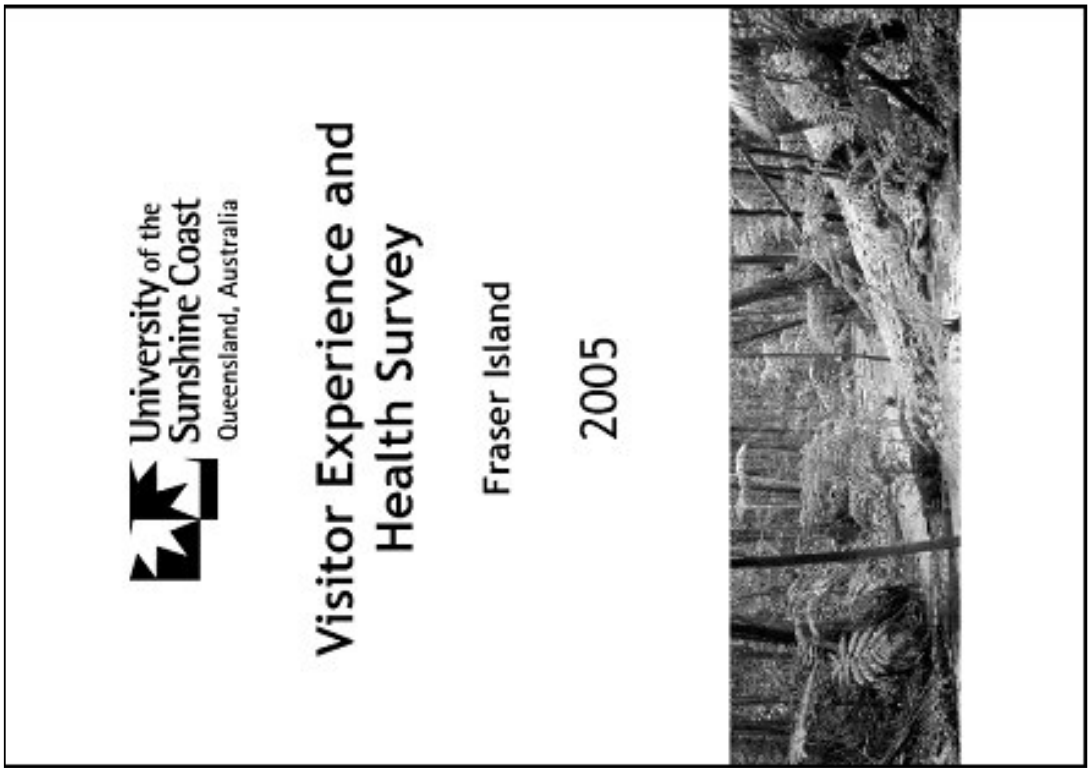
Theme	Category	Variable	Qu #
Theme 1 Motivations and purpose	Purpose	Holiday	1
		Time with Friends or relatives	
		Convention/Conference	
		Business	
		Training and/or Research	
		Education	
		Religion/Pilgrimages	
		Other	
	Nature (importance of)	Pristine, clean area	6
		The Scenery	
		Close to Nature	
		To see wildlife	
	Personal (importance of)	Slows my mind down	
		Personal Achievement	
		Escape the routine	
		Spiritual Experience	
		Preparation for future trips	
		Solitude	
		Adventure	
		Risk	
		Challenge	
		Part of my job	
		Recharge my body	
		Rest	
		Learn about island	
	Practical (importance of)	Ease of getting to	
		Driving Distance from home	
		Cost	
		School holidays	
	Activities (importance of)	The fishing	
		To go four-wheel driving	
		Bushwalking	
	Social (importance of)	Family and friends	
		Do something with others	
	Attractions (importance of)	It's a World Heritage Area	
		Aboriginal Culture	
		To experience resort facilities	
Theme 2 Perceptions of Experience	Extremes	Best aspect	4
		Worst Aspect	5
	Environment	natural place	7
		experience the beauty of nature	
		remote place	
		air quality	

