



**THE UNIVERSITY OF QUEENSLAND**  
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**Understanding Non-compliance in National Parks: An Extension of the  
Theory of Planned Behaviour**

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## **Abstract**

A plethora of studies have investigated motivations behind non-compliant behaviours at National Parks. This study focused on the non-compliant behaviour of visitors venturing off-trail at Blue Mountains National Park (BMNP). The Theory of Planned Behaviour (TPB) was employed as the theoretical framework for this study to understand the attitudes, perceived difficulties and social pressure involved in visitors' non-compliant behaviours, and together with the New Ecological Paradigm (NEP), to understand environmental values.

The study adopted a mixed methods design with qualitative and quantitative research techniques. The qualitative stage elicited salient beliefs of visitors through interviews with BMNP experts (n=5) and BMNP visitors (n=22). Based on the elicitation study, a questionnaire was developed for the quantitative study (n=325) to predict visitors' behavioural intentions to venture off-trail at BMNP. Results of the quantitative study revealed that the TPB predicted 14.8 percent ( $R^2$ ) in the prediction of off-trail behavioural intentions. Social norm was the strongest predictor followed by attitudes. The role of perceived difficulties and environmental values were not significant in the regression analysis when predicting off-trail behavioural intentions.

The main factors that motivated off-trail behavioral intentions included having a closer view of nature, and finding a shorter route. The reference groups of other visitors and friends emerged as important reference groups. Although the perceived difficulty factor as a whole was not significant, there were certain items such as lack/ no signage, lack of access to park facilities and challenging terrains that were significant in off-trail behavioural intentions. Lastly, BMNP visitors reported a high NEP score of 76, which reflected strong environmental values held towards general environmental matters. However, these strong general environmental values were not translated into attitudes towards venturing off-trail at BMNP, as reported in the non-significant results in the regression and mediation analysis. This suggested that visitors to BMNP had very strong pro-environmental values in general but did not associate venturing off-trail as contrary to their environmental values.

By demonstrating the significance of attitudes and subjective norms, this thesis will contribute to the advancement of social marketing campaigns for Park administrators and policy makers by providing guidance to develop preventive measures to increase park safety and decrease non-compliant activities at BMNP.

### **Declaration by author**

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

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No contributions by others.

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None.

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*Knowledge is dichotomous and an oxymoron.*

*You can only learn if you do not know something.*

*The end of the PhD is only the beginning of the end.*

*Let this be a memorable milestone in my life and certainly one of my greatest legacies.*

### **Keywords**

theory of planned behaviour, pro-environmental values, new ecological paradigm, non-compliance behaviour, national parks, tourism management, tourism social marketing

### **Australian and New Zealand Standard Research Classifications (ANZSRC)**

150603	Tourism Management	30%
150604	Tourism Marketing	30%
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1505	Marketing	30%
1506	Tourism	70%

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# 1. INTRODUCTION

The history of national parks in Australia can be traced to over a century ago when the first national park, The Royal National Park, was officially opened in Sydney in 1879 (Beckmann, 1991; Westcott, 1993; Hall, 2000). Since then, the Australian Government has conserved and dedicated a total of 28 million hectares of land across 511 national parks, which attract a total of 83.5 million visitors per year (DEWHA, 2011). Clearly, national parks are an important element in tourism and in the Australian landscape. The purpose of Australian National Parks is to protect substantial areas of land for members of the public, and for tourists to engage in relaxing activities such as picnics, sporting activities, holiday accommodation, and outdoor activities.

According to the International Union for Conservation of Nature (2011), national parks are “natural area of land / or sea, designated to: 1) protect the ecological integrity of one or more ecosystems for present and future generations; 2) exclude exploitation or occupation inimical to the purposes of designation of the area; and 3) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible.” This same definition of national parks continues to apply, but with an even greater emphasis on maintaining environmental and conservation values (Wright, 1996). However, a key problem faced by management at national parks is the non-compliant behaviour of visitors who violate protective regulations such as walking off-trail and, in doing so, place themselves and others at risk (Gramann et al., 1995; Ward & Roggenbuck, 2003; Fredman et al., 2009).

Non-compliant behaviour is seen as decisions that go against protective recommendations through calculated actions taken in expectation of some outcome or reward associated with this non-compliance (Espiner, 1999). For example, ignoring park signage and walking off a designated track to have a closer look at a site attraction is a form of non-compliant behaviour (Bradford & McIntyre, 2007). While this problematic behaviour is generally a case of naiveté rather than malicious intent, it results in exposure to the risk of accidents and can have undesirable outcomes for an individual and for other visitors

(Espiner, 2001). Visitors are more likely to be non-compliant and involved in accidents while overseas than within their country of residence (Bentley et al, 2001) due to more relaxed attitudes and less consciousness of risk while on holidays (Espiner, 2001). The act of non-compliance is also more likely to be higher in visitors who have low levels of perceived risk towards unfamiliar environments. Bentley et al. (2001) suggested that activities that are perceived as low risk might actually have the highest injury risk. For example, an experienced rock climber died after falling down a cliff in the Blue Mountains, NSW, Australia, as he was setting ropes in preparation for abseiling (Robinson, 2010). In order to curb non-compliant behaviour, BMNP management has adopted a mixture of direct and indirect measures. Direct measures involve strict enforcement of rules and regulations through fines, site restrictions, permit rationing and visitor zoning (Manning, 1999; Kuo, 2002; Hockett et al., 2010). Indirect measures to curb non-compliant behaviour adopt more subtle and light-handed approaches through persuasive communications, interpretation and site design to encourage voluntary changes in behaviour without the explicit threat of penalties (Manning, 1999; Park et al., 2008).

The Blue Mountains National Park (BMNP) is a world heritage site, and an ideal environment to study visitors' behavioural intentions to comply with regulations that they stay on-trail. Visitor management at BMNP is challenging due to its total heritage area of 1.03 million hectares, high level of 3 million visitations every year, and the vast number of outdoor adventure activities on offer such as bush walking and canyoning (NSW National Parks and Wildlife Service, 2013). Generally, most of these visitors comply with the rules and regulations at BMNP. However, Park Management has encountered visitors who chose to non-comply and venture off-trail. As a result, these off-trail visitors been injured, or in extreme cases have encountered fatal misadventures, than those visitors who stayed on-trail. The exact number of off-trail visitors is unknown and is difficult to detect, given the 1.03 million hectares that comprise the park (NSW National Parks and Wildlife Service, 2013). Therefore, most cases of off-trail non-compliance go undetected unless the non-complying visitor requires medical assistance or emergency rescue as a result of venturing off-trail.

In 2010, the Springwood Police Department, NSW, and BMNP released official figures of 53 police rescue operations in the year 2009 – 2010 that were carried out at in the park to rescue visitors who experienced misadventures as a result of venturing off-trail (Howden, 2010). For example, in 2010, three visitors to the park ignored warning signs, deviated from the designated path, and climbed over locked gates to go canyoning during torrential rain. They were reported missing by their family members, which led to a search and rescue operations involving over 100 National Park Rangers, Police Officers and Emergency Services Officers, who endangering their own lives to save the visitors (Howden, 2010). Ignoring warning signs and venturing off-trail is a frequent non-compliant behaviour that can result in accidents and, in some instances, death. For example in 2009, a visitor died when his parachute snagged on trees in the park after he ignored warning signs that stated, “no BASE jumping allowed”. In 2013, a British visitor ventured off-trail and tried to walk across Wentworth Falls at BMNP. Unfortunately, he fell to his death after slipping on some rocks while trying to do so (Cunningham-Lewis, 2013).

Venturing off-trail is prohibited and highly discouraged by Park Management at BMNP for reasons related to visitor safety and resource protection. In 2000, the park received heritage listing for its outstanding representation of the evolutionary adaptation and diversification of Australia's eucalypts and the important biodiversity within the park, which comprises 10 percent vascular flora as well as significant numbers of rare or threatened species. These include endemic and evolutionary relict species such as the Wollemi pine which have persisted in highly-restricted microsites (UNSECO, 2013). Therefore, the act of venturing off-trail can have negative environmental impacts, including litter left behind by visitors (Cole, 1990; Leung & Marion, 2000), and increased stress levels on the site’s fragile ecosystems and damage to the natural environment (Janowsky & Becker, 2002).

Park Managers at BMNP have adopted a mixture of direct and indirect management techniques to minimise off-trail behaviour. For example, Park Rangers police the national park and issue fines for visitors who contravene park regulations, such as entering restricted zones, causing a public nuisance and theft of park property. This has been

challenging, as it is almost impossible for a small team of Park Rangers to police the vast terrain of the park. Another common direct measure is the use of barriers to implement site restrictions. However, only certain ‘hot spots’ are covered due to the large surface area and the need to maintain the overall beauty and scenic views of the park. Management at BMNP has also relied on indirect management techniques such as onsite signage designed to dissuade visitors from leaving designated paths, except on days when these paths are closed for various reasons. In such cases, visitors are redirected to use alternative unmarked paths if necessary. Specifically, safety signage and interpretative information are available for visitors in Visitor Centers and along trails to convey the dangers and hazards associated with venturing off-trails. However, despite the management techniques employed by Park Management, a proportion of visitors still choose to venture off-trail.

## **1.2. Research Problem, Contribution and Significance**

Non-compliant behaviour is one of the most significant problems reported by management at nature based tourist establishments (Gramann et al., 1995; Ward & Roggenbuck, 2003; Fredman et al., 2009); at BMNP this non-compliant behaviour is particularly evident in visitors venturing off-trail. According to Mr. Geoff Luscombe, Regional Manager of Blue Mountains National Park, *“Off-trail behaviour is a major problem that poses great danger to the individual, other park visitors and wildlife ... this results in a significant portion of budget wasted on park maintenances, repairs and rescue operations”* (G. Luscombe, 2011, personal interview, March 1). Notwithstanding, research in this area is limited, with few studies on non-compliant behaviour (Nesbitt, 2006), including off-trail behaviour, carried out at national parks. Within these limited studies, most non-compliant recommendations are general in nature rather than site specific, and do not provide site managers with theoretical frameworks for analysing visitor behaviour or making decisions with respect to communication approaches that would be best suited to influence and change these non-compliant behaviours (Ham et al., 2008; Brown et al., 2010). Behavioural change is a complicated psychological process (Cottrell & Graefe, 1997; Ham & Weiler, 2002). However, one prominent theory, The

Theory of Planned Behaviour (TPB) (Ajzen, 1991, 2011), has been applied successfully in previous non-compliant behavioural studies such as hunting intentions in parks (Hrubes et al., 2001), petrified wood theft in parks (Ward & Roggenbuck, 2003), 'do not feed black bears' warning signs in national parks (Lackey & Ham, 2004), walking dogs off leash in parks (Nesbitt, 2006), and feeding wildlife in national parks (Ballantyne & Hughes, 2006). The TPB postulates that individuals' behavioural intentions and actual performance are guided by their attitudes toward particular behaviour, social pressure towards the particular behaviour, and perceived difficulties in performing that behaviour. For example, if a visitor has positive attitudes towards venturing off-trail, has support from important reference groups to venture off-trail and perceives little difficulties in venturing off-trail, he/she will have a higher chance of performing the off-trail behaviour. However, some researchers (Godin & Kok, 1996; Armitage & Conner, 2001) have argued that additional variables other than the TPB variables might be included in the prediction of intentions and behaviour. If additional predictors could demonstrate a significant portion of variance in intention or behaviour was captured after taking the TPB variables into account, these additional predictors could be used to augment the standard TPB model. However, if these additional variables were not significant in the prediction of intentions and behaviour, they could be background factors indirectly influencing the TPB variables (attitude, subjective norm and perceived behavioural control) (Ajzen, 2005).

This thesis proposes three recommendations to overcome this limitation in visitor off-trail behaviour research. First, it applies the TPB to specifically target factors and attitudes toward non-compliant behavior of venturing off-trail at BMNP. This will add to the body of knowledge, as no research to date has applied TPB to understand visitors' off-trail behaviour. Second, the study employs values theory using the New Ecological Paradigm (NEP) (Dunlap et al., 2000) to explore the relationship among pro-environmental values, beliefs and attitudes towards off-trail behaviour at BMNP. As well as exploring the practical use of pro-environmental values in relation to off-trail behaviour, researchers have called for more research into understanding the relationship between values, beliefs, attitudes and behaviour (Schwartz & Bardi, 2003), as research into values, beliefs and attitudes can still overlap and are treated in the same manner by researchers (Chaiken et

al., 2001). There have also been debates about whether values do influence behaviour or simply influence beliefs, attitudes and behaviour in a hierarchical manner, as proposed by Fulton et al (1996). Moreover, Schwatz and Bardi (2003) stated that while it has not yet been proven that values generally influence behaviour, in some cases values do play a part in changing behaviour. Therefore, this thesis will add to the body of knowledge by examining the role of pro-environmental values in the usefulness of predicting off-trail behavioural intentions and relationship (if any) among pro-environmental values, TPB beliefs and attitudes. Lastly, this thesis aims to identify and recommend practical solutions for Park Management in developing strategies to prevent off-trail behaviour at Blue Mountains National Park (BMNP).

### **1.3. Research Aim and Objectives**

This thesis explores underlying factors that influence visitors with regards to their off-trail behaviour when visiting Blue Mountains National Park (BMNP).

Specifically, the research objectives are:

**Research Objective 1:** To understand the association between direct measures of the TPB with visitors' behavioural intentions of venturing off-trail when visiting Blue Mountains National Park (BMNP).

**Research Objective 2:** To understand the association between indirect measures of the TPB with visitors' behavioural intentions of venturing off-trail when visiting Blue Mountains National Park (BMNP).

**Research Objective 3:** To understand the association between pro-environmental values (NEP) of visitors and attitudes and behavioural intentions towards venturing off-trail at Blue Mountains National Park (BMNP).

The proposed research objectives are a combination of The Theory of Planned Behaviour (Ajzen, 1991) as the main research framework and New Ecological Paradigm (Dunlap et al., 2000) that provides background factors of the TPB. The New Ecological Paradigm is

applied to understand visitors' pro-environmental values and how these values relate to beliefs and attitudes towards visitors' behavioural intentions of walking off-trail at Blue Mountains National Park.

## **1.4. Thesis Structure**

Five chapters are included in this thesis.

Chapter 1 provides the background, overview and importance of the thesis. Key trends and issues faced by academics and practitioners in the area of non-compliant behaviour at national parks, pro-environmental values, and using The Theory of Planned Behaviour as a research framework are discussed. It clearly states the research aims and objectives. Finally, the theoretical and practical contributions of the study are summarised.

Chapter 2 introduces the Blue Mountains National Park and reviews key areas of relevant literature: 1) visitor management at national parks; 2) values research and pro-environmental values; 3) motivations behind non-compliant behaviour; and 4) the theoretical framework (TPB). This chapter forms the theoretical basis of this thesis by identifying the research gaps identified in the introduction section.

Chapter 3 outlines the development of the conceptual framework and methodology used in this study. Research hypotheses are tested to answer the research objectives. It also discusses the methodology and research paradigm adopted in this research. The methodology consists of two stages: qualitative and quantitative. The final questionnaire is developed based on the findings from the qualitative study. This chapter includes sampling design, questionnaire design, data collection methods, and data analysis procedures.

Chapter 4 aims to answer the research questions and discusses the results of the present study by comparing the findings with past studies using TPB, pro-environmental values, and studies related to non-compliant behaviour and off-trail walking.



Chapter 5 provides the conclusions and recommendations of the present study. Theoretical and practical implications are discussed, as well as the contribution of this study to the body of knowledge for the development of social marketing strategies for national park authorities. Limitations of the study are acknowledged and future research areas are discussed.

## **1.5. Definition of key terms**

### **1.5.1. Non-Compliant Behaviour**

The term ‘non-compliant behaviour’ can be described as decisions to not comply with protective recommendations, which are calculated actions taken in expectation of some outcome or reward associated with non-compliance (Espiner, 1999). This term was further explained by Ward and Roggenbuck (2003), in that behaviours are considered non-compliant when: 1) the visitor intentionally or unintentionally refuses to comply with social norms (e.g., to knowingly enter a restricted area when the majority of visitors would disapprove of such behaviour); 2) the visitor will often be motivated to pursue some form of personal goal (e.g., to venture off-trail and successfully complete a bushwalk; and 3) the visitor possesses somewhat of a ‘self-maximising’ ‘tragedy of the commons’ attitude to acquire benefits for themselves at the expense of public welfare (Hardin, 1968; Gramann et al., 1992) (e.g., to venture off-trail to take souvenirs home from national parks). This can be seen as actions and practices that do not adhere to the rules and regulations of national parks, such as standing near cliff edges and swimming in restricted water catchment areas. This thesis focuses on the non-compliant behaviour of walking off-trail at Blue Mountains National Park (BMNP).

### **1.5.2. National Parks**

Within this study, national parks are defined as “natural area of land / or sea, designated to: 1) protect the ecological integrity of one or more ecosystems for present and future

generations; 2) exclude exploitation or occupation inimical to the purposes of designation of the area; and 3) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible” (International Union for Conservation of Nature, 2011). This same definition endures, although with a greater emphasis on maintaining environmental and conservation values in national parks (Wright, 1996).

### **1.5.3. Pro-Environmental Values**

Pro-environmental values are defined as general values that individuals refer to if they need them in a situation that concerns environmental issues, or values that are specific to the environment topic of interest (Stern et al., 1995). These environmental values are believed to be crucial in determining or influencing behavior towards the environment (Kollmuss & Agyeman, 2002; Casey & Scott, 2006). Lockwood (1999, p. 382) referred to these environmental values as “intrinsic, instrumental, held and assigned values” that can be used to understand environmental beliefs, norms and behaviour.

### **1.5.4. Theory of Planned Behaviour**

This thesis adopts The Theory of Planned Behaviour (TPB) as its main theoretical framework. It is a rational decision making model used to examine the anticipation of a behaviour from the intentions of an individual to perform that particular behaviour (Fishbein & Ajzen, 1975; Ajzen, 1991, 2011). There are three key variables used in the prediction: 1) people’s attitudes (Att) towards a particular behaviour; 2) their perception of others’ influence (subjective norm - SN) as to whether they would approve or disapprove of their performance of that particular behavior; and 3) perceived behavioural control (PBC) of an individual’s perceived ease or difficulty in performing a particular behaviour. According to the principles of the TPB, an individual will have stronger intentions to perform a particular behaviour if they have had a positive evaluation outcome of that behaviour, have reference groups who approve of the performance of that

behaviour, and believe that they have control over and few perceived difficulties in performing that particular behaviour (Ajzen, 1991).

## **1.6. Conclusion**

In this chapter, the researcher has introduced the background problem and significance of the research study. A summary of research aims was provided, along with the hypotheses that serve as answers to the research questions. The structure of the thesis consists of five chapters starting with the introduction, which is followed by an in-depth literature review on national parks, motivational behaviour, Theory of Planned Behaviour and Values Theory. The third chapter focuses on the development of the conceptual framework and methodology used in the thesis. Chapter four focuses on the results and discussion, while Chapter five focuses on the conclusion, practical recommendations, limitations and future research.

## **2. LITERATURE REVIEW**

In this chapter, the literature on national parks is reviewed to serve as a precursor to allow the reader to understand the scope of the study. The chapter then discusses past literature on underlying motivational factors of non-compliant behaviour, followed by the role of environmental values research, and beliefs and attitudes in tourism research. Next, the methodologies used to understand visitor motivations are discussed. Finally, the discussion will focus on the literature about behavioural models developed by Ajzen, 1991 (TRA and TPB).

### **2.1. Australia National Parks**

In 1872, Yellowstone National Park in the US was declared the world's first national park. National parks in Australia have a similarly long history (Westcott, 1993), with this country's first official national park, The Royal National Park in Sydney, being created in 1879 (Beckmann, 1991; Hall, 2000). In its current iteration, it provides picnic areas, sporting activities and holiday accommodation for visitors (Pigram, 1983). The purpose of Australia's national parks is to protect substantial areas of land for members of the public to engage in recreational activities (Wearing & Neil, 1999; Hall, 2000), and since 1879 a significant amount of protected land has been allocated by the Australian Government to be designated as national parks. By 2000, 511 national parks in Australia encompassed approximately 28 million hectares of land and attracted 83.5 million visitors per year (Figgis, 1999; NSW National Parks and Wildlife Service, 2013). As can be seen, national parks are an important element in tourism and the Australian landscape.

According to the International Union for Conservation of Nature (2011), national parks are "natural area of land / or sea, designated to: 1) protect the ecological integrity of one or more ecosystems for present and future generations, 2) exclude exploitation or occupation inimical to the purposes of designation of the area, and 3) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all

of which must be environmentally and culturally compatible". This same definition endures, although with a greater emphasis on maintaining environmental and conservation values in national parks (Wright, 1996). This objective is clearly stated in the National Parks and Wildlife Act 1974, No 80, Section 30E that a national park is to be managed in accordance with the following principles:

1. The conservation of biodiversity, the maintenance of ecosystem function, the protection of geological and geomorphological features and natural phenomena and the maintenance;
2. The conservation of places, objects, features and landscapes of cultural value;
3. The protection of the ecological integrity of one or more ecosystems for present and future generations;
4. The promotion of public appreciation and understanding of the national park's natural and cultural values;
5. Provision for sustainable visitor or tourist use of enjoyment that is compatible with the conservation of the national park's natural and cultural values;
6. Provision for the sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to the conservation of the national park's natural and cultural values;
7. Provision for the carrying out of development in any part of a special area in the national park that is permitted under section 185A having regard to the conservation of the national park's natural and cultural values; and
8. Provision for appropriate research and monitoring.

As can be seen from the above national park objectives, the main purpose of national parks is to conserve natural values through environmental and recreational use. National parks are important for a country to retain their natural heritage. Approximately 10 percent of Australia's landmass has been classified as protected in more than 500 national parks (DEWHA, 2011; Figgis, 1999). One of the most popular national parks is the Blue

Mountains National Park (BMNP), which receives a total of 3 million visitors annually (NSW National Parks and Wildlife Service, 2013).

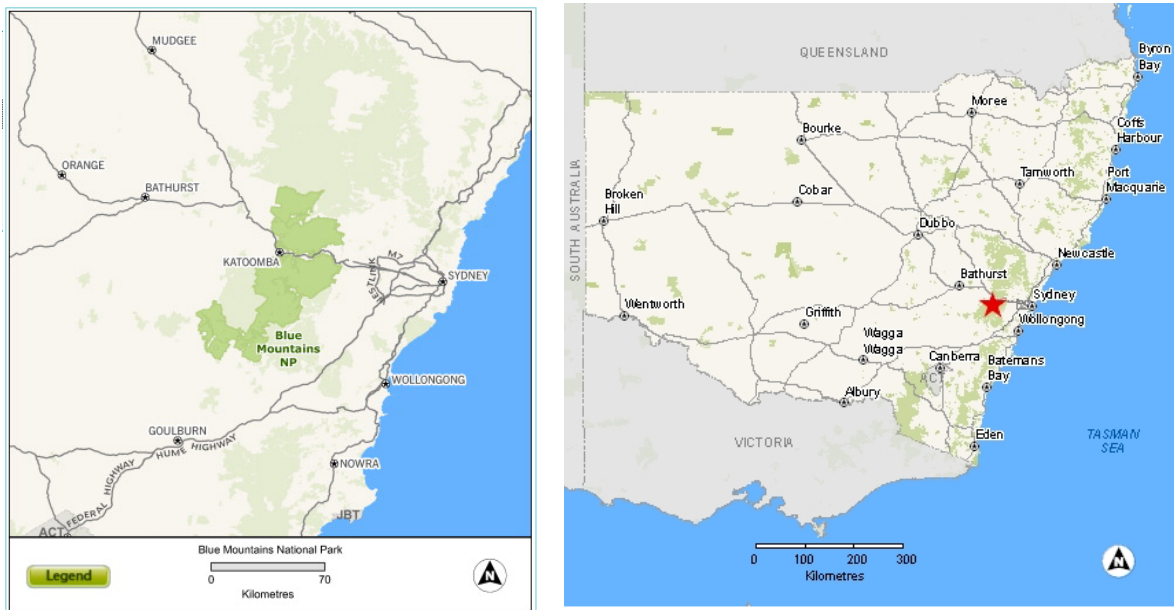
### **2.1.1. Blue Mountains National Park (BMNP)**

This section provides an overview of BMNP. The park is part of the Blue Mountains region, which comprises eight protected areas with a total heritage area of 1.03 million hectares. In 1959, the Blue Mountains National Park was declared as such under the NSW Wilderness Act 1987. The park is made up of wilderness areas such as Kanangra-Boyd Wilderness, and the Grose Wilderness (NSW National Parks and Wildlife Service, 2013). These areas contain beautiful landforms and scenery characteristic of the region's sandstone landscape. According to The United Nations Educational, Scientific and Cultural Organization (UNESCO) (2013), BMNP is noted for its representation of the evolutionary adaptation and diversification of eucalypts in post-Gondwana isolation on the Australian continent. The site provides significant representation of Australia's biodiversity, with ten percent of its vascular flora as well as significant numbers of rare or threatened species, including endemic and evolutionary relict species such as the Wollemi pine which have persisted in highly-restricted microsites (UNESCO, 2013). Given its uniquely rich heritage, the Greater Blue Mountains Region was in 2000 listed by UNESCO as a heritage site, in recognition of its outstanding universal value as a natural heritage listed national park. Many of the trails and lookout points in the Blue Mountains have been opened to the public since the late 19<sup>th</sup> century (NSW National Parks and Wildlife Service, 2013). There are many attractions and activities such as scenic driving routes, cliff-top lookouts, bushwalking, rock climbing, camping, abseiling and canyoning. Over the years, some of these activities have attracted commercial companies that run adventure tours such as guided walks, bird watching, bicycling, horse riding and canyoning. Importantly, all recreational uses in the wilderness areas of BMNP are restricted to activities that are self-reliant and have minimal impact on the environment (NSW National Parks and Wildlife Service, 2013).

### 2.1.2. Location of BNMP

The BMNP is located in New South Wales between the Great Dividing Range and the coastal lowlands of the Cumberland Plain (see Exhibit 2.1), and is governed by the City of Blue Mountains. The park is about 100km via the M4 from Sydney’s CBD (NSW National Parks and Wildlife Service, 2013). The Great Western Highway runs east west through the urban developments of the City of Blue Mountains, which is enclosed by the national park’s boundaries. An alternate road to BMNP is the Bells Line Road running through the northern part of BMNP.

**Exhibit 2.1. Geographic location of BMNP**



*Source: NSW National Parks and Wildlife Service (2013)*

### 2.1.3. Visitors and attractions at BNMP

One of the most famous attractions of BMNP is the Three Sisters rock formation (see Exhibit 2.2.) at Echo Point, Katoomba, which draws about 2.8 million visitors annually (NSW National Parks and Wildlife Service, 2013). While there are many activities that

visitors can participate in in the park, including scenic drives, cliff-top lookouts, bushwalking, camping and rock climbing, lookouts have been reported to be the most popular attraction. For example, over 2 million visitors come to the Jamison Valley every year and 450,000 of these visit the Jamison Valley Lookout (see Exhibit 2.3) (NSW National Parks and Wildlife Service, 2013). Most of the lookouts are accessible by short walking trails from the main entrance to the Blue Mountains National Park.

### **Exhibit 2.2. Three Sisters**



*Source: UNESCO (2013)*



### Exhibit 2.3. Jamison Valley Lookout



*Source: NSW National Parks and Wildlife Service (2013)*

#### **2.1.4. Visitor Accidents at BMNP**

In 2010, 53 Police rescue operations were carried out at BMNP to rescue visitors who had experienced misadventures during their leisure activities (Howden, 2010). According to Mr. Geoff Luscombe, Regional Manager of Blue Mountains National Park, *“The number of incidents involving off-trail behaviour has been increasing... it is difficult to track official number of incidents as most non-compliant visitors will claim that they have obeyed the regulations but accidents just happen and it’s not their fault.... Furthermore, we do not keep records of these incidents”* (G. Luscombe, 2011, personal interview, March 1). However, several cases of non-compliant behaviour involving visitors at BMNP have been reported in Australian newspapers and reports.

In 2006, a 25-year-old disabled woman ventured off-trail and fell to her death while picnicking 3 metres from the edge of a cliff at Hargraves Lookout near Blackheath. There were signs at this site warning visitors to refrain from getting too close to cliff edges (Brown, 2009). In 2007, a 31-year-old man got lost while bushwalking near Oberon in the Blue Mountains and died as a result. He failed to bring any modes of communication with him (Blue Mountains Gazette, 2011). Similarly, in 2009, a 19-year-old British male backpacker was lost for 12 days before being rescued near Ruined Castle. He also had failed to bring any modes of communication, and had left the designated path (Sydney Morning Herald, 2009). Another mishap occurred in 2009 when a domestic visitor died after his parachute got caught between trees in the Blue Mountains after he ignored warning signs that stated “no BASE jumping allowed” (Blue Mountains Gazette, 2009). A landmark incident happened in 2010 when three visitors ventured off-trail, ignored warning signs and climbed over locked gates to go canyoning in the Blue Mountains during torrential rain, which resulted in National Parks Rangers and Police Officers endangering their own lives to save the visitors. The visitors were each fined \$1000 and placed on a 12-months good behaviour bond (Howden, 2010). In another unfortunate incident, a 23-year-old man ventured off-trail into a restricted area at BMNP and as a result fell to his death from 15 metres off a cliff at Blackheath. Warning signs were displayed at the entrance to the restricted area that clearly showed the safety hazards (Blue Mountains Gazette, 2010).

A further incident in 2011 involved two teenaged climbers being rescued by Police after getting lost; they had failed to ensure proper preparations by carrying an EPIRB (Emergency Position Indicating Radio Beacon) when embarking on their expedition into the Blue Mountains (Kwek, 2011). In 2012, a woman left the designated trail and was hospitalised after falling off a cliff in Katoomba (Blue Mountains Gazette, 2012). In 2013, a British visitor fell to his death after venturing off-trail and attempting to traverse Wentworth Falls, BMNP (Cunningham-Lewis, 2013). As can be seen from the above incidents, ignoring warning signs and venturing off-trail is a costly non-compliant problematic behaviour faced by management at BMNP that can result in injury or death. More importantly, this problematic non-compliant behaviour in other recreational activities has also resulted in fatal accidents and deaths such as skiing accidents

(Hildebrandt et al., 2011), water recreation activities (Thomassin et al., 2010), bicycle helmet usage (Robertson et al., 2014), etc.

## 2.2. Visitor Management at National Parks

National Parks are governed separately by each respective state in Australia (Wescott, 1993; Farrier, 1993). This means that the Commonwealth Government has no direct power to legislate on environmental issues and management of protected areas. In New South Wales (NSW), the NSW National Parks and Wildlife Service is the management organisation under the Department of Environment that is responsible for the management of national parks in that state (see Table 2.1 for full listing of all Australian Public Sector National Park Organisations). With the increasing number of visitors to national parks, management at national parks are faced with the dilemma of protecting the flora and fauna, while also attracting and encouraging members of the public to use the parks' facilities (Beckmann, 1991, Fennell, 1999).

**Table 2.1. Australian Public Sector National Park Organisations**

State	Government Department	Management Organisation
National	Environment Australia	Parks Australia
Victoria	Department of Sustainability and Environment	Parks Victoria
New South Wales	Department of Environment	NSW National Parks and Wildlife Service
Queensland	Environmental Protection Agency	QLD Parks and Wildlife Service
Northern Territory	Department of Infrastructure, Planning and the Environment	Parks and Wildlife Commission of the Northern Territory
Western Australia	Department of Conservation and Land Management	Department of Conservation and Land Management
South Australia	Department of Environment	National Parks and Wildlife
Tasmania	Department of Primary Industries, Water	Parks and Wildlife Service

	and Environment	
ACT	Department of Urban Services	Environment ACT

*Source: DEWHA (2013)*

Visitor management seeks to maintain the integrity and sustainability of national parks to enhance the visitor experience (Kuo, 2002). The next section examines some of the visitor management tools available and adopted by park authorities to manage non-compliant behaviour at national parks.

### **2.2.1. Spatial Management**

One of the visitor management tools to manage non-compliant visitors is spatial management, which refers to the patterns of movement of people in a given space (Wicker, 1981). This determines the appropriate levels and types of use for different areas within a national park (Eagles & McCool, 2002; Lankford et al., 2004). Xia et al. (2005) divided spatial behaviour of visitors into five attributes based on identity, position, distance, direction of movement, and sequence and itinerary. These attributes can be monitored using direct observations, camera based monitoring, questionnaires with maps, GPS based monitoring, timing systems and mobile phone based tracking. One of the main issues faced by park managers when making use of spatial planning is the lack of a suitable method to collect data on spatial behaviour. For example, getting visitors to complete the traditional self reported travel diary has low reliability as it relies on visitors' memory and honesty (Modsching et al., 2006). At BMNP, a GPS based system is utilised to locate the precise locations of visitors only if the EPIRB (Emergency Position Indicating Radio Beacon) is activated. However, this spatial behavioural tool could be utilised further by incorporating GPS monitoring functions into the EPIRB such that visitors' spatial patterns could be studied to better identify 'hot' spots' where non-compliant behaviour is frequently committed.

### **2.2.2. Carrying Capacity and Zoning Management**

One view on managing capacity is to examine the carrying capacity of a national park. Carrying capacity is the ability of a site to absorb visitation before any negative impacts such as overcrowding are felt by the host community (Brown, 1998; Navarro et al., 2013). As mentioned by Saveriades (2000), carrying capacity is the ability to express in terms of an unambiguous standard measure in order to facilitate tourism planning. This is very similar to the definition by The World Tourism Organisation that tourism carrying capacity is “the level of visitors use an area can accommodate” (Buckley, 1999, p. 206). Thus, rather than allowing unlimited number of visitors, park managers can determine the number of visitors that can be absorbed without compromising park facilities. Although this management framework sounds like a good tool, park authorities do not necessarily see a direct relationship between the number of visitors and associated impacts (Stankey & McCool, 1984). Hill and Pickering (2002) have also argued that there are no systematic and transparent ways to measure carrying capacity and acceptable thresholds for activities and areas. This difficulty sees park managers reluctant to monitor visitor numbers, and it is often seen as low priority. However, zoning schemes are commonly used by Australian park authorities to determine parkland for specific purposes (Fluker & Richardson, 2004). In the Blue Mountains, zoning is a primary management tool to delineate where certain activities are allowed and restricted. Zoning strategies can be enforced and capacity regulated to limit non-compliant behaviour through restrictions on types of equipment permitted (e.g., no BASE jumping equipment allowed in park), acceptable size of party groups (e.g., no more than 50 visitors in a group), permitted activities (e.g., no dogs off leash area), and maximum length of stay allowed (e.g., overnight permits valid for only two days). Some park authorities also manage visitor capacity by implementing temporal limitations at certain times of day (e.g., park recreational facilities will be available from 8am – 6pm) or seasonal closure (e.g., certain walking trails will be closed during winter or the rainy season). These approaches are normally implemented with some penalties and fines for breaching these regulations (Wearing & Neil, 1999).

### **2.2.3. Economic Management**

According to Buckley et al. (2002), Australian park agencies charge park entrance fees (e.g., \$7 per vehicle at BMNP, Glenbrook entrance), or camping fees, or both. In addition, local councils in Australia are planning to implement some form of pricing mechanism to charge visitors an entrance fee (Campion, 2009). This management tool is seen as an aggressive approach and remains a very sensitive topic of debate among visitors (Buckley, 2003). The reason for this is that the public's perception of national parks is that they are public goods that have already been funded by taxpayers (Buckley, 2003, p.64), and that Australia has a long history of free access to natural and cultural heritage assets (Eagles, 2001, p. 23). From a park management point of view, introducing a pricing strategy can be seen as a disincentive to charge higher fees for private car users, higher fees for weekends, or fines for inappropriate behaviour (Buckley, 1999; Kuo, 2002). For example, in 2010, three visitors were fined \$1000 each for failing to comply with warning signs and entering a restricted area in BMNP. Ultimately, park agencies tend to use non-economic mechanisms such as time restrictions to restrict visitor numbers or activities for environmental or social reasons (Buckley et al., 2003; Bushell, 2003).

### **2.2.4. Managing Non-Compliance**

Non-compliant behaviour is one of the most significant problems reported by management at nature based establishments (Gramann et al., 1992; Ward & Roggenbuck, 2003). According to Espiner (1999), non-compliant behaviour is seen as a decision to not comply with protective recommendations, which is a calculated action taken in expectation of some outcome or reward associated with non-compliance. Actions and practices that do not adhere to the rules and regulation of national parks include standing near cliff edges, swimming in restricted water catchment areas and venturing off-trail. Park authorities can manage this problem directly or indirectly (Manning, 1999). Direct management involves the strict enforcement of rules and regulation to govern visitor behaviour (Gramann et al., 1992; Manning, 1999). This direct approach focuses on authoritarian regulations and there is a high degree of control by park managers (Brown

et al., 1987; Hendee & Dawson, 2002; Kuo, 2002). These measures might include fines, site restrictions, permits rationing and visitor zoning, and be communicated through regulatory signs. Given that recreation is intended to be a pleasurable and rewarding activity, these regulatory direct management strategies are justifiable only when necessary (Duncan & Martin, 2002). As reported by Hockett et al. (2010), national park visitors are less supportive of increased ranger presence, restrictions and fines, and would rather be managed indirectly with educational signs.

Indirect measures such as persuasive communications, interpretation and site design are used to encourage voluntary changes in visitor behaviour without the explicit threat of penalties for failure to comply (Gramann et al., 1992; Manning, 1999). Indirect management tools are more subtle and light-handed, where the visitor retains freedom of choice (Brown et al., 1987; Hendee & Dawson, 2002, Kuo, 2002). According to the Regional Manager of BMNP, *“In a perfect law abiding world, voluntary compliance and change is ideal but there are circumstances within the national parks that regulations are necessary to ensure visitor safety such as safety signage about dangerous terrains... and to protect the heritage site of the Three Sisters.”* (G. Luscombe, 2011, personal interview, March 1).

Most national parks have adopted both direct and indirect approaches, with past studies reporting mixed results on the use of direct and indirect measures. For example, Ward and Roggenbuck's (2003) study reported that both direct and indirect measures were equally effective in changing visitor behaviour in national parks. These included using persuasive signs at various points in the park and issuing fines for removing petrified wood from the park. They found that persuasive signs were useful in educating and creating awareness about unintended theft, and that the issuing of fines corrected this problematic behaviour as *“visitors rationalized the act of taking smaller pieces of wood as an acceptable behaviour and it would not hurt anything”*. Johnson and Swearingen (1992), and Martin (1992) found direct messages with penalty fines to be more effective than interpretive or social influence messages. Park et al. (2008) noted that 20 years of research points towards the combination of direct and indirect methods as being more effective. For example, Littlefair and Buckley (2008) reported using interpretive

messages, presence of a role model and verbal appeals as the most successful combination in reducing non-compliant behaviour of taking shortcuts. It is important for park authorities to consider if the management tool is appropriate, feasible, effective (Roggenbuck, 1992), and compatible with the purposes of the national park. Hendee and Dawson (2002) recommended that park managers try using indirect management tools first before switching to hard, authoritative direct management techniques. Enhancing understanding of the profile of visitors to the national parks and selecting suitable techniques to manage non-compliant behaviour will aid this process.

### **2.3. Profile of Nature Visitors and National Parks**

The natural physical environment can acquire different meanings and significance for different visitors (Lengkeek et al., 1997). Although national parks are seen as a common ground for all visitors as a public good for common recreational use, different visitors have different reasons to visit national parks. Nature visitors can be profiled according to demographics, familiarity, expertise, and motivational factors.

#### **2.3.1. Psychographics and Demographics**

Psychographics have been reported to be useful in identifying groups of national park visitors (Stamps, 1999). In particular, pro-environmental values are commonly found among nature visitors. For example, Silverberg et al. (1996) identified two types of nature visitors: first, the conservationists who are concerned about humankind's abuse of the environment, the delicate balance of nature, earth's limited resources, limits of industrial growth, and the importance of people living in harmony with nature; and second, the consumptive nature visitors who holds views about the rights of humans to modify the natural environment, that the environment should suit the needs of humans, and that humankind should rule over nature. In a study on visitor behaviour at Lamington National Park, Weaver and Lawton (2001) profiled ecotourists as people who had strong environmental commitment, were physically active, stayed longer, emphasised personal



experiences, and had expectations of limited service from the destinations. Similarly, Wurzinger and Johansson (2006) identified nature-based tourists as having pro-environmental attitudes towards participating in activities that benefit the ecosystem of the park.

Demographics such as age have been used to identify nature-based visitors. Studies have shown that nature-based destination preference varies in terms of age characteristics (Berg & Koole, 2006). For example, elderly visitors have higher preference for well-managed nature in a more controlled environment, whereas younger demographics prefer wild natural landscapes with a higher degree of freedom (Berg & Koole, 2006). This younger demographic has a lower participation rate in nature based tourism, which could be due to increased time spent on the computer and watching television (Berg & Koole, 2006). These preferences change according to age, together with contextual factors (Lyons, 1983) such as socio-economic status in education and income (Berg & Koole, 2006). People with higher incomes and higher education levels make up the majority of nature users (Virden, 1990).

### **2.3.2. Familiarity and Expertise**

Most studies have reported the overall positive relationship between place of residence and familiarity with the destination (Berg & Koole, 2006). Familiarity has been reported to influence how people judge environmental aesthetics (Zub et al., 1974; Lyons, 1983; Berg & Koole, 2006). Young (1999) collected cognitive maps drawn by nature based visitors, and found that visitors who were more familiar with the area drew more landmarks and paths and were more advanced in their spatial learning. Interestingly, DeLucio and Mugica (1996) found expert visitors preferred and knew the best areas of the roughest and most inaccessible landscapes in national parks. This implies that familiar visitors display more diverse spatial behaviour patterns than visitors who do not have prior knowledge of an area. Berg and Koole (2006) also reported that the expertise of visitors influences landscape preferences. For example, members of environmental

groups are more attracted to wilderness scenes. This composition of group members also plays a major role in outdoor recreation choice.

### **2.3.3. Motivation**

The role of motivation within tourism and recreation has been extensively examined. Most of these studies based their work on studies by Dann (1977), Crompton (1979), and Iso-Ahola (1980). Dann (1977) identified two main reasons for visitors to travel: 1) anomie, which is the desire to have a break from everyday life; and 2) ego-enhancement, which is the desire for recognition. Crompton (1979) further examined reasons to travel and identified nine factors: escape from everyday life; exploration and evaluation of self; relaxation; prestige; regression; enhancement of kinship relationships; facilitation of social interaction; novelty; and education. Iso-Ahola (1980) developed a social psychological model for tourism motivations based on seeking and escaping, with both dimensions having a personal and interpersonal component. For example, visitors may visit national parks to escape from their personal world (such as personal problems) and/or interpersonal world (such as friends and family), to seek personal rewards (such as rest and relaxation), and/or for interpersonal rewards (interacting with friends in a new place). These theories of and concepts in visitor motivation are important as they provide the introductory foundation for sections to be discussed in later chapters of this thesis.

## **2.4. Values**

Values convey what is important in our lives and can be seen as a form of motivation to perform certain behaviour. Understanding values is important, because values are more strongly held and less changeable than attitudes in terms of general behaviour. Attitudes are less stable than values in predicting behaviours because they are more specific to certain situations and behaviours, whereas values are based on principles about society in general (Rokeach, 1973; Ettinger et al., 1994; Feather, 1999; Vaughan & Hogg, 2013). One of the most cited definitions of values is by Rokeach (1973, p. 5), that is, “a value is

an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable". This is similar to Kluckhohn (1951) who defined values as a concept of desirability, which can influence behaviour.

However, Rokeach (1973, p.25) argued further that values must be treated differently from attitudes in understanding behaviour because an individual holds certain value beliefs in life and these beliefs "transcends attitudes toward objects and towards situations". Attitudes can be defined as "an organization of several beliefs around a specific object or situation" (Rokeach, 1973, p.18), which may be positive or negative evaluations towards a certain behaviour (Ajzen, 1991; Dietz et al., 2005). Another key authority in values research also highlighted the difference between values and attitude. Schwartz and Bilsky (1987, p. 551) explained that "attitudes can be defined as concepts or beliefs about desirable end states or behaviours that transcends specific situations, guide selection or evaluation of behaviours and events, and are ordered by relative importance". This notion is supported by Vaughan and Hogg (2013), who defined attitudes as "an organization of beliefs, feelings and behavioral tendencies or a general feeling or evaluation", which is precipitated by higher order thinking about values that provides a structure for organising attitudes.

It can be seen from the various definitions outlined above that most researchers define values as desirable concepts that transcend attitudes, which then influence an individual to behave in a certain manner in a specific situation. This is important because most researchers in social psychology view attitudes as the main concept for predicting behaviour (see Rohan, 2000; Vaughan & Hogg, 2013); however, attitudes may not be entirely accurate or as stable as values. For example, Chaiken et al. (2001, p. 900) mentioned "strictly speaking, values are just attitudes in the sense that they convey people's evaluations of objects". Schwatz and Bardi (2003) stated that it has not yet been proven that values generally influence behaviour, and that only in some cases do values play a part in changing behaviour. Since values are translated into a set of attitudes as part of their definition, research about either attitudes or values can still overlap or be useful to the other (Chaiken et al., 2001). Therefore, it is not surprising that some studies do not lead to conclusions and values are hard to identify (Schwartz, 1992). Furthermore,

most researchers simply disregard the role of beliefs in the value and attitude relationship. This is problematic as beliefs are more specific statements held by individuals about a particular behaviour and are more stable than attitudes in specific situations (Hoffman, 2003), whereas attitudes tend to be more general in nature (Fishbein, 1967).

### **2.4.1. Development of Values Theory**

Concepts about human values have been developed and used in modern sociology, psychology and tourism disciplines (Seymour et al., 2010; Vaughan & Hogg, 2013). Research about human values originated from early psychological studies about values being an alternative and additional explanation in understanding behaviours (Vaughan and Hogg, 2013). Throughout these disciplines, values have been defined and redefined in many ways. The term ‘values’ has different meanings, including economic value of a product in a transaction, or moral value of a person to behave in a certain religious manner. For example, Yankelovich (1991, p.123) defined values as a reflection of an individual’s ideas and goals, while Seymour et al. (2010) defined them as “specific modes of conduct or guiding principles that influence our actions” (p. 142).

Values influence attitudes where values are the product of assigning relative importance (Borrie et al., 2002), and attitudes are in turn influenced by behavioural beliefs (Fishbein, 1967; Ajzen, 1991). Pauls (1990) explained that the meaning of the word ‘values’ is based on the context stipulated by the interpreter and the objects that values are bestowed upon. Because human values are individually different, one cannot claim all human values to be universally similar and true for everyone. Most researchers have recognised the complex nature of values (Adler, 1956; Rokeach, 1973). Further, most researchers agree that values are derived individually and are based on an individual’s perspective, which are used to motivate and guide our actions (Shand, 2001). The use of values as a guide to human behaviour can be categorised into three types (descriptive, normative and meta-normative) of values theories (Pauls, 1990). Descriptive value theory looks at eliciting which values are held by different individuals or groups of individuals. For example, individuals who donate to charity organisations are seen to have altruistic values. Normative values theory tends to focus on the definition of what values are and

should be, while meta-normative values theory provides criteria to evaluate normative and descriptive theories, which tend to be application-based research.

Another way to look at values is to see them as a system of connected values dependent on and influenced by other values, which is a hierarchical structure based on the strength of mutual influence (Rokeach, 1973). According to Rokeach (1973, p. 5), value is “an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable”. Rokeach’s value research can be categorised as descriptive values research where individuals are divided into two categories of values: 18 terminal and 18 instrumental values (see Table 2.2). Terminal values represent goals in life to be achieved, and instrumental values refer to preferable modes of behaviour that are desirable (Rokeach, 1973, p. 3). Terminal values can be further categorised into social (e.g., recognition) and personal (e.g., pleasure) values, which determine an individual’s attitude based on his/her priority of social and personal values in a given situation, and represent individual or societal goals that people aim to achieve. Similarly, instrumental values can be divided into moral (e.g., responsibility) and competence (e.g., self control) values. Rokeach (1973, p. 12) explained that his concept of value is descriptive in that a value system is “a learned organization of principles and rules to help one choose between alternatives, resolve conflicts, and make decisions”.

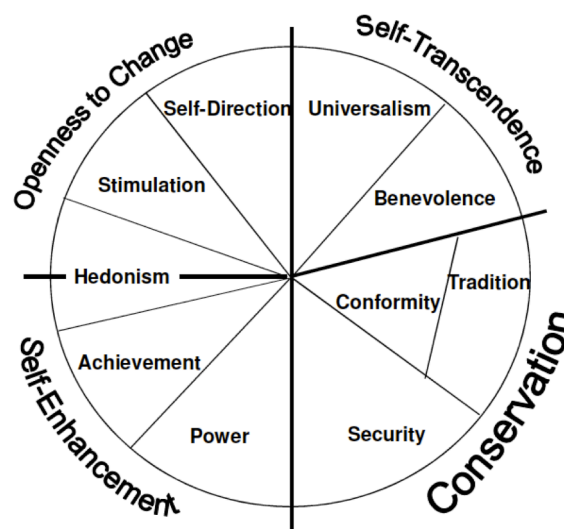
**Table 2.2. Rokeach’s Value Survey Items**

<b>Terminal values</b>	Personal	comfortable life, exciting life, sense of accomplishment, happiness, inner harmony, pleasure, salvation, self respect, wisdom
	Social	a world of peace, a world of beauty, equality, family security, freedom, mature love, national security, social recognition, true friendship
<b>Instrumental values</b>	Moral	broadmindedness, forgiveness, helpfulness, honesty, love, obedience, politeness, responsibility, loyal
	Competence	ambition, capability, cleanliness, courage, cheerfulness, imagination, independence, intellect, logic, and self control

*Source: Rokeach (1973)*

Schwartz and Bilsky's (1987) review of literature on values identified five common themes in values research: "values are 1) concepts or beliefs; 2) about desirable end states or behaviours; 3) that transcend specific situations; 4) guide selection or evaluation of behaviour and events; and 5) are ordered by relative importance" (p. 551). Rokeach's descriptive concept of values is frequently cited as the basis of new value theory developments such as Schwartz's Value Theory (Schwartz, 1992), and New Ecological Paradigm based on Environmental values (Dunlap et al., 2000). However, one major limitation of Rokeach's model is that he did not show the relation between these values and other values, but rather two separate categories of values (Schwartz, 1994; Rohan, 2000). To address this gap, Schwartz (1992) developed The Schwartz Value Theory consisting of 10 values that represented distinct goals or motivating principles that influenced individuals' daily behaviours. Schwartz's Value Theory suggested that these 10 values have a dynamic relationship, which is compatible or incompatible between each value (Schwartz, 1992).

**Figure 2.1. Schwartz's Value Theory**



*Source: Schwartz (1992, p. 45)*

**Table 2.3. List of Schwartz's Value Items**

Universalism	"understanding, appreciation, tolerance, and protection for the welfare of all people and for nature" (p. 12)
Benevolence	"preservation and enhancement of the welfare of people with whom one is in frequent personal contact" (p. 11)
Conformity	"restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms" (p. 9)
Tradition	"respect, commitment, and acceptance of the customs and ideas that one's culture or religion impose on the individual" (p. 10)
Security	"safety, harmony, and stability of society, of relationships, and of self" (p. 9)
Power	"attainment of social status and prestige, and control or dominance over people and resources" (p. 9)
Achievement	"personal success through demonstrating competence according to social standards" (p. 8)
Hedonism	"pleasure or sensuous gratification for oneself" (p. 8)
Stimulation	"excitement, novelty, and challenge in life" (p. 8)
Self-direction	"independent thought and action-choosing, creating, and exploring" (p. 5)

*Source: Schwartz (1992)*

According to Schwartz, these 10 values can be plotted on a circular continuum into four categories: 1) Self-transcendence; 2) Conservation; 3) Self-enhancement; and 4) Openness to change. The placement of these values on the diagram shows which values are adjacent or opposed to each other and which value dimension they belong to (Lindeman & Verkasalo, 2005). For example, an individual who pursues self-enhancement as a life goal will have achievement and power values as compared to values in adjacent positions such as universalism and benevolence. Schwartz's (1992) study was conducted in 20 countries to justify that these values were universal, and concluded that his values could be generalised. However, he acknowledged that these

values could change and evolve over time as social conditions transformed. His argument is consistent with that of most researchers that values are not permanent and can change over time. Nevertheless, the Schwartz Value Theory has been widely used by other researchers in understanding values (Rohan, 2000; Rezsöházy & Neil, 2001; Dietz et al., 2005) and forms an important underpinning to environmental values research.

### **2.4.2. Values, Beliefs, Attitudes and Behaviour**

As can be seen in the definitions of values by Rokeach (1973), and Schwartz (1992), both researchers clearly defined values as a set of beliefs of desirable conduct that is used to guide behaviour. The development of these values in an individual could be influenced by their surroundings and society in general. Individuals are exposed to everyday society that, by majority view, defines what ought to be good, and these exposures influence the development of values in individuals. In addition, an individual's reference group such as family and friends can influence that individual's values development (Vaughan & Hogg, 2013). However, to understand the development of values, it is necessary to distinguish between values, beliefs and attitudes.

Beliefs are statements held by individuals about what is perceived about a situation or behaviour and tends to be more specific (Fishbein, 1967); for instance, "walking alone in the Blue Mountains National Park at night is dangerous". Attitudes tend to be more general (Ajzen, 2001), and can be seen as "*a person's overall evaluation of persons, objects and issues*" (Petty & Wegener, 1998, p. 323) that guides their choices and decisions for action (Hogg & Vaughan, 2013). The distinction between values, beliefs and attitudes is often blurred and used interchangeably in research. This is summarised by Chaiken et al (2001, p. 900), who stated that values are "just attitudes" in the sense that they convey people's evaluation of objects. Yet, researchers continue to use values, attitudes and beliefs simultaneously to refer to the same object. Notwithstanding, the universal nature of values means that they act as an external motivator that should influence beliefs about a particular behaviour, and that this would be followed by forming attitudes towards a particular behaviour and attitudes that influence the actual behaviour.



The interchangeable use of values, beliefs and attitudes makes it difficult to distinguish among a researcher's perceptions of values, beliefs and attitudes. For example, in the case of values and attitudes, strong attitudes about a general behaviour might represent a general value. The general consensus sees values translating into attitudes (Feather, 2002; Kaiser et al., 2005; Hogg & Vaughan, 2013); for instance, when individuals are faced with a conflicting decision, their attitudes could change but their values would remain the same. In this situation, individuals learn from past judgments, and values could evolve and alter through learning and reflection.

If the above relationship between values and attitudes is true, the role of beliefs could play an important role in providing further explanation of how attitudes are related to beliefs. Fishbein (1967) introduced the Expectancy-Value Model, which stated that behaviour is affected by the values of the possible outcomes weighted by the estimated probabilities of those outcomes. This sees overall attitudes toward an object being viewed as a combination of overall attitudes toward the object modified by beliefs of subjective values and the strength of associations (Fishbein, 1967; Ajzen, 1991). Ajzen (1991) referred to these behavioural beliefs as an indirect measure of attitude, and the overall attitude as the direct measure of attitude. Direct measures are more stable in predicting behaviour due to its global measure and general consensus among a wider audience, whereas beliefs are more specific in nature and used to understand specific motivations towards behaviour. In addition, attitudes have been reported to be the strongest predictor of behaviour (Ajzen, 1991; Armitage & Conner, 2001) and commonly used to activate a change in behaviour. Therefore, a change in beliefs might also have an effect on attitudes that in turn affects values, and vice versa. Even though the role of beliefs could be useful in bridging the link between values and attitudes, using beliefs to determine attitudes through the Expectancy Value Model has some limitations. First, an individual's beliefs towards associated behaviours can change from time to time and as a result attitudes formed can be somewhat temporary (Ajzen, 2001). Another feature of the Expectancy Value Model is that beliefs about evaluations are made spontaneously, and assume that those beliefs that are most readily accessible are those that lay the foundation of attitudes. Ajzen (1991) refers to these as salient beliefs, which are readily accessible when evaluating a behaviour. However, researchers such as Liberman and Trope (1998) have

argued that beliefs about a goal are more readily attained for goals in the distant future than goals that require decisions in the short term. They argued that beliefs are more readily accessible if individuals have been thinking about the evaluation for a longer period of time as compared to spontaneous decisions. Nevertheless, the role of beliefs has played an instrumental role in attitude behavioural studies, where most studies have used a qualitative stage in their methodology to elicit readily accessible beliefs (Ajzen, 1991; 2001).

The relationships among values, beliefs, attitudes and behaviour are suggested by Fulton et al. (1996, p. 25) to be “fundamental cognitions”, which serve as a foundation for beliefs and attitudes. They proposed a hierarchical relationship in the form of a pyramid, illustrating value orientations at the top of the pyramid that flow down to influence basic beliefs, followed by attitudes and behaviour (Vaske & Donnelly, 1999; Choi, 2011). This hierarchical relationship is consistent with other established attitude–behaviour theories such as the Value Belief Norm Theory (Stern, 2000), and The Theory of Planned Behaviour (Ajzen, 1999). Therefore, understanding the role of values, beliefs and attitudes can contribute towards understanding behaviour in the present study on why visitors venture off-trail at BMNP.

### **2.4.3. Environmental Values and National Parks**

The role of values should be considered when making management decisions in national parks as values can influence visitors’ interests in natural areas (Winter, 2007). These values influence beliefs and, in turn, attitudes and behaviours. Several studies have identified the importance of values in natural resource management. For example, Myers and Close (1998), and Jakes (1998) identified values as a critical component for decision makers to understand public expectations of land management regarding desired future use and conditions of those resources.

While most visitors understand that national parks contain significant biodiversity and other natural values, limited focus has been given to examining the types of values visitors in terms of national parks. These values are important, as park managers are

responsible for making strategic decisions in relation to these values (Tranel & Hall, 2003). This importance is stressed by Winter and Lockwood (2004, p. 11), who pointed out that *“Making decisions that affect natural environments whether for their use, protection or conservation is an important role for government. It is desirable that such decisions are based on a sound appreciation of how people value natural areas”*.

Furthermore, the need to examine environmental values in this thesis is based on environmental impacts on national parks due to increasing visitor numbers. These environmental concerns are evident among the general public. For example, among 24,785 respondents, Levine (2009) reported that 21 percent of Australians rated the environment as the most important issue facing the world. Therefore, there is a possibility that environmental values are important in understanding visitor motivations in their non-compliant behaviour. For example, visitors with pro-environmental values could be more likely to comply with regulatory signs and stay on designated walking paths in national parks. According to Stern and colleagues (1995), environmental values are general values that individuals refer to if they need them in a situation that concerns environmental issues, or are values that are specific to the environment topic of interest. Gurluk (2013) has also suggested that visitors who have strong environmental values could be supportive of congestion pricing to help prevent overcrowding at recreation areas. According to Gifford (1997, p. 47), environmental attitudes and values are “an individual’s concern for the physical environment as something that is worthy of protection, understanding or enhancement”. The focus is mainly on how individuals care for the state of the environment and how this is reflected in their attitudes and values (La Trobe & Acott, 2000).

Environmental values are believed to be crucial in determining or influencing behaviour towards the environment (Kollmuss & Agyeman, 2002; Casey & Scott, 2006). Lockwood (1999, p. 382) referred to these environmental values as “intrinsic, instrumental, held and assigned values” that can be used to understand environmental beliefs, norms and behaviours. Intrinsic values are similar to terminal values and were described by Rokeach (1973) as something meaningful towards life, which in the case of environmental values is to value nature for itself. Instrumental values refer to the value in terms of achieving

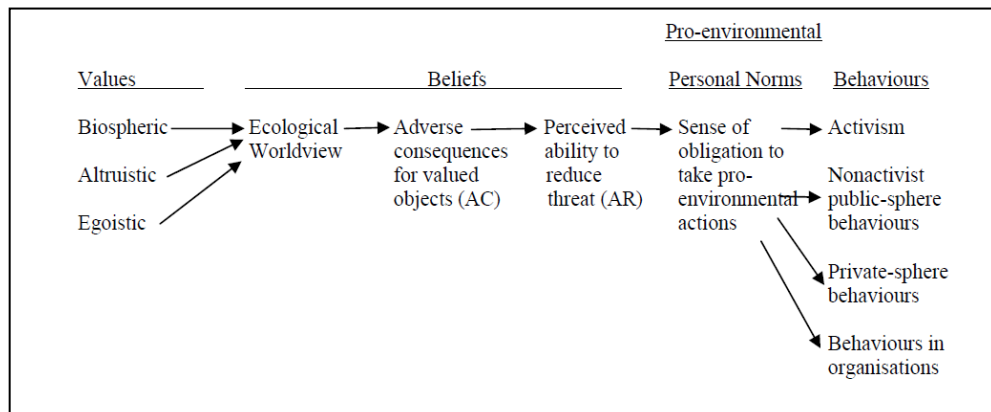
the end object, such as being responsible in order to save money or receive recognition from others. Held values refer to Rokeach's (1973) concept of enduring belief towards a specific mode of conduct or end-state of existence that is personally or socially preferable. Lastly, assigned values could correspond to attitudes, which could correspond to specific situations or behaviours. Two frameworks are widely used to understand environmental values: 1) Value Belief Norm (VBN) theory by Stern (2000); and 2) The New Environmental Paradigm (NEP) by Dunlap et al. (2000). These two frameworks have been acknowledged for their usefulness in understanding pro-environmental behaviours (Nordlund & Garvill, 2003; De Groot & Steg, 2008).

#### **2.4.3.1. Value - Belief – Norm Theory**

The Value Belief Norm Theory was developed by Stern and colleagues (Stern et al., 1995; Stern et al., 1999; Stern, 2000), who applied the basic values concept to develop the Value Belief Norm (VBN) theory of environmentalism. The VBN explains environmental behaviour of individuals based on their values, beliefs or worldviews, personal norms and behaviour (see Figure 2.2). This theory is of interest to this study because past studies have shown that individuals hold certain environmental values toward natural landscapes such as life sustaining, spiritual, and ecological values (Brown et al., 2002; Tarrant & Cordell, 2002). This sense of obligation, knowledge of environmental consequences, and worldviews are seen as predicting factors for behaviour to help alleviate threat and restore those values (Stern et al., 1999; Stern, 2000; Dietz et al., 2005; Kaiser et al., 2005). The Value Belief Norm Theory is based on three environmental held value orientations – biospheric, altruistic, and egoistic (Stern et al., 1995). People with biospheric values are mostly concerned with the well being of all living things. Those with altruistic values are more concerned about the welfare of others, and people with egoistic values are more concerned about their self-interest and are likely to protect environmental aspects that affect them personally. These held values in turn have a direct influence on the structure of environmental beliefs, also known as ecological worldviews (Stern, 2000). The individual then evaluates the adverse consequences for valued objects (AC) with regards to the three environmental values. For

example, biospheric values are measured with two statements: 1) over the next several decades, thousands of species will become extinct; 2) claims that current levels of pollution are changing earth's climate are exaggerated (Stern, 2000). This is followed by evaluating the perceived ability to reduce threats (AR). Next, the individual evaluates his/her sense of obligation to take pro-environmental actions, which can be seen as a sense of moral obligation to act to preserve the environment. Stern (2000) suggested that an individual would be more likely to engage in pro-environmental behaviour if he/she was more aware of potential consequences, perceived stronger ability to reduce the threats and had a stronger sense of obligation. For example, visitors face choices between making non-compliant decisions that have positive or negative consequences for themselves, for others, or for the environment, such as leaving human footprints (e.g., littering or trampling on plants when walking off-trail) at national parks. This negative consequence could result in visitors behaving in more compliant ways when visiting national parks to prevent further human destruction to the environment.

**Figure 2.2. Value – Belief – Norm (VBN) Model**



Source: Stern (2000)

Several researchers (Ore & Katz-Gerro, 2006; Gifford et al., 2011) have examined the use of The Value Belief Norm Theory to augment the Theory of Planned Behaviour in the explanation of pro-Environmental behaviour. Ore and Katz-Gerro (2006) collected

data from 27 countries in their study of environmental friendly behaviour across behaviours such as recycling and avoiding car usage. They found that post-materialistic values affected environmental concern, which along with perceived threat and perceived behavioural control influenced willingness to sacrifice. Their environmentally friendly behaviour model was reliable, and recommended that values be included as a useful variable for predicting environmental behaviour. Similarly, Gifford et al. (2011) suggested that The Value Belief Norm Theory and The Theory of Planned Behaviour are possible models for exploring the predictors of environmentally friendly behaviour, but neither have enough constructs or predictive power to explain pro-environmental behaviours by themselves. The Value Belief Norm Theory has been applied widely as a useful framework to explore the motivational determinants of environmental behaviour (Stern et al., 1993; Nordlund & Garvill, 2002; De Groot & Steg, 2008). However, this model limits the considerations of pro-environmental behaviour to the individual self and does not account for social pressure from social groups. This is important, because social pressure from people important to an individual can influence that individual's behaviour (Ajzen, 1991).

#### **2.4.3.2. The New Ecological Paradigm**

The New Ecological Paradigm Scale is a modified version of the original Dominant Social Paradigm (Pirages & Ehrlich, 1974; Dunlap & Van Liere, 1978) to measure beliefs and values about limited resources, continuous progress, faith in science and technology to solve problems, a strong emotional commitment to a laissez-faire economy, limited government planning and private property rights. All of these beliefs and values are used to measure individuals' views towards a more ecologically sound world (Dunlap & Van Liere, 1978). The New Environmental Paradigm Scale measures the overall relationship between humans, their value and belief systems, and the environment to maintain a well-balanced relationship between people and nature (Dunlap & Van Liere, 1978; Albrecht et al., 1982).

**Table 2.4. The New Environmental Paradigm Scale (12 items)**

	<b>Item</b>	<b>Environmental value</b>
1	The balance of nature is very delicate and easily upset.	Balance of nature
2	When humans interfere with nature, it often produces disastrous consequences.	Balance of nature
3	Humans must live in harmony with nature in order to survive.	Balance of nature
4	Mankind is severely abusing the environment.	Balance of nature
5	Humans have the right to modify the natural environment to suit their needs.	Anti-anthropocentrism
6	Mankind was created to rule over the rest of nature.	Anti-anthropocentrism
7	Plants and animals exist primarily to be used by humans.	Anti-anthropocentrism
8	We are approaching the limit of the number of people the earth can support.	Limits to growth
9	To maintain a healthy economy, we will have to develop a steady-state economy where industrial growth is controlled.	Limits to growth
10	The earth is like a spaceship with only limited room and resources.	Limits to growth
11	Humans need not adapt to the natural environment because they can remake it to suit their needs.	Anti-anthropocentrism
12	There are limits to growth beyond which our industrialized society cannot expand.	Limits to growth

*Source: Dunlap et al. (1978, p. 13)*

The New Environmental Paradigm Scale is based on three key environmental values: balance of nature; limits to growth; and anti-anthropocentrism. Balance of nature looks at how people view the importance of living with nature in this world (e.g., humans must live in harmony with nature in order to survive). Limits to growth looks at perceptions of how people view the expansion of society and its effect on nature (e.g., There are limits to growth beyond which our industrialised society cannot expand). Anti-anthropocentrism looks at how human beings regard themselves as the central and most significant life form on earth (e.g., plants and animals exist primarily to be used by humans). These three key environmental values are measured with 12 items (Dunlap & Van Liere, 1978, p. 14) (see Table 2.4). Dunlap and Van Liere (1978) reported that these 12 items exhibited a high level of internal consistency with alpha coefficients of 0.81. All of these items are measured using a Likert scale 1–7.

In sum, people who reflect a high score on the New Environmental Paradigm view the world more ecologically, and these values can influence their attitudes and beliefs toward more specific environmental behaviours (Stern et al., 1995; Pierce et al., 1999). However, Dunlap and colleagues faced suggestions and criticism from other researchers (such as Albrecht et al., 1982; Geller & Lasley, 1985; Noe & Snow, 1990; Roberts & Bacon, 1997; Fruman, 1998) that worldviews on ecological issues have changed after 20 years. One of

the most common criticisms was that the New Environmental Paradigm items measured more than one construct of environmental concern. For example, Gooch (1995), and Scott and Willits (1994) found that the 12 items measured two constructs, Shetzer et al. (1991) reported three, Roberts and Bacon (1997), Furman (1998), and La Trobe and Acott (2000) identified four, and Geller and Lasley (1985) reported that the items measured five constructs of environmental concern. This criticism was acknowledged by Dunlap et al. (2000, p. 430), who mentioned that “While the bulk of available evidence converges to suggest the overall validity of the New Environmental Paradigm Scale, there is far less consensus on the question of whether the scale measures a single construct or is inherently multidimensional”. Therefore, the New Environmental Paradigm Scale was modified with a new version known as the New Ecological Paradigm (NEP) scale (Dunlap et al., 2000).

**Table 2.5. The New Ecological Paradigm Scale (15 items)**

	<b>Item</b>	<b>Environmental value</b>
1.	We are approaching the limit of the number of people the earth can support.	Limits to growth
2.	Humans have the right to modify the natural environment to suit their needs.	Anti-anthropocentrism
3.	When humans interfere with nature, it often produces disastrous consequences.	Balance of nature
4.	Human ingenuity will insure that we do not make the earth unlivable	Anti-exemptionalism
5.	Humans are severely abusing the environment.	Eco-crisis
6.	The earth has plenty of natural resources if we just learn how to develop them.	Limits to growth
7.	Plants and animals have as much right as humans to exist.	Anti-anthropocentrism
8.	The balance of nature is strong enough to cope with the impacts of modern industrial nations.	Balance of nature
9.	Despite our special abilities, humans are still subject to the laws of nature	Anti-exemptionalism
10.	The so-called “ecological crisis” facing humankind has been greatly exaggerated	Eco-crisis
11.	The earth is like a spaceship with only limited room and resources.	Limits to growth
12.	Humans were created to rule over the rest of nature.	Anti-anthropocentrism
13.	The balance of nature is very delicate and easily upset	Balance of nature
14.	Humans will eventually learn enough about how nature works to be able to control it.	Anti-exemptionalism
15.	If things continue on their present course, we will soon experience a major ecological catastrophe.	Eco-crisis

*Source: Dunlap et al. (2000, p. 433)*



The New Ecological Paradigm (NEP) scale (Dunlap et al., 2000) was revised with the addition of two new environmental values (anti-exemptionalism and eco-crisis) to broaden the content of the previous paradigm scale. Anti-exemptionalism refers to the idea that, unlike other species, humans are exempt from the constraints of nature (Dunlap & Catton, 1994). Eco-crisis refers to the likelihood of potentially catastrophic environmental changes besetting humans. This was due to the emergence of knowledge about ozone depletion, climate change, and human-induced global environmental change in general (Dunlap et al., 2000). These researchers recommended that the NEP scale (see Table 2.5.) should use all 15 items (strongly agree to strongly disagree) as a uni-dimensional construct to measure pro-environmental views. The eight odd numbered questions (items 1, 3, 5, 7, 9, 11, 13 and 15) are worded so that agreement indicates a pro-environmental view. The seven even numbered questions (items 2, 4, 6, 8, 10, 12 and 14) are worded such that disagreement indicates a pro-environmental view. However, some researchers (e.g., Dolnicar & Leisch, 2008) reverse code the even number questions such that higher scores for all 15 items reflect a more pro-environmental view. Researchers have also reported and suggested mean scores of the NEP scale to be between 54 and 58 (Dunlap et al., 2000; Kotchen & Reiling, 2000; Hunter & Rinner, 2004).

#### **2.4.3.3. New Ecological Paradigm and National Park Visitors**

Ultimately, the New Ecological Paradigm (NEP) serves to perform the function of its previous New Environmental Paradigm, however with a greater emphasis on the fact that “the welfare of modern societies, even with their complex forms of social organization and sophisticated technologies, is intricately linked to the health of the ecosystems on which they depend for their existence” (Dunlap & Martin, 2002, p. 21). The NEP has been applied widely to measure environmental values and beliefs about ecological worldviews. For example, Imran et al. (2014) reported tourism stakeholders of protected areas who had positive environmental orientations were supportive of pro-environmental behaviours. However, few studies (e.g., Beaumont, 2001; Weaver & Lawton, 2001) have applied the NEP in relation to national parks in Australia. Given the limited literature on

national parks and NEP application, related studies can be grouped geographically into three main countries: USA, Australia, and other countries.