Theme	Category	Variable	Qu #
	Education	learn about nature and the environment	
		Aboriginal History	
	Emotions	excitement	
		relaxation	
	Social	friends or family	
		Meet new people	
		be by myself	
		physically active	
	Facilities	Travel on Fraser Island Roads	
		access to shops	
	Change	concentration	30
		normal routine	
		level of trust	
		happiness	
		Stress	
		Blood pressure	
		Nervousness	
		Motivation	
		Emotional problems	
		Physical health	
		Overall health and wellbeing	
	Restorativeness (Perceived Restorativeness Scale)	Being Away (5 Qu's)	8
		Fascination (8 Qu's)	
		Coherence (4 Qu's)	
		Compatibility (9 Qu's)	
	Social Capital Norms	Level of Trust	9a
		Level of Reciprocity	9b
		Diversity	9c
		Level of Cooperation	10 & 11
	Mechanisms of Influence	On health and general feelings	29
Theme 3 Subjective Wellbeing	Personal Wellbeing	Life as a whole	20
		Standard of living	13
		Health	14
		Current achievements	15
		Personal relationships	16
		Safety	17
		Community Involvement	18
		Future Security	19
	Positive and Negative Affect (PANAS scale)	interested	12
		upset	
		scared	
		proud	
		ashamed	
		determined	
		active	
		distressed	
		strong	
		hostile	
		irritable	
		inspired	
		attentive	
		afraid	

Theme	Category	Variable	Qu #
		excited	
		guilty	
		enthusiastic	
		alert	
		nervous	
		jittery	
Theme 4 Self-reported health status (SF-8)	General health	Health rating	21
	Physical Functioning	Limit usual activities	22
	Physical Health – Role Limitations	Difficulty performing activities	23
	Emotional Problems – Role Limitations	Affect on activities	28
	Social Functioning	Extent that health impacts on social activities	26
	Pain	How much experienced	24
	Emotional Wellbeing	How much emotional problems have bothered you	27
	Energy and Fatigue	Amount of energy	25
Theme 5 Demographics	Trip	Duration of Stay in nights	2
		Previous Activity	2.3
		Companions	3
		Tour satisfaction	31
		Expectation of visitor numbers	32
		Familiarity with Fraser Island	33
		Number of previous visits to similar areas	34
		Number of years visiting similar areas	35
		Number of trips in last year, even if just for one day	36
	People	Gender	37
		Age	38
		Lifecycle Category	39
		Educational Qualifications	40
		Work Status	41
		Aboriginality/Torres Strait Islander	42
		Ethnic Background	46
		Main Language	45
		Current place of Residence	44
		Size of place where currently living	47
		Size of place where growing up	48
Standard items recorded	Weather	Cloud Cover	n/a
		Wind	n/a
	Tour	Type	n/a
		Tour Driver	n/a

Appendix B: Questionnaire

The following pages contain the questionnaire that was designed for this research.



This survey is designed to collect information about your experience on Fraser Island, your general health, and the factors that influence those experiences. This survey contains standard health instruments that are validated for Australian use. The main parts of this questionnaire are about your trip, your thoughts, your wellbeing, your health and yourself.

The information collected during the study will assist in establishing effective management strategies for Fraser Island and help determine how health relates to your visitor experience.

We appreciate your time in filling out this questionnaire.
Your personal details will not be collected.
All information obtained will be anonymous.

Section A: About Your Trip

This section is about your trip to Fraser Island and helps us understand why you came here, how long you are staying and who came with you.

Please answer each question below.

1. Please indicate your **main** reason for visiting Fraser Island by placing a tick in **one** box next to your choice.

- ☐ Holiday
- ☐ Time with friends or relatives
- ☐ Convention or conference
- ☐ Business
- ☐ Training and/or research
- ☐ Education
- ☐ Religion/pilgrimages
- ☐ Other (please specify)

_____

2. How long are you staying on Fraser Island during THIS trip? Place a tick in **one** box next to your choice.

- ☐ Day Trip Only - Please go to Q. 2.2 (over page)
- ☐ Staying at least one night - Please go to Q. 2.1

2.1 Please write a number on each line below that completes the statements.

I have ALREADY stayed _____ nights on Fraser Island

I am staying a total of _____ nights on Fraser Island

2.2 In the 4 weeks before arriving on Fraser Island, I have been mostly...(please tick the appropriate box)

- ☐ Working
- ☐ Studying
- ☐ Retired
- ☐ On holidays/backpacking
- ☐ Other_____

_____

2.3 What was your predominant/main feeling/mood during the 4 weeks before arriving on Fraser Island? Please write on the line below.

_____

3. **Who** are you travelling with? Please tick all that apply.

- ☐ I'm travelling alone
- ☐ Spouse/Partner
- ☐ Parents/in-laws/step-parents
- ☐ Children whom I am responsible for
- ☐ Extended family members
- ☐ Another family
- ☐ Friend/s or Colleague/s (whom you knew before the tour)
- ☐ Other (please specify)

_____

Section B: Your thoughts

This section is about your thoughts regarding your visit to Fraser Island. This information will help those managing the island improve their management decisions.

4. What has been the most **positive** aspect of your visit to Fraser Island? We would like to know your thoughts, so please describe all details about your positive aspect.

_____

_____

_____

_____

_____

_____

5. What has been the most **negative** aspect of your visit to Fraser Island? Remember that this survey is anonymous, and that your tour guide and the researchers will not know who wrote what. Please write as much as you can.

_____

_____

_____

_____

_____

_____

6. Think back to your answer for Question 1. How important were each of the following factors in your **decision** to come to Fraser Island as opposed to going elsewhere? Please tick the box under your choice using the scale below, which ranges from **not important** to **very important**, or **not applicable**.

	Not Important				Very Important	Not Applicable
Ease of getting to	☐	☐	☐	☐	☐	☐
Driving distance from home	☐	☐	☐	☐	☐	☐
Cost	☐	☐	☐	☐	☐	☐
To be with family & friends	☐	☐	☐	☐	☐	☐
To visit a pristine, clean area	☐	☐	☐	☐	☐	☐
The Scenery	☐	☐	☐	☐	☐	☐
To experience adventure	☐	☐	☐	☐	☐	☐
To experience resort facilities	☐	☐	☐	☐	☐	☐
To be close to nature	☐	☐	☐	☐	☐	☐
To Rest	☐	☐	☐	☐	☐	☐
Its part of my job	☐	☐	☐	☐	☐	☐
The fishing	☐	☐	☐	☐	☐	☐
The solitude	☐	☐	☐	☐	☐	☐
Learn about Island	☐	☐	☐	☐	☐	☐
To see Wildlife	☐	☐	☐	☐	☐	☐
To take a risk	☐	☐	☐	☐	☐	☐
Aboriginal Culture	☐	☐	☐	☐	☐	☐
Spiritual experience	☐	☐	☐	☐	☐	☐
Slows my mind down	☐	☐	☐	☐	☐	☐
To visit a World Heritage Area	☐	☐	☐	☐	☐	☐
To escape the normal routine	☐	☐	☐	☐	☐	☐
It's school holidays	☐	☐	☐	☐	☐	☐
To go bush walking	☐	☐	☐	☐	☐	☐
Do something with others	☐	☐	☐	☐	☐	☐
To recharge my body	☐	☐	☐	☐	☐	☐
To challenge myself	☐	☐	☐	☐	☐	☐
Personal achievement	☐	☐	☐	☐	☐	☐
Preparation for future trips	☐	☐	☐	☐	☐	☐
To experience Four-wheel Driving	☐	☐	☐	☐	☐	☐

7. These questions are about how your visit to Fraser Island has made **you FEEL**. Select the answer that best completes each of following statements. Place a tick in the box under your choice using the scale below, which ranges from **very negative** to **very positive**, or **not applicable**.

	Very Negative				Very Positive	Not Applicable
To be in a natural place has been...	☐	☐	☐	☐	☐	☐
To meet new people has been...	☐	☐	☐	☐	☐	☐
To learn more about nature and the environment has been...	☐	☐	☐	☐	☐	☐
To experience the beauty of nature has been...	☐	☐	☐	☐	☐	☐
To be physically active has been...	☐	☐	☐	☐	☐	☐
To have some excitement has been...	☐	☐	☐	☐	☐	☐
To experience a different air quality has been...	☐	☐	☐	☐	☐	☐
To travel on Fraser Island roads has been...	☐	☐	☐	☐	☐	☐
To relax and unwind has been...	☐	☐	☐	☐	☐	☐
To be in a remote place has been...	☐	☐	☐	☐	☐	☐
To be with friends or family has been...	☐	☐	☐	☐	☐	☐
The level of access to shops has been...	☐	☐	☐	☐	☐	☐
To discover the Aboriginal History on the island has been...	☐	☐	☐	☐	☐	☐
To be by myself has been...	☐	☐	☐	☐	☐	☐

8. We are interested in your experience of this place (Fraser Island). To help us understand your experience, we have provided the following statements for you to respond to. Please read each statement carefully, then ask yourself, 'How much does this statement apply to my experience here?