- 1) NEP Studies and national parks in the USA: Silverberg et al. (1996) conducted a study to investigate differentiating factors among nature-based tourists in the US about their worldviews on the environment. Surveys were administered to 334 respondents consisting of frequent travelers with an interest in the environment who were randomly selected from a commercial mailing list purchased from a research company. Their results identified two key segments (conservationists and consumptives) of nature-based tourist from the NEP scale. Consumptives accounted for 51.8 percent of the NEP scale with views about human rights to modify the natural environment, the environment as a place to suit the needs of humans, and mankind as a creation to rule over nature. Conservationists accounted for 40.8 percent of the NEP items and were more concerned about humankind's abuse of the environment, the delicate balance of nature, earth's limited resources, limits of industrial growth, and the importance of people living in harmony with nature. Similarly, Floyd et al. (1997) applied the NEP – 12 items to investigate environmental concern and acceptability of environmental impacts among 628 visitors to two national parks (Cape Lookout National Seashores and Moores Creek National Park) in the USA. Three types of environmental concern groups (low concern, middle concern, and high concern) were identified with a range of NEP scores from 15 to 75. Visitors with NEP scores greater than 62 had higher levels of environmental concerns and were less accepting of environmental impacts.
- 2) NEP Studies and national parks in Australia: Beaumont (2001) examined 418 visitors' environmental attitudes and behaviour at Lamington National Park in Queensland, Australia. They applied a derivative model of the NEP known as the Ecological Paradigm scale (Olsen et al., 1992). The Ecological Paradigm scale focuses on how humans relate to ecosystems with the emphasis on the total ecosystem rather than any particular eco problems. Their study found that environmental knowledge did not correspond with an increase in environmental

attitude and behaviour. Weaver and Lawton (2001) studied the environmental attitudes and behaviour of visitors relating to the Lamington National Park. 1500 tourists participated in a postal survey about environmental issues, behavioural possibilities of ecotourism, and motivations for visiting ecotourism sites. Their study identified three segments of ecotourists: harder, softer, and structured ecotourists. Harder tourists had the strongest pro-environmental attitudes. These ecotourists were profiled as people with strong environmental commitments, were physically active, took longer trips, emphasised personal experience, and expected limited service from the destinations. They also found all segments to hold biocentric attitudes, which indicated agreement with the concept of society's change in values of the environment and its link to modern society.

- 3) NEP Studies and national parks in other countries: In Lake Takern Nature Reserve, Sweden, Wurzinger and Johansson (2006) applied the NEP – 15 items to understand tourists' environmental attitudes and behaviours. Respondents were selected via ecotourism-labeled companies in Sweden that offered holiday packages. Questionnaire surveys were handed to tourists at their hotels as identified through the ecotourism-labeled companies. Among the 245 respondents, three key segments were identified (eco-tourists, nature-based tourists, and city tourists). Using a 5-point Likert scale (strongly disagree to strongly agree), eco-tourists were mostly pro-environment, with the highest pro-environmental average score of 3.87 relating to participating in activities that benefited the ecosystem of the park. The nature tourist segment had the second highest NEP average score of 3.68, while city tourists had the lowest NEP average score of 3.49. Their research recommended a possibly effective way for tourism companies to attract ecotourists and nature tourists through the use of advertisements that declared travel destinations as being environmentally friendly.

In Kenya, Wanjobi (2005) examined tourists' (n=131) environmental attitudes towards Amboseli National Park. Respondents were randomly selected, with every third tourist vehicle entering the park approached. Three key segments of tourists were identified (environmentalists, independent tourists, and 'want it all')

tourists). They reported that environmentalists and independent tourists with ecocentric views preferred that resources of the National Park be conserved. The 'want it all' tourists had stronger anthropocentric views and supported the transformation of the environment in favour of human development. Wanjobi's study also reported that the environmentalists desired less visible man-made structures, fewer tourist vehicles on site, and more conservation measures taken by park management. The 'want it all' tourists were motivated to visit the park for socialising reasons such as meeting other tourists, and preferred to have more tourist information made available throughout the park with more signposting. The independent tourist segment was reported to prefer national parks to be unpolluted and not to be overcrowded, and to explore the park on their own.

In China, Luo and Deng (2008) investigated park visitors' (n=335) environmental attitudes using the NEP-15 items. Two trails at Yellowstone and Golden Whip Stream National Park were used as locations for the data collection. Respondents were sampled at resting points along the two trails. Questionnaires were given to representatives from various tourist groups. The study concluded that tourists who were more supportive of limits to growth and more concerned about eco-crisis tended to be more motivated to be close to and learn about nature, and to escape from daily routines and issues associated with cities. Those motivated to develop skills and abilities or to seek to experience new things and environments tended to be more supportive of the notion of humans over nature. An interesting finding was that the frequency of visits to the park was not significantly related to the NEP scale. This finding was different from previous studies (e.g., Noe & Snow, 1990), which argued that visitors to national parks could develop a deep appreciation of nature and the environment, and demonstrate a high level of NEP values or even a high level of commitment to environmentally friendly behaviour.

As can be seen from the above studies, the NEP (both 12 and 15 items) is a useful measure of pro-environmental orientation in terms of the way people perceive the environment, and how this perception influences their visitation behaviour. For example, visitors who possess pro-ecological worldviews may behave in a more environmental

friendly manner during their holidays, such as properly disposing of their litter in national parks and refraining from removing natural artifacts as personal souvenirs. Furthermore, Formica and Uysal (2002, p. 47) encouraged researchers to “incorporate environmental values into travel studies since one’s attitude about nature and use of resources may influence destination selection process”. However, little research has examined the connection between visitors’ environmental values and their beliefs about non-compliant behaviour at national parks. Therefore, this thesis aims to employ the New Ecological Paradigm (NEP) – 15 items to better understand visitors’ pro environmental values in relation to their beliefs and attitudes towards non-compliance to venture off-trail at BMNP.

## **2.5. Motivations of Visitor Non-compliance at National Parks**

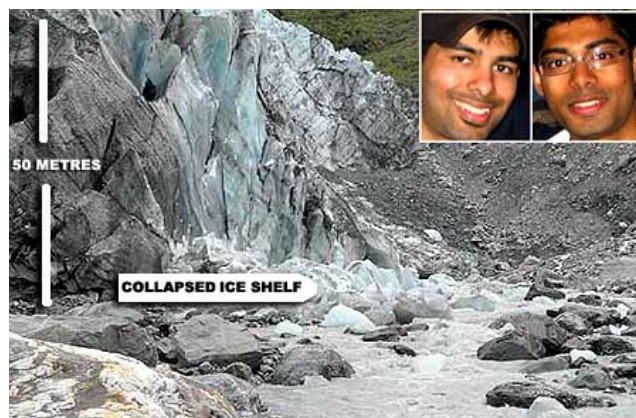
Non-compliant behaviour is seen as decisions to not comply with protective recommendations that are calculated actions taken in expectation of some outcome or reward associated with non-compliance (Espiner, 1999). According to Ward and Roggenbuck (2003), non-compliant behaviour can be explained using three scenarios: 1) the visitor intentionally or unintentionally refuses to comply with social norms (e.g., to knowingly enter a restricted area when the majority of other visitors would disapprove of such behaviour); 2) the individual will often be motivated to pursue some form of personal goal (e.g., to venture off-trail and successfully complete the bushwalk; and 3) the visitor possesses somewhat of a 'self-maximising' 'tragedy of the commons' attitude to acquire benefits for that individual at the expense of public welfare (e.g., to take souvenirs home from national parks) (Hardin, 1968; Gramann et al., 1992).

The motivation to comply can be further understood by Harding et al.'s (2000) four-stage decision model. They proposed that visitors go through a four-stage decision model when complying with recommendations from park managers: 1) comprehension of the situation (e.g., dangerous terrains, do not enter); 2) information retrieval about possible behaviour options from memory (e.g., alternative routes available 500 metres ahead); 3) judgment formation as to which behaviours are most appropriate (e.g., due to limited trekking equipment, it's wiser to take safer route); and 4) behavioural response in choosing which behaviour to perform. Non-compliant behaviour is a problematic behaviour and one of the most significant problems reported by management at nature-based tourist establishments (Gramann et al., 1992; Ward & Roggenbuck, 2003). Past studies have identified possible reasons for this problematic behaviour, such as overcrowding (Manning, 1999), lack of authority presence (Hendricks et al., 2000), little or no reward for compliance (Gramann et al., 1992), unrealistic goal (Bogie, 2007), and higher level of perceived tolerance (Geller et al., 1982). For the purposes of this thesis, these reasons for non-compliance have been categorised into four categories according to the four-stage model of decision-making by Harding et al. (2000). These non-compliant reasons can be categorized into: 1) situation interpretation; 2) information retrieval; 3) judgment formation; and 4) behavioural response.

### 2.5.1. Situation circumstances and interpretation

The surrounding situational circumstances facing visitors in outdoor recreation settings can encourage non-compliant behaviour (Manning, 1999). This situational interpretation can be influenced by existing conditions, hazard awareness, voluntary nature of recreation, and the role of authority enforcement. For example, existing conditions such as tendency to litter an area that is already littered (Finnie, 1973; Geller et al., 1977). Similarly, Samdahl and Christensen (1985) found an increased vandalism of picnic tables where previous evidence of vandalism existed. For example, on Feb 6, 2010, several vandalism activities were committed at the Washpools camping area in Towarri National Park, NSW. Vandals covered the information shelter with graffiti and plastics were burnt onto barbeque plates, which resulted in \$3000 damage (The Scone Advocate, 2010). One explanation for this ‘monkey see, monkey do’ copying behaviour in crowds is rationalisation (Manning, 1999). Visitors alter and rationalise their normal behaviour based on the behaviour of other visitors. For example, seeing visitors and guided tours crossing safety barriers may encourage other visitors to adopt a “if they can do it, why can’t we” mentality. In 2009, two Australians died after being crushed by 100 tons of ice at Fox Glacier, New Zealand (see Exhibit 2.4).

**Exhibit 2.4. Collapsed ice at scene of death**



*Source: The Sydney Morning Herald (2009)*

It was reported that the pair had crossed safety barriers and walked towards the glacier face to take photos when a section of ice collapsed (Ramachandran, 2009). While little is known about whether the pair had crossed the barrier after seeing other visitors climb over it, the New Zealand Department of Conservation reported that in 2007 one-third of 600,000 visitors ignored warning signs and entered danger zones at Fox Glacier (Ramachandran, 2009). Therefore, there is a 33.3 percent possibility that these two Australians could have seen other visitors crossing the safety barriers and followed suit. Beckmann (1995) conducted a study on visitors' adherence to warning signs at Murrumbidgee River in ACT, Australia. She found that visitors had a higher tendency to participate in unauthorised swimming activities when other visitors were swimming in the river. Similarly, Parkin (2003) found evidence of visitors ignoring warning signs to go for a swim in restricted areas if they saw others swimming, as it created an assumption that it was safe to swim there. Clearly, the purpose of safety barriers and regulations is to help visitors recognise a need for compliance with hazard awareness and increase visitor safety, because most visitors have little or no previous experience on which to gauge hazard perceptions. Further, visitors may downplay risky situational surroundings due to more relaxed attitudes and less self-consciousness while on holidays (Espiner, 2001).

This relaxed attitude is associated with recreation being perceived as a leisure activity that carries with it a sense of freedom and free choice in both thoughts and actions (Manning, 1999). As such, regulatory and safety barriers contradict the nature recreation experience. Frost and McCool (1988) found visitors to be more dissatisfied with their recreational experience when restrictions were placed to ensure compliance. Similarly, Duncan and Martin (2002) compared the effectiveness of interpretive and sanction messages for influencing wilderness visitors' intended compliant behaviour. They found visitors to be more resistant to regulatory methods of control as a sense of freedom is perceived by visitors to be the most important aspect of a wilderness experience. Freuler and Hunziker (2007) highlighted the need to maintain a balance by lowering barriers and providing visitors with appropriate information and infrastructure to influence non-compliant behavioural change. In addition, these relaxed attitudes have created higher expectations in visitors to rely on park authorities to inform and provide appropriate facilities for safe access. It is more likely that visitors will be non-compliant and involved



in accidents while overseas than within their country of residence (Bentley et al, 2001) as they take less responsibility for themselves. It has also been reported that most visitors believed that “they wouldn’t be allowed to come here if it wasn’t safe” (Espiner, 2001). This relaxed attitude can influence visitors to engage in non-compliant activities such as walking off-trail, as the probability of being caught by park enforcement in national parks is often minimal. As mentioned by the Regional NSW Park Manager, “*Given the 1.03 million hectares of BMNP, it is impossible to monitor all visitor activities ... although there were 53 official incidents reported by the Police Operations and Rescue Squad, there should be more unreported cases that have not been detected*” (G. Luscombe, 2011, personal interview, March 1). Similarly, Hendricks et al. (2000) reported that mountain bikers did not adhere to designated bike trails when uniformed officers and other visitors were not around. This could be due to the relaxed perception that regulations and safety measures are somewhat voluntary. To overcome this, park authorities must enforce and issue fines if a non-compliant behaviour has been performed. This will serve as a warning to other visitors, especially when it is reported in the local newspaper. For example, a man was fined \$600 for littering at a campsite at Lane Poole Reserve, Western Australia. This incident was reported in the local newspaper with the headline “WA campers have been warned to use the bin or take their rubbish with them” (Perth Now, 2010) (see Exhibit 2.5).

#### **Exhibit 2.5. Litter at campsite**



*Source: Perth Now (2010)*

### 2.5.2. Information retrieval of compliant behaviour

Persuasive communication provided by park authorities must be remembered and retrieved by visitors when they are deciding what to do. This communication effort is a common tool used to influence visitor behaviour voluntarily to protect park resources (Roggenbuck, 1992). However, humans tend to seek shortcuts to retrieve information more quickly and easily. This makes compliance to persuasive communications less likely if the messages are unclear to visitors (Borrie & Harding, 2002, p. 3). For example, in 2006, a woman died after falling off a cliff in BMNP. She and her partner ventured off-trail and were picnicking just 3 metres from the cliff edge. A reporter took a picture of the picnic site and it revealed a small and unclear safety signage (Brown, 2009) (see Exhibit 2.6).

**Exhibit 2.6. Poor signage at scene of death**



*Source: The Sydney Morning Herald (2009)*

Past studies have found the effectiveness of different persuasive communication strategies at parks such as using signage (Chavez et al., 2004), fear based and moral appeals (Parkin & Morris, 2005), bulletin boards (McCool & Cole, 2000), and

interpretive messages (Littlefair & Buckle, 2008). One common strategy is through the use of signage. For example, Chavez et al. (2004) investigated international signage comprehension among visitors (n=262) at the Angeles and San Bernardino National Forest in California. They found that only half of the symbols assessed were correctly identified. There were six symbols (no alcohol, no charcoal grills, amphitheater, carry water, fish hatchery, and conserve water) used in the signage at the national park that were misunderstood by visitors. This is an important finding, because if visitors do not understand the symbols, it reduces the effectiveness of persuasive strategies in national parks.

Another common persuasive strategy used is through moral appeals. For example, Parkin and Morris (2005) used a safety sign with details of the consequences of risk-taking behaviour of rock pool swimming in Springbrook National Park, Queensland. A total of 169 respondents participated in the survey. The message communicated in the persuasive material had a strong moral appeal through storytelling about how a visitor jumped into the rock pool and became a paraplegic after sustaining spinal cord injuries. Their study reported 67 percent of visitors being more cautious after reading the sign, and would think twice about swimming in the rock pool as accidents can happen.

Bulletin boards are another frequently used method of persuasive communication. For example, McCool and Cole (2000) used an experimental bulletin board to minimise impact behaviour at the Selway-Bitterroot Wilderness in Montana, USA. Visitors (n = 453) were observed through using an infrared beam-activated film recorder as the visitors approached the bulletin board. They reported that hikers (85 percent) were more likely to stop at the bulletin board than were horseback riders. One possible explanation could be that hikers were more likely to be overnight visitors and therefore perceived the information as more useful. This is supported in their results in terms of the amount of time spent reading the message on the bulletin board. On average, visitors spent about five seconds reading each of the displayed messages, with hikers spending more time than horse riders reading the messages. The authors found bulletin boards to be more effective for hikers as the messages on these boards may not have been perceived as useful by horseback riders. They recommended that persuasive communication must be

spread across a variety of media, and research must be carried out to understand visitors better and how they respond to various messages.

Researchers have also used interpretive messages as a form of persuasive communication strategy. For example, Littlefair and Buckley (2008) experimented with different interpretation techniques to reduce visitor impacts (noise, litter and trampling) in Lamington National Park, Southeast Queensland. A total of 449 visitors participated in the research through the use of five interpretative programs. These were: Control program – tour guides carried on unrelated conversations with no reference to the actual site; Generic program – tour guides provided broad natural history information; Role model program – tour guides themselves acted to minimise impacts; Appeal program – tour guides explained the types of impacts and its significance; Complete program – a combination of role model and appeal approach. Their results revealed that using the complete program was the most effective interpretive tool in reducing all three visitor impacts. This suggests that the interpretive components reflect the view that tourists respond to interpretive information in a rational manner.

According to McGuire (1985), persuasive educational communication is only effective when the visitor has received, understood, processed, accepted, remembered and applied such information. Similarly, different intervention strategies are necessary to correct different types of visitor actions deemed careless, unskilled, uninformed, unavoidable and illegal (Gramann & Vander Stoep, 1987; Hendee & Dawson, 2003). For example, Allesa et al. (2003) found that 84 percent of hikers in Blue Ridge Parkway, USA were unaware that the trail was off limits. Johnson and Swearingen (1992) recommended the use of persuasive messages to address non-compliant behaviour as a result of visitors being careless, unskilled and uninformed. Sanctions will be more effective in situations where visitors have been made aware of the restriction but choose to do it anyway with clear intentions of non-compliance.

The wording of a message can play a significant role in communication effectiveness. For example, Ormrod and Trahan (1982) found that a negative text sign emphasising probable crowding was not as effective as one that emphasised the positive aspects of a more solitary experience in redistributing visitor use. Similarly, using interpretive

prescriptive messages that encourage positive conduct is more effective than a proscriptive message that discourages negative conduct (Winter et al., 2000; Hughes et al., 2011). For example, Littlefair (2004) used interpretive prescriptive positive messages to reduce off-trail short cutting from 100 percent to 7 percent. Using proscriptive messages, however, might be more effective for illegal activities, as demonstrated by Cialdini et al. (2006). They found prevention of petrified wood theft was most effective with the compliant sign “Please don’t remove the petrified wood from the park”.

The location of signs has also been reported to influence the information retrieval process. Bradford and McIntyre (2007) reported that regulatory signs are most effective when placed at non-compliant areas. They found 88 percent of visitors ventured off-trail when no signs were present, 87 percent did not comply when signs were at information booths, and 65 percent did not comply when signs were placed at the intersection of the official and off-trail.

Appealing to the moral and fear factor of visitors can influence the retrieval of information. Parkin and Morris (2005) used graphic signage that appealed to the fear element and possible consequences of engaging in non-compliant behaviour of rock diving and swimming at The Cougal’s Cascades at Springbrook National Park, Gold Coast, Australia. They reported that fear-based appeal did influence the awareness of visitors about the dangers of swimming in natural areas. Visitors became more conscious of the fact that they needed to check the safety of the area before diving into the water. Similarly, Winter (2006) adopted a moral appeal signage, that is, “Please don’t go off the established paths and trails, in order to protect the Sequoias and natural vegetation in this park”. It was found that visitors were influenced by the moral message and there was a drop in the number of off-trail hiking incidents at Kings Canyon National Park, USA.

The most obvious communication strategy is through the direct management method of physical barriers (Johnson et al., 1987; Park et al., 2008). One such barrier is fencing to restrict non-compliant activities (Cahill et al., 2008). Swearingen and Johnson (1988) reported the use of yellow rope barriers to be the most effective method for reducing non-compliance in off-trail walking. In a study conducted at Acadia National Park, USA, they found that using low fencing and signs was the most effective method in deterring

visitors to go off-trail (Park et al., 2008). Other researchers have also found the use of barriers in combination with the presence of uniformed officers to be most effective (Rochefort & Gibbons, 1992) whereas some studies have reported that the using only uniformed officers is as effective as using barriers (Swearingen & Johnson, 1995; Widner & Roggenbuck, 2000; Ward & Roggenbuck, 2003).

### **2.5.3. Judgment formations in compliance**

The decision to comply may be influenced by judgments formed towards a situation. Borrie and Harding (2002, p. 3) referred to these judgments as *“heuristics or shortcuts that are used to make fast and frugal decisions. Sometimes these choices are optimal, but sometimes the first seemingly satisfactory alternative is chosen”*. The judgment is influenced by other motivating factors such as ignorance of consequences, social justification and the cost of conforming (Ward & Roggenbuck, 2003). In a study on petrified wood theft, Ward and Roggenbuck (2003, p.1) reported that *“visitors rationalized the act of taking smaller pieces of wood as an acceptable behaviour and it would not hurt anything”*. Similarly, Martin (1992) found that visitors defended their actions of removing pumice from Mount St Helens National Volcanic Monument as socially acceptable. This was corrected through persuasive communication efforts with a fear appeal using sanctions for the removal of pumice, which resulted in a decrease of 97 percent in pumice removal. Nesbitt (2006) drew attention to what was perceived as a ‘minor issue’, that is, dog owners viewed dogs being off-leash as a minor violation and that it would not hurt for dogs to have a little fun. These minor violations are difficult to control as non-compliers may view these regulations as unimportant with minimal consequences (Martin, 1992). Non-compliance judgments can also be formed through social justification. For example, Parkin and Morris (2005) reported that 60 percent of swimmers watched friends and others swimming in the rock pools to justify their behaviour. On the contrary, Parkin (2003) explained that the use of social justification would not be applicable to certain visitors such as regular visitors and experienced walkers. It was reported that even if people who regularly swam at a location knew of

serious accidents that had happened in the past, they would still swim there, as they believed a similar accident would not happen to them.

Gramann and Vander Stoep (1987) viewed this as a possible failure to comply with social norms about what behaviours are widely accepted beliefs of right and wrong in a given situation. This set of social norms internalise into a set of moral standards, which is then used by individuals to evaluate their own actions (Heberlein, 1972; Samdahl & Christensen, 1985). This is very similar to subjective norms, which influence an individual to act based on support and approval from important social groups (Ajzen, 1991). Violating social norms are common in everyday life, such as littering, jay walking and illegal parking. According to Gramann and Vander Stoep (1987), these violations depend on the extent to which a norm is considered as inappropriate by society, and this heavily dictates the frequency with which a non-compliant act is performed. Gramann and Vander Stoep (1987) have developed a framework of six social norm violations:

1. Unintentional violations: These actions occur because visitors are unaware or lack knowledge about social norms in a particular situation, for example, lighting a campfire to cook dinner. Other researchers have agreed that unintentional violation is the primary source of deviant behaviours (Martin, 1992; Allesse et al., 2003).
2. Uninformed violations: These actions are often well intentioned, and are committed without awareness of the behaviour's damaging consequences. These actions include feeding wildlife because of a love for animals. Visitors may know of the general norm for behaviour but may not see its applicability to a particular act in the context of their visit to the park (Ward & Roggenbuck, 2003).
3. Releasor cue violations: These actions are due to a social environment that promotes non-compliant behaviour. These violations occur from seeing others commit a violation, or seeing traces of violation that have gone unpunished through enforcement or indirectly through social stigma. These actions include walking off-trail in national parks because everyone is doing so.

4. Responsibility denial violations: These actions occur because visitors feel that the non-compliant behaviour is justified. This justification is based on the individual's belief that a particular action is wrong, but he/she does not assume moral responsibility for that action in certain circumstances because conforming seems unreasonable or impossible. These actions include illegal hunting in national parks to prevent death from starvation.
5. Status conforming violations: These actions occur in response to social influence from important reference groups or social networks. These visitors are motivated to non-comply because of peer pressure to conform (Ajzen, 1991). These actions might include encouragement and support from friends to enter restricted areas.
6. Wilful violations: These non-compliant actions occur freely for financial gain, ideological protest, revenge, malice or fun. These visitors are fully aware of their wrong actions but do so to satisfy their conflicting goal of resource protection. These actions include vandalising park facilities.

Lastly, the level of perceived cost associated with conforming to regulations can influence visitors in their judgment formation. This associated perceived cost can be seen as losses or lack of rewards for conforming (Graman et al., 1995). Graman and Vander Stoep (1987) stated that when protective rules are obeyed voluntarily, this act of obedience is seen as the perceived cost to the conformer for obeying. However, when anticipated experience is negatively different from actual experience, visitors often feel that the personal cost of remaining behind a barrier, for instance, is greater than the costs associated with going beyond the barrier (Espiner, 2001). For example, Espiner (2001) reported that 70 percent of visitors expressed the desire to cross the safety barrier to get closer to the glacier because they felt it involved minimal perceived risk.



#### **2.5.4. Behavioural response to comply**

The objective of understanding non-compliant reasons among visitors is so that park authorities can design appropriate interventions to address non-compliant behaviours. This can be done using direct and indirect techniques (Manning, 1999; Hockett et al., 2010). Direct management dictates the strict enforcement of rules and regulation to govern visitor behaviour (Gramann et al., 1992; Manning, 1999). This direct approach focuses on authoritarian regulations and there is a high degree of control by park managers (Brown et al., 1987; Hendee & Dawson, 2002; Kuo, 2002). These measures include fines, site restrictions, permits rationing and visitor zoning. On the other hand, park authorities can use indirect measures such as persuasive communication, interpretation and site design to encourage voluntary changes in visitor behaviour without the explicit threat of penalties for failure to comply (Gramann et al., 1992; Manning, 1999). Indirect management tools are more subtle and light-handed, and the visitor retains freedom of choice (Brown et al., 1987; Hendee & Dawson, 2002, Kuo, 2002). Given that recreation is a pleasurable and rewarding activity, regulatory direct management strategies are justifiable only when it is necessary (Duncan & Martin, 2002). Hockett et al. (2010) reported that visitors are less supportive of increased ranger presence and restrictions with fines but more supportive of being managed indirectly with educational signs.

Many researchers have reported the negative view of direct management techniques by visitors (Roggenbuck, 1992; Widner & Roggenbuck, 2000; Vistad, 2003; Sibley & Liu, 2004; Bullock & Lawson, 2007; Marion & Reid, 2007; Park et al., 2008). For example, Roggenbuck (1992) found that visitors preferred information based strategies because it gave them the freedom to decide and behave freely in a leisure and outdoor environment. Similarly, Hendee and Dawson (2002) found the use of information based interventions to be effective in correcting non-compliant behaviour as it allowed visitors to retain the freedom desired in an outdoor leisure setting. As reported by Park et al. (2008), 90 percent of visitors viewed educational signs as acceptable management tools to prevent vegetation damage due to off-trail hiking. Other studies have reported the use of indirect techniques to be popular among park managers (Manning, 1999; Vistad, 2003; Park et al.,

2008; Brown et al., 2010). For example, park managers indicated their preferences for educational and interpretive interventions over regulatory restrictions and access fees as it allowed a deeper appreciation and sensitivity to recreation resources (Vistad, 2003). Similar views were advanced by Manning (1999), Ham et al. (2008), and Brown et al. (2010), that is, information based strategies were preferred by park managers as it was lower in operational cost and aligned with the mission statement of national parks to provide for the enjoyment of its lands.

Although indirect management techniques are more acceptable to visitors and preferable among park managers, the effectiveness of transforming compliant messages into actual compliant behaviour varies. Bullock and Lawson (2007) recommended using intervention messages that explained the consequences of non-compliant behaviour and reasons for management policies as it has been found to be acceptable among visitors. Winter et al. (2000) suggested focusing on prescriptive messages that emphasised desired behaviour to be more effective as compared to proscriptive messages that focused on undesirable behaviour. For example, a prescriptive message would focus on the benefits of staying on-trail rather than listing the disadvantages of off-trail walking. This is supported by Bradford and McIntyre (2007), who suggested that rather than discouraging non-compliant behaviour, park managers should explain the impacts of non-compliant behaviour so that visitors can identify and reflect upon these impacts. The depreciation of a nature site can influence visitors' responses to indirect interventions. As seen in Bullock and Lawson (2008), visitors tended to comply with indirect interventions when they felt the site resources were degrading to a low level. On the other hand, when sites were highly fragile and degraded, visitors' non-compliant behaviour were better addressed through direct interventions using site regulation and uniformed rangers (Park et al., 2008). The type of recreation settings and experiences also influences the visitor's behavioural response to compliance. In a study across different types of recreation opportunity spectrum, Martin et al. (2009) found visitors of primitive and wilderness areas more tolerant of and responded better to direct interventions such as site closures that in the view of management needed to be done to protect the natural resources and experiential qualities valued by these visitors. Lastly, in terms of the failure to comply with social norms section, indirect intervention strategies are most effective when non-

compliant behaviour is a result of unintentional and uninformed violations, where visitors have the opportunity to conform to persuasive communication materials.

## **2.6. Theory of Planned Behaviour as a framework to understand non-compliant behaviour in national parks**

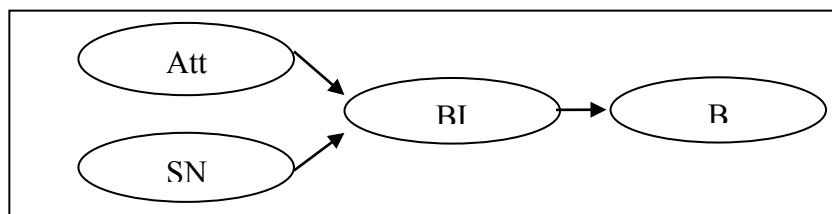
Promoting pro-environmental and compliant behaviour in national parks is challenging because of the nature of the park experience. Although park managers prefer the use of indirect informational-based management strategies, most have not been provided with theoretical frameworks to make decisions and analyse visitor behaviour (Ham et al., 2008; Brown et al., 2010). The Theory of Planned Behaviour (TPB) is recommended by Ham et al. (2008) and Reigner (2008) as a framework to understand visitor non-compliant behaviour and its cognitive precursors. This framework enables park managers to make better strategic decisions in developing indirect persuasive messages aimed at reducing non-compliant behaviour.

Over the past decades, there has been growing interest among social science researchers into the relationship between attitudes and behaviour. This led to the introduction of two multi-attribute models: the Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB) (Ajzen, 1991; Fishbein & Ajzen, 1975). Most importantly, the TRA was designed to predict behavioural intentions when an individual is under volitional control (Ajzen & Fishbein, 1980). However, even simple behaviours can be affected by uncontrollable factors. Therefore, the TRA was modified in 1985 with the addition of perceived behavioural control to account for this gap, that is, to better predict behavioural intentions for behaviours that are under both volitional and non-volitional control (Ajzen & Madden, 1986). This section has provided a description of the key variables of the TRA and TPB. Section 2.6.3 will review some of the studies that have applied the TPB within the national park context.

### 2.6.1. Theory of Reasoned Action (TRA)

From the TRA's perspective, human beings are presumed to behave rationally and use information available to them (Ajzen & Fishbein, 1980). The basic concept of the TRA postulates that behaviour is a function of intentions to perform the behaviour, and individuals will consider the implications of their actions (Ajzen & Fishbein, 1980). The TRA only accounts for behaviour under volitional control of the individual; therefore, performance of the behaviour is solely determined by an individual's intentions (Trafimow et al., 2002). The TRA does not consider the interference of administrative, personal, and environmental barriers in predicting behavioural intentions (Armitage & Conner, 2001). Two independent components of the TRA influence intentions to perform a particular behaviour: an individual's attitudes (Att) towards the particular behaviour; and the individual's subjective norms (SN) about that particular behaviour (see Figure 2.3). Attitudes reflect an individual's positive or negative evaluation of performing a particular behaviour. Subjective norms reflect an individual's perception of whether people who are important to them think they should or should not perform a particular behaviour, which is a form of social pressure.

**Figure 2.3. Theory of Reasoned Action Model**



*Sources: Ajzen (1991); Ajzen and Fishbein (1980)*

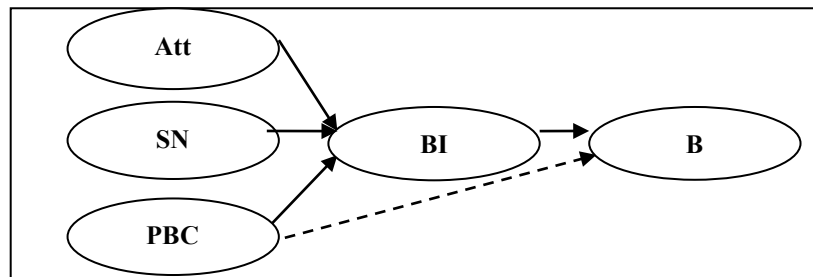
However, non-motivational factors can affect and influence an individual's performance towards a particular behaviour, including lack of time and resources. This omission of control factors can pose a limitation when understanding behavioural decisions made by visitors in national parks where environmental conditions can vary widely and place constraints on visitors' ability to act on their intentions. For example, a visitor may have

positive attitudes and strong support from important reference groups towards staying on-trail, but may have temporal difficulties that force him/her to take a short cut by venturing off-trail. Therefore, the TRA was extended by a third independent component, that is, perceived behavioural control, to account for non-volitional behaviours. The extended theory is referred to as the Theory of Planned Behaviour (TPB) (Ajzen, 1985, 1991).

### **2.6.2. Theory of Planned Behaviour**

The Theory of Planned Behaviour (TPB) is a rational decision making model used to examine the anticipation of a behaviour from behavioural intentions of an individual (Fishbein & Ajzen, 1980; Ajzen, 1991). There are three key variables used in the prediction: 1) people's attitudes (Att) towards a particular behaviour; 2) perception of others' influence (subjective norm - SN) as to whether they would approve or disapprove of the performance of a particular behaviour; and 3) perceived behavioural control (PBC) of an individual's perceived ease or difficulty in performing a particular behaviour. According to the principles of the TPB, individuals will have stronger intentions to perform a particular behaviour if they have a positive evaluation outcome of that behaviour, have reference groups who approve of the performance of that behaviour, and believe that they have control over and few perceived difficulties in performing that particular behaviour (Ajzen, 1991) (see Figure 2.4). For example, visitors will have stronger intentions to comply with park regulations if they have a positive attitude towards complying with park regulations, have important reference groups supporting that decision, and believe that they face little perceived difficulties (such as no temporal constraints) in complying with park regulations.

**Figure 2.4. Theory of Planned Behaviour Model**



Source: Ajzen (1991); Ajzen and Fishbein (1980)

One major advantage of this model is the inclusion of perceived difficulty of factors where an individual has no volitional control. Therefore, the perceived behavioural control variable is useful in the prediction of intentions when an individual's volitional control over the behaviour is low (Ajzen, 1991). Empirical studies have shown support for the inclusion of perceived behavioural control in predicting both intentions and behaviours under non-volitional conditions (Ajzen & Madden, 1986; Armitage & Conner, 2001). Past studies (e.g. Hrubes et al., 2001; Ward & Roggenbuck, 2003; Ham et al., 2008; Brown et al., 2010) have utilised the TPB to investigate non-compliant behaviour of visitor intentions to comply with park regulations. For example, Ham et al. (2008), and Brown et al. (2010) found the TPB useful in understanding and reducing noncompliant behaviour of littering in national parks, feeding wildlife at national parks, and walking dogs off lead in protected areas. Among the three predictors, attitudes have been reported to be the strongest predictor (Armitage & Conner, 2001; Ajzen, 2002).

### **2.6.2.1. Attitudes (Att)**

According to one of the leading authorities on attitudes, Allport (1935, p. 810) stated that, "attitudes can be seen as exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related". This attitudinal influence can be seen as "a person's overall evaluation of persons, objects and issues" (Petty & Wegener, 1998, p. 323) that guides their choices and decisions for action (Hogg & Vaughan, 2013). Another leading authority on attitudes and behaviour, Ajzen (2001, p. 3)

refers to overall evaluation of attitudes as “*a frame of reference for organizing information about the world, attaining rewards and avoiding punishment, managing emotional conflicts to distinguish oneself from other people in a social group*”. The conceptualisation of attitudes in the TPB model uses the expectancy value model formulated by Fishbein and Ajzen (1975), where an individual’s evaluation outcome of behaviour can be captured as beliefs formed about the behavioural outcome. In other words, an individual’s overall attitude towards the behavioural outcome is determined by their strength of association with that outcome. The stronger the associations and positive value an individual has towards the outcome, the more overall positive attitude they would have. The expectancy value model also suggests that, although there can be many different beliefs by individuals about an outcome, only the beliefs which are readily accessible in memory readily influence attitudes (Ajzen, 2001).