To indicate your answer, please circle one number for each statement.

Statement	Not at all	Very little	Rather little	Neither little nor much	Rather much	Very Much	Completely
a) Being here is an escape experience.	0	1	2	3	4	5	6
b) Spending time here gives me a break from my day-to-day routine.	0	1	2	3	4	5	6
c) It is a place to get away from it all.	0	1	2	3	4	5	6
d) Being here helps me to relax my focus on getting things done.	0	1	2	3	4	5	6
e) Coming here helps me to get relief from unwanted demands on my attention.	0	1	2	3	4	5	6
f) This place has fascinating qualities.	0	1	2	3	4	5	6
g) My attention is drawn to many interesting things.	0	1	2	3	4	5	6
h) I want to get to know this place better.	0	1	2	3	4	5	6
i) There is much to explore and discover here.	0	1	2	3	4	5	6
j) I want to spend more time looking at the surroundings.	0	1	2	3	4	5	6
k) This place is boring.	0	1	2	3	4	5	6
l) The setting is fascinating.	0	1	2	3	4	5	6
m) There is nothing worth looking at here.	0	1	2	3	4	5	6
n) There is too much going on.	0	1	2	3	4	5	6

Statement	Not at all	Very little	Rather little	Neither little nor much	Rather much	Very Much	Completely
o) It is a confusing place.	0	1	2	3	4	5	6
p) There is a great deal of distraction.	0	1	2	3	4	5	6
q) It is chaotic here.	0	1	2	3	4	5	6
r) Being here suits my personality.	0	1	2	3	4	5	6
s) I can do things I like here.	0	1	2	3	4	5	6
t) I have a sense that I belong here.	0	1	2	3	4	5	6
u) I can find ways to enjoy myself here.	0	1	2	3	4	5	6
v) I have a sense of oneness with this setting.	0	1	2	3	4	5	6
w) There are landmarks to help me get around.	0	1	2	3	4	5	6
x) I could easily form a mental map of this place.	0	1	2	3	4	5	6
y) It is easy to find my way around here.	0	1	2	3	4	5	6
z) It is easy to see how things are organized.	0	1	2	3	4	5	6

9. The statements below are about what **you** think about your fellow travellers on Fraser Island. Circle the corresponding number using the options below, ranging from **not at all** to **completely**.

Statement	Not at all										Completely
a) Generally speaking, most people can be trusted.	0	1	2	3	4	5	6	7	8	9	10
b) Most of the time, people try to be helpful.	0	1	2	3	4	5	6	7	8	9	10
c) People around here share the same values	0	1	2	3	4	5	6	7	8	9	10

10. If visitors to Fraser Island were asked to conserve electricity, how likely do you think they are to cooperate with this request?

Very Unlikely	Unlikely	Neither /depends	Likely	Very Likely
1	2	3	4	5

11. If visitors to Fraser Island were asked **not** to wear sun protection cream when swimming to avoid polluting the lakes, how likely do you think they are to cooperate with this request?

Very Unlikely	Unlikely	Neither /depends	Likely	Very Likely
1	2	3	4	5

Section C: Your Wellbeing

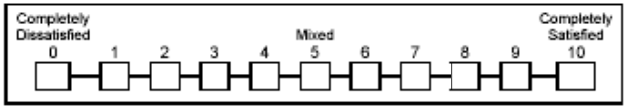
This section is about your personal wellbeing and what you think about life in general. This information will help us determine how Fraser Island has impacted on your thoughts and how your life in general has influenced your experience.

12. This table consists of 20 words that describe different feelings and emotions. For each word indicate to what extent you feel this way **right now**, that is, at the present moment. Using the scale at the top of the table, write a number from 1 - 5 on the line next to each item.

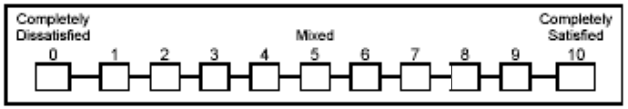
1 very little or not at all	2 a little	3 moderately	4 quite a bit	5 extremely
_____ Interested		_____ Irritable		
_____ Distressed		_____ Alert		
_____ Excited		_____ Ashamed		
_____ Upset		_____ Inspired		
_____ Strong		_____ Nervous		
_____ Guilty		_____ Determined		
_____ Scared		_____ Attentive		
_____ Hostile		_____ Jittery		
_____ Enthusiastic		_____ Active		
_____ Proud		_____ Afraid		

The following questions are about **your life in general** (i.e. When you are **not** on holiday or visiting new places). Please tick the corresponding box under your choice.

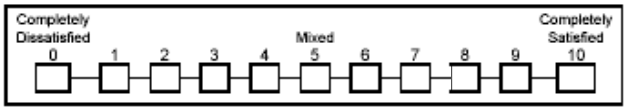
13. How satisfied are you with your STANDARD OF LIVING?



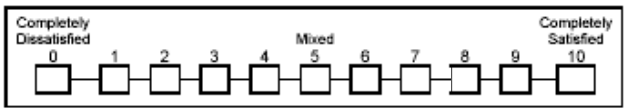
14. How satisfied are you with your HEALTH?



15. How satisfied are you with WHAT YOU ARE ACHIEVING IN LIFE?

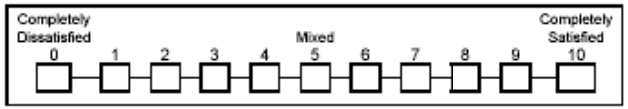


16. How satisfied are you with your PERSONAL RELATIONSHIPS?

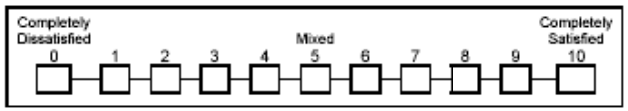


17. How satisfied are you with HOW SAFE YOU FEEL?

18. How satisfied are you with FEELING PART OF THE COMMUNITY?



19. How satisfied are you with your FUTURE SECURITY?



20. Thinking about your own life and personal circumstances, how satisfied are you with your life as whole?

Section D: Your Health

The following 8 questions will measure your general health **prior** to visiting Fraser Island. This information will help us explore how your health has influenced your experience on the island.

Please take the time to read and answer each question carefully by ticking the appropriate box that best represents your answer. Some questions may look like others, but each one is different. Please answer every question.

21. Overall, how would you rate your health during the **past 4 weeks?**

Excellent	Very good	Good	Fair	Poor	Very Poor
☐	☐	☐	☐	☐	☐

22. During the **past 4 weeks**, how much did physical health problems limit your usual physical activities (such as walking or climbing stairs)?

Not at all	Very little	Somewhat	Quite a lot	Could not do physical activities
☐	☐	☐	☐	☐

23. During the **past 4 weeks**, how much difficulty did you have doing your daily work, both at home and away from home, because of your physical health?

None at all	A little bit	Some	Quite a lot	Could not do daily work
☐	☐	☐	☐	☐

24. How much **bodily** pain have you had during the **past 4 weeks**?

None	Very mild	Mild	Moderate	Severe	Very Severe
☐	☐	☐	☐	☐	☐

25. During the **past 4 weeks**, how much energy did you have?

Very much	Quite a lot	Some	A little	None
☐	☐	☐	☐	☐

26. During the **past 4 weeks**, how much did your physical health or emotional problems limit your usual social activities with family or friends?

None at all	Very little	Somewhat	Quite a lot	Could not do social activities
☐	☐	☐	☐	☐

27. During the **past 4 weeks,** how much have you been bothered by **emotional problems** (such as feeling anxious, depresses or irritable)?

Not at all	Slightly	Moderately	Quite a lot	Extremely
☐	☐	☐	☐	☐

28. During the **past 4 weeks,** how much did personal or emotional problems keep you from doing your usual work, school or other daily activities?