As discussed earlier, attitudes are determined by salient beliefs in the TPB, and that while an individual may have many beliefs about a particular behaviour, only some of these beliefs are salient (prominent) and determine attitudes (Fishbein, 1976; van der Pligt & Eisher, 1984). In order to capture the salient beliefs of an individual, Fishbein and Ajzen (1975) recommended using the first 5 to 9 free response captured beliefs to be considered as salient beliefs. Attitudes can be assessed and measured either directly or indirectly (Ajzen & Madden, 1986). Figure 2.5 illustrates the direct and indirect measures of the TPB.

Direct measures of attitudes reflect the degree to which an individual has a positive or negative evaluation towards performing a particular behaviour, which is known as behavioural beliefs (Fishbein & Ajzen, 1975, p. 6). Indirectly, an individual’s attitude towards performing a particular behaviour is shaped by their salient beliefs and is based on their evaluation of the consequences of performing that behaviour, which are indirect measures of attitudes (Ajzen & Fishbein, 1980). The measurement of strength of each behavioural belief (BB<sub>i</sub>) is multiplied by the evaluation outcome (OE<sub>i</sub>) and summed across the number of behavioural beliefs (i) to measure the attitudinal component (Ajzen, 1988; Ajzen & Fishbein, 1980; Ajzen, 2005). The formula used (Ajzen, 1991, 2005) to calculate the indirect measure of attitude (Att) is  $Att \approx \sum (BB_i \times OE_i)$ .

Several researchers have argued that most behaviours are under attitudinal control (e.g., Armitage & Conner, 2001; Ajzen, 2002). In a meta-analysis on 20 years of research on TRA, Van Deute (1991) reported attitudes having greater correlations with behavioural intentions than subjective norms. Ajzen and Fishbein (1980) also concluded that when attitudes and subjective norms were both used to predict behavioural intentions, attitudes generally had greater regression weights than subjective norms, indicating better predictive power of behavioural intentions (Miniard & Cohen, 1981; Triandis, 1994).

#### **2.6.2.2. Subjective Norms (SN)**

The second independent variable of the TPB is subjective norm, which can be assessed and measured both directly and indirectly. The direct measure refers to an individual's perceived social pressure by reference groups (Ajzen & Fishbein, 1980; Ajzen, 1991). These important 'others' can be referent individuals/groups such as colleagues, friends, relatives, and other visitors who may approve or disapprove of the individual's performance of a particular behaviour. Normative beliefs used in the TPB, as proposed by Ajzen (1991), refer to injunctive norms (what people ought to be doing in a particular situation), focusing on the perception of other people's approval or disapproval. For example, you should stay on trails at National Parks because that is what your parents always told you to do.

Indirect measures of subjective norms are determined by an individual's normative beliefs, how reference groups perceive the performance of a particular behaviour, and the extent to which the individual is motivated to comply with those expectations of perceived pressure (Armitage & Conner, 2001). For example, if visitors believe that their friends will support their behaviour of venturing off-trail, and if their motivation to comply with their friends is strong, they are likely to feel encouraged to venture off-trail. Subjective norms are measured by asking respondents to rate the extent to which important reference groups would approve or disapprove the performance of a particular behaviour. This normative belief (NB<sub>j</sub>) is multiplied by the individual's motivation to comply (MC<sub>j</sub>) and summed across the number of reference groups (j) (Ajzen & Fishbein,



1980; Ajzen, 2005). The formula (Ajzen, 1991; 2005) used to calculate the indirect measure of subjective norms (SN) is  $SN \approx \sum (NB_j \times MC_j)$ .

Several researchers have argued that of the three independent variables, subjective norm is generally the weakest predictor of behavioural intentions (Armitage & Conner, 2001; Godin & Kok, 1996; Sheppard et al., 1988; Van Den Putte, 1991). In a review of TPB studies pertaining to health, Godin and Kok (1996) found that attitudes and perceived behavioural control were most often significant in predicting behavioural intentions. Across seven different health behaviour categories, the average correlation between behavioural intentions and subjective norms was the weakest ( $r = 0.34$ ), compared to attitudes with behavioural intentions and perceived behaviour control, with behavioural intentions having similar correlations of 0.46. In a meta-analysis on the efficacy of TPB in 185 studies conducted by Armitage and Conner (2001), the correlation between subjective norms and behavioural intentions was the weakest with an average score of 0.34. This explained only 12 percent of the variance, compared to attitudes with an average correlation of 0.49 explaining 24 percent of the variance and perceived behavioural control, with an average correlation of 0.43 explaining 18 percent of the variance. This empirical evidence has shown that attitudes are a better predictor of behavioural intentions than subjective norms and perceived behavioural control. However, there was one exception, that is, driving behaviours, where subjective norms had the strongest correlations with behavioural intentions of 0.48, compared to attitudes (0.26) and perceived behavioural control (0.44) (Godin & Kok, 1996).

The reason for this exception could be that certain behaviours are normatively driven. Several researchers have argued that subjective norm is an important factor, and may even be the strongest predictor in some studies. In a meta-analysis of condom use studies, Sheeran and Taylor (1999) found the average correlation between subjective norms and behavioural intentions to be 0.42, which was close to the correlation for attitude (0.45) and perceived behavioural control (0.37). Their study suggested that subjective norms play an important role in the prediction of behavioural intentions for this particular behaviour, which is obviously directly related to a person's partner.

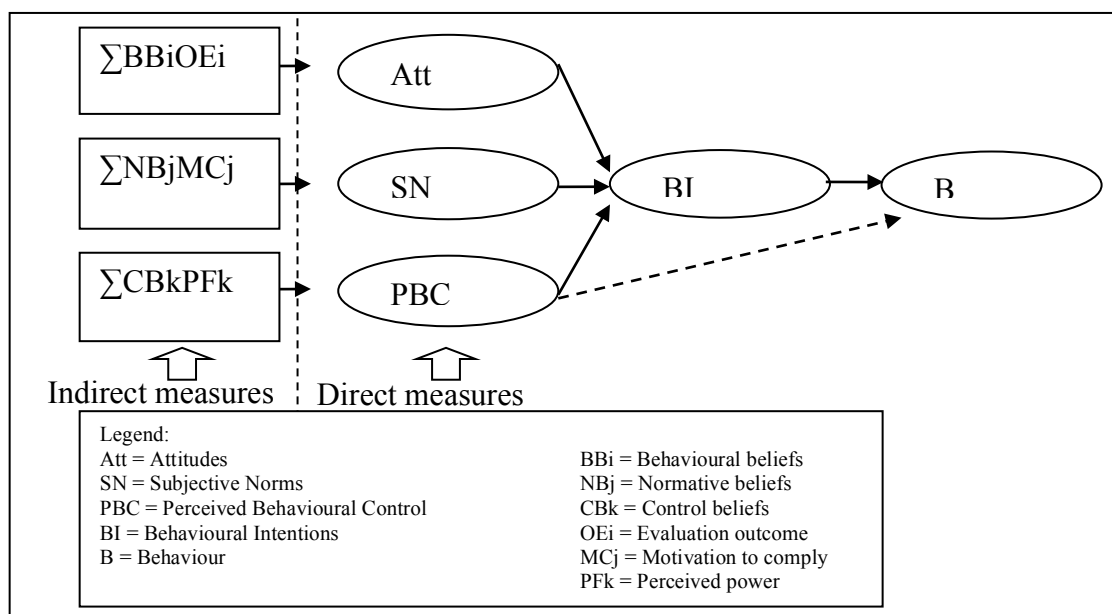
Latimer and Ginis (2005) found subjective norms to be important for those who are highly concerned about receiving disapproval from others. This study was tested with the “brief fear of negative evaluation scale”, and it showed that subjective norm was a significant predictor of intentions for respondents who feared receiving negative evaluation from their important reference groups. In a study across 30 behaviours, Trafimow and Finlay (1996) found that subjective norms added slightly but significantly over and above attitudes to the prediction of intentions for 18 out of the 30 behaviours. Their findings also suggested that most behaviours are controlled by subjective norms to a certain extent, and that this might be important for a minority of people. Other researchers have also reported that some people are normatively controlled for a range of behaviours, for example: spending time on schoolwork (Miller & Grush, 1984), non-opinion leaders to patronise credit unions (Arie et al., 1979), going into debt on credit card (Trafimow & Finlay, 1996), sun-protective behaviour (Terry & Hogg, 1996), drinking (Latimer & Ginis, 2005), and tax compliance (Bobek et al., 2013).

### **2.6.2.3. Perceived Behavioural Control (PBC)**

Controllability reflects perceptions of external barriers to engaging in a particular behaviour, including locus of decision control and logistical opportunities (Ajzen, 2006; Francis et al., 2004). Perceived behavioural control can be measured directly through an individual’s perception of the degree of difficulty of performing a particular behaviour (Ajzen, 1991, p. 183). This perceived difficulty could directly affect their performance of a particular behaviour. However, several researchers (Bandura, 1989; Conner & Norman, 1996; Rhodes & Courneya, 2003; Abdul-Muhmim, 2007) have suggested that PBC is closely related to self-efficacy, and that self-efficacy is synonymous if not different from perceived behavioural control. Ajzen (2005) argued that the use of PBC itself is a sufficient measure of control in the Theory of Planned Behaviour, as PBC is conceptualised in both internal (confidence) and external (available resources) perceived control factors.

Indirect measures of perceived behavioural control use salient control beliefs where it is likely that certain obstacles or barriers can facilitate or hinder an individual's engagement in the performance of a particular behaviour (Ajzen, 1991; Ajzen & Madden, 1986). For example, if visitors believe that a certain level of health fitness is needed to complete a bushwalk, and if health fitness is an important factor for successful appreciation of bushwalking, they are likely to feel they have less control over completing the bushwalk if they do not possess the necessary health fitness and could go off-trail to reduce the burden on their fitness. In other words, the greater the perceived control, the more likely will be the performance of a particular behaviour. The belief-based measures of perceived behavioural control can be calculated by using the perceived likelihood of the control belief (CB<sub>k</sub>) occurring, multiplied by the perceived power (PF<sub>k</sub>) of each control beliefs that will hinder or facilitate the performance of the particular behaviour and summed across the number of control dimensions (k) (Ajzen, 1991; 2005). The formula (Ajzen, 1991, 2005) used to calculate the indirect measure of perceived behavioural control (PBC) is  $PBC \approx \sum (CB_k \times PF_k)$ .

**Figure 2.5. Direct and Indirect Measures of the Theory of Planned Behaviour**



Source: Ajzen (1991; 2005)

Past studies have shown that the perceived behavioural control component is a good predictor of behavioural intentions and behaviours. In a review of 19 TPB studies from 1985–1990, Ajzen (1991) found that perceived behavioural control had an average correlation of 0.39, compared to subjective norms (0.10) and attitudes (0.39). Similarly, Godin and Kok (1996) reported overall correlations of 57 health-related behaviour studies, and found that perceived behavioural control and attitudes had the same high correlation coefficient of 0.46 with behavioural intentions. Perceived behavioural control added 13 percent of variance to the prediction of behavioural intentions, and added 12 percent of variance to the prediction of behaviour. In a meta-analysis across exercise behaviour studies, Hausenblas et al. (1997) compared the differences between studies that used TRA with TPB, and found the latter more useful, based on the higher level of correlations between perceived behavioural control, behavioural intentions and behaviours. A meta-analysis of 185 TPB articles by Armitage and Conner (2001) found that perceived behavioural control had strong correlations of 0.43 with intentions. Attitudes had correlation coefficient of 0.49 with intentions, and subjective norms had correlations of 0.34 with intentions. Perceived behavioural control was a stronger predictor than subjective norms for most behaviour.

#### **2.6.2.4. Behavioural Intentions (BI)**

The TPB postulates that the three independent variables (attitude, subjective norm and perceived behavioural control) can influence an individual's intention to perform a particular behaviour (Ajzen, 1991). According to the principles of the TPB, an individual will have stronger intentions to perform a particular behaviour if they had a positive evaluation outcome of that behaviour, had important reference groups who approve of the performance of that behaviour, and the individual believes that they have strong control and few perceived difficulties in performing that particular behaviour (Ajzen, 1991). For example, visitors will have stronger intentions to comply with safety signage if they have a positive attitude towards compliance with safety signage, have reference groups

supporting their decision to comply with safety signage, and believe that they have control and few perceived difficulties in compliance to safety signage in BMNP.

#### **2.6.2.5. Behaviour (B)**

Both the TRA and TPB postulate that the performance of a behaviour is a function of an individual's intention to perform that particular behaviour (Ajzen, 1991). During the period of transition from intentions to actual behaviour performed, behavioural intentions is the best predictor of behaviour (Ajzen & Fishbein, 1980). Empirical evidence has shown that the TPB components are highly correlated with behavioural intentions and behaviours (Ajzen, 1988; Armitage & Conner, 2001; Sheeran et al., 2001). In a meta-analysis of 87 studies, Sheppard et al. (1988) found correlations of 0.53 between behaviour and behavioural intentions. Randall and Wolf (1994) conducted a meta-analysis on 98 studies and found correlations of 0.45. Other meta-studies also have similar findings: Godin and Kok (1996) (0.46, 35 studies); Sheeran and Orbell (1998) (0.44, 28 studies); Sutton (1998) (0.49, 7 meta-analyses); and Armitage and Conner (2001) (0.47, 185 studies). The average correlation between behavioural intentions and behaviour for the abovementioned studies is 0.47, which is a medium effect size (0.3), and very close to a large effect size (0.5) (Cohen, 1992). In terms of variance explained, Sheeran et al. (2001) found that both intentions and behaviour accounted for 20 to 40 percent of variance. Godin and Kok (1996) conducted a meta-analysis on 76 health-related behaviours and found that behavioural intentions and perceived behavioural control accounted for 34 percent of variance in behaviours in 35 studies. Armitage and Conner (2001) also found that across 185 studies, intentions and perceived behavioural control explained 27 percent of variance for behaviour, and that perceived behavioural control added 2 percent variance to behaviour. The TPB has had some degree of success in predicting a variety of behaviours (Ajzen, 1988, 1991; Armitage & Conner, 1999; Sutton, 1998). These behaviours range from health (Courneya & Hellsten, 1998), exercise (Abraham & Sheeran, 2003; Latimer & Kethleen, 2005), alcohol (Johnston & White, 2003; Latimer & Ginis, 2005; Deshpande & Rundle-Thiele, 2011), smoking (Bagozzi & Kimmel, 1995; Moan et al., 2005), leisure and destination decisions (Ajzen

& Driver, 1992; Sparks & Pan, 2009; Han et al., 2010), consumer behaviour (Sheeran & Orbell, 1999; Malik & Guptha, 2013), parental selection of schools (Goh, 2011); student plagiarism (Bennington & Harmeet, 2013); and crisis management (Wang & Ritchie, 2013).

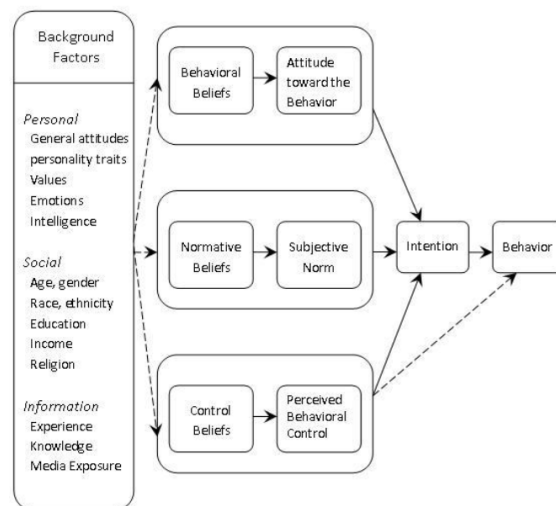
#### **2.6.2.6. Background Variables / Additional Variables**

Ajzen (1991, p. 199) acknowledged that additional predictors other than the TPB variables may be included “*if it can be shown that they capture a significant portion of variance in intention or behaviour after taking into account the TPB variables*”. When considering which variables to employ in augmenting the TPB, it is important to consider the above as to whether the additional variables are likely to add significantly to the standard TPB model. Some additional variables may simply be background factors that predict the standard TPB model but do not tend to provide any unique explanatory power (Ajzen, 2005). For example, willingness to perform a given behaviour is often used interchangeably with behavioural intentions (White and Hyde, 2010). This shows that background variables could have a mediating effect on behaviour, and influence behavioural intentions and behaviours indirectly through the three independent components of the TPB (Ajzen, 2005). For example, some studies have reported that past experiences significantly contribute to intentions. Ouellette and Wood (1998) found that 11 out of 13 studies predicted behavioural intentions significantly from past behaviour, with average correlations of 0.21. They also found stronger correlations between past behaviour and future behaviour ( $r = 0.39$ ), behavioural intentions and future behaviour ( $r = 0.54$ ), attitudes and future behaviour ( $r = 0.33$ ), subjective norms and behaviour ( $r = 0.23$ ), and perceived behavioural control and behaviours ( $r = 0.21$ ). Their results showed that past behaviour can be an important predictor of future behaviour, and might be even a better predictor than attitudes and subjective norms.

However, few studies have explored the role of environmental values as a background factor in the TPB equation. One such study that attempted to augment the TPB with the inclusion of environmental values is by Kaiser et al. (2005) who applied the Value Belief

Norm Theory and TPB to predict conservation behaviour. Their results reported that TPB accounted for 95 percent of conservation behaviour, while the Value Belief Norm Theory accounted for only 64 percent. Moreover, the fit statistics using structural equation modeling did not support the theoretical constructs. Studies in environmental values using the New Ecological Paradigm have not examined the relationship between pro-environmental values and the TPB. This is not surprising as most environmental studies investigate intentions and behaviours directly through values and attitudes. The sole reliance on attitudes or values to predict behaviour is problematic, as the measurement of the attitude–behaviour relationship may only be carried out at a general level rather than with specific behaviours, despite NEP values being found to be general worldwide views about the environment (Dunlap et al., 2000; Schaper & Carlsen, 2004; Ajzen, 2005). Second, there are other human dimensional variables that can influence behaviour such as subjective norms and perceived control (Fulton et al., 1996; Ajzen, 2005) as discussed previously.

**Figure 2.6. The Role of Background Factors in the Theory of Planned Behaviour**



*Source: Ajzen (2005)*

Explaining the value – beliefs – attitudes – behaviour correlation is necessary to understand visitors' off-trail behaviour. Therefore, this thesis seeks to examine if the role of pro-environmental values (NEP) are related to an individual's beliefs and attitudes as reported by other researchers (Stern et al., 1995; Stern, 2000; Dunlap et al., 2000; Ajzen, 2005).

### **2.6.3. Theory of Planned Behaviour in Visitor Management**

#### **Studies at National Parks**

Although the theory of planned behaviour has been applied to a wide range of behaviours, there is a paucity of studies that have investigated visitor behaviour at national parks. These studies (Ajzen & Driver, 1992; Harding et al., 2000; Hrubes & Ajzen, 2001; Lackey & Ham, 2004; Ward & Roggenbuck, 2003; Kouthouris & Spontis, 2005; Bright & Burtz, 2006; Ham et al., 2008; Brown et al., 2010) have shown positive relationships between TPB independent variables and behavioural intentions, and can be grouped into two main categories: 1) intentions to participate in leisure activities at national parks; and 2) intentions to comply with regulations at national parks.

The first group of studies that applied TPB to understand visitor behaviour was pioneered by Ajzen and Driver (1992) to investigate leisure activities such as going to the beach, mountain climbing, jogging, boating and biking. They found strong correlations among all TPB variables with behavioural intention. Perceived behavioural control was reported as the strongest predictor of intentions and behaviour. Their overall prediction for TPB was  $R^2 = 0.74$ ,  $p < 0.01$ . Perceived behavioural control was reported to be an important predictor of leisure activities. Hrubes and Ajzen (2001) carried out a similar study examining hunting behaviour and attempted to extend the TPB model with the inclusion of other hunting beliefs (wildlife enjoyment, wildlife rights, self-transcendence and openness). Their study examined hunting behaviour in Vermont, USA. All TPB variables (attitude, subjective norm and perceived behavioural control) were positively correlated and predicted hunting intentions. Their overall prediction of intentions ( $R^2 = 0.86$ ,  $p < 0.01$ ) and behaviour ( $R^2 = 0.38$ ,  $p < 0.01$ ) were both positive. Interestingly, perceived



behavioural control had little influence over hunting intentions. Kouthouris and Spontis (2005) applied the TPB to understand recreation participation, including activities such as kayaking, orienteering and archery. Their study reported only attitude and perceived behavioural control to be significant predictors of intentions ( $R^2 = 0.597$ ,  $p < 0.001$ ). The role of subjective norms did not have a significant role in explaining individuals' intentions to participate in outdoor activities. This is similar to previous research by Ajzen and Driver (1992), who argued that social pressure had a small influence on one's intention to participate in outdoor activities.

The second group of TPB studies in visitor management studies relates to understanding non-compliant behaviour in national parks. For example, Lackey and Ham (2004) used the TPB to elicit salient beliefs of campers toward proper food storage behaviour in Yosemite National Park. This compliance was important to reduce conflicts between humans and black bears. Their main findings were that inconvenience was the major negative attitude towards proper food storage, people who appreciated nature were supportive of the campers' action to store food properly, and the lack of food storage lockers in the national park was a perceived difficulty that prevented them from storing their food properly. Ward and Roggenbuck (2003) examined the non-compliant behaviour of petrified wood theft at Petrified Forest National Park and found attitudes towards the non-compliant act to be a key influencer. They reported that most respondents perceived the act of petrified wood theft as acceptable, believing that the piece of stolen wood was so small that taking it would not hurt anything. More importantly, non-compliers did not view removing a small piece of wood from the national park as a non-compliant behaviour. Nesbitt (2006) investigated non-compliant behaviour of off-leash dog walking in national parks and found all TPB variables (attitudes, subjective norms and perceived behavioural control) to be motivating factors of behavioural intention. Dog owners held the strongest attitudes, "Sometimes it is OK if a dog runs off-leash", that influenced their decision to walk their dog off-leash. The social support of other dog owners who allowed their dogs to roam freely in the park also contributed to the decision to engage in off-leash dog walking. Dog owners also perceived few difficulties, as there were ample opportunities within the park for dogs to be off-leash.

In a study on non-compliant behaviour of crossing safety barriers at national parks, Hayes (2008) found visitors' attitudes, subjective norms and perceived behavioural control to influence non-compliant behaviour. It was found that visitors' attitudes toward protective recommendations by park management were unrealistic and unworthy of their respect. One of the main findings was the minimal social pressure to remain behind barriers as many other visitors ventured beyond safety barriers and this encouraged others to follow and non-comply. Visitors were also reported to be motivated by a high level of perceived behavioural control and saw no obvious consequences for crossing safety barriers. In a comprehensive study of three non-compliant behaviours (littering, wildlife feeding and letting dogs off-leash), Ham et al. (2008) and Brown et al. (2010) found behavioural beliefs to exert the greatest influence on attitude formation and behavioural intentions. They reported that most non-compliers chose not to pick litter up because of the possibility of injuring themselves at Russell Falls National Park. In the study on wildlife feeding at Badger Weir National Park, most non-compliers had the behavioural belief that if they did not feed the birds, the birds would not come so close to them. Lastly, Ham et al. (2008) reported that most dog owners at Yellagonga Regional Park perceived that if they kept their dogs on a lead, their dogs wouldn't be getting enough exercise. By using the TPB to understand these non-compliant behaviours, researchers and park managers developed a better knowledge of salient beliefs and were able to design more persuasive communication campaigns in correcting non-compliant behaviours.

## **2.7. Conclusion**

The literature review revealed the importance of understanding non-compliant behaviour, which researchers have described as one of the most significant problems reported by management at nature based tourist establishments (Gramann et al., 1992; Ward & Roggenbuck, 2003). However, more studies are needed to explore these salient beliefs toward non-compliant behaviour in national parks. In summary, several factors have been found to influence non-compliant behaviour, such as interpretation of site situation, retrieval of information, formation of judgment and behavioural response. Both visitors

and park managers generally preferred these aspects to be managed indirectly through persuasive information campaigns and interpretive strategies.

The review of environmental values revealed important cues on the type of values national park visitors possess, which tend to be pro-environmental values. However, the literature review revealed a gap in values research where values and attitudes are used interchangeably and seemed to refer to the same construct used to predict behaviour directly. Furthermore, the definitions of values have seen the term environmental values, environmental beliefs and environmental attitudes used to define values in various definitions. The role of beliefs has lost its significance and importance in most environmental studies, where general attitudes are used to understand behaviour and specific insights into behaviour motivation using beliefs are often omitted.

More importantly, the second research gap sees most TPB studies focusing their research on the application of TPB independent variables to understand various behaviours of interest. However, there is a paucity of studies examining background factors and their associations with TPB independent variables. Ajzen (1991, 2005) has called for more research into this area to explore the role of background factors in TPB studies. Therefore, there is an opportunity to close the research gaps in the literature by adopting the TPB model to provide a useful systematic and theoretical framework for eliciting specific salient beliefs about off-trail behaviour, and explore the role of pro-environmental values as background factors in the TPB model. The existing TPB independent variables (attitudes, subjective norms and perceived behavioural control) along with background factors of pro-environmental values should be incorporated and directed through persuasive communication campaigns to minimise off-trail walking at BMNP.

### **3. DEVELOPMENT OF HYPOTHESES AND METHODOLOGY**

The main objective of the present study is to understand non-compliant behaviour among visitors at Blue Mountains National Park (BMNP) in Australia. This is achieved by employing the theory of Planned Behaviour (TPB) as an established framework, and by using pro-environmental values to address the identified research gaps. Initially, this chapter outlines the research questions and hypotheses (see Figure 3.1) developed and proposed for this thesis. The second part of this chapter explores the study in terms of the appropriate research paradigm, research design, sampling, procedures and statistical analyses used to explore the research questions and hypotheses. This research study is divided into two stages: elicitation study and quantitative study (as recommended by Ajzen & Fishbein, 1980). The setting for this study was limited to The Blue Mountains National Park (BMNP) (see section 2.1.1.).

#### **3.1. Research Questions and Hypotheses**

##### **Research Question 1**

Are the direct measures of the TPB associated with visitors' behavioural intentions of venturing off-trail when visiting Blue Mountains National Park (BMNP)?

Hypothesis 1

*Visitors' attitude (Att) towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

Attitudes refer to the extent that an individual evaluates a particular behaviour to be favourable or unfavourable (Ajzen, 1991). This hypothesis is based on findings from prior studies, which have shown that most non-compliant studies examining reasons for non-compliant behaviour placed great reliance and dominance on attitudes (Ward & Roggenbuck, 2003; Ham et al., 2008; Brown et al., 2010). For example, visitors non-

complied because they felt positive about their non-compliance, such as feeling that it was alright to take a small piece of petrified wood (Roggenbuck, 2003), or to let their dogs off-leash so that their dogs could have more exercise. In these instances, visitors saw nothing wrong with their non-compliant behaviour.

### Hypothesis 2

*Visitors' subjective norm (SN) towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

Subjective norms refer to perceived social pressure by reference groups. Important reference groups may approve or disapprove of a particular behaviour (Ajzen & Fishbein, 1980; Ajzen, 1991). The role of subjective norms has been reported to be a key-motivating factor to non-compliance (Beckmann, 1995; Parkin, 2003; Parkin & Morris, 2005). For example, Parkin and Morris (2005) reported other visitors to be a key determinant of non-compliant behaviour. Visitors who saw other visitors swimming in restricted pools felt that if they were doing it, it should be safe and socially acceptable.

### Hypothesis 3

*Visitors' perceived behavioural control (PBC) towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

Perceived behavioural control refers to the perceived degree of difficulty to perform a particular behaviour, which is not fully within volitional control (Ajzen, 1991). Although some studies identified difficulty reasons of visitors, this area is not widely covered as compared to attitudes. This component is relevant, because perceived behavioural control is known directly to affect the performance of certain behaviours (Ajzen, 1991). The inclusion of perceived behavioural control along with other independent variables (attitude and subjective norm) adds to the prediction of behavioural intentions, compared to attitude and subjective norms alone (Ajzen, 1991). For example, Ward and

Roggenbuck (2003) reported that visitors perceived little difficulty in performing a particular act of non-compliance, as they believed that no one would care if they removed small pieces of petrified wood from a national park. Similarly, Nesbitt (2006) found dog owners perceived few difficulties, as there were ample opportunities within the park for dogs to be off-leash. Hayes (2008) reported that non-compliant visitors perceived a high level of control in performing non-compliant behaviours and saw no obvious consequences for crossing safety barriers. According to Ajzen (1991), these three independent components (attitude, subjective norm and perceived behavioural control) influence an individual's intention to perform a particular behaviour (Ajzen, 1991).

## **Research Question 2**

How are the indirect measures of the TPB associated with visitors' behavioural intentions towards venturing off-trail when visiting Blue Mountains National Park (BMNP)?

Hypothesis 4

*Visitors' indirect measure  $\sum BBiOEi$  towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

Attitudes towards a particular behaviour are determined by salient behavioural beliefs (BBi) towards a particular behaviour outcome evaluation (OEi) and summed across the number of beliefs. Therefore, the assessment of both behavioural beliefs (BBi) and evaluation outcome (OEi) is included in the questionnaire. In the present study, behavioural beliefs (BBi) refer to visitors visiting BMNP to have a certain outcome. Evaluation outcome (OEi) refers to visitors' evaluation of the desired expected outcome by participating in off-trail behaviour at BMNP.

#### Hypothesis 5

*Visitors' indirect measure  $\sum NB_j MC_j$  towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

Subjective norms are determined by salient normative beliefs (NB<sub>j</sub>) of important reference groups multiplied by the individual's motivation to comply (MC<sub>j</sub>) and summed across the number of beliefs. Normative beliefs (NB<sub>j</sub>) refer to the perception of important reference groups' approval or disapproval towards non-compliance at BMNP. Motivation to comply (MC<sub>j</sub>) refers to visitors' willingness to conform to referent individuals who would approve or disapprove of the choice to venture off-trail at BMNP.

#### Hypothesis 6

*Visitors' indirect measure  $\sum (CB_k PF_k)$  towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

Perceived behavioural control is determined by the perceived likelihood of the salient control belief (CB<sub>k</sub>) occurring, multiplied by the perceived power (PF<sub>k</sub>) of each control beliefs that will hinder or facilitate the performance of the particular behaviour and summed across the number of beliefs. Control belief (CB<sub>k</sub>) refers to an individual's subjective probability of availability of resources, skills and opportunities that facilitate or hinder their non-compliant behaviour at BMNP. Perceived power (PF<sub>k</sub>) refers to visitors' assessment of the availability and difficulty factor in off-trail behaviour when visiting BMNP.

The three main components of the TPB (Att, SN and PBC) are derived from the sum of their respective salient beliefs. In addition, the theoretical model by Ajzen and Fishbein (1975) states that the effects of belief components on behavioural intentions are indirect. According to Ajzen (1991), these three independent components (attitude, subjective norm and perceived behavioural control) influence an individual's intention to perform a particular behaviour (Ajzen, 1991).

### Research Question 3

How are pro-environmental values (NEP) of visitors related to attitudes and behavioural intentions towards venturing off-trail at BMNP?

#### Hypothesis 7

*Visitors' Summed NEP score is positively related to attitude (Att) towards venturing off-trail at BMNP.*

This is based on the basic human values theory by Rokeach (1973, P.25) who recommended that values correspond to attitudes, which in turn shape behaviours because an individual holds certain value beliefs in life and these beliefs “transcends into attitudes toward objects and towards situations”. Stern et al. (1995), and Pierce et al. (1999) suggested that people who reflect a higher NEP score view the world more ecologically, and that these values can influence their attitudes toward more specific environmental behaviours. Therefore, NEP and attitudes should be positively correlated.

#### Hypothesis 8

*Visitors' Summed NEP score is mediated through behavioural beliefs, attitudes and behavioural intentions.*

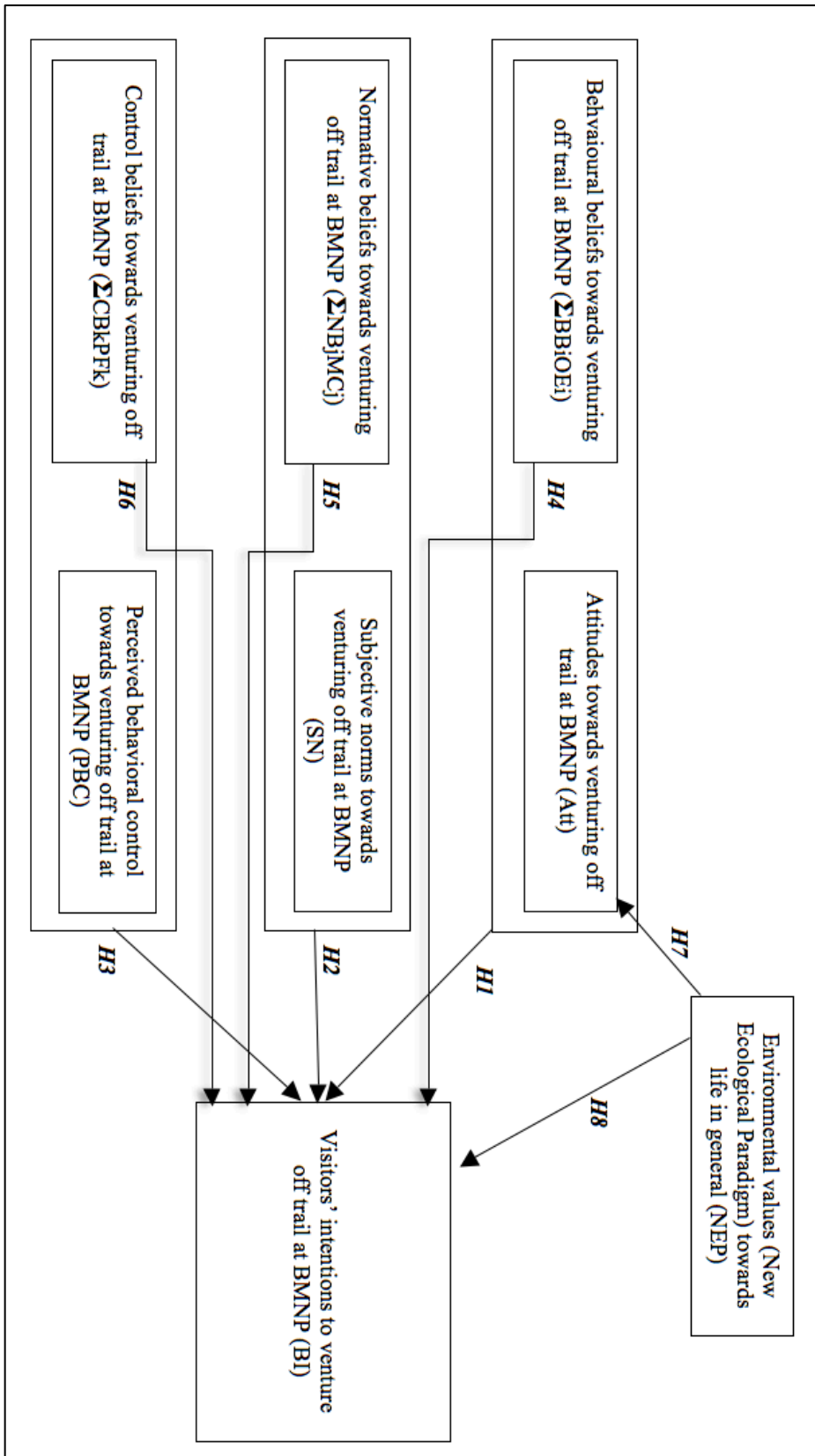
As can be seen in the definitions of values by Rokeach (1973), and Schwartz (1992), both researchers clearly defined values as a set of beliefs of desirable conduct used to guide their behaviours influenced by their surroundings and society in general (Vaughan & Hogg, 2013). Beliefs are statements held by individuals about what is perceived about a situation or behaviour and tend to be more specific (Fishbein, 1967), whereas attitudes tend to be more general (Ajzen, 2001) and can be seen as “a person’s overall evaluation of persons, objects and issues” (Petty and Wegener, 1998, p. 323) that guides their choices and decisions for action (Hogg & Vaughan, 2013). The distinction between values, beliefs and attitudes is often blurred and used interchangeably in research. Given that values are universal and act as external motivators, values should influence beliefs



towards a behaviour. This is followed by forming attitudes towards the particular behaviour and attitudes influencing the actual behaviour.