Not at all	Very little	Somewhat	Quite a lot	Could not do daily activities
☐	☐	☐	☐	☐

29. How has your visit to Fraser Island **influenced** your own **health** and **general feelings**? Please think of both **good** influences and **bad** influences. Please write as much as you can on the lines below, and remember that this survey is anonymous.

Good influences on my health:_____

_____

_____

_____

_____

_____

_____

_____

Bad influences on my health:_____

_____

_____

_____

_____

_____

_____

_____

30. These statements are about how your visit to Fraser Island has **changed** the way **you FEEL**. Please complete each statement by ticking the appropriate box, which ranges from **very negative** to **very positive**, or **not applicable**.

Statement	Very Negative				Very Positive	Not Applicable
The change in my concentration has been...	☐	☐	☐	☐	☐	☐
The change from my normal routine has been...	☐	☐	☐	☐	☐	☐
The change in my level of trust I put in others has been...	☐	☐	☐	☐	☐	☐
The change in my level of happiness has been...	☐	☐	☐	☐	☐	☐
The change in my level of stress has been...	☐	☐	☐	☐	☐	☐
The change in my level of motivation has been...	☐	☐	☐	☐	☐	☐
The change in how I feel emotionally has been...	☐	☐	☐	☐	☐	☐
The change in how I feel physically has been...	☐	☐	☐	☐	☐	☐
The change in my overall health and wellbeing has been...	☐	☐	☐	☐	☐	☐
Other _____ _____	☐	☐	☐	☐	☐	☐
Other _____ _____	☐	☐	☐	☐	☐	☐

Section E: About You

The following questions are about you and practical aspects of your trip to Fraser Island.

For the next 4 questions, please tick the appropriate box.

31. How satisfied are **you** with your tour of Fraser Island?

- ☐ Very satisfied
- ☐ Moderately satisfied
- ☐ Slightly satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Slightly dissatisfied
- ☐ Moderately dissatisfied
- ☐ Very dissatisfied

32. Please indicate **your perception** on the **number** of people you saw on Fraser Island.

- ☐ A lot less people than expected
- ☐ A little less people than expected
- ☐ About as many people as expected
- ☐ A little more than expected
- ☐ A lot more than expected
- ☐ Did not have any expectations

33. How many times have you **previously** visited **Fraser Island**?

- ☐ None, first trip
- ☐ Once before
- ☐ 2-6 times before
- ☐ More than 6 times before

34. How many times in your life have you previously visited areas such as National Parks, State Forests or other natural areas?

- ☐ First Trip
- ☐ Once before
- ☐ 2-6 times before
- ☐ More than 6 times before

For the next 2 questions, please write on the lines provided.

35. For how many **years** have you been visiting areas such as National Parks, State Forests or other similar natural areas?

_____year/s

36. In the last **12 months**, how many trips did **you** make to areas such as National Parks, State Forests or other similar natural areas, even if it was just for the day?

_____ trip/s

For the next 6 questions, please tick the appropriate box.

37. What is your gender?

- ☐ Male
- ☐ Female

38. Which age bracket do you fit into?

- 18-24 years of age ☐
- 25-34 years of age ☐
- 35-44 years of age ☐
- 45-54 years of age ☐
- 55-64 years of age ☐
- 65 years or older ☐

39. Which category best describes your home life?

- Single ☐
- Couple/No Children ☐
- Single Parent Family (youngest child under 6 years in my care) ☐
- Single Parent Middle Family (youngest child 6-15 years in my care) ☐
- Single Parent Mature Family (youngest child 16 and over in my care) ☐
- Family (youngest child under 6 years in my care) ☐
- Middle Family (youngest child 6-15 years in my care) ☐
- Mature Family (youngest child 16 and over in my care) ☐

40. What is the highest level of education you have obtained (or currently obtaining)? Please tick the closest equivalent option.

- Primary School ☐
- Secondary School ☐
- Tertiary/Bachelor ☐
- Trade or Technical certificate ☐
- Diploma or Associate Degree ☐
- Postgraduate Coursework Degree ☐
- Postgraduate Research Degree ☐
- Other (please specify) ☐

_____

41. Are you currently... (indicate the one that **mostly** describes you)

- Employed Full-time ☐ → Is this... Permanent/ continuing ☐
- Employed Part-time ☐ → Is this... Casual ☐
- Self-employed ☐
- Unemployed ☐
- Not working because of poor health ☐
- Full-time house-person ☐
- Student ☐
- Retired ☐
- Other (Please specify) _____

42. Are you of Australian Aboriginal or Torres Strait Island origin?

- No ☐
- Yes, Australian Aboriginal ☐
- Yes, Torres Strait Islander ☐

43. In which country were you born? Please write on the line below.

_____

44. Are you an Australian resident?

- Yes ☐ Please go to Q. 45
- No ☐ Please read below

If you answered NO in the above question, what is your usual country of residence? Please write the country on the line below.

_____

45. What language do you mainly speak at home? Please write the language on the line below.

_____

46. To what (if any) ethnic group do you feel you belong? Please write this group on the line below.

_____

47. What term best describes the place you live normally?

Unit/flat/apartment	☐
House/detached dwelling/duplex/townhouse	☐
Farm/Rural	☐

48. What term best describes the place you lived most of the time when you were a child (under the age of 12 years)?

Unit/flat/apartment	☐
House/detached dwelling/duplex/townhouse	☐
Farm/Rural	☐

49. If you have any other comments you would like to make, please use the lines below.

_____

_____

_____

_____

_____

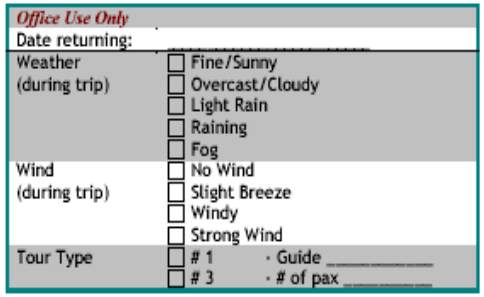
50. If time permits, are you willing to have a short 3 minute follow up chat about how your trip has impacted on your health with the researcher just after you hand this back?

Yes	☐
No	☐

If **yes**, please let Belinda, the researcher, know when you hand back this form. If **no**, please hand this form back to either Belinda or her research assistant.

Thank you!

Thank you very much for taking the time to participate in this research. We wish you the best for the rest of your journey!


Office Use Only
Date returning:
Weather
(during trip)
Fine/Sunny
Overcast/Cloudy
Light Rain
Raining
Fog
Wind
(during trip)
No Wind
Slight Breeze
Windy
Strong Wind
Tour Type
1
3
· Guide
· # of pax

Appendix C: Research Project Information Sheet

RESEARCH PROJECT INFORMATION SHEET

University of the Sunshine Coast
Queensland, Australia

Project Title
Visitor Experiences and Health Survey – A Case Study on Fraser Island.

Description and purpose of this Research Project
This is an exploratory study to characterise visitor experiences in relation to individual health and wellbeing among tour guests after a wilderness experience. The study will be conducted on Fraser Island during July and August 2005 and is designed to collect information about your experience on Fraser Island, your general health, and the factors that influence those experiences. This survey contains standard health instruments that are validated for Australian use. The main parts of this questionnaire are about your trip, your thoughts, your wellbeing, your health and yourself.

Through collecting this information, we hope to gain a better understanding of what visitors gain from visiting the island and identify the factors that influence those experiences. The information collected during the study will assist in the characterisation of how health relates to a wilderness experience, and provide a foundation for future studies in health and wellbeing based at the university.

How can you be involved?
We will be asking those of you who **volunteer** to take part to **complete one questionnaire**. It will be expected to take between **15 and 20 minutes to complete.** The completed questionnaires will be collected prior to your departure from the island or disembarkation from the barge/fastcat.

In addition to the questionnaire, you are invited to participate in a **short 3 minute discussion with the researcher, if you wish to do so.** This will be about the research and if you would like to go into more depth about the questions asked.

This is an anonymous survey. Your name and address will NOT be collected. We will not be able to identify you from the information you provide.

Voluntary Participation
Participation in this study is voluntary. You do not have to give any reason to anyone if you decide not to take part. If you do decide to volunteer but later change your mind, you may stop participation at any time without the need to provide an explanation, in which case any information already provided by you will be excluded from the analysis, unless you give your permission to include this information.