Therefore, this hypothesis serves to explore the mediation relationship between values, beliefs, attitudes and behaviour as suggested by Fulton et al. (1996, p. 25), that is, they are “fundamental cognitions” that serve as a foundation for beliefs and attitudes. This hierarchical relationship can be seen in the form of a pyramid illustrating value orientations at the top of the pyramid that flow down to influence basic beliefs, followed by attitudes and behaviour (Vaske & Donnelly, 1999; Choi, 2011).

Figure 3.1. Conceptual Model used in Present Study



**Table 3.1. Summary of research questions and hypotheses**

**The main research aim of the present study is to understand visitors' behavioural intentions to venture off-trail when visiting Blue Mountains National Park in Australia.**

**Research Question 1:** Are the direct measures of the TPB associated with visitors' non-compliant behavioural intentions of venturing off-trail when visiting Blue Mountains National Park (BMNP)?

*Hypothesis 1: Visitors' attitude (Att) towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

*Hypothesis 2: Visitors' subjective norm (SN) towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

*Hypothesis 3: Visitors' perceived behavioural control (PBC) towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

**Research Question 2:** How are the indirect measures of the TPB associated with visitors' behavioural intentions of venturing off-trail when visiting Blue Mountains National Park (BMNP)?

*Hypothesis 4: Visitors' indirect measure  $\sum BBiOEi$  towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

*Hypothesis 5: Visitors' indirect measure  $\sum NBjMCj$  towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

*Hypothesis 6: Visitors' indirect measure  $\sum CBkPFk$  towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

**Research Question 3:** How are pro-environmental values (NEP) of visitors related to attitudes and other TPB indirect measures towards venturing off-trail at BMNP?

*Hypothesis 7: Visitors' Summed NEP score is positively related to attitude (Att) towards venturing off-trail at BMNP.*

*Hypothesis 8: Visitors' Summed NEP score is mediated through behavioural beliefs, attitudes and behavioural intentions.*

## **3.2. Research Paradigms**

According to Burns and Bush (2014), research paradigms are systematic investigations where data are collected and analysed in a manner to understand, describe, and predict or control a phenomenon. Research paradigms are important as they influence the way knowledge is interpreted. The term paradigm has been loosely defined as a collection of related assumptions, propositions and concepts that orient thinking (Creswell, 2011). This section explores three commonly used research paradigms (Creswell, 2011): positivist, interpretivist, and pragmatic (Burke & Onwuegbuzie, 2004).

### **3.2.1. Positivist Paradigm**

Positivist research has been labeled as and referred to by academics as scientific research based on rationalistic and empirical philosophy that reflects a deterministic philosophy in which ‘causes’ determine certain outcomes (Creswell, 2011). This is conducted mostly through quantitative research methods where social observations are treated as entities in the same way as physical phenomena are treated (Zachariadis et al., 2013). Positivist research also uses empirical justification of stated hypotheses involving a formal research design process (Mertens, 2010; Zachariadis et al., 2013) that removes bias and ensures objectivity in the research. Hence, the positivist research paradigm has particular strengths in validating and testing hypotheses and how phenomena may occur. Through hypothesis testing, positivist research can be used to generalise research findings if there is a sufficiently large sample size (Mertens, 2010). The actual data analysis is normally conducted using statistical software such as SPSS (Statistical Package for Social Science). However, the positivist paradigm contains a key weakness in that it focuses purely on hypotheses; as a result phenomena can be missed, and in some cases the research findings can be too abstract and general.

### **3.2.2. Interpretivist Paradigm**

Interpretivist research paradigms have been described as focusing on the world of human experience where reality is socially constructed (Cohen et al., 2011). Researchers using

interpretive methods have often rejected positivism (Creswell, 2013), countering the claims of positivism. They believe that there are multiple constructed realities and that context free generalisations are neither possible nor desirable. Rather than focusing on hypotheses testing, interpretivists prefer detailed, rich, empathic descriptions where the subjective knower is the only source of reality (Creswell, 2013). Interpretivist research tends to be qualitative in nature and involves studying a small sample size with detailed research findings. The key strength of interpretivist research is that it is useful for exploring and understanding personal experience of phenomena such as values and beliefs where the researcher can be responsive to local settings and environments (Cohen et al., 2011). The drawbacks of interpretivist research are that it can be biased and influenced by the researcher's idiosyncrasies or personal values. This may result in a lack of objectivity and be based on knowledge that is only valid in a particular setting as it lacks generalisation with the wider population. Due to the rich data desired, qualitative research is often time consuming in terms of collecting and analysing data, and difficult with regards to testing hypotheses and making predictions.

### **3.2.3. Pragmatic Paradigm**

According to Creswell (2013), the pragmatic paradigm can be described as not being committed to any one philosophy or system of reality, but rather to what needs to be done to address the research problem. The pragmatic paradigm places the research problem centrally and applies different research approaches to understand the problem. When the research problem becomes the main focus, data collection, methodologies and analytical tools can be chosen to best fit the research without any restrictions. Due to its indifference towards having to only select either positivist or interpretivist paradigms, pragmatic research paradigm can be seen as the underlying philosophical framework for mixed methods research.

### **3.2.4 Mixed methodology**

The development of mixed methodology arose through combining different views from positivist and interpretivist researcher paradigms. The positivist stance views knowledge creation as a scientific method, one in which a phenomenon is reduced to a measurable research objective through the acceptance or rejection of a hypothesis using quantifiable statistical methods. This is done in an unobtrusive manner with objectivity (Creswell, 2013). The interpretivist stance looks at knowledge creation through a subjective lense such that humans will behave according to circumstantial perceptions of reality, and knowledge is created from subjective descriptions of a phenomenon (Creswell, 2013). The growth of mixed methodology is closely linked to the pragmatic paradigm that combines qualitative and quantitative approaches in the methodology of a research study (Tashakkori & Teddie, 2003; Zachariadis et al., 2013). A research study using a mixed methodology approach can divide the study into two stages, with a qualitative approach eliciting ideas that can be further investigated via a quantitative approach (Zachariadis et al., 2013).

A positivism approach using quantitative methods has been adopted by most researchers in tourism research studies (Walle, 1997; Riley & Love, 2000; Ballantyne et al., 2009; Mason et al., 2010). According to Jennings (2001), positivism predicts and explains behaviour in the natural and social world governed by universal laws based on objectivity. These findings can be explained by testing hypotheses through analysis of collected data (Tribe, 2005; Mason et al., 2010; Xin et al., 2013). These analyses are based on experiments, surveys and statistics (Song, 2013; Xin et al., 2013). However, positivism research has been criticised for excluding meanings and interpretations from collected data, and that it tends to exclude discovery from the domain of scientific inquiry (Song, 2013). Qualitative methodology has also been embraced in tourism research (Dan & Philips, 2000; Xin et al., 2013). While much tourism research has focused on quantitative methods (Ballantyne et al., 2009), it has been argued that qualitative studies have provided useful insights that quantitative studies have failed to gain on the tourist experience (Cohen, 1988; McIntosh, 1998; Opperman, 2000; Jennings, 2001; Ballantyne et al., 2009; Xin et al., 2013). Qualitative research adopts the interpretive paradigm that is

primarily concerned with meanings to understand social actors' definitions of a situation (Schwandt, 1994) to explain a phenomenon (Tribe, 2005). The interpretive paradigm collects data through qualitative methods such as in-depth interviews, case studies and focus groups (Xin et al., 2013).

There has been an increased application of mixed methodologies in tourism research (Ballantyne et al., 2009; Xin et al., 2013). According to Tashakkori and Teddie (2003, p. 14), there are some advantages to using mixed methods research design methodology such as “answering research questions that pure qualitative and pure quantitative research methods cannot; provide better inferences; and provide the opportunity for presenting a greater diversity of divergent views”. In a way, mixed methods are used to overcome the weaknesses of qualitative or quantitative methods to complement rather than compete with each other (Song, 2013; Xin et al., 2013). This increases validity of research findings from one type of research approach to be checked against the findings of a other research approach. For example, while it is often not possible to generalise results from qualitative research approaches, it may be useful to explain the underlying dimensions of the phenomenon studied. This can be useful to develop questionnaire items for the quantitative research stage (Tribe, 2005; Xin et al., 2013). Furthermore, using a mixed methodology is commonly adopted in TPB studies, as a list of elicited reasons is necessary before conducting a quantitative study (Ajzen, 1991; Francis et al., 2004). Therefore, the present study uses both qualitative research and quantitative research as a mixed methodology to add depth and richness to the data collected (Tribe, 2005; Xin et al., 2013).

### **3.3. Stage One – Elicitation Study**

The elicitation study identified a list of items for the development of the second stage TPB questionnaire regarding visitors' non-compliant behaviour of venturing off-trail at BMNP. Based on personal interviews with the Regional Manager of BMNP, Mr. Geoff Luscombe, and the literature review, the main non-compliant behaviour engaged in at BMNP was found to be the act of venturing off-trail. Therefore, this non-compliant act

was investigated in this thesis. Ajzen and Fishbein (1980) recommended using an elicitation study based on a small sample from the population under study to generate questionnaire items that would lead to a quantitative study (Goh, 2009, 2011; Wang & Ritchie, 2013). In the present study, the elicitation study identified the following reasons for the non-compliant act of venturing off-trail when visiting BMNP:

- (1) Most frequently perceived reasons for venturing off-trail at BMNP;
- (2) Groups of people important to the visitor who would support or disapprove his/her venturing off-trail at BMNP; and
- (3) Perceived difficulties faced when staying on-trail at BMNP.

### **3.3.1. Fieldwork Administration**

#### **3.3.1.1. Sample**

The appropriate sample size of the elicitation stage was not pre-determined, but judged by the completeness of the data collected. This is known as ‘theoretical saturation’, which is the point at which sampling should stop as no new or relevant data have surfaced (Glaser and Strauss, 1967). More importantly, the elicitation study followed the guidelines proposed by the founders of the TPB model who recommended that sample size during the elicitation stage should be of a sufficient size ( $n \geq 25$ ) (see Ajzen and Fishbein, 1980; Godin & Kok, 1996). Two sample groups were chosen for the elicitation study: 1) visitors to BMNP; and 2) experts in BMNP. Visitors were defined as those who were visiting BMNP for leisure reasons, while experts in BMNP were defined as management and frontline employees working at BMNP as well as key stakeholders with a strong understanding of non-compliant issues at BMNP. Using two different sample groups in the elicitation study allowed for triangulation to ensure that important items were included in the quantitative stage (Churchill, 1998) as well as to increase the reliability of the results (Song et al., 2013; Xin et al., 2013).



### **3.3.1.2. Interviews with Visitors**

Interviews were conducted with visitors to elicit each respondent's unique personal information and probe for further insights if necessary (Oliphant et al., 2008). The interviews used open-ended questions as recommended by Ajzen (1991). Under the guidelines and framework of the TPB model, interview questions used in the elicitation study were guided by the independent variables of the TPB (attitude, subjective norm and perceived behavioural control) (Ajzen and Fishbein, 1980), and worded as follows:

Q1). The BMNP likes visitors to stay on the designated paths at all times, but sometimes people need to go off-trail. What might be some of the reasons you have for leaving the path?

Q2). What problems do you think leaving the path might cause?

Q3). What do you think other people would think about walking off-trail? Do their opinions matter to you? Whose opinions matter the most?

Q4). What are some of the difficulties you face when trying to stay on-trail?

The advantage of using open-ended questions at the qualitative stage is to identify issues that have not been considered by the researcher, which is a restriction found in closed-ended questions (Mays & Pope, 1995). Questions 1 and 2 were designed to capture the attitudes of the visitors, Question 3 captured the subjective norms variable, and Question 4 identified perceived difficulties.

### **3.3.1.3. Interview with Park Administrators**

The second group of interviews was conducted with park administrators about why visitors non-comply and venture off-trail at BMNP. Seven park administrators and key stakeholders were targeted for their expertise and knowledge about visitors' non-compliant behaviour at BMNP. They included:

- 1) Mr Geoff Luscombe, Regional Manager, BMNP
- 2) Mr Randall Walker, President, BM Tourism Council

- 3) Mr David Myres, Blue Mountains Mayor
- 4) Mr Tim Lanyon, Track Maintenance Manager, BMNP
- 5) Mr Richard Kingswood, Area Manager, BNMP
- 6) Sgt Ian Colless, Search and Rescue Operation Team Leader, Springwood Police
- 7) Mr Kerry Bartlett, Former Member of Parliament for Macquarie (16 years)

Four similar questions were used in the personal interviews:

Q1). The BMNP likes visitors to stay on the designated paths at all times, but sometimes people need to go off-trail. What might be some of the reasons visitors have for leaving the path?

Q2). What problems are faced by BMNP when visitors leave the designated path?

Q3). Who do you think are the people who influence visitors' decision to walk off-trail? Do their opinions matter to the visitors? Whose opinions matter the most?

Q4). What are some of the difficulties visitors face when trying to stay on-trail?

#### **3.3.1.4. Data Collection**

Personal interviews were used during the data collection in the qualitative stage (see Table 3.2.). In order to administer the research to visitors at BMNP, the researcher collected information at the Echo Point Trailhead at Katoomba, a popular lookout point for visitors. After explaining that the research was about venturing off-trail at BMNP, visitors were informed that this research was solely for academic purposes and they could refuse to participate. Respondents were also told that if they agreed to participate they could withdraw from the research at any point by not answering the questions or walking away. An invitation was extended to visitors to participate in a short interview at a local café to discuss the research topic, which lasted about 10 minutes. The four questions

served as the main topics for discussion. Short notes were taken during the discussion to ensure that important comments were given special attention. Once repetitive answers started to emerge, the data collection stopped due to data saturation. The seven identified experts were contacted via email for a personal interview with a set of four questions, inviting them to participate in the research.

**Table 3.2. Summary of Data Collection Methods (Elicitation Stage)**

<b>Sample groups</b>	<b>Data Collection method</b>	<b>Location</b>	<b>Questions</b>
Visitors	Personal interviews	Echo Point Lookout at Katoomba, BMNP	<p>Q1). The BMNP likes visitors to stay on the designated paths at all times, but sometimes people need to go off-trail. What might be some of the reasons you have for leaving the path?</p> <p>Q2). What problems do you think leaving the path might cause?</p> <p>Q3). What do you think other people would think about walking off-trail? Do their opinions matter to you? Whose opinions matter the most?</p> <p>Q4). What are some of the difficulties you face when trying to stay on-trail?</p>
Park Administrators and key stakeholders	Personal interviews	Greater Blue Mountains Region	<p>Q1). The BMNP likes visitors to stay on the designated paths at all times, but sometimes people need to go off-trail. What might be some of the reasons visitors have for leaving the path?</p> <p>Q2). What problems are faced by BMNP when visitors leave the designated path?</p> <p>Q3). Who do you think are the people who influence visitors' decision to think about walking off-trail? Do their opinions matter to the visitors? Whose opinions matter the most?</p> <p>Q4). What are some of the difficulties visitors face when trying to stay on-trail?</p>

### 3.3.1.5. Analysis of the Elicitation Study

Several guidelines (see Table 3.3.) were used to analyse the elicitation study, as recommended by Creswell (2011). First, the data were prepared for analysis in that all completed questionnaires were checked for missing answers and interviews were transcribed verbatim. Second, the researcher carefully explored and read through the data to obtain a general sense of the data and note key points and ideas. The purpose of the data exploration was to identify and develop a coding system for a list of belief items. Third, the explored data was coded as recommended by Ajzen (1991) through content analysis, where content categories were identified and data were systematically coded to enable numerical analysis. Fourth, common and similar answers were grouped together as a broad belief category. Once all the codes were assigned, a frequency count was conducted based on the number of times a particular item appeared in the data. These beliefs were then arranged in a descending order of frequency counts, and the first 75 percent of these beliefs were considered representative to those of the target population (Ajzen & Fishbein, 1980).

**Table 3.3. Summary of Data Analysis used in Elicitation Study**

<b>Steps</b>		<b>Description</b>
1	Data analysis preparation	Questionnaires are checked for missing answers and interviews transcribed into verbatim.
2	Data exploration	Data are explored and read through to obtain a general sense and identify key points and ideas.
3	Data coding	Explored data are coded as recommended by Ajzen (1991) through content analysis, with content categories identified and data systematically coded to enable numerical analysis
4	Generating categories and themes	Common and similar answers are grouped together as a broad belief category.
5	Representing and reporting findings	Once all the codes are assigned, a frequency count is conducted based on the number of times a particular item appears in the data. These beliefs are then arranged in a descending order of frequency counts, and the first 75 percent of these beliefs are representative to those of the target population (Ajzen and Fishbein, 1980)
6	Interpreting findings	Conclusions are drawn about the phenomenon studied.

*Source: Adapted from Ajzen and Fishbein (1980) and Creswell (2011)*

#### **3.3.1.6. Validity and Reliability**

In order to ensure that the items used in the elicitation study measured what they were supposed to measure, measurements of content validity and construct validity were applied to the present elicitation study (Tribe, 2005; Song, 2013; Xin et al., 2013). The researcher and an expert in this field examined content validity to determine if the results represented in the qualitative research were sufficiently covered and had been obtained in a systematic way. The factors generated from the qualitative research conformed to the strict guidelines recommended by Fishbein and Ajzen (1980) in relation to the TPB. Construct validity was achieved in this study by following the set of guidelines for developing a TPB questionnaire by Fishbein and Ajzen (1980), and Francis et al. (2004) as mentioned in section 3.3.1.5.

### **3.4. Stage Two – Quantitative Study**

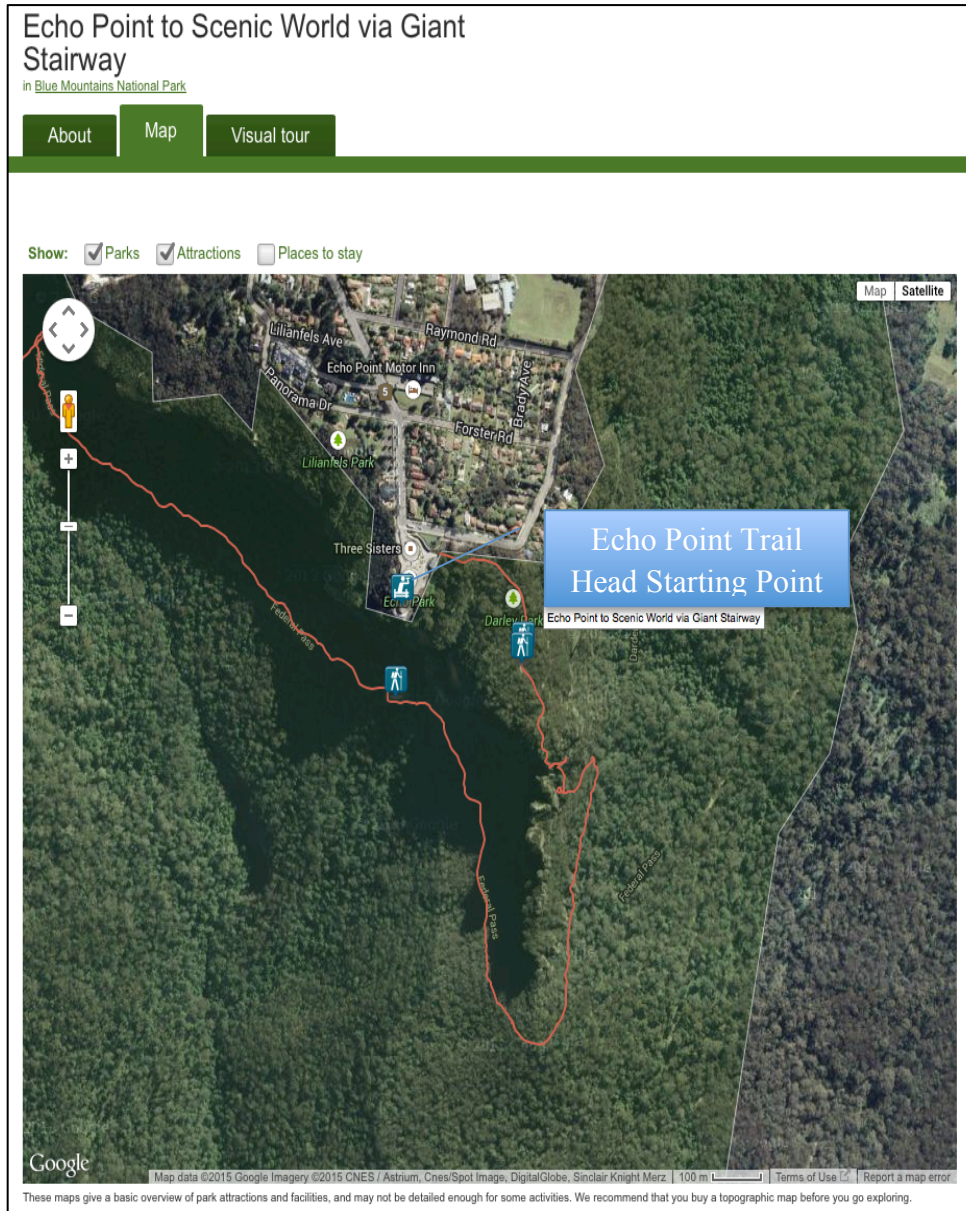
A questionnaire survey was developed based on the results of the elicitation study. Using questionnaire surveys is one of the most widely used methods for collecting quantitative data from a large number of respondents, and is less biased and intrusive than other methods (O’Shea and McKenzie, 2013). This method is also less expensive and faster (Veal, 2011). Furthermore, due to the nature of the present study, using a survey method was a good way to collect information on people’s attitudes, beliefs, behaviours and opinions (Walter, 2009).

#### **3.4.1. Fieldwork Administration**

##### **3.4.1.1. Settings and Study Site**

The Echo Point trailhead (see exhibit 3.2) of BMNP at Katoomba, New South Wales, Australia, was utilised as the data collection site (see exhibit 3.3 and 3.4) for the quantitative study. The Echo Point Trailhead was chosen because it was one of the most popular lookouts among visitors, with various trailheads leading to Katoomba Falls to 29 km to Scenic Railway.

### Exhibit 3.1. Map of Echo Point Trailhead



Source: Google Map (2015)

**Exhibit 3.2. Location Shot of Echo Point Trailhead**



*Source: Site Shot (2012)*

**Exhibit 3.3. PhD candidate (far right), Assistants and MP Roza Sage at Echo Point Trailhead**



*Source: Site Shot (2012)*

Therefore, it provided a better chance to capture a wide range of visitors who were ideal candidates for completing the survey. The data collection process took place over four weekends between 7am-4pm. The researcher and several research assistants set up a booth next to the entrance of Echo Point Trailhead. The researcher supervised the data collection process and was personally involved in the survey facilitation. Visitors were greeted before they began their walk and presented with a brief explanation of the nature of study. A filter question (“Will you be walking on any of the BMNP trails in the next 7 days?”) was used to identify suitable candidates for this study. Only visitors who intended to walk on the BMNP trails in the next seven days were eligible to participate. Respondents were given a survey to complete with a free cup of coffee or bottle of water. In addition, respondents were asked at the end of the survey if they would be willing to participate in a follow up telephone / email interview in the following week. If they answered ‘yes’, their contact details were recorded.

#### **3.4.1.2. Sampling Method and Size**

A sample to population inference was used in this study, as it was impossible to collect data from every single visitor to BMNP. One solution was to use appropriate sampling techniques where general statements about the population can be drawn from the sample (Punch, 2009). The present study used convenience sampling (a form of non-probability sampling) to select respondents primarily on the basis of their availability and willingness to respond. A convenience sampling technique has advantages in being faster and less expensive to execute. However, there are some limitations to the technique, including selection bias and that it lacks generalisation (Shaughnessy et al., 2012). There are many different approaches to determine sample size, and choice depends on what is being studied (Nardi, 2006). Due to the nature of surveys, this study was limited to an easier and less expensive way of sampling a population (Fowler, 2009). Having a sufficient response rate is important if the sample is to be representative of the population (Minichiello et al., 2004). The first method to determine adequate sample size is the principle suggested by Neuman (2010), where the smaller the population, the bigger the sampling ratio has to be for a more accurate sample. This is because the accuracy of



results decreases when the sample size becomes smaller. Babin et al. (2012) proposed a rule of thumb ( $n = 322$ ) for a population size of  $500,000 - \infty$  with  $\pm 5$  percent reliability. Burns and Bush (2014) recommended a sample size of  $n = 385$  to obtain a 95 percent accuracy at 95 percent confidence interval.

This formula is:

$$n = z^2 (pq) / e^2$$

$$= 1.95^2 (0.5 \times 0.5) / 0.05^2 = 385$$

$n$  = sample size,  $z$  = standard error at 95 percent confidence interval,  $p$  = estimated variability in the population to be 50 percent,  $q = (100-p)$ , and  $e$  = acceptable error at  $\pm 5$  percent.

*Source: Burns and Bush (2014)*

A second method to determine sample size is to rely on the judgment of previous researchers (Aaker et al., 2012; Babin et al., 2012). A summary of past tourism studies using the TPB shows that the majority used a sample size of  $n < 500$  (see Table 3.4).

**Table 3.4. Summary of Sample Size used in Past TPB / Tourism Studies**

Sample size range	Authors
100 - 200	Ajzen and Driver (1992)( $n=146$ ); Thompson and Vourvachs (1995)( $n=142$ ); Athiyaman (2002)( $n=150$ ); Teo and Lee (2010)( $n=157$ ); Scannell and Melnyk (2011)( $n=127$ ); Solesvik et al. (2012)( $n= 192$ ); Chang and Chou (2014)( $n=198$ )
200 - 300	Van Zaten (2005)( $n=204$ ); Lam and Hsu (2006)( $n=299$ ); Lee and Back (2007)( $n=245$ ); Lee and Choi (2009)( $n=235$ ); Stone et al. (2009)( $n=271$ ); Alam and Sayuti (2011)( $n=257$ )
300 - 400	Hrubes and Ajzen (2001)( $n=395$ ); Lam and Hsu (2004)( $n=328$ ); Chang et al. (2006)( $n=394$ ); Hyang et al. (2009)( $n=319$ )

400 - 500	Huang (2007)(n=406); Cheng et al. (2005)(n=426); Han et al. (2010)(n=428)
500 - 600	Sparks and Pan (2009)(n=548); Chen et al. (2011)(n=535)
600 and above	Chen and Lu (2011)(n=626); Sparks (2007)(n=1089); Holdershaw et al. (2011)(n=1262)

The third method to estimate sample size is to consider the type of statistical tests used in the research. In the present study, two main data analyses were used (factor analysis and regression analysis). With regards to factor analysis, Hair et al. (2009) recommended a sample size of 100 or more, and that a sample size of below 50 was inappropriate. Similarly, Hatcher (1994) argued that the number of subjects used should be greater than 5 times the number of variables.

For regression analysis, Cohen et al. (2003) recommended a sample size of 136 for regression with alpha level of 0.05, and that 8 predictors be used to obtain medium effect size ( $r = 0.15$ ) with a predictive power of  $R^2 = 0.8$ . Tabachni and Fidell (2001) proposed a formula ( $n > 50 + 8m$ ), where  $m$  = number of independent variables to achieve a medium size relationship between the independent variables and the dependent variable. In this study, 4 independent variables were used. Therefore, a sample size of 82 and above is sufficient to conduct the regression analysis. Another heuristic recommended by Garson (2007) is that there must be at least 20 times as many cases as independent variables using the formula:  $n > 40m$ . In this present study, a sample size of 160 and above is sufficient to conduct reliable regression analysis.

The last method to estimate sample size is to consider the estimated response rate. Mail surveys normally achieve a response rate of less than 15 percent (Malhotra, 2009). Past similar tourism studies using the TPB and the survey method have seen an average of 45 percent response rate (e.g., Hrubes & Ajzen, 2002; MacKay & Campnell, 2004).

Therefore, based on the above considerations, the sample size used in this thesis aimed at 700 respondents with an expected response rate of 45 percent. The final sample size was 315.

### **3.4.1.3. Questionnaire Design and Items**

Questionnaire items were structured using Ajzen and Fishbein's (1980) guidelines. The questionnaire items were divided into three components: traditional TPB items, NEP items, and demographic items. The items depended on the results from the elicitation study. After determining the types of scale and items to be used in the questionnaire, the next step involved planning and constructing the visual questionnaire. The physical layout of a questionnaire is very important, because it can directly influence a respondent's enthusiasm to complete the questionnaire (Aaker et al., 2012). This section discusses the sequence, layout and wording of the questionnaire used in this present study.

#### ***3.4.1.3.1. Sequence and Layout***

The sequence and layout of the questionnaire began with a broad filter question "Will you be walking on any of the BMNP trails in the next 7 days?" This simple and direct question helped to build the respondents' confidence and reassure them that the questionnaire would be easy to complete. More importantly, it helped to identify ideal candidates for the research. This section was followed with more focused and detailed questions, which were related to the different components of the TPB. Demographic questions were included in the last section due to their personal nature (Robertson & Sundstrom, 1990; Jane, 1999; Burns & Bush, 2014). For example, certain demographic questions such as age and income can be embarrassing and sensitive (Malhotra, 2009). Therefore, if demographic questions appear at the beginning of the questionnaire, respondents may become too distracted to continue. As this thesis attempted to capture actual behaviour, respondents were asked at the end of the survey if they would be willing to participate in a follow up interview the following week. If they answered 'yes', their contact details were recorded.

One of the proposed strategies used to increase response rate was the inclusion of pictures (Gendall, 1996; Bellfield et al., 2011) of various attractions in BMNP to catch the attention and interest of respondents. A cover letter and instruction page was attached to the questionnaire to provide details about the research study. Instructions for completing

the questionnaire were crucial in providing respondents with a better understanding of the study and to clarify ambiguities. These instructions were checked for clarity of wording, presentation layout and ambiguous terms to reduce the chances of error (Babin et al., 2012). The instructions were short and precise and used bullet points to avoid confusion, but still encouraged respondents to complete each section of the questionnaire (Hinkin et al., 1997; Burns & Bush, 2014).

#### **3.4.1.3.2. Wording**

Technical jargon was avoided (e.g., “perceived behavioural control” was replaced with “factors making it difficult”) to ensure easy understanding and completion (Jane, 1999; Frazer & Lawley, 2000; Burns & Bush, 2014). Questions refrained from being double-barreled, to prevent respondents from agreeing to one part of the question and disagreeing with another. Further, the questions were not asked in a leading manner that would have suggested certain answers or a desired opinion (Aaker et al., 2012). Each question consisted of no more than 20 words to ensure that respondents did not suffer from fatigue or have difficulty in comprehension (Aaker et al., 2012). Sensitive questions were provided with a range of answers rather than specific answers (for example, income offered a range of answers, such as between \$300 and \$499, rather than asking respondents to state exactly how much they earned).

#### **3.4.1.3.3. Items**

The target behaviour of non-compliance was defined as venturing off-trail at BMNP within the next seven days. Visitors were informed that ‘off-trail’ referred to any other areas of the trail besides the designated trail path as identified by Park Management through clear footpaths. Please refer to Appendix 2 for the full questionnaire.

#### **Measuring Attitudes, subjective norms, perceived behavioural control, and NEP**

Attitudes, subjective norms, and perceived behavioural control items were measured on semantic differential scales 1–7. These items were developed based on the elicitation

study. Pro-environmental values were measured using the NEP items, assessed using a semantic differential scale between 1 (strongly disagree) to 7 (strongly agree).

### *Measuring Intentions*

Most importantly, visitors' willingness to comply was used as an alternative outcome measure rather than their intention to non-comply. This is because people are sometimes reticent to state that they would be willing to engage in non-compliant behaviour but may be more likely to report willingness to do so if the situation arose (such as overcrowding or damaged designated pathways). In order to overcome respondents' reticence towards non-compliant behaviour, White and Hyde (2010) recommended measuring intentions through their willingness. The average of their two intention items produced a reliable scale of 0.75,  $p < 0.001$ . Therefore, in this study, six questions were used to measure non-compliant intentions to venture off-trail:

"I would be willing to walk off the designated trail at BMNP in the next 7 days if the trail was very crowded". Item measured from 1 (strongly disagree) to 7 (strongly agree).

"I would be willing to walk off the designated trail at BMNP in the next 7 days in order to take some nice pictures". Item measured from 1 (strongly disagree) to 7 (strongly agree).

"I would be willing to walk off the designated trail at BMNP in the next 7 days in order to avoid challenging terrains". Item measured from 1 (strongly disagree) to 7 (strongly agree).

"I would be willing to walk off the designated trail at BMNP in the next 7 days in order to access park facilities such as toilets". Item measured from 1 (strongly disagree) to 7 (strongly agree).

"I would be willing to walk off the designated trail at BMNP in the next 7 days in order to access food and water". Item measured from 1 (strongly disagree) to 7 (strongly agree).

“I would be willing to walk off the designated trail at BMNP in the next 7 days if the signage was missing or confusing”. Item measured from 1 (strongly disagree) to 7 (strongly agree).

#### **3.4.1.4. Pre-Test and Amendments**

##### ***3.4.1.4.1. Expert Judge Assessment***

Before pre-testing, expert judges (two academics) were presented with the developed questionnaire for their independent assessment and for constructive feedback. Experts’ assessments are invaluable in pre-testing because they can find problems based on their vast knowledge and experience, and their feedback is most useful before fieldwork (Czaja, 1998; Burns & Bush, 2014).

##### ***3.4.1.4.1.2. Pre-testing***

Pre-testing is an integral part of the questionnaire development process (Reynolds & Diamantopoulos, 1998; Burns & Bush, 2014) to ensure that data collected is sufficient in quality and quantity to satisfy the objectives of the research (Malhotra, 2009). After making the necessary changes based on the comments from the experts, a pre-test of the questionnaire was conducted with 20 visitors at BMNP. A pre-testing sample size of 20 is recommended by Boyed et al. (1977), while Zatalmand and Burger (1975) recommended a ‘small’ pre-test sample group but did not specify an ideal size. The pre-test was conducted using a planned field survey because it covered all aspects of the actual survey and was less likely to be affected by interviewer bias (Reynolds & Diamantopulos, 1998; Babin et al., 2012). In order to overcome sampling bias, only respondents who were similar to those in the actual survey were included (Churchill & Iacobucci, 2010). Respondents’ comprehension of the questionnaire terms were evaluated and necessary corrections made based on their reactions and comments. After the pre-testing, final corrections and modifications were made to the questionnaire before conducting the actual survey.

### **3.4.2. Data Collection**

After identifying suitable and willing respondents, the questionnaire was given to them. Although there is a high tendency for poor response rate using self-administered questionnaires (Malhotra, 2009), they are the most cost effective survey method and can provide large amount of data, which was suitable for the present study. A low response rate is a form of respondent bias due to a lack of interest or time, which is one of the greatest challenges in self-administered surveys (Shaughnessy et al., 2012). Therefore, to encourage respondents to complete the surveys, respondents who completed the survey were given free coffees and bottles of water. Using incentives can be an effective motivation to encourage questionnaire completion (Minichiello et al., 2004). Contact details of respondents were recorded voluntarily such that a follow up survey would be possible to see if there was any actual non-compliance and brief reasons for doing so.

#### **3.4.2.1. Analysis of Quantitative Study**

The analysis of the questionnaire was carried out through the use of the statistical package SPSS (Statistical Package for the Social Sciences) version 19 to prepare the data for analysis, conduct descriptive analysis of respondents' demographics, factor analysis, correlations analysis and regression analysis. This software has been widely used and accepted by researchers as a data analysis technique (Babin et al., 2012). Initially, Cronbach's alpha was used to determine reliability of scale items. This was followed by exploratory factor analysis to ensure that the intended items measured the respective constructs (e.g., attitude items should be measuring the attitude construct). This was then followed with correlations and regression analysis for hypothesis testing (see Table 3.5 for summary of data analysis used).

##### **3.4.2.1.1. Missing Data**

Following the collection of data, each questionnaire was physically screened to ensure completeness of data and keyed into SPSS. Questionnaires that were 75 percent completed were included in the analysis as recommended by Sekaran and Bougie (2009).

After entry, the data was screened for missing data, outliers and normality. This was done by running frequency checks to ensure that all values were within allowable specified ranges (Aaker et al., 2012). Missing data is important as it may contribute to bias in the results and affect the generalisation of the findings (Tabachnick & Fidell, 2012). The pattern and reason for the missing data can be critical as well. Random missing data is treated more leniently as compared to non-random missing data (Tabachnick & Fidell, 2012). One solution used to address missing data is to use the mean substitution method. Variables with less than 5 percent of missing data are considered acceptable (Churchill & Iacobucci, 2010) with the mean value used to substitute the missing value (Hair et al., 2009). The second solution is to simply exclude missing data in calculations (Hair et al., 2009) if the missing data occurs randomly and is not due to a consistent pattern.

#### ***3.4.2.1.2. Normal Distribution***

The data collected were assessed to determine normal distribution, as factor and regression analysis both require variables to be normality distributed (Tabachnick & Fidell, 2012; Hair et al., 2009; Kline, 2011). Positive skewness shows that the data is more concentrated on the left side, and negative skewness shows more concentration on the right side (Tabachnick & Fidell, 2012). Kurtosis values of more than 0 show a distribution with very high peak and short tails, while 0 shows a very flat distribution (Hair et al., 2009). There are several methods to check for deviation from normality. One method is to assess the skewness and kurtosis of the data. In order for the data to be normality distributed, the values for skewness and kurtosis should be significant (Hair et al., 1995; Tabachnick & Fidell, 2012). In addition, Hair et al. (2009) argued that for large sample sizes of 200 and above, measures of skewness and kurtosis can be significant but yet not substantive. Kline (2011) proposed a general rule of thumb that absolute values of above 3 are considered too skewed, while kurtosis values greater than 8 are problematic.



#### ***3.4.2.1.3. Validity and Reliability***

It is imperative that the questionnaire designed for the present study measured what it was supposed to measure, and that the content achieved the objective of measuring its intent (Bryman & Cramer, 2012). Content validity of the questionnaire was assessed by reviewing relevant literature and by its undergoing expert academic assessment to ensure that it adequately represented the content to be covered. The construct and predictive validity of the questionnaire was ensured under the strict guidelines set by Fishbein and Ajzen (1980). Fishbein and Ajzen recommended that TPB studies needed to check for reliability and internal consistency among the TPB variables. In other words, similar results should be elicited when repeated measures are performed (LoBiobdo-Wood & Haber, 1997). Cronbach's alpha was chosen to measure reliability in the present study, as it is the most widely used measure by researchers (Hair et al., 2009). Cronbach's alpha ranges from 0 to 1, with 0 indicating no reliability and 1 being very reliable (Coates, 2012). The recommended minimum reliability score is 0.8 for a mature scale and 0.7 for an immature scale (Nunnally & Bernstein, 1994). Since the TPB was an established theory, Cronbach's alpha was set at 0.8 for this study. For direct measures, internal consistency was examined to establish whether the items in the scale were measuring the same construct.

#### ***3.4.2.1.4. Exploratory factor analysis***

Factor analysis is a useful statistical analysis to condense, simplify or summarise theoretically or conceptually interrelated data (Tabachnick and Fidell, 2012). This is a useful tool to identify underlying dimensions through interpretable factors and reduce a large number of items to more manageable sets (Stewart, 1981; Hair et al., 2009). The exploratory factor analysis (EFA) was used in the present study to identify and discover underlying factors and measure reliability (Tabachnick and Fidell, 2012). The key objective of EFA in the present study was to see whether the TPB direct and indirect items included in the questionnaire measured a single construct or if there were sub-components to these constructs (e.g., attitude items should appear under the attitude factor and not the subjective norms factor). Based on the TPB direct constructs, there

should be four factor loadings: attitude; subjective norms; perceived behavioural control; and behavioural intentions.

The Principal Components Analysis (PCA) extraction method was used with Varimax rotation. This method of oblique rotation allows checking for correlations among the factors. A cut off point of 0.4 is seen as a significant factor loading (Gerbing & Anderson, 1988; Hair et al., 2009). The same procedure was conducted on the indirect measures of the TPB with a 7 factor loading expectation comprised of behavioural beliefs, evaluation outcome, normative beliefs, motivation to comply, control beliefs, perceived power and behavioural intentions. The following general rules were used to measure significance when using EFA. First, only items with factor loadings equal or greater than 0.4 (Gerbing & Anderson, 1988; Hair et al., 2009) were considered significant. Second, all retained factors from the EFA should account for at least 60 percent of the total variance of the data (Hair et al., 2009). Third, estimated correlations between the factors should not be greater than 0.85 (Kline, 2011).

#### ***3.4.2.1.5. Correlations and Regression analysis***

The first step was to test the strength of the relationship between indirect measures (sum behavioural beliefs, sum normative beliefs, sum control beliefs) and sum behavioural intentions using the Pearson product moment correlation coefficient  $r$  as recommended by Ajzen and Fishbein (1980). Similarly, this was conducted with direct measures and external variables of the TPB. Measures with correlations of less than 0.3 are perceived as being of little use and should be eliminated (Ajzen & Fishbein, 1980). Similarly, Cohen (1992) commented that the product moment  $r = 0.3$  can be classified as a medium effect size, which is approximately the average size of observed effects in various fields of study. In the present study, multiple regression was used to test the hypotheses. Regression analysis is a useful tool for determining the relationships between a dependent variable and independent variable(s), which shows the level of contribution from independent variables in the prediction power (Hair et al., 2009). The independent variables (attitude, subjective norms, perceived behavioural control) were entered into the regression equation with behavioural intentions keyed in as the dependent variable.

The  $R^2$  and its statistical significance measured the proportion of variance contributed by the independent variables. The strength of beta coefficients and regression coefficients ranged from 0 to 1 with 0.3 as medium size to 0.5 as large size with acceptable significance at  $p < 0.05$  (Cohen et al., 2003). During regression analysis, the independent variables were tested for multicollinearity. First, the variance inflation factor (VIF) of the independent variables should be greater than 10. Second, the tolerance values should explain more than 10 percent of any independent variance. Third, the condition index should be less than 30 (Hair et al., 2009).

**Table 3.5. Summary of Data Analysis Procedures**

Type of data analysis	Purpose	Significant criteria	Recommended
<b>Missing data</b> <b>Normal distribution</b>	Used for checking and preparing data for statistical analysis	<i>Mean value substitution</i> <i>Skewness &lt; 3</i> <i>Kurtosis &lt; 8</i>	Churchill & Iacobucci, (2010); Hair et al. (2009)  Kline (2011)  Kline (2011)
<b>Reliability analysis</b>	Used for checking reliability and internal consistency between TPB and NEP variables.	<i>Cronbach's alpha <math>\geq 0.8</math></i>	Nunnally and Bernstein (1994); Coates (2012)
<b>Exploratory factor analysis (EFA)</b>	Used for reducing and ensuring questionnaire items measure the intended constructs.	<i>Factor loadings <math>\geq 0.4</math></i> <i>Retained factors variance <math>\geq 60\%</math></i> <i>Correlations between factors <math>\leq 0.85</math></i>	Gerbing and Anderson (1988)  Hair et al. (2009)  Kline (2011)
<b>Correlations analysis</b>	Used for establishing relationships between TPB and NEP variables	<i>Correlations <math>r \geq 0.3, p &lt; 0.05</math></i>	Cohen (1992); Cohen et al. (2003)
<b>Multicollinearity</b>	Used for checking to ensure independent variables are not highly correlated.	<i>Variance inflation factor &gt; 10</i> <i>Tolerance value of variance &gt; 10%</i> <i>Condition index &lt; 30</i>	Hair et al. (2009)
<b>Regression analysis</b>	Used for predicting dependent variable and contribution of variance from independent variables	<i>Beta value <math>\geq 0.3, p &lt; 0.05</math></i> <i>Regression coefficient <math>R^2 \geq 0.3, p &lt; 0.05</math></i>	Cohen (1992); Cohen et al. (2003)

### **3.5. Ethical considerations**

This research was approved by the Ethics Committee, Tourism Cluster, School of Business, The University of Queensland. Some of the key ethical considerations included ensuring that respondents had full knowledge and were made aware of the purpose and content of the research topic. Furthermore, respondents were not obligated to complete the survey if they did not wish to. Most importantly, all respondents were assured that their personal information and answers would remain anonymous and used solely for academic purposes.

## **4. RESULTS AND DISCUSSION**

This section presents the results of the elicitation and quantitative study. The response rate is presented along with analysis of the results, followed by discussions on the key findings and their associations with the literature review.

### **4.1. Elicitation Study**

This section presents results of the elicitation study divided into two parts. The response rates for the interviews conducted are presented, followed by the elicited items from behavioural, normative, and control beliefs.

#### **4.1.2. Sample Size and Response Rate**

Data for the elicitation study were collected from seven industry experts from BMNP and 22 visitors to BMNP. Of the seven industry experts, only five participated in the interviews (71 percent response rate). Two industry experts declined to be interviewed due to personal reasons. Of the 32 visitors approached at BMNP, 22 agreed to be interviewed (65 percent response rate). The sample of 22 visitors was determined due to data saturation after the 20<sup>th</sup> respondent when a similar trend of answers started to appear, with no new data emerging and inferences regarding the topic being confirmed. This method is known as theoretical sampling, as proposed by Glaser and Strauss (1967). This involves simultaneously collecting and analysing data before deciding which data to collect next, who to interview next, and how many respondents need to be included (Japhet & Usman, 2013). Strauss and Corbin (1998, p. 9) noted that this method allows researchers to treat the prescribed components as “items on a smorgasbord table from which they can choose, reject and ignore according to their own taste”. In the present study, 27 respondents (experts and visitors) participated in the qualitative interviews. The sample size met sufficient size for TPB elicitation studies ( $n \geq 25$ ) as recommended by Ajzen and Fishbein (1980).

### **4.1.3. Elicited Beliefs**

The Theory of Planned Behaviour was used to guide the categories of the qualitative research according to three independent variables: 1) Attitudes – behavioural beliefs; 2) Subjective Norms – normative beliefs; and 3) Perceived Behavioural Control – control beliefs. The main objective of the qualitative stage was to identify beliefs salient to the non-compliant behaviour of venturing off-trail at BMNP. As discussed in Table 3.3, several guidelines were used to analyse the elicitation study as recommended by Creswell (2011). First, all interview data were checked for missing answers and interviews were transcribed verbatim. Second, the researcher carefully explored and read through the data to obtain a general sense of the data and note key points and ideas. The data exploration was conducted by the researcher who originally formulated the questions and conducted the interviews, as this person was the best suited to analyse the data (Rossiter, 2002). During the data exploration stage, the researcher developed a coding system for a list of belief items according to the three categories: behavioural beliefs (attitudes) were coded as Bi1, Bi2, etc.; normative beliefs (subjective norms) were coded as Ni1, Ni2, etc.; and control beliefs (perceived behavioural control) were coded as Ci1, Ci2, etc. Third, the explored data were coded as recommended by Ajzen (1991) through content analysis, where content categories were identified and data systematically coded to enable numerical analysis. Fourth, common and similar answers were grouped together as a broad belief category. Once all the codes had been assigned, a frequency count was conducted based on the number of times a particular item appeared in the data. These beliefs were then arranged in a descending order of frequency counts, and the first 75 percent of these beliefs were considered representative to those of the target population (Ajzen and Fishbein, 1980). Lastly, these categories and data were presented in ascending order to draw conclusions about the phenomenon under study.

#### **4.1.3.1. Behavioural Beliefs**

Positive behavioural beliefs were factors relating to advantages of walking off-trail at BMNP. Negative behavioural beliefs were factors relating to the disadvantages of

walking off-trail. Over 17 behavioural beliefs were initially identified in the qualitative study. After categorisation and content analysis, these items were reduced to a final list of 5 salient behavioural beliefs, which were the first 75 percent of the elicited beliefs. The behavioural beliefs in terms of visitors leaving the path to go off-trail were as follows:

- Behavioural belief 1 - to have a closer view of nature (n=27)
- Behavioural belief 2 - to be more adventurous (n=20)
- Behavioural belief 3 - to have a different walking experience (n=17)
- Behavioural belief 4 - to use a shorter route (n=12)
- Behavioural belief 5 - to have more freedom (n=9)

It is important to note that the behavioural beliefs were presented as positive statements. During the interviews, these beliefs were discussed in terms of the motivation to or not to venture off-trail. For example, the belief of using a shorter route was elicited by respondents who perceived that venturing off-trail would result in a shorter route, as well as by those who thought that venturing off-trail would not result in a shorter route. For the purpose of generating a list of salient beliefs, this was included once as positive statement.

The attitude towards venturing off-trail revealed several reasons for their motivation. Overall, there was strong agreement between park administrators and visitors with regards to common behavioural beliefs. The most mentioned motivation by all 27 respondents was to have a closer view of nature at BMNP. For example, one of the interviewed park administrators mentioned:

*“Given that we have fenced off areas to preserve heritage sites, some visitors venture off-trail to have a closer look and take souvenir photos.”* **Expert 1**

*“Visitors do it mainly to get closer to nature and take some pictures of faunas and exotic animals such as the lyrebirds, especially for the experienced nature lovers*

*who would go all out just to get a shot of the unique plants and animals.”*

**Expert 4**

Similarly, this view was shared by responses from the visitors.

*“A reason for going off-trail is for photography reasons such as closer views of butterflies. For example, a friend of mine recently took a few steps off the path to follow the flight of butterflies. Last month, my choir members took a PR shot from a big bunch of flat rocks which was off the path – just to get a better view.”*

**Visitor 5**

*“An interesting view or a better view of the landscape. Maybe some flora and fauna that looks interesting could attract visitors to have a closer view and touch.”*

**Visitor 9**

The second most mentioned behavioural belief (n=20) was the adventurous feeling when venturing off-trail. Park experts mentioned the excitement and thrill that some visitors were seeking when they deviated from designated paths. For example, two experts mentioned:

*“Ultimately, the aim of BMNP is to ensure that visitors get to experience their walk in a safe environment. Sure, some visitors are looking for more excitement and adventure and decide to venture off course midway by climbing over fences and having picnics near cliffs.”* **Expert 1**

*“Perhaps some find the marked paths lacking in excitement, so they decide to explore for themselves.”* **Expert 2**

This view was shared among visitors who mentioned that staying on the path was boring and did not fulfill their expectations. Visitors were not hesitant to admit that even though



it could be risky, the nature environment provided a platform for them to explore and engage in adventurous activities. Two visitors mentioned:

*“To find a discreet location to have sex in an exciting outdoor environment.”*

**Visitor 6**

*“Often there are well-trodden off-trail tracks that make one curious to see what they lead to and bring out the “explorer” that lives in all of us.”* **Visitor 13**

The third most mentioned behavioural belief (n=17) was that experts and visitors felt that going off-trail created a different walking experience. This stemmed from the belief that going off-trail allowed visitors to learn new things and visitors did want to walk the same path over and over again. Two respondents mentioned:

*“Some visitors want to have a different/ better experience.”* **Expert 3**

*“Since I have been to BMNP a couple of times, it can be quite boring if we were to walk the same trail seeing the same scenery again. It’s like going to the same country visiting the same places. Going off-trail helps to satisfy my needs for something new”* **Visitor 1**

By venturing off-trail, some experts and visitors (n=12) believed that going off-trail was a shorter route. The more experienced visitors especially perceived this. Two of these respondents mentioned:

*“Some visitors have the perception that they will be saving time if they did not stick to the path. They believe that cutting across terrains will help them to reach their end point quicker. This perception is particularly in the mindset of experienced walkers.”* **Expert 4**

*“Some visitors could be rushing for time and therefore take short cuts to complete their walk faster.”* **Visitor 14**

The last behavioural belief elicited was freedom (n=9). This was not surprising given that national parks are places where visitors believe they can be carefree and should have the freedom to roam around as they please. Three respondents mentioned:

*“The freedom to roam freely in National Parks is important as a National Park is meant to be open and free. Whether I walk on the paths or venture off-trail, I need to feel free in National Parks.”* **Visitor 2**

*“Feeling of entitlement/disrespect to BMNP as, after all, no one ‘owns’ the national parks...especially not a government department (stickin' it to the man!)”*

**Visitor 3**

*“People don't like to be subjected to rules.”* **Visitor 9**

In sum, the attitude of park experts and visitors tended to be quite similar among most of the respondents. However, there were some varied attitudes, including that some respondents felt that going off-trail provided a shorter route, while others felt that going off-trail would not result in a shorter route.

#### **4.1.3.2. Normative Beliefs**

Six normative beliefs were identified as important in visitors' decisions of whether or not to venture off-trail at BMNP. These normative beliefs were:

- Normative belief 1 – Other visitors (n=24)
- Normative belief 2 – Friends (n=19)
- Normative belief 3 – Family (n=16)
- Normative belief 4 – Tour guides (n=13)
- Normative belief 5 – Park rangers (n=10)
- Normative belief 6 – Celebrities (n=6)

Overall, a number of social groups influenced visitors' behaviour to venture off-trail. The most mentioned social group was "other visitors". Of the 27 respondents interviewed, 24 mentioned "other visitors" who have ventured off-trail previously to be a strong influence. Two industry experts mentioned:

*"Other previous visitors are strong influencers. Sometimes visitors simply follow others in front as a guide for their actions as heuristics, for example, venturing off-trail to set up camps based on the perceptions that if other visitors can camp here, why can't I do it?"* **Expert 3**

*"No doubt about this. Visitors follow other visitors. If other visitors are doing it or can do it, why can't we? This is very motivating especially when other visitors share their experience about the things that they have seen."* **Expert 4**

Similarly, visitors mentioned this social group:

*"Visitors are consciously making their own decisions or maybe it's a call of nature; so yes, visitors' opinions matter to themselves and a call of nature is hard to ignore (especially for people who are out of touch with nature ... which is probably 90 percent of us.) BMNP opinion is very valid but I can see how the visitor's opinions would overrule because BMNP is a department not a person. I'm going to go with other visitors' opinions mattering the most, purely because I believe most of us are out of touch with nature and we tend to learn and follow the actions of other visitors who seem to know what they are doing."*

**Visitor 3**

*"Other visitors who have stories of secret sights, different cultural understandings of protected areas and different experiences in other protected areas could be a strong influence in visitors to go off-trail."* **Visitor 13**

The second normative belief identified by most respondents was friends. When deciding to go off-trail, 19 of 27 respondents mentioned friends as an important social group in supporting their non-compliant behaviour. Most respondents reported that if friends

within a group decided to go off-trail, there was a very high chance that they themselves would follow due to peer pressure. This was especially prevalent among younger visitors. Two respondents mentioned:

*“Friends who have gone off-trail are important promoters of off-trail behaviour. This is especially among the younger demographics who have little experience in bush walking and tend to rely on friends’ past experience.”* **Expert 1**

*“Peer pressure from friends. If friends are going off-trail, you tend to follow so as not to feel left out.”* **Visitor 7**

The third most mentioned (n=16) social group was family. This item had both positive and negative support in off-trail behaviour. For example, family members such as parents were seen as strong influencers in discouraging their children to walk off-trail. However, family members could influence and encourage the behaviour if parents felt that going off-trail had little risk. Three respondents mentioned:

*“Visitors who are parents usually give in to their children when they are together in the park. This is the case as parents want to ensure that their children have a good time and generally believed that if their children are under their watch, nothing serious could happen.”* **Expert 3**

*“Anyone in the family could influence each other. If one dominant family member decides to walk away from the path and other members think that it’s safe they will follow the family member.”* **Expert 4**

*“If my partner supports me in venturing off-trail, we will do it together since we are in this together”* **Visitor 12**

Tour guides / leaders was the next most mentioned (n=13) social group. This view was expressed among park experts to be concerning, as these tour guides may deliberately venture off-trail as a promise to visitors to make their adventure more exciting. For example, two experts mentioned:

*“Tour guides who are leading international or domestic visitors are an emerging group of non-compliers at BMNP. More often than not, these tour guides are organising adventure walks and visitors just follow blindly without knowing that they are non-complying. More often than not, these tour guides know that they are not sticking to the designated path but choose to venture off-trail and bring visitors to see something different from other tour companies.”* **Expert 1**

*“Tour leaders and guided tours. I know of some tour leaders that provide specialized guides to see unique landscapes and features of the park using unbeaten paths.”* **Expert 4**

Another mentioned social group (n=10) was park rangers. This social group had two distinctive points of views from the interviews. Park experts mentioned that rangers were seen as authority figures in disapproving of off-trail behaviour. For example, one expert mentioned:

*“Rangers are important in disapproving off-trail behaviour. This is effective especially when visitors see park rangers patrolling the BMNP.”* **Expert 5**

On the other hand, interviewed visitors expressed a different view that park rangers could be encouraging off-trail behaviour indirectly by not issuing fines and they themselves used off-trails for shortcuts.

*“Even the park rangers do not stay on-trail so why should we. I have seen some rangers walking off-trail so I think that it should be safe. No one would be walking into a burning forest.”* **Visitor 1**

The least mentioned group was an interesting one – celebrities. Out of the 27 respondents, 6 mentioned that celebrities of adventure documentaries such as Bear Grylls on “Man vs. Wild” and Steve Irwin had in a way encouraged off-trail behaviour. For example, one expert and one visitor mentioned:

*“Celebrities such as Bear Grylls who has a show “Man vs. Wild” where he shows audience how to survive in harsh conditions and terrains. This has strong influence especially among the younger demographics”* **Expert 5**

*“TV adventure shows such as “Survivors”, “Man vs. Wild” and wildlife celebrities such as Steve Irwin portray a cool image to be adventurous. This indirectly supports non-compliant behaviour as these celebrities have made dangerous activities look cool and seen as role models.”* **Visitor 11**

It was evident that subjective norm played an important role in visitors’ going off-trail, with the opinions of important others influencing whether they would go off-trail or not. This means that any persuasive communications by park administrators need to include non-compliers and friends who have influence in their decision making process. The views of others such as tour guides and park rangers also needs to be reconditioned in order for them to set good examples and abide by the rules of BMNP.

#### **4.1.3.3. Control Beliefs**

Regarding control beliefs, some respondents indicated that as much as they would like to stay on-trail, some difficulties outside their control could motivate them to venture off-trail. Six control beliefs were identified as factors that prevented them from staying on-trail. These were:

- Control belief 1 – Lack / unclear signage (n=23)
- Control belief 2 – Damaged / unclear walking trail (n=18)
- Control belief 3 – Lack of park facilities (n=15)
- Control belief 4 – Overcrowded pathways (n=13)
- Control belief 5 – Lack food and water (n=11)
- Control belief 6 – Challenging terrains (n=5)

In most cases where visitors were not involved in compliant on-trail walking, it was not because they perceived that the act was wrong, but rather because of certain factors outside their control. The most mentioned (n=23) external factor was the lack / unclear signage in the Park. Surprisingly, all park experts acknowledged this. Two experts mentioned:

*“Sure, we have been hearing complaints about the lack of signage in BMNP. Having said that, BMNP is a heritage listed site and you wouldn’t want signage erected at every corner that could obstruct heritage views in BMNP.”* **Expert 1**

*“Some might not have noticed the signs or forget about them as they are unclear or not positioned in strategic points along the path.”* **Expert 2**

Similarly, two visitors mentioned:

*“Sometimes signage is unclear without any words. It shows a picture but doesn’t say do not enter and do not have any barriers to prevent visitors from entering.”*

**Visitor 1**

*“There are some intersections in the park that do not have any signs to warn visitors about unlawful walking trails. The chances of going off-trail are greater when we do not know what we are not supposed to.”* **Visitor 12**

The second most mentioned (n=18) perceived difficulty was damaged / unclear walking trails. A majority of respondents expressed going off-trail because the paths were damaged due to storms and overgrown grass for example. Park experts mentioned this was partly due to the vastness of BMNP that makes it impossible for maintenance to be conducted thoroughly throughout the park. For example, two experts mentioned:

*“Throughout the year, we are constantly clearing fallen trees and repaving pathways. In such situations we will block off the trail but some visitors will still ignore the barriers and venture off-trail.”* **Expert 3**

*“Some visitors venture off the trails because of perceived safety issues that the damaged paths are less dangerous. This is especially so after a thunderstorm.”*

**Expert 5**

Visitors viewed damaged walking trails as a safety hazard, and most of them were willing to take a risk and use alternate routes to avoid the damaged trails. For example, two respondents mentioned:

*“Usually visitors will stay on the track. However, sometimes when there has been a lot of rain and the paths are very wet or eroded, visitors might need to do a slight detour to get to their destination.”* **Visitor 5**

*“There could be debris on track that visitors could be avoiding. After a heavy storm, paths tend to be waterlogged and visitors have to find a way around.”*

**Visitor 10**

The lack of park facilities was the third most mentioned (n=15) perceived difficulty visitors faced when trying to stay on-trail. Both experts and visitors expressed the need for toilet breaks as one of the main barriers forcing them to go off-trail. For example, two experts mentioned:

*“We have to understand that the entire national park covers several thousand hectares of land area and therefore, it’s impossible to have facilities provided at every corner. I know lots of visitors who simply have toilet breaks in the bushes. This is not ideal and dangerous but we can only do so much. I think a couple of years back, a woman fell down a cliff while taking a leak.”* **Expert 2**

*“Some visitors could be in need of using the bathroom and can’t find one in time. Or they can’t find facilities to cook their food.”* **Expert 4**

Two visitors mentioned:

*“There is a lack of facilities within the park such as toilets and when you need to go urgently, the only way is to do it in the bushes.”* **Visitor 2**

*“There are limited camping sites and the only way to camp at some places is to create your campsite.”* **Visitor 4**



The next perceived barrier to compliant behaviour was overcrowded pathways. Experts and visitors mentioned the overcrowding of pathways due to overcapacity during peak periods, and popular walkways. For example, two experts mentioned:

*“Sometimes during the weekends and holidays when there are lots of visitors at BMNP, paths can be quite congested and some visitors will go off-trail to avoid large crowds clogging the paths.”* **Expert 1**

*“There could be too many visitors using the path of exercising, dog walking, etc. Sometimes cyclers use the walking paths as well, which could be stretching the park’s capacity.”* **Expert 4**

Two visitors mentioned:

*“Sometimes during peak times you might have to step aside to let the crowds through coming from the other way or maybe even going off-trail to overtake large crowds.”* **Visitor 7**

*“Some popular trails can be crowded at certain times that restrict viewing opportunities. This forces visitors to use other pathways or off-trails to get a view.”* **Visitor 13**

Limited resources of food and water were other factors that prevented visitors from complying with staying on-trail. Eleven respondents who expressed the need for basic food and water during their walk mentioned this. If they did not equip themselves with sufficient resources before the walk, visitors could not purchase any of this midway and had to go off-trail to obtain food and water. For example, two respondents mentioned:

*“We have come across a number of visitors who did not equip themselves with enough food and water for their journey and had to regress from the path to search for water from waterfalls. This could have been prevented if visitors planned their journey more realistically.”* **Expert 1**

*“As mentioned, some visitors go unprepared with limited food and water resources and not bring their mobile phones. So if they run out of resources in the*

*middle of the park and need food and water, they will search for nearby water sources or mushrooms.” Expert 4*

The least mentioned (n=5) perceived behavioural control factor was the challenging terrains that posed as barriers to visitors when trying to stay on-trail. Experts and visitors mentioned that some visitors were not well prepared or unrealistic in choosing their walks, and might find the paths too difficult to complete and decide to take alternative off-trail routes. For example, two respondents mentioned:

*“The difficulty of terrains ranges from beginners to expert level. Some visitors could be too ambitious and take on the difficult terrains and then realise that it’s too tough to complete and then decide to take shortcuts to reach their end point. Having said that, it does not necessarily mean that it’s safe. There could be cliff drops, wild animals and result in them getting lost.” Expert 3*

*“The terrain might be difficult to negotiate and visitors tend to take shortcuts that they perceive to be easier to navigate.” Visitor 9*

The perceived behavioural control variable of the TPB was relevant for the majority of the respondents who stated they would non-comply given the barriers and obstacles facing them. The perceived behavioural control factor was effective in identifying the reasons for low intentions to comply among visitors. It also provided insights to certain park modifications such as more toilet facilities and clearer signage that would make it more likely that visitors would stay on-trail.

#### **4.1.4. Discussion of Elicitation Stage (Stage 1)**

The objective of the elicitation stage (Stage 1) was to elicit items through interviews with industry experts and visitors to form questionnaire items for the quantitative stage (Stage 2). Results indicated that visitors ventured off-trail due to various reasons. Having a closer view of nature was found to be the most frequently mentioned reason for venturing off-trail in BMNP. This reason has been cited in several news reports of accidents in

national parks; for example, two Australians died after being crushed by tons of ice at Fox Glacier, New Zealand. They were reportedly trying to get a closer picture of the glaciers (Ramachandran, 2009). The second and third most mentioned off-trail reasons were seeking more adventure and having a different walking experience. A possible explanation could be that visitors were dissatisfied with the mundane route and sought some excitement by not complying, as suggested by Frost and McCool (1988). The next two most mentioned non-compliant reasons were perceptions that walking off-trail equated to a shorter walking route and provided visitors with more freedom in the Park. The latter has been supported by researchers such as Duncan and Martin (2002), who argued that a sense of freedom is the most important reason for people to visit a national park. Visitors want to enjoy the freedom of nature and not be limited by boundaries and barriers.

Other visitors and friends were perceived as the two most important reference groups influencing off-trail behaviour at National Parks. These findings were consistent with prior studies such as Beckmann (1995), Parkin (2003), and Parkin and Morris (2005) who reported visitors participating in non-compliant activities upon seeing other visitors non-complying. This rationalised copying behaviour (Manning, 1999) suggests that normative influence could have a major impact on non-compliant decisions.

Lack of signage / unclear signage was the most frequently stated perceived difficulty factor that reduced visitors' intentions to stay on-trail when walking at national parks. This finding is in line with past research (Allesa et al., 2003; Chavez et al., 2004; Bradford & McIntyre, 2007). Damaged / unclear walking trail was the second most mentioned reason for venturing off trail in national parks. The present study also identified the lack of park facilities as another perceived difficulty faced by visitors in terms of trying to stay on-trail.

## **4.2. Quantitative Study**

### **4.2.1. Sample Size, Response Rate and Demographics**

Out of the 605 respondents approached, only 331 attempted the questionnaire. Upon cleaning the data, it was discovered that 6 questionnaires had more than 2 pages of omitted sections and therefore had to be discarded. Therefore, 325 completed questionnaires (response rate = 54 percent) were used to perform the data analysis. This sample size met the required sample size of at least 315 to run reliable statistical analysis as discussed in section 3.4.1.2. Of the 325 respondents, 165 (51 percent) were male and 158 (49 percent) were female. A majority of 117 respondents (36 percent) were single, followed by 91 married with children (28 percent), 82 married with no children (25 percent), and 21 divorced (6.5 percent). The largest group of 98 respondents (30 percent) was aged 21–30, and the second largest group of 73 respondents (22.5 percent) was aged 31–40. The third group of 60 respondents (18.5 percent) was aged 51–60. This was consistent with past research reporting both younger and older demographics as potential visitors to national parks (Berg & Koole, 2006).

In terms of highest educational qualification, 138 respondents (42.5 percent) had a bachelor's degree, and 62 respondents (19 percent) had a master's degree. Sixty-two respondents (19 percent) had a Tafe / diploma qualification. With regards to current jobs, the largest group of 112 respondents (34.5 percent) was in the administrative sector, followed by professionals (97 respondents, 30 percent), and those in managerial jobs (72 respondents, 22 percent). The largest income group earning \$30001 to \$75000 consisted of 108 respondents (33 percent). The second largest income group earning \$75000 to \$150000 consisted of 89 respondents (27 percent). The third group with \$0 income consisted of 35 respondents (11 percent), and was predominantly comprised of retirees and students. The higher education level and income level of respondents in this survey reflected a close representation of national park visitors as reported by past research (Viriden, 1990; Berg & Koole, 2006). With regards to the number of times visitors had been at BMNP in the last five years, a majority of the 145 respondents (45 percent) had been there more than 10 times, 81 respondents (25 percent) had visited the Park less than

10 times, 80 respondents (24 percent) had visited once, and 19 respondents (6 percent) who had not visited BMNP before.

The sample demographics of this study represented a similar profile to past studies of national park visitors in New South Wales. For example, Buultjens and Luckie (2004) conducted a survey on visitors in North Eastern National Parks in NSW Australia as part of a Sustainable Tourism Cooperative Research Centre (CRC) initiative. A total of seven NSW national parks (Yuraygir, Nightcap, Border Ranges, Boonoo Boonoo, Bald Rock, Gibraltar Range and Washpool) were covered in their research. Visitor profile in this study was made up of individuals in the 20-59 age group of (47.9 percent of respondents) while the gender balance was fairly equally distributed with 52 percent female and 48 percent male. The authors also reported similar education levels to this present study with the majority being bachelor holders (28 percent) followed by those with postgraduate qualifications (27 percent). Their report also showed that the majority of national park visitors earned between \$20000 - \$35000, which was similar to the present study's demographics. Their study also reported that professionals (37.3 percent) made up the majority of visitors to NSW national parks. Therefore, the sample of this present study reflected a good distribution and coverage of demographics that was similar to other National Park visitors in New South Wales Australia. Table 4.1 shows the sample demographics.

**Table 4.1 Demographic Results (n=325)**

<b>Characteristic</b>	<b>Number (n)</b>	<b>Percentage</b>
<b>Gender</b>		
Male	165	51
Female	158	49
<b>Marital Status</b>		
Single	117	36
Married	82	25.2
Married with children	91	28
Divorced	21	6.5
Others	11	3.1
<b>Age</b>		
Below 20	23	7.1

<b>Characteristic</b>	<b>Number (n)</b>	<b>Percentage</b>
21–30	98	30.2
31–40	73	22.5
41–50	39	12
51–60	60	18.5
61 and above	30	9.2
<b>Highest Education Qualification</b>		
Primary	3	0.9
Secondary	34	10.5
Tafe / Diploma	62	19.1
Bachelor	138	42.5
Masters	62	19.1
Doctorate	23	7.1
<b>Job (occupation) Classification</b>		
Professional	97	29.8
Managerial	72	22.1
Administrative	112	34.5
Technical	26	8
Others	18	5.6
<b>Income (per year)</b>		
\$0	35	10.8
Below \$6000	19	5.8
\$6001 to \$30000	34	10.8
\$30001 to \$75000	108	33.2
\$75000 to \$150000	89	27.4
Above \$150000	23	7.1
Declined to answer	17	5.2
<b>Number of times to BMNP in the last 5 years</b>		
None	19	5.8
Once	80	24.6
Less than 10 times	81	24.9
More than 10 times	145	44.6

### **4.2.2. Computing Sum Measures for TPB Constructs**

This study used two different types of measures (direct and indirect) to calculate behavioural intentions separately. For direct measures, mean scores of each Att, SN and PBC items were used directly to predict BI. With regards to indirect measures, a sum measure was computed for each independent variable. Principles of the expectancy value model were applied: Summed behavioural beliefs  $\sum BB_i O E_i$  – (behavioural beliefs multiplied by evaluation outcome), Summed normative beliefs  $\sum NB_j M C_j$  – (normative beliefs multiplied by motivation to comply) and Summed control beliefs  $\sum CB_k P K_k$  – (control beliefs multiplied by perceived power). The products were then summed to calculate the scores of Summed behavioural beliefs  $\sum BB_i O E_i$ , Summed normative beliefs  $\sum NB_j M C_j$ , and Summed control beliefs  $\sum CB_k P K_k$ . The dependent variable BI was calculated by summing the values from the six behavioural intention questions to become summed BI.

### **4.2.3. Missing Data and Outliers**

Following the collection of data, each questionnaire was physically screened to ensure completeness of data and keyed into SPSS. Questionnaires that were 75 percent completed were included in the analysis as recommended by Sekaran and Bougie (2009). After entry, the data were screened for missing data and outliers (see Table 4.2). This was done by running frequency checks to ensure that all values were within allowable specified ranges (Aaker et al., 2012). Missing data are important as they may contribute to bias in the results and affect the generalisation of the findings (Tabachnick & Fidell, 2012). Six questionnaires had random missing data and were treated more leniently as compared to non-random missing data (Tabachnick & Fidell, 2012).

**Table 4.2. Treatment of Outliers and Extreme Values**

	Mean	Std. Dev	Outliers identified	Extreme values identified	Treatment
<b>Direct Measures</b>					
Att 1 – Desirable	4.17	2.064	None	None	-
Att 2 - Good	3.97	2.054	None	None	-
Att 3 - Wise	3.25	1.935	None	None	-
Att 4 – Favourable	3.71	1.988	None	None	-
SN 1 - Social pressure	1.80	1.397	Respondent 64,132,142, 234,275	None	Mean substitution
SN 2 - People who are important to me	2.15	1.683	Respondent 114	None	Mean substitution
SN 3 - Expectations of me	1.92	1.586	None	Respondent 124, 227, 275,296	Mean substitution
PBC 1 – Confident	4.20	2.135	None	None	-
PBC 2 - Completely up to me	4.52	2.266	None	None	-
PBC 3 – Easy	3.90	2.027	None	None	-
<b>Indirect Measures</b>					
BBi 1 - Closer view of nature	4.27	2.009	None	None	-
BBi 2 - More adventurous	4.32	2.070	None	None	-
BBi 3 - Different walking experience	4.60	2.003	None	None	-
BBi 4 - Shorter route	3.06	1.573	None	None	-
BBi 5 - More freedom	3.83	1.941	None	None	-
OEi 1 - Closer view of nature	3.45	1.864	None	None	-
OEi 2 - More adventurous	3.29	1.928	None	None	-
OEi 3 - Different walking experience	3.38	1.965	None	None	-
OEi 4 - Shorter route	2.54	1.599	Respondent 33	None	-
OEi 5- More freedom	3.19	1.949	None	None	-
NBi 1 - Other visitors	2.05	1.459	Respondent 82	None	Mean substitution
NBi 2 - My friends	2.18	1.598	None	Respondent 68	Mean substitution
NBi 3 - My family	1.88	1.461	Respondent 275	Respondent 68, 122, 295	Mean substitution
NBi 4 - Tour guides	1.94	1.459	None	None	-
NBi 5 - Park rangers	1.78	1.488	None	None	-
NBi 6 – Celebrities	1.94	1.514	None	None	-
MCi 1 - Other visitors	2.67	2.042	None	None	-
MCi 2- My friends	3.01	1.998	None	None	-
MCi 3 - My family	3.38	2.113	None	None	-
MCi 4 - Tour guides	3.64	2.241	None	None	-



MCi 5 - Park rangers	4.65	2.198	None	None	
MCi 6 – Celebrities	1.96	1.724	Respondent 142, 226	Respondent 262, 301	Mean substitution
CBk 1 - Lack / no signage	4.37	2.138	None	None	-
CBk 2 - Walking paths are damaged / unclear	4.65	2.051	None	None	-
CBk 3 - Lack access to park facilities	4.26	2.103	None	None	-
CBk 4 - pathways are overcrowded	3.85	1.974	None	None	-
CBk 5 - Lack food and water	2.95	1.968	None	None	-
CBk 6 - Terrains are too challenging	2.97	1.957	None	None	-
PFk 1 - Lack / no signage	3.02	1.605	None	None	-
PFk 2 - Walking paths are damaged / unclear	3.11	1.543	None	None	-
PFk 3 - Lack access to park facilities	3.13	1.613	None	None	-
PFk 4 - pathways are overcrowded	2.94	1.454	None	None	-
PFk 5 - Lack food and water	2.56	1.561	None	None	-
PFk 6 - Terrains are too challenging	2.55	1.528	None	None	-
<b>Behavioural Intentions</b>					
BI 1 - Likely to stay off-trail if overcrowded	2.94	1.895	None	None	-
BI 2 - Likely to stay off-trail to take nice pictures	3.48	2.013	None	None	-
BI 3 - Likely to stay off-trail to avoid challenging terrains	2.50	1.677	None	None	-
BI 4 - Likely to stay off-trail to gain access to toilets and other non-park facilities	3.39	2.001	None	None	-
BI 5 - Likely to stay off-trail to access food and water	2.71	1.845	None	None	-
BI 6 - Likely to stay off-trail signage was missing or confusing	3.47	2.036	None	None	-
<b>NEP</b>					
NEP 1	4.76	1.864	None	None	-
NEP 2	4.14	1.812	None	None	-
NEP 3	5.12	1.631	None	None	-
NEP 4	4.21	1.744	None	None	-
NEP 5	5.36	1.533	Respondent 272	None	Mean substitution
NEP 6	5.45	1.522	Respondent 265	None	Mean substitution
NEP 7	5.73	1.588	None	None	-
NEP 8	5.17	1.650	None	None	-
NEP 9	5.96	1.320	Respondent 62	None	Mean substitution
NEP 10	4.79	1.873	None	None	-
NEP 11	5.30	1.676	None	None	-
NEP 12	5.07	1.887	None	None	-
NEP 13	5.55	1.493	None	None	-
NEP 14	4.67	1.744	None	None	-
NEP 15	5.11	1.549	None	None	-

To address the missing data issue, the mean substitution method was used. As no variables had more than 5 percent missing data, it was considered acceptable (Churchill & Iacobucci, 2010) and the mean value was used to substitute the missing value as recommended by Hair et al. (2009). Of the 331 surveys collected, only 325 were used in the data analysis as the other 6 had more than 50 percent uncompleted sections and were therefore discarded. Outliers were identified using boxplot analysis to summarise information about the distribution of the median, 25<sup>th</sup> and 75<sup>th</sup> percentiles, and extreme scores in the distribution. The smallest and largest observed values within the distribution are known as ‘whiskers’ with horizontal lines at both ends of the box. Outliers were identified if the distribution had values between one and a half and three box lengths from the upper or lower edge of the box (represented by a circle in SPSS). Extreme values were identified if the distribution had values between three or more box lengths from the upper or lower edge of the box (represented by an asterisk in SPSS). Both of these outliers and extreme values identified by SPSS were revisited and replaced with the mean of the corresponding data within the same category of values as recommended by Tabachnick and Fidell (2012).

#### **4.2.4. Normal Distribution**

The data collected were assessed to determine normal distribution, as factor and regression analysis both require variables to be normally distributed (Hair et al., 2009; Kline, 2011; Tabachnick & Fidell, 2012). The data revealed a mixture of positive and negative values within acceptable skewness and kurtosis values (Tabachnick & Fidell, 2012). In order to assess the skewness and kurtosis of the data for normality distribution, the general rule of thumb was used, as proposed by Kline (2011), that absolute values of above 3 were considered too skewed, while kurtosis values greater than 8 were problematic. As shown in Table 4.3, all values of skewness were below 3 and kurtosis values were not greater than 8. This shows that the data collected reflected a normal distribution.

**Table 4.3. Skewness and Kurtosis Analysis to ensure Normal Distribution**

	Skewness		Kurtosis		Comments about Skewness	Comments about Kurtosis
	Statistic	Std. Error	Statistic	Std. Error		
<b>Direct Measures</b>						
Att 1 - Desirable	-.199	.135	-1.220	.270	Acceptable	Acceptable
Att 2 - Good	.014	.135	-1.254	.270	Acceptable	Acceptable
Att 3 - Wise	.460	.135	-.938	.270	Acceptable	Acceptable
Att 4 - Favourable	.147	.135	-1.166	.270	Acceptable	Acceptable
SN 1 - Social pressure	2.023	.135	3.481	.270	Acceptable	Acceptable
SN 2 - People who are important to me	1.379	.135	.859	.270	Acceptable	Acceptable
SN 3 - Expectations of me	1.918	.135	2.881	.270	Acceptable	Acceptable
PBC 1 - Confident	-.156	.135	-1.348	.270	Acceptable	Acceptable
PBC 2 - Completely up to me	-.320	.135	-1.409	.270	Acceptable	Acceptable
PBC 3 - Easy	-.009	.135	-.938	.270	Acceptable	Acceptable
<b>Indirect Measures</b>						
BBi 1 - Closer view of nature	-.226	.135	-1.206	.270	Acceptable	Acceptable
BBi 2 - More adventurous	-.318	.135	-1.185	.270	Acceptable	Acceptable
BBi 3 - Different walking experience	-.531	.135	-.927	.270	Acceptable	Acceptable
BBi 4 - Shorter route	.357	.135	-.621	.270	Acceptable	Acceptable
BBi 5 - More freedom	.012	.135	-1.064	.270	Acceptable	Acceptable
OEi 1 - Closer view of nature	.250	.135	-.982	.270	Acceptable	Acceptable
OEi 2 - More adventurous	.359	.135	-1.025	.270	Acceptable	Acceptable
OEi 3 - Different walking experience	.324	.135	-1.107	.270	Acceptable	Acceptable
OEi 4 - Shorter route	.858	.135	-.080	.270	Acceptable	Acceptable
OEi 5 - More freedom	.372	.135	-1.097	.270	Acceptable	Acceptable
NBj 1 - Other visitors	1.533	.135	1.753	.270	Acceptable	Acceptable
NBj 2 - My friends	1.286	.135	.678	.270	Acceptable	Acceptable
NBj 3 - My family	1.853	.135	2.917	.270	Acceptable	Acceptable
NBj 4 - Tour guides	1.577	.135	1.686	.270	Acceptable	Acceptable
NBj 5 - Park rangers	1.946	.135	2.798	.270	Acceptable	Acceptable
NBj 6 - Celebrities	1.532	.135	1.366	.270	Acceptable	Acceptable
MCj 1 - Other visitors	.822	.135	-.765	.270	Acceptable	Acceptable
MCj 2 - My friends	.536	.135	-1.024	.270	Acceptable	Acceptable
MCj 3 - My family	.312	.135	-1.253	.270	Acceptable	Acceptable
MCj 4 - Tour guides	.141	.135	-1.431	.270	Acceptable	Acceptable
MCj 5 - Park rangers	-.559	.135	-1.112	.270	Acceptable	Acceptable
MCj 6 - Celebrities	1.711	.135	1.710	.270	Acceptable	Acceptable
CBk 1 - Lack / no signage	-.288	.135	-1.321	.270	Acceptable	Acceptable
CBk 2 - Walking paths are damaged / unclear	-.542	.135	-1.012	.270	Acceptable	Acceptable

CBk 3 - Lack access to park facilities	-.239	.135	-1.267	.270	Acceptable	Acceptable
CBk 4 - pathways are overcrowded	-.097	.135	-1.254	.270	Acceptable	Acceptable
CBk 5 - Lack food and water	.729	.135	-.689	.270	Acceptable	Acceptable
CBk 6 - Terrains are too challenging	.620	.135	-.873	.270	Acceptable	Acceptable
PFk 1 - Lack / no signage	.514	.135	-.536	.270	Acceptable	Acceptable
PFk 2 - Walking paths are damaged / unclear	.483	.135	-.467	.270	Acceptable	Acceptable
PFk 3 - Lack access to park facilities	.473	.135	-.528	.270	Acceptable	Acceptable
PFk 4 - pathways are overcrowded	.326	.135	-.676	.270	Acceptable	Acceptable
PFk 5 - Lack food and water	.859	.135	-.020	.270	Acceptable	Acceptable
PFk 6 - Terrains are too challenging	.796	.135	-.071	.270	Acceptable	Acceptable
<b>Behavioural Intentions</b>						
BI 1 - Likely to stay off-trail if overcrowded	.619	.135	-.811	.270	Acceptable	Acceptable
BI 2 - Likely to stay off-trail to take nice pictures	.182	.135	-1.242	.270	Acceptable	Acceptable
BI 3 - Likely to stay off-trail to avoid challenging terrains	.911	.135	-.144	.270	Acceptable	Acceptable
BI 4 - Likely to stay off-trail to gain access to toilets and other non-park facilities	.264	.135	-1.167	.270	Acceptable	Acceptable
BI 5 - Likely to stay off-trail to access food and water	.806	.135	-.485	.270	Acceptable	Acceptable
BI 6 - Likely to stay off-trail when signage was missing or confusing	.050	.135	-1.263	.270	Acceptable	Acceptable
<b>NEP</b>						
NEP 1	-.459	.135	-.814	.270	Acceptable	Acceptable
NEP 2	.016	.135	-.943	.270	Acceptable	Acceptable
NEP 3	-.598	.135	-.425	.270	Acceptable	Acceptable
NEP 4	-.115	.135	-.768	.270	Acceptable	Acceptable
NEP 5	-.984	.135	.509	.270	Acceptable	Acceptable
NEP 6	-1.041	.135	.640	.270	Acceptable	Acceptable
NEP 7	-1.158	.135	.545	.270	Acceptable	Acceptable
NEP 8	-.763	.135	-.130	.270	Acceptable	Acceptable
NEP 9	-1.425	.135	1.864	.270	Acceptable	Acceptable
NEP 10	-.511	.135	-.816	.270	Acceptable	Acceptable
NEP 11	-.958	.135	.315	.270	Acceptable	Acceptable
NEP 12	-.714	.135	-.560	.270	Acceptable	Acceptable
NEP 13	-.874	.135	.041	.270	Acceptable	Acceptable
NEP 14	-.431	.135	-.617	.270	Acceptable	Acceptable
NEP 15	-.627	.135	-.127	.270	Acceptable	Acceptable

#### 4.2.5. Validity and Reliability

It was imperative that the questionnaire designed for the present study measured what it was supposed to measure, and that the content achieved the objective of measuring its intent (Bryman & Cramer, 2012). Content validity was assessed by reviewing relevant literature and through expert assessment to ensure that the questionnaire adequately represented the content to be covered. The questionnaire was checked for content validity by two leading academics who are experts in this field. The construct and predictive validity of the questionnaire were ensured under the strict guidelines set by Fishbein and Ajzen (1980). These authors recommended that TPB studies needed to check for reliability and internal consistency among the TPB variables. Cronbach's alpha was used to measure reliability in the present study, as it is the most widely used measure by researchers (Hair et al., 2009). Cronbach's alpha ranges from 0 to 1, with 0 indicating no reliability and 1 being very reliable (Coates, 2012). The recommended minimum reliability score is 0.7 (Nunnally & Bernstein, 1994). As can be seen in Table 4.4, all constructs revealed strong reliability of alpha between 0.78 and 0.95. This shows that all constructs were reliable in measuring what they intended to measure.

**Table 4.4 Reliability Analysis**

<b>Constructs</b>	<b>No. of items</b>	<b>Cronbach's Alpha</b>	<b>Comments</b>
Direct Measures - Attitude (Att)	4	.904	Strong reliability
Direct Measures - Subjective Norm (SN)	3	.817	Strong reliability
Direct Measures - Perceived Behavioural Control (PBC)	3	.769	Reliable
Indirect Measures - Behavioural Belief (BBi)	5	.871	Strong reliability
Indirect Measures - Evaluation of Outcome (OEi)	5	.919	Strong reliability
Indirect Measures - Normative Belief (NBj)	6	.943	Strong reliability
Indirect Measures - Motivation to Comply (MCj)	6	.860	Strong reliability
Indirect measures - Control Belief (CBk)	6	.792	Reliable
Indirect measures - Perceived Power (PFk)	6	.783	Reliable
Behavioural Intention (BI)	6	.853	Strong reliability
New Ecological Paradigm Items (NEP)	15	.902	Strong reliability

The validity between direct and indirect measures of the TPB variables were tested using Pearson's bivariate correlations ( $r$ ) to determine correlations between direct measures: attitude (Att), subjective norm (SN) and perceived behavioural control (PBC), with indirect measures: summed behavioural beliefs  $\sum BBiOEi$ , summed normative beliefs  $\sum NBjMCj$ ; and summed control beliefs  $\sum CBkPFk$ . Correlations are significant when the relationship between two variables have a statistical  $p$  value of  $p < 0.05$ . Effect sizes of 0.3 - 0.5 are seen as having mid effect size, and 0.5 and above are seen as large effect sizes (Cohen, 1983). The results in Table 4.5 reveal that all correlations between respective direct and indirect measures were significant at the  $p < 0.01$  level (two-tailed), except for PBC and  $\sum CBkPFk$ . Correlations between Att and  $\sum BBiOEi$  had a large effect size ( $r = 0.674$ ,  $p < 0.01$ ), and correlations between SN and  $\sum NBjMCj$  reported large effect size ( $r = 0.611$ ,  $p < 0.01$ ). This suggested that the Theory of Reasoned Action (TRA) model was more suitable in predicting behavioural intentions of venturing off-trail at BMNP, where the postulation of Att and SN are functions of the underlying salient beliefs specific to the non-compliance behaviour under study.

**Table 4.5. Correlations between Direct and Indirect Measures of TPB**

	Att	SN	PBC	$\sum BBiOEi$	$\sum NBjMCj$	$\sum CBkPFk$
Att	1					
SN	0.448**	1				
PBC	0.618**	0.314**	1			
$\sum BBiOEi$	0.674**	0.518**	0.597**	1		
$\sum NBjMCj$	0.381**	0.611**	0.252**	0.447**	1	
$\sum CBkPFk$	0.105	0.262**	0.055	0.168**	0.324**	1

\*\* Correlation is significant at the 0.01 level (two-tailed)  
\* Correlation is significant at the 0.05 level (two-tailed)

## **4.2.6. Exploratory Factor Analysis (EFA)**

Factor analysis is a useful statistical analysis to condense, simplify or summarise theoretically or conceptually interrelated data (Tabachnick & Fidell, 2012). This is a useful tool for identifying underlying dimensions through interpretable factors and reducing a large number of items to more manageable sets (Stewart, 1981; Hair et al., 2009). The exploratory factor analysis (EFA) was used to identify and discover underlying factors and measure reliability (Tabachnick & Fidell, 2012) of the TPB constructs. The key objective of EFA in the present study was to see whether the TPB direct and indirect items included in the questionnaire measured a single construct or if there were sub-components to these constructs (e.g., attitude items should be appearing under the attitude factor and not the subjective norms factor). The principal components analysis extraction method with Varimax rotation was used in the factor analysis. This method of varimax rotation allows checking for correlations among the factors. A cut off point of 0.4 is seen as a significant factor loading (Gerbing & Anderson, 1988; Hair et al., 2009).

### **4.2.6.1. Direct Measures**

Direct measures of TPB (attitude, subjective norm, perceived behavioural control, and behavioural intentions) were factor analysed to check for factor loadings. The following general rules were used to measure significance when using EFA. First, only items with factor loadings equal or greater than 0.4 (Gerbing & Anderson, 1988; Hair et al., 2009) were considered significant. Second, all retained factors from the EFA should account for at least 60 percent of the total variance of the data (Hair et al., 2009). Third, estimated correlations between the factors should not be greater than 0.85 (Kline, 2011).

**Table 4.6. KMO and Bartlett's Test for Direct Measures**

<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</b>	.880
<b>Bartlett's Test of Sphericity</b>	<b>Approx. Chi-Square</b> 2768.452
	<b>df</b> 120
	<b>Sig.</b> .000

As can be seen in Table 4.6, the Bartlett's test of sphericity had a significant score of 0.880,  $p < 0.01$ . This indicated that the patterns of correlations were relatively compact and the factors were reliable as recommended by Kaiser (1974) that values greater than 0.5 are acceptable for factor analysis. The correlations matrix also revealed all items having a correlation score of 0.85 and below between items. This suggested multicollinearity did not exist among all items.

**Table 4.7. Total Variance Explained for Direct Measures in Factor Analysis**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.010	37.561	37.561	6.010	37.561	37.561	3.696	23.102	23.102
2	2.617	16.354	53.915	2.617	16.354	53.915	3.445	21.531	44.633
3	1.609	10.058	63.973	1.609	10.058	63.973	2.271	14.193	58.825
4	.974	6.091	70.064	.974	6.091	70.064	1.798	11.238	70.064
5	.729	4.557	74.620						
6	.539	3.371	77.991						
7	.524	3.274	81.265						
8	.481	3.006	84.271						
9	.455	2.845	87.117						
10	.392	2.452	89.569						
11	.375	2.342	91.911						
12	.333	2.081	93.992						
13	.308	1.927	95.919						
14	.265	1.654	97.572						
15	.219	1.366	98.939						
16	.170	1.061	100.000						

Extraction Method: Principal Component Analysis.



During exploratory factor analysis, it was important to check if retained factors explained a significant amount of total variance of the direct measures of TPB. As a rule of thumb, Hair et al. (2009) suggested that all retained factors from the exploratory factor analysis should account for at least 60 percent of the total variance of the data. As can be seen in Table 4.7, the analysis reported four factors retained in the exploratory factor analysis that accounted for 70 percent variance of the data.

**Table 4.8. Factor Loadings of Direct Measures**

Items	Factor Loadings			
	1	2	3	4
Att 1 – Desirable	.813			
Att 2 – Good	.834			
Att 3 – Wise	.817			
Att 4 - Favourable	.872			
SN 1 - Social pressure			.813	
SN 2 - People who are important to me			.819	
SN 3 - Expectations of me			.794	
PBC 1 – Confident				.621
PBC 2 - Completely up to me				.885
PBC 3 - Easy				.639
BI 1 - Likely to stay off-trail if overcrowded	.686			
BI 2 - Likely to stay off-trail to take nice pictures	.706			
BI 3 - Likely to stay off-trail to avoid challenging terrains	.781			
BI 4 - Likely to stay off-trail to gain access to toilets and other non-park facilities	.781			
BI 5 - Likely to stay off-trail to access food and water	.732			
BI 6 - Likely to stay off-trail signage was missing or confusing	.762			

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.

The next step in factor analysis was to examine the factor loadings of the items. As can be seen in Table 4.8, the three key independent direct measures (Attitude – Att; Subjective Norm – SN; Perceived Behavioural Control – PBC) of TPB loaded onto distinctive components with significant factor loadings of 0.5 and above. All four direct measures of attitude loaded onto factor 1 with very strong factor loadings of 0.8 and above. Factor 3 had loadings that came from questions relating to subjective norms. All

three questions on direct measures of subjective norms loaded onto factor 3 with loadings of 0.8. All three questions relating to perceived behavioural control loaded onto factor 4 with loadings of 0.6 to 0.8. Direct attitudes loaded onto component 1; direct subjective norms loaded onto component 3; direct perceived behavioural control loaded onto component 4; and intention items loaded onto component 2. Only items with factor loadings equal or greater than 0.4 (Gerbing & Anderson, 1988; Hair et al., 2009) were considered significant. All behavioural intention items loaded onto factor 2 with loadings between 0.6 and 0.7. Therefore, the factor loadings for direct measures of TPB and Behavioural Intentions indicated that the exploratory factor analysis confirmed relationships consistent with the questionnaire design and the Theory of Planned Behaviour framework.

#### 4.2.6.2. Indirect Measures

Indirect measures of TPB were factor analysed to check for factor loadings using a 7-factor extraction. The following general rules were used to measure significance when using EFA. First, only items with factor loadings equal or greater than 0.4 (Gerbing & Anderson, 1988; Hair et al., 2009) were considered significant. Second, all retained factors from the EFA should account for at least 60 percent of the total variance of the data (Hair et al., 2009). Third, estimated correlations between the factors should not be greater than 0.85 (Kline, 2011).

**Table 4.9. KMO and Bartlett's Test for Indirect Measures**

<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</b>		.880
	<b>Approx. Chi-Square</b>	8715.251
<b>Bartlett's Test of Sphericity</b>	<b>df</b>	780
	<b>Sig.</b>	.000

As can be seen in Table 4.9, the Bartlett's test of sphericity had a significant score of 0.880,  $p < 0.01$ . This indicated that the patterns of correlations were relatively compact and the factors were reliable as recommended by Kaiser (1974) that values greater than 0.5 were acceptable for factor analysis. The correlations matrix also revealed all items to have a correlation score of 0.85 and below among items. This suggested multicollinearity did not exist among all items. The exploratory factor analysis reported seven factors retained (see Table 4.10) in the exploratory factor analysis that accounted for 66 percent variance of the data, which was above the 60 percent recommended by Hair et al. (2009).

**Table 4.10. Total Variance Explained for Indirect Measures in Factor Analysis**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.282	25.705	25.705	10.282	25.705	25.705	6.254	15.635	15.635
2	4.470	11.176	36.882	4.470	11.176	36.882	5.051	12.626	28.262
3	3.543	8.857	45.739	3.543	8.857	45.739	3.601	9.002	37.263
4	2.794	6.984	52.723	2.794	6.984	52.723	3.580	8.950	46.214
5	2.285	5.712	58.435	2.285	5.712	58.435	2.921	7.302	53.516
6	1.616	4.040	62.475	1.616	4.040	62.475	2.523	6.307	59.823
7	1.385	3.461	65.937	1.385	3.461	65.937	2.446	6.114	65.937
8	1.115	2.786	68.723						
9	.993	2.481	71.204						
10	.876	2.190	73.394						
11	.858	2.144	75.538						
12	.748	1.870	77.408						
13	.682	1.705	79.113						
14	.643	1.608	80.722						
15	.591	1.477	82.199						
16	.554	1.384	83.584						
17	.517	1.291	84.875						
18	.471	1.178	86.053						
19	.450	1.125	87.178						
20	.420	1.051	88.230						
21	.375	.938	89.167						
22	.372	.931	90.098						
23	.346	.864	90.962						
24	.334	.835	91.797						

25	.313	.782	92.580
26	.304	.759	93.339
27	.292	.731	94.070
28	.278	.695	94.765
29	.255	.637	95.402
30	.229	.574	95.975
31	.220	.549	96.525
32	.210	.524	97.048
33	.191	.478	97.526
34	.174	.436	97.962
35	.169	.422	98.385
36	.161	.403	98.788
37	.137	.343	99.131
38	.135	.337	99.468
39	.113	.282	99.749
40	.100	.251	100.000

Extraction Method: Principal Component Analysis.

The next step was to examine the factor loadings of the indirect items (behavioural beliefs – BBi, evaluation outcome – OEi, normative beliefs – NBj, motivation to comply – MBj, control beliefs – CBk, perceived power – PFk and behavioural intentions – BI). As can be seen in Table 4.11, the independent indirect measures of TPB loaded onto distinctive components with significant factor loadings of 0.4 and above, which were seen as significant as recommended by Gerbing and Anderson (1988), and Hair et al. (2009). Items from behavioural beliefs (BBi) and evaluation outcomes (OEi) loaded onto the same factor 1. An explanation for this is that respondents treated both behavioural belief items and evaluation outcome items similarly. This is not surprising, as respondents could have indicated similar agreement levels of behavioural beliefs with equal importance in their evaluation outcomes. All normative beliefs (NBj) loaded onto factor 2 and all motivation to comply items (MCj) loaded onto factor 3. However, not all control beliefs (CBk) loaded onto the same factor. Control beliefs CBk1, CBk2, CBk3 loaded onto factor 6 and control beliefs CBk4, CBk5, CBk6 loaded onto factor 7. One possible explanation for the control beliefs being loaded onto two factor loadings could be due to the concept of perceived self-efficacy (Bandura, 1977), which refers to an individual’s judgment of how well one can execute courses of action required to deal

with a prospective situation (Bandura, 1986). Several researchers (Bandura, 1989; Conner & Norman, 1996; Rhodes & Courneya, 2003; Abdul-Muhmim, 2007)) have suggested that PBC is closely related to self-efficacy, and that self-efficacy is synonymous if not different from perceived behavioural control. However, Ajzen (2005) has argued that the use of PBC itself is a sufficient measure of control in the Theory of Planned Behaviour as PBC is conceptualised in both internal (confidence) and external (available resources) perceived control factors. Likewise, Armitage and Conner (2001) conducted a meta-analysis and found both perceived behavioural control and self-efficacy having similar correlations ( $r = 0.44$ ) with behavioural intentions. They also found perceived behavioural control had correlations of 0.40 with behaviour and self-efficacy had correlations of 0.35 with behaviour. Both these variables also added similar proportions (2 per cent) of explained variance to the prediction of behaviour. Perhaps the control beliefs had a mixture of perceived behavioural control items as well as self-efficacy items, which according to Ajzen (2005) should be treated under the same construct of perceived behavioural control, as it is a sufficient measure of control in the Theory of Planned Behaviour model. Therefore, this study combined control belief items loaded in factors 6 and 7 into a single component to represent the control belief factor.

All perceived power (PFk) items were loaded onto components 5. All behavioural intention (BI) items loaded onto factor 4 with loadings between 0.6 and 0.7. Therefore, the factor loadings for indirect measures of TPB and Behavioural Intentions indicated that the exploratory factor analysis confirmed relationships consistent with the questionnaire design and the TPB framework.

**Table 4.11. Factor Loadings of Indirect Measures**

Items	Factor Loadings						
	1	2	3	4	5	6	7
BBi 1 - Closer view of nature	.745						
BBi 2 - More adventurous	.850						
BBi 3 - Different walking experience	.796						
BBi 4 - Shorter route	.431						

BBi 5 - More freedom	.811
OEi 1 - Closer view of nature	.760
OEi 2 - More adventurous	.809
OEi 3 - Different walking experience	.791
OEi 4 - Shorter route	.419
OEi 5- More freedom	.813
NBj 1 - Other visitors	.824
NBj 2 - My friends	.783
NBj 3 - My family	.841
NBj 4 - Tour guides	.839
NBj 5 - Park rangers	.834
NBj 6 - Celebrities	.821
MCj 1 - Other visitors	.753
MCj 2- My friends	.853
MCj 3 - My family	.863
MCj 4 - Tour guides	.832
MCj 5 - Park rangers	.668
MCj 6 - Celebrities	.594
CBk 1 - Lack / no signage	.799
CBk 2 - Walking paths are damaged / unclear	.847
CBk 3 - Lack access to park facilities	.639
CBk 4 - pathways are overcrowded	.627
CBk 5 - Lack food and water	.733
CBk 6 - Terrains are too challenging	.759
PFk 1 - Lack / no signage	.785
PFk 2 - Walking paths are damaged / unclear	.809
PFk 3 - Lack access to park facilities	.619
PFk 4 - pathways are overcrowded	.532
PFk 5 - Lack food and water	.561
PFk 6 - Terrains are too challenging	.507
BI 1 - Likely to stay off-trail if overcrowded	.663
BI 2 - Likely to stay off-trail to take nice pictures	.682
BI 3 - Likely to stay off-trail to avoid challenging terrains	.745
BI 4 - Likely to stay off-trail to gain access to toilets and other non-park facilities	.779
BI 5 - Likely to stay off-trail to access food and water	.704
BI 6 - Likely to stay off-trail signage was missing or confusing	.728
Extraction Method: Principal Component Analysis.	
Rotation Method: Varimax with Kaiser Normalization.	

## 4.2.8. Hypothesis Testing

Research hypotheses for the TPB were tested using a series of correlation and multiple regression analysis. Pearson product moment correlation coefficient  $r$  was used as recommended by Ajzen and Fishbein (1980) to examine associations between TPB variables. Cohen (1992) commented that the product moment  $r = 0.3$  can be classified as a medium effect size, which is approximately the average size of observed effects in various fields of study. However, any significant associations less than 0.3 should be examined and considered before dismissing their usefulness (Cohen, 1992). Multiple regression analysis was chosen as a procedure for a covariate analysis to investigate if critical variables contributed to the prediction equation for a dependent variable after other predictor variables were eliminated from the equation (Hair et al., 2009). Conclusions were based on the results of multiple regression tests. Behavioural intentions (BI) represented the dependent variable in the multiple regression analysis. Direct measures of the TPB were attitude (AB), subjective norms (SN), and perceived behavioural control (PBC). Indirect independent variables were Summed behavioural beliefs  $\sum BB_i OE_i$ , Summed normative beliefs  $\sum NB_j MC_j$ , and Summed control beliefs  $\sum CB_k PF_k$ . The  $R^2$  and its statistical significance measured the proportion of variance contributed by the independent variables. Strength of beta coefficients and regression coefficients ranged from 0 to 1, with 0.3 as medium size to 0.5 as large size with acceptable significance at  $p < 0.05$  (Cohen et al., 2003). During the regression analysis, the independent variables were tested for multicollinearity. First, the variance inflation factor (VIF) of the independent variables should be less than 10. Second, the tolerance values should explain more than 10 percent of any independent's variance. Third, the condition index should be less than 30 (Hair et al., 2009).

### 4.2.8.1. Research Question 1

Are the direct measures of the TPB associated with visitors' behavioural intentions towards venturing off-trail when visiting Blue Mountains National Park (BMNP)?

### Hypothesis 1

*Visitors' attitude (Att) towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

### Hypothesis 2

*Visitors' subjective norm (SN) towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

### Hypothesis 3

*Visitors' perceived behavioural control (PBC) towards venturing off-trail at BMNP is positively associated with their venturing off-trail behavioural intentions at BMNP.*

According to Ajzen (1991), the TRA predicts behavioural intentions to correlate significantly with attitudes (Att) and subjective norms (SN). A third independent variable perceived behavioural control (PBC) was added as the third variable in the TPB model to significantly correlate with behavioural intentions. The preliminary step in testing the TRA and TPB model was to establish that correlations were significant. Pearson's bivariate correlations (r) were performed to determine correlations between behavioural intention (BI) and independent direct measures: attitude (Att); subjective norm (SN); and perceived behavioural control (PBC). Correlations were significant when the relationship between two variables had statistical effect size of 0.3 or more ( $p < 0.05$ ) and did not occur by coincidence alone (Ajzen & Fishbein, 1980).

**Table 4.12 Correlations between BI and Direct Measures of TPB**

	<b>BI</b>	<b>Att</b>	<b>SN</b>	<b>PBC</b>
<b>BI</b>	1			
<b>Att</b>	0.326**	1		
<b>SN</b>	0.319**	0.488**	1	
<b>PBC</b>	0.260*	0.314**	0.618**	1

\*\* Correlation is significant at the 0.01 level (two-tailed)  
\* Correlation is significant at the 0.05 level (two-tailed)



Results in Table 4.12 reveal that all three independent variables were significantly correlated with BI. Among the three independent variables, Attitude ( $r = 0.326$ ,  $p < 0.01$ ) and Subjective Norm ( $r = 0.319$ ,  $p < 0.01$ ) had the strongest positive correlation with BI. PBC ( $r = 0.260$ ,  $p < 0.05$ ) had the weakest correlations with BI and, as recommended by Ajzen and Fishbein (1980), should not be considered significant, as its effect size was less than 0.3 thus lacking statistical significance. Therefore, H1 and H2 are not rejected, but H3 is rejected.

**Table 4.13. Predicting Visitors' Off-trail Behavioural Intentions from Direct Measures: Multiple Regression**

Variables	r	$\beta$	R	R <sup>2</sup>	Tolerance	VIF	Condition Index
			0.384**	0.148**			
Att	0.326**	0.180**			0.547	1.829	4.202
SN	0.319**	0.212**			0.797	1.255	6.177
PBC	0.260*	0.082			0.617	1.622	7.840

\*\*p < 0.01, \*p < 0.05

In terms of predictive power of off-trail behavioural intentions, regression analysis results in Table 4.13 reveal that all independent variables (direct measures) did not show signs of multicollinearity as the variance inflation factor (VIF) of the independent variables were less than 10, tolerance values explained more than 10 percent of all three independent variables' variance, and the condition index was less than 30 for all three independent variables.

In examining the predictive power of the TPB model, all three independent direct measures together explained 14.8 percent (R<sup>2</sup>) of the variance in BI towards venturing off-trail behaviour at a significance level of  $p < 0.01$ . Examination of direct measures Att ( $\beta = 0.180$ ,  $p < 0.01$ ) and SN ( $\beta = 0.212$ ,  $p < 0.01$ ) revealed significant  $\beta$  weights towards venturing off-trail behavioural intentions. However, PBC ( $\beta = 0.082$ ) did not contribute significantly in the prediction. These results indicate that subjective norm (SN) was the strongest predictor of non-compliant behavioural intentions. This meant that the more

that visitors felt that others important to them supported their decision to venture off-trail, the greater would be their intention to do so. Although the three direct measures provided significant overall prediction in  $R^2$ , only Att and SN added significant predictive value to the overall prediction of venturing off-trail behavioural intentions. The regression model supported H1 and H2, but the inclusion of PBC to predict venturing off-trail behavioural intentions did not prove useful. This suggested that the non-compliant behaviour of venturing off-trail was a volitional behaviour within the control of visitors.

#### 4.2.8.2. Research Question 2

How are the indirect measures of the TPB associated with visitors' behavioural intentions towards venturing off-trail when visiting Blue Mountains National Park (BMNP)?

Hypothesis 4

*Visitors' indirect measure  $\sum BBiOEi$  towards venturing off-trail at BMNP is predictive of their venturing off-trail behavioural intentions at BMNP.*

Hypothesis 5

*Visitors' indirect measure  $\sum NBjMCj$  towards venturing off-trail at BMNP is predictive of their venturing off-trail behavioural intentions at BMNP.*

Hypothesis 6

*Visitors' indirect measure  $\sum CBkPFk$  towards venturing off-trail at BMNP is predictive of their venturing off-trail behavioural intentions at BMNP.*

Pearson's bivariate correlations ( $r$ ) were performed to determine correlations between behavioural intention and indirect variables. Correlations were significant when the relationship between two variables had a statistical effect size of 0.3 or more ( $p < 0.05$ ). Indirect independent variables were: Summed behavioural beliefs  $\sum BBiOEi$ ; Summed normative beliefs  $\sum NBjMCj$ ; and Summed control beliefs  $\sum CBkPFk$ .

**Table 4.14 Correlations between BI and Indirect Measures of TPB**

	BI	$\sum BBiOEi$	$\sum NBjMCj$	$\sum CBkPFk$
BI	1			
$\sum BBiOEi$	0.327**	1		
$\sum NBjMCj$	0.325**	0.447**	1	
$\sum CBkPFk$	0.317**	0.168**	0.324**	1

\*\* Correlation is significant at the 0.01 level (two-tailed)  
\* Correlation is significant at the 0.05 level (two-tailed)

Results in Table 4.14 reveal that all three independent variables were significantly correlated with BI. Indirect measure of attitude -  $\sum BBiOEi$  ( $r = 0.327$ ,  $p < 0.01$ ) had the strongest positive correlation with BI, followed by the indirect measure of subjective norm -  $\sum NBjMCj$  ( $r = 0.325$ ,  $p < 0.01$ ) and the indirect measure of perceived behavioural control -  $\sum CBkPFk$  ( $r = 0.317$ ,  $p < 0.01$ ). All three independent indirect measures had acceptable correlations effect sizes of 0.3 and above as recommended by Ajzen and Fishbein (1980). Therefore, H4, H5 and H6 are not rejected. Results from the regression analysis in Table 4.15 reveal all independent variables (indirect measures) did not show signs of multicollinearity as the variance inflation factor (VIF) of the independent variables were less than 10, tolerance values explained more than 10 percent of all three independent variables' variance, and the condition index was less than 30 for all three independent variables.

**Table 4.15. Predicting Visitors' Off-trail Behavioural Intentions from Indirect Measures: Multiple Regression**

Variables	r	$\beta$	R	$R^2$	Tolerance	VIF	Condition Index
			0.466**	0.217**			
$\sum BBiOEi$	0.327**	0.277**			0.799	1.251	3.292
$\sum NBjMCj$	0.325**	0.229**			0.736	1.358	3.750
$\sum CBkPFk$	0.317**	0.127*			0.894	1.118	5.195

\*\*p < 0.01, \*p < 0.05

In examining the predictive power of the TPB model, all three independent indirect measures collectively explained 21.7 percent ( $R^2$ ) of the variance in BI for non-compliance at a significance level of  $p < 0.01$ . Examination of indirect measures revealed all three independent variables  $\sum BBiOEi$  ( $\beta = 0.277$ ,  $p < 0.01$ ),  $\sum NBjMCj$  ( $\beta = 0.229$ ,  $p < 0.05$ ), and  $\sum CBkPFk$  ( $\beta = 0.127$ ,  $p < 0.05$ ) with significant  $\beta$  weights towards behavioural intentions to venture off-trail. These results indicate that the indirect measure of attitude  $\sum BBiOEi$  was the strongest predictor of behavioural intentions towards venturing off-trail at BMNP. This meant that as visitors developed stronger attitudes towards the action of venturing off-trail at BMNP, the greater their intention to non-comply. Interestingly, indirect measure  $\sum CBkPFk$  had the lowest contribution score ( $\beta = 0.127$ ,  $p < 0.05$ ) towards predicting BI as compared to when using direct measure - subjective norms (SN), which reported the strongest predictive value to BI. This reinforced the decision not to reject H4 to H6.

In order to better understand how indirect measures contributed to the prediction of behavioural intentions, multiple regression analysis was performed on each indirect belief item as independent variables and on behavioural intentions (BI) as the dependent variable. Standardised regression weights ( $\beta$ ) were used to examine the predictive power of each indirect belief item. The significance level of each  $\beta$  weight associated with each indirect belief item was used to test for significance. The significance level must be less than 0.05 to be considered significant. All indirect belief items were entered in a single step in the regression analysis, as shown in Table 4.16.

**Table 4.16. Regression Analysis of indirect measures on Behavioural Intentions**

Indirect Belief Items	$\beta$	Tolerance	VIF	Condition Index
Indirect measures of Attitude				
$\sum (BBi1 \times OEi1)$ - Closer view of nature	0.192*	0.335	2.989	3.122
$\sum (BBi2 \times OEi2)$ - More adventurous	-0.149	0.196	5.104	3.332
$\sum (BBi3 \times OEi3)$ - Different walking experience	0.037	0.206	4.862	4.787
$\sum (BBi4 \times OEi4)$ - Shorter route	0.297**	0.641	1.561	6.107
$\sum (BBi5 \times OEi5)$ - More freedom	0.069	0.214	4.671	6.368
Indirect measures of Subjective Norm				
$\sum (NBj1 \times MCj1)$ - Other visitors	0.124*	0.322	3.109	6.532

Indirect Belief Items	$\beta$	Tolerance	VIF	Condition Index
$\Sigma$ (NBj2 x MCj2) - My friends	0.187*	0.243	4.120	7.029
$\Sigma$ (NBj3 x MCj3) - My family	-0.117	0.275	3.643	7.608
$\Sigma$ (NBj4 x MCj4) - Tour guides	-0.043	0.317	3.153	8.164
$\Sigma$ (NBj5 x MCj5) - Park rangers	0.097	0.420	2.382	8.794
$\Sigma$ (NBj6 x MCj6) - Celebrities	-0.041	0.507	1.974	9.591
Indirect measures of Perceived Behavioural Control				
$\Sigma$ (CBk1 x PFk1) - Lack / no signage	0.129*	0.419	2.388	10.357
$\Sigma$ (CBk2 x PFk2) - Walking paths are damaged / unclear	0.012	0.395	2.531	10.413
$\Sigma$ (CBk3 x PFk3) - Lack access to park facilities	0.133*	0.619	1.616	11.445
$\Sigma$ (CBk4 x PFk4) - pathways are overcrowded	0.068	0.632	1.582	12.520
$\Sigma$ (CBk5 x PFk5) - Lack food and water	0.096	0.530	1.886	14.018
$\Sigma$ (CBk6 x PFk6) - Terrains are too challenging	0.129*	0.547	1.829	15.197

\*\*p < 0.01, \*p < 0.05

Results in Table 4.16 reveal that seven beliefs (two behavioural beliefs, two normative beliefs and three control beliefs) were significant in the prediction of BI. Among behavioural beliefs,  $\Sigma$  (BBi4 x OEi4) - Shorter route ( $\beta = 0.297$ ,  $p < 0.01$ ) was the strongest predictor. This was followed by  $\Sigma$  (BBi1 x OEi1) - Closer view of nature ( $\beta = 0.192$ ,  $p < 0.05$ ). This reflected that respondents strongly associated venturing off-trail with the perception that it would shorten their walking route and allow them to have a closer look of nature.

With regards to normative beliefs,  $\Sigma$  (NBj2 x MCj2) – My friends ( $\beta = 0.187$ ,  $p < 0.05$ ) was the strongest predictor, followed by  $\Sigma$  (NBj1 x MCj1) – Other visitors ( $\beta = 0.124$ ,  $p < 0.05$ ). This suggested that when respondents saw other visitors going off-trail, there was the likelihood that they would do the same. Likewise, a social group of friends was a strong reference group that visitors used to guide their behaviour, especially when visitors were walking into wilderness and had no choice but to rely on their group of friends as a reference point.

In relation to control beliefs,  $\Sigma$  (CBk3 x PFk3) – Lack access to park facilities ( $\beta = 0.133$ ,  $p < 0.05$ ) was the strongest predictor of BI. This suggested that visitors had some difficulty staying on designated tracks if there were not adequate park facilities available and that they were motivated to non-comply and venture off-trail at BMNP. For example,

if visitors needed to a toilet break during their walking journey and no facilities were close by, they were motivated to go off-trail to address their needs. Likewise, control belief item Terrains are too challenging –  $\sum (CBk6 \times PFk6)$  ( $\beta = 0.129, p < 0.05$ ) significantly predicted BI. This suggested that when visitors faced challenging terrains, they perceived staying on-trail as a difficulty and would non-comply and venture off-trail to walk on easier walking trails.

$\sum (CBk1 \times PFk1)$  – Lack / no signage had a similar beta value ( $\beta = 0.129, p < 0.05$ ). This suggested that visitors perceived little control over the lack / no signage in their non-compliance that leads them to venture off-trail at BMNP. In other words, visitors felt that they did not have control over the availability of signage in BMNP that had adequate information to prevent them from venturing off-trail. The results in Table 4.15 show that only certain belief items contributed significantly to the prediction of BI. These must be addressed in future social marketing campaigns, because they are the beliefs that visitors place more importance on with regards to venturing off-trail.

### **Research Question 3**

How are pro-environmental values (NEP) of visitors related to attitudes and behavioural intentions towards venturing off-trail at BMNP?

Hypothesis 7

*Visitors' Summed NEP score is positively related to attitude (Att) towards venturing off-trail at BMNP.*

This was based on Rokeach (1973) basic human values theory. Rokeach recommended that values correspond to beliefs and attitudes, which in turn shape behaviour because an individual holds certain value beliefs in life, and these beliefs “transcend into attitudes toward objects and towards situations” (p. 25).

All 15 items of the NEP scale were used as a uni-dimensional construct to measure pro-environmental views as recommended by Dunlap et al. (2000). The eight odd number questions (items 1, 3, 5, 7, 9, 11, 13 and 15) were worded so that agreement indicates a pro-environmental view. The seven even number questions (items 2, 4, 6, 8, 10, 12 and 14) were worded such that disagreement indicated a pro-environmental view. However, for the purpose of making it easier for respondents to understand, this study reverse-coded the even number questions such that a higher score of all 15 items would reflect a more pro-environmental behavioural as recommended by Dolnicar and Leisch (2008). Pearson's bivariate correlations ( $r$ ) were performed to determine correlations between attitude (Att) and Summed NEP. Correlations were significant when the relationship between two variables had a statistical effect size of 0.3 or more ( $p < 0.05$ ). The results in Table 4.18 reveal correlations between attitude (Att) and Summed NEP to be 0.011,  $p > 0.05$ . Therefore, the correlations between attitude (Att) and Summed NEP were not significant. A further test was conducted using regression analysis between attitude (Att) and Summed NEP. Summed NEP was entered as the independent variable and attitude (Att) was entered as the dependent variable.

These results indicate that NEP values were not translated into attitudes towards venturing off-trail at BMNP. Therefore, H7 is rejected. This implied that the association between values and attitudes was not significant when trying to explain non-compliant behaviour of venturing off-trail at BMNP. Interestingly, the NEP score (76.39) in this study was higher than other studies that reported and suggested mean scores of the NEP scale to be between 54 and 58 (Dunlap et al., 2000; Kotchen & Reiling, 2000; Hunter & Rinner, 2004). This suggests that visitors to BMNP had very strong pro-environmental values in general but did not associate venturing off-trail as going against their pro-environmental values.

#### Hypothesis 8

*Visitors' Summed NEP score is mediated through behavioural beliefs, attitudes and behavioural intentions.*

This analysis was conducted to test for mediation pathway relationships between the Pro-environmental values variable (NEP) with behavioural beliefs, attitudes and behavioural intentions. According to Baron and Kenny (1986), mediation is a hypothesised causal chain where one variable affects the second variable that in turn affects the third variable. The intervening variable is known as the mediator, which ‘mediates’ the relationship between the predictor (A) and the dependent variable (C). In this thesis, the Pro-Environmental Values (NEP) variable is treated as the predictor of Behavioural Intentions (BI), which is the dependent variable (C), and the behavioural beliefs and attitudes of the TPB are treated as mediators (M). In other words, the mediation test is designed to see if NEP affects Behavioural beliefs / Attitudes that, in turn, affects Behavioural Intentions. In order to test for mediation, Baron and Kenny (1986) recommended a four-step test approach:

Step 1: Conduct a simple regression analysis to see if the predictor (NEP) is positively significant with the dependent variable (BI).

Step 2: Conduct a simple regression analysis to see if the predictor (NEP) is positively significant with the mediator ( $\sum \text{BBiOEi} / \text{Att}$ ).

Step 3: Conduct a simple regression analysis to see if the mediator ( $\sum \text{BBiOEi} / \text{Att}$ ) is positively significant with the dependent variable (BI).

Step 4: Conduct a multiple regression analysis to see if the predictor (NEP) and mediator ( $\sum \text{BBiOEi} / \text{Att}$ ) are positively significant with the dependent variable (BI).

The purpose of steps 1–3 is to establish if zero-order relationships among the variables do exist. If any of the relationships are not significant in steps 1–3, it means that mediation is not possible or unlikely and one can assume that there is no mediation relationship between the variables (Baron and Kenny, 1986) In this case, Step 4 will not be necessary (Baron and Kenny, 1986; MacKinnon et al., 2007).



**Table 4.17. Testing for Mediation Relationship between NEP, Behavioural Beliefs and Behavioural Intentions Using Regression Analysis**

Mediation Test	Relationship Pathway	R	R <sup>2</sup>	Comments
Step 1	NEP → BI	0.008	0.000	Relationship Not Significant
Step 2	NEP → ∑BBiOEi	0.083	0.007	Relationship Not Significant
Step 3	∑BBiOEi → BI	0.372	0.138**	Relationship Significant
Step 4	NEP + ∑BBiOEi → BI	0.374	0.140**	Not required as Steps 1 and 2 were not significant

\*\*p < 0.01, \*p < 0.05

In the above pathways, A is seen as the predictor (NEP), B is seen as the mediator (∑BBiOEi), and C is seen as the dependent variable (BI)

**Table 4.18. Testing for Mediation Relationship between NEP, Attitudes and Behavioural Intentions Using Regression Analysis**

Mediation Test	Relationship Pathway	R	R <sup>2</sup>	Comments
Step 1	NEP → BI	0.008	0.000	Relationship Not Significant
Step 2	NEP → Att	0.011	0.000	Relationship Not Significant
Step 3	Att → BI	0.326	0.106**	Relationship Significant
Step 4	NEP + Att → BI	0.326	0.106**	Not required as Steps 1 and 2 were not significant

\*\*p < 0.01, \*p < 0.05

In the above pathways, A is seen as the predictor (NEP), B is seen as the mediator (Att), C is seen as the dependent variable (BI)

As can be seen in tables 4.17 and 4.18, steps 1 and 2 were not significant in the relationship path between NEP with Behavioural Intentions and Behavioural beliefs / Attitudes. A possible explanation for these results could be because values are universal and act as an external motivator; however, these values will only influence beliefs towards a behaviour, and forming attitudes towards the particular behaviour will only occur if an individual perceives the importance and relevance of these values to the specific behaviour. Despite values being defined as a set of beliefs of desirable conduct used to guide their behaviours (Rokeach, 1973; Schwartz, 1992), they can only influence beliefs, attitudes and behaviours when individuals associate with and trigger these values for a specific behaviour. The association between values and behavioural beliefs /

attitudes in this thesis was not significant when trying to explain non-compliant behaviour of venturing off-trail at BMNP. Therefore, the hypothesis (H8) on mediation relationship between values, beliefs, attitudes and behaviour is rejected.

Given that the mediation relationship between NEP values, beliefs, attitudes and behaviour was rejected, a further test was conducted to see if the NEP value had any significant direct associations with behavioural intentions. Pearson's bivariate correlations ( $r$ ) were performed to determine correlations between Summed NEP with behavioural intentions (BI). Correlations are significant when the relationship between two variables has a statistical effect size of 0.3 or more ( $p < 0.05$ ). The results in Table 4.19 reveal that correlations between Summed NEP and behavioural intentions (BI) were not significant at  $r = 0.002$ ,  $p > 0.05$ . Therefore, the correlation between Summed NEP and behavioural intentions of TPB was not significant.

**Table 4.19. Stepwise Regression using TPB Direct Measures and Summed NEP on Behavioural Intentions**

Variables	$r$	$\beta$	$R$	$R^2$	$\Delta R^2$	Tolerance	VIF	Condition Index
			0.384**	0.148**				
Att	0.326**	0.180**			-	0.547	1.829	4.202
SN	0.319**	0.212**			-	0.797	1.255	6.177
PBC	0.260*	0.082			-	0.617	1.622	7.840
NEP	0.002	0.001			0.000	0.997	1.003	13.320

\*\* $p < 0.01$ , \* $p < 0.05$

A further test was conducted using NEP items to predict behavioural intentions using Stepwise regression analysis to determine if there was a significant change in regression scores after the NEP variable was included. The three TPB direct variables (Attitude, Subjective Norm, and Perceived Behavioural Control) were entered in the regression analysis as the first step followed by the NEP variable as the second step. The change in regression score was significant if the change in  $\Delta R^2$  was  $p < 0.05$ . The results in Table 4.19 reveal that the NEP variable did not contribute to the prediction of behavioural intentions significantly ( $\beta = 0.001$ ). Therefore, this suggests that although visitors to BMNP had very strong pro-environmental values, they did not associate their NEP

general values with venturing off-trail. In other words, the act of venturing off-trail at BMNP was not seen as a violation of their pro-environmental values.

## 4.3. Discussion

### 4.3.1. Discussion: Research Objectives 1 and 2 – Visitors' attitudes, subjective norms, perceived behavioural control, and behavioural intentions towards engaging in non-compliant behaviour of walking off-trail at BMNP.

#### 4.3.1.1. Behavioural Intentions using TRA / TPB

In terms of explanatory power, the TRA model, using direct measures, explained 14.8 per cent ( $R^2 = 0.148$ ,  $p < 0.01$ ) of variance in the prediction of non-compliant behavioural intentions to venture off-trail at BMNP, and indirect measures explained 21.7 per cent ( $R^2 = 0.217$ ,  $p < 0.01$ ). This predictive value was slightly lower than past TRA/TPB studies reporting variances of 20 to 50 percent in behavioural intentions (Ajzen, 1991; Armitage & Conner, 2001; Godin & Kok, 1996; Sheeran et al., 2001). The present study finds indirect measures to be better predictors of behavioural intentions compared to direct measures, which supports past studies that reported similar results (Chan & Fishbein, 1993; Richardson et al., 1997; Fazekas et al., 2001; Goh 2011). Ajzen (1991) recommended that direct measures be used to explain behavioural intentions and that indirect measures be used to explain specific insights into beliefs influencing their behavioural intentions.

However, these findings must be treated with caution, because direct measures and indirect measures in the present study produced a different set of results. Direct measures reported subjective norms (SN) ( $\beta = 0.212$ ,  $p < 0.01$ ) as the stronger predictor of behavioural intentions over attitudes (Att) ( $\beta = 0.18$ ,  $p < 0.01$ ). Indirect measures reported indirect attitudes –  $\sum BBiOEi$  ( $\beta = 0.277$ ,  $p < 0.01$ ) as the stronger predictor over indirect subjective norms –  $\sum NBjMCj$  ( $\beta = 0.229$ ,  $p < 0.01$ ). In other words, there were inconsistencies in beta ( $\beta$ ) weights between the direct and indirect measures. These inconsistencies in  $\beta$  weights may be explained by the respondents' perceptions of the nature of simple direct measures compared to more specific belief items. The general items (social pressure, most of the people important to me, and expected of me) used to

measure direct measures of subjective norm could easily be related directly to the behaviours of the respondents in the present study. However, the direct measure of attitudes (desirable, good, wise, favourable) may be too general and respondents may not have identified specific behavioural beliefs that directly related to the behaviour of venturing off-trail.

#### **4.3.1.2. Direct and Indirect measures of Perceived Behavioural Control**

In addressing research questions 1 and 2, results from the regression analyses show direct measure ( $\beta = 0.082$ ) of PBC to be not significant, and indirect measure ( $\beta = 0.127$ ,  $p < 0.05$ ) of PBC to be significant in the prediction of behavioural intentions. These inconsistencies in  $\beta$  weights may be explained by the respondents' perceptions of the nature of simple direct measures compared to more specific belief items. The direct measure of PBC (e.g., confidence, completely up to me) may be too general and respondents may not have identified specific control beliefs that directly related to the behaviour, whereas indirect measures (e.g., lack of signage, avoid damaged trails) of PBC could be easily related directly to the non-compliant behaviour of venturing off-trail by the respondents in the present study. This is not surprising, with other researchers (Chan & Fishbein, 1993; Richardson et al., 1997; Fazekas et al., 2001; Goh, 2011) also finding that indirect measures could better predict behavioural intentions. In discussing the results of this present study, the use of direct measures of PBC will be used to explain behavioural intentions, and the use of indirect measures of PBC will be used to explain specific insights to beliefs influencing their behavioural intentions as recommended by Ajzen (1991).

In the present study, PBC was not significant in predicting behavioural intentions. This result differs from those of past studies (Ajzen, 1991; Godin & Kok, 1996; Hausenblas et al., 1997; Armitage & Conner, 2001; Lam & Hsu, 2004) where PBC was usually a significant and strong predictor of behavioural intentions. However, Ajzen (1991) warned that not all behaviours are volitional in nature. Past studies have also reported PBC to be not significant in understanding certain behaviours such as wine drinking (Thompson & Vourvachis, 1995; Van Zanten, 2005), buying lottery tickets (Sheeran & Orbell, 1999),

and selecting public schools (Goh, 2011). Results of the present study suggest that the Theory of Reasoned Action (TRA) was more suitable for predicting non-compliant behavioural intentions of venturing off-trail at BMNP. This sees behavioural intentions of visitors venturing off-trail at BMNP under the volitional control of visitors. In other words, respondents in this study felt confident and found it easy to venture off-trail.

There are a few explanations for the non-contribution of the control variable in the prediction model in this study. First, it could be due to new and unfamiliar elements having entered the situation (Ajzen, 2005). In non-compliant behaviours, Manning (1999) referred to these as interpretations of surrounding situational circumstances. For example, Bradford and McIntyre (2007) found 88 percent of visitors in their study ventured off-trail because of the absence of warning signs. This is not surprising, as Allesas et al. (2003) found that 84 percent of hikers who ventured off-trail were not aware of their non-compliance. In a new environment or unfamiliar situation, it is easy for visitors to non-comply, especially without any visible signage to guide them in the right direction. Results from the indirect measures of PBC in the present study support this view. As reported in Table 4.15, visitors to BMNP had a significant beta score ( $\beta = 0.129, p < 0.05$ ) for  $\sum(CBk1 \times PFk1) - \text{Lack / no signage}$ . This suggests that visitors were motivated to venture off-trail because there was a lack or absence of signage at BMNP to inform and guide visitors along the walking trail.

Second, the absence and limited presence of Park authorities to cover the entire BMNP makes it easier to venture off-trail without being noticed and prosecuted. Visitors relied on and perceived uniformed park authorities to be an information source or to police areas that are dangerous. For example, overseas visitors have been found to non-comply as they take less personal responsibility when overseas, coupled with the belief that if an area were unsafe, they would not have been able to enter the site (Bentley et al., 2001). The lack of park authorities on patrol lowers and removes the perceived difficulty in visitors to non-comply. Similarly, Hendricks et al. (2000) reported that mountain bikers did not adhere to designated bike trail when uniformed officers were not present. With BMNP's massive 1.03 million hectares of natural environment, however, it is impossible

for park authorities to patrol the entire area. Thus, the opportunity for visitors to non-comply and venture off-trail is significantly increased.

In relation to specific control beliefs, there were three control beliefs that were significant in the prediction of venturing off-trail at BMNP. Firstly,  $\sum(\text{CBk3} \times \text{PFk3})$  – Lack of access to park facilities ( $\beta = 0.133$ ,  $p < 0.05$ ), was the strongest predictor of non-compliant behavioural intentions of venturing off-trail at BMNP. This suggests that visitors perceived this as a difficulty in staying on-trail due to the limited access to park facilities, and were motivated to non-comply and venture off-trail to search for substitutes in BMNP. For example, if visitors needed a toilet break during their walking journey and if there weren't toilet facilities around, they were motivated to go off-trail to search for a private spot to address their needs. This was similar to past non-compliant studies where researchers reported limited access to park facilities as a key motivator in non-compliant behaviours at national parks. For example, Ham et al. (2008), and Brown et al. (2010) reported that non-compliers littered at national parks due to the lack of litterbins within the parks, and that they were not motivated to hold on to their own litter or others' litter. Similarly, Lackey and Ham (2004) reported the lack of park facilities of food storage lockers provided by the national park as perceived difficulties that prevented visitors from storing their food properly, and as a result this led to the illegal feeding of bears. Nesbitt (2006) also reported that dog owners non-complied and let their dogs off leash in national parks as there was a lack of designated areas within national parks for dogs to roam freely. With regards to this study, Park Management at BMNP should provide more park facilities such as portable toilets at strategic points along trails, as most toilet facilities are currently located near the entry points of the national park. Given this, it is not surprising that visitors were motivated to venture off-trail in the midst of their walk.

The second significant control belief was the Lack / no signage  $\sum(\text{CBk1} \times \text{PFk1})$  ( $\beta = 0.129$ ,  $p < 0.05$ ). This suggests that visitors perceived little control over the lack / no signage in their non-compliance that motivated them to venture off-trail at BMNP. Past studies have reported this to be a key reason for non-compliant behaviours in national parks. For example, Allesa et al. (2003) found that 84 percent of visitors in Blue Ridge Parkway ventured off-trail due to a lack of signage near the non-compliant area. Bradford

and McIntyre (2007) reported similar findings where 88 percent of visitors ventured off-trail when no signs were present. They also reported 87 percent of visitors ventured off-trail as they found signs at the information booths were too far from the non-compliant site and, by the time they got into the national park, it was difficult to identify the actual non-compliant site. Clearly, most visitors have a common naïve view that if it was unsafe or off limits, someone (park management) would have informed them through signage or park authorities (Espiner, 2001). Like most national parks, however, the BMNP covers a vast area, in this case 1.03 million hectares, which makes it difficult to cover every single restricted area. More importantly, most visitors saw national parks as a leisure venue that should provide a sense of freedom and that signage had a negative impact on this freedom and reduced their recreational experience.

However, warning and regulatory signage are important in preventing misadventures related to non-compliance off-trail ventures, and park authorities must continue to improve signage presence at key no entry areas. More importantly, BMNP must be careful in communicating park opening hours, especially when they have to close due to poor weather or fire danger. The information provided by BMNP must be more specific and avoid general statements such as “some parts of the park close overnight and details are provided at specific site locations”. In general, this information is problematic as 1) It indirectly invites visitors to visit the park at night, which can be dangerous, and 2) it does not specify which sites are closed overnight. This lack of information means that visitors only learn about certain site closure upon arrival, at which point most would simply ignore the closure sign as they have invested time and effort to travel all the way to the national park. The absence of information from Park Management can motivate visitors to non-comply and venture off-trail, as visitors possess a certain level of expectation to rely on them to inform and provide appropriate facilities for safe access. If sufficient and clear information is available to visitors, their motivation to venture off-trail would decrease. Hence, more information about specific sites within BMNP needs to be provided on the BMNP website, and brochures about regulations and restrictions provided at specific sites. To discourage visitors from walking on trails after dark or during certain periods, it is recommended that BMNP implements site restrictions through temporal limitations at certain times of day (e.g., all park recreational facilities



will be available from 8am – 6pm), or seasonal closure (e.g., all walking trails will be closed during winter or rainy season).

Another key significant control belief item – challenging terrains  $\sum (CBk6 \times PFk6)(\beta = 0.129, p < 0.05)$  – motivated visitors to venture off-trail at BMNP. This suggests that visitors perceived some difficulties in staying on designated trails and were motivated to venture off-trail when faced with challenging trails during their walk. Most visitors should employ basic common sense and choose trails that match their levels of competency. However, some visitors inflate their competencies and believe that they are capable of handling challenging terrains even before starting their walk; they are then faced with the decision to venture off-trail when confronting challenging terrains. For example, Parkin (2003) reported that regular visitors who claimed to be ‘experts’ were repeat non-compliers who ventured off-trail to swim in rock pools in the national park. These non-compliers felt confident about the terrain and even if they knew of past accidents at the rock pool, they believed that a similar accident would not happen to them as they were experts. Espiner (2001) reported that 70 percent of visitors to Fox Glacier National Park in New Zealand expressed confidence in crossing safety barriers to get closer to the glacier because they felt it involved minimal risk. The thought process of choosing suitable trails and avoiding challenging trails can be assisted indirectly by national parks. In order to better manage visitor expectations about difficulty levels of trails, BMNP should provide more information about the difficulty of trails at the entrance of BMNP and also communicate this at the beginning of all trails. The current information of trail difficulty is provided through the BMNP website. However, most visitors need a reality check when they are physically on the trails, because adrenalin can temporarily inflate their perceptions of their own capabilities. If terrains are too challenging for visitors to handle upon commencement of the trail, they may look for easier alternatives. This is often the case in the midst of a walking trail where there is only a single on-trail pathway, and it is either a case of turning back and returning to where the visitor walked from, or going off-trail in search of an alternate easier route. Besides providing information about the difficulty level of trails, BMNP could divide walking trails into different difficulty zones. For zones with extremely difficult trails, all visitors should be required to sign out and carry an EPIRB (Emergency Position

Indicating Radio Beacon) GPS based system so that Park Rangers can easily locate them in cases of emergency. To encourage visitors to carry a safety beacon, the issuing of EPIRBs would need to be decentralised to include both the entrances to the park and the starting points of these difficult zones.

#### **4.3.1.3. Direct and Indirect measures of Subjective Norm**

Results in this study report both direct ( $\beta = 0.212, p < 0.01$ ) and indirect measures  $\sum(NB_j MC_j)$  ( $\beta = 0.229, p < 0.01$ ) of subjective norms to be significant. The correlation between direct and indirect measures of subjective norms was significant ( $r = 0.611, p < 0.01$ ). This sees subjective norms as a key determinant of off-trail behaviour, and can be linked to social norm violations as described by Gramann and Vander Stoep (1987). Two social groups were significant in the prediction of BI towards venturing off-trail.  $\sum(NB_{j2} \times MC_{j2})$  – My friends ( $\beta = 0.187, p < 0.05$ ) was the strongest predictor, followed by  $\sum(NB_{j1} \times MC_{j1})$  – Other visitors ( $\beta = 0.124, p < 0.05$ ). This suggests that when respondents saw other visitors and their friends going off-trail, there was the likelihood that they would do the same. Thus, these two social groups have the potential to help guide visitors' behaviour at BMNP, especially when visitors are in the wilderness and they have no choice but to rely on their group of friends and other visitors as reference points. This is consistent with past studies reporting non-complying visitors to have an influencing effect on others to engage in off-trail behaviour, such as climbing over safety barriers (Hayes, 2008; Ramachandran, 2009); letting dogs off leash in restricted areas (Nesbitt, 2006; Ham et al., 2008); and swimming in restricted rock pools (Beckmann, 1995; Parkin, 2003; Parkin & Morris, 2005).

One possible explanation for this copying behaviour in the present study is rationalising. If other visitors are walking off-trail at BMNP, visitors may see this behaviour as normal and not harmful. Friends in the present study also proved to be significant, and added social pressure in influencing visitors to engage in off-trail behaviour. This rationalised their behaviour to engage in off-trail behaviour and therefore they saw nothing wrong in doing so. This pressure from others can be explained as a form of social norm violation

known as status conforming violations where visitors are encouraged and supported by friends to engage in off-trail behaviour (Gramann & Vander Stoep, 1987). The pressure to conform to social norms in venturing off-trail can also be explained using Ajzen's (1991) version of subjective norms, where individuals were motivated to venture off-trail because of peer pressure to conform to the group. The predictive power of subjective norms in past TPB meta-studies has been reported to be the weakest predictor of behavioural intentions (Armitage & Conner, 2001; Godin & Kok, 1996; Sheppard et al., 1988). However, findings in the present study report direct measures of subjective norms ( $\beta = 0.212$ ,  $p < 0.01$ ) to be the strongest predictor of behavioural intentions over the other attitudes and perceived behavioural control. This strongly suggests that venturing off-trail is a normatively driven behaviour. This contributes to past TPB studies suggesting that certain behaviours such as spending time on schoolwork (Miller & Grush, 1984), non-opinion leaders to patronise credit unions (Arie et al., 1979), going into debt on credit cards (Trafimow & Finlay, 1996), sun-protective behaviour (Terry and Hogg, 1996), binge drinking (Latimer & Ginis, 2005), and tax compliance (Bobek et al., 2013) can be seen as normatively driven and may even be the strongest predictor of certain behaviours. Although attitudes have predominantly been reported to be the strongest influencing factor of behaviours (Ajzen, 1991; Godin & Kok, 1996; Armitage & Conner, 2001), there could be certain behaviours that are normatively driven and seen as more important for certain people, especially for those who are highly concerned about receiving disapproval from others. One interesting study by Shresth and Burns (2009) also pointed out the importance of facilities and services in Parks to be designed to meet the requirement of social groups than individual needs.

Therefore, there is a possibility that non-compliant behaviours such as off-trail walking are normatively driven where social norms about what behaviours are right and wrong in a given walking situation are widely accepted. These normative beliefs are important social cues that transform into a set of social standards that are then used to evaluate an individual's actions (Heberlein, 1972; Samdahl & Christensen, 1985). This evaluation of an individual's actions as to whether they are right or wrong is reinforced when important reference groups support the individual's decision to non-comply. For example, even though BMNP authorities do not allow visitors to walk off-trail, visitors saw this

behaviour as acceptable. Therefore, if the general public (other visitors and friends) supports off-trail behaviour at BMNP, this non-compliant behaviour is seen as acceptable and reinforced when visitors see them going off-trail.

One solution to addressing off-trail behaviour is to address normative pressure through the use of preventive messages appealing to normative groups important to non-complying visitors such as “A true friend will not force his mate to go off the trails”, “Do not follow others”, “Be a man, do the right thing and stick to the path”. The second recommendation is to enforce regulations and fines to visitors who venture off-trail at BMNP. Generally, NSW Park authorities operate under the National Parks and Wildlife Regulation (NPW) ACT 2009 (NSW Legislation, 2013). Park authorities can prosecute visitors who venture off-trail under Part 2, Division 3, Clause 13 of the NSW ACT 2009 as “offensive conduct” to send a clear message to non-compliers, especially given that results from the current study and past studies have reported that the actions of other visitors is a significant motivator in venturing off-trail.

#### **4.3.1.4. Direct and Indirect measures of Attitude**

Results in this study reported both direct ( $\beta = 0.18, p < 0.01$ ) and indirect measures of attitudes  $\sum BBiOEi$  ( $\beta = 0.277, p < 0.01$ ) to be significant. The correlation between direct and indirect measures of attitudes was significant ( $r = 0.674, p < 0.01$ ). This sees attitudes as a key determinant of off-trail behaviour, as previously reported by Ham et al. (2008) and Brown et al. (2010).

Two behavioural beliefs were significant in the prediction of BI towards venturing off-trail.  $\sum(BBi4 \times OEi4)$  – Shorter route ( $\beta = 0.297, p < 0.01$ ) was the strongest predictor, followed by  $\sum(BBi1 \times OEi1)$  – Closer view of nature ( $\beta = 0.192, p < 0.05$ ). This suggested that respondents strongly associated venturing off-trail with the perception that it will shorten their walking route and allow them to have a closer look at nature. Past studies have also reported getting closer to nature as one of the key attitudinal reasons for non-compliance at national parks. For example, Hayes (2008) reported that visitors’ attitudes toward protective recommendations were that these recommendations were

unrealistic. They prevented visitors from having a good scenic view, and therefore these attitudes influenced their decision to non-comply and go off-trail. As mentioned above, two Australians were killed at Fox Glacier National Park in New Zealand after they climbed over barriers to take close-up photos of the glacier and a section of ice collapsed on them (Ramachandran, 2009). In a study at Badger Weir National Park in Australia, Hams et al. (2008) found behavioural beliefs to exert the greatest influence over the formation of attitudes and behavioural intentions towards non-compliance. Visitors believed that they had to feed the birds in order to have a closer view of them. This behavioural belief motivated their actions to feed the birds illegally despite signage informing visitors not to do so.

With regards to strategies to address the perceptions of visitor that venturing off-trail created a shorter route, there are several measures that Park Management could implement. Firstly, BMNP should look into the possible issue of overcrowding and determine the number of visitors that can be absorbed without compromising park facilities. Although this management framework sounds like a good tool, park authorities are quite reluctant to adopt it given the lack of statistical data that shows a direct relationship between the number of visitors and associated impacts. As pointed out by Hill and Pickering (2002), there is a lack of statistical data because no systematic and transparent ways have been developed to measure carrying capacity and acceptable thresholds for activities and areas. Therefore, it is not surprising that park managers are reluctant to monitor visitor numbers and often see this as a low priority due to its threshold ambiguity. However, this present study recommends that site capacity at BMNP be calculated based on standards of 300 visitors per 1 acre of space to monitor certain popular walking trails such as Echo Point and Valley of the Waters. This restriction of no more than 300 visitors