Inclusion/Exclusion Criteria
To participate in this study, you **must….**

1. **Have just completed a tour of Fraser Island**
2. **Be 18 years or over**

If you do not fit into any one of the above categories, then please hand all material back to the researcher, and we thankyou for considering to participate.

Who will benefit from this research?
Participant Benefits: Your involvement in this study will provide an opportunity for you to reflect on your experiences while on the island. You may also request to gain access to the report outlining the results of this study (the contact details to arrange this are at the bottom of this information sheet).

Benefits for Others: By participating in this research, your tour operator may be able to incorporate the findings into their operations of what types of experiences they should cater for. The results may also be

able to be used to inform park management strategies that benefit Fraser Island and guide the selection of future policies for management organisations such as the Queensland Parks and Wildlife Service.

Risk of Harm to Participants

We believe there are no elements of this research that might cause physical or emotional pain, discomfort or stress. None of the questions are designed to modify your knowledge, thinking, attitudes, feelings or behaviour. Participation in this project is entirely voluntary, and anonymity and confidentiality is assured. Therefore, we believe none of the procedures or research elements will adversely affect you or any other parties, including those conducting the project.

Privacy considerations

This study will not be possible without the willingness of yourself and other tour gests to participate. All aspects of this study will conform with the *University of the Sunshine Coast Human Research Ethics Committee Guidelines for ethics approval for research involving humans*. In addition, the required approvals have been obtained from your tour operator. As researchers, we will respect the privacy and the wellbeing of yourself and other volunteers throughout the study. All meetings and discussions between yourself and the researcher will be conducted only during the administration of the questionnaire.

Participation in the study will involve the collection of personal information such as your gender, age, educational qualifications, ethnicity and preferred language, as required to answer specific research aims. **Your name and address will NOT be collected.** The investigators will ensure that your personal information remains confidential, and it is anticipated that these details will **not** be able to be tracked back to you. The information collected will only be used for the purposes of this research project.

It is likely that the data obtained from the study will be used to prepare a publication for submission to a scientific journal, or for presentation at a scientific conference. The investigators will provide the results of the study in written form to the University of the Sunshine Coast, and also at a seminar in November 2005 at the University of the Sunshine Coast as part the requirements of a Bachelor of Science (Honours).

The Research Team

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Principle Investigator/Supervisor: Dr Anne Neller, Lecturer in Health and Environment; Faculty of Science, Health and Education, University of the Sunshine Coast. Phone: (07) 54 302839. Email: aneller@usc.edu.au.

Participants may contact the Researcher or Principal Investigator with regard to any matter of concern about the research on the contact number/e-mail addresses provided above.

Miss Belinda Warren, Dr Anne Neller, Associate Professor Ron Neller (Co-Supervisor), and the University of the Sunshine Coast, appreciate your participation in the research project.

The investigators gratefully acknowledge the endorsement and support provided for this project by Sand Island Safaris and Kingfisher Bay Resort and Village.

If you have any complaints about the way this research project is being conducted you can either raise them with the Principal Investigator or, if you prefer an independent person, contact the Chairperson of the Human Research Ethics Committee at the University of the Sunshine Coast: (c/- The Secretary, University of the Sunshine Coast, Maroochydore DC 4558; telephone (07) 5430 1144; facsimile (07) 54301111; e-mail mellis@usc.edu.au).

Appendix D: Interview Proforma

Interview Proforma

Visitor Experience and Health Survey
Fraser Island 2005

Date	Tour	Survey #	Your Initials	Notes

"Hi there, I would just like to ask you a few questions about how you think visiting Fraser Island has impacted on your health.

Has there been any particular times or events that you think influence your health?"

If yes, probe fully.

_____

_____

_____

_____

_____

_____

Ask things like:
- Where did it occur (on Fraser Island)?
- How did it make you feel?
- What changes did you notice in yourself?
- Why do you think you felt that way?

and so on...(use discretion and common sense here!!
Remember your ethical values!)

If not, ask "How do you think visiting Fraser Island could influence other people's health?" (Probe fully)

_____

_____

_____

"Do you have any suggestions for management or other visitors to Fraser Island that would improve the impact on their health? "(Probe fully)

_____

_____

_____

"Well that looks about it. Thanks very much for chatting. Enjoy the rest of your holidays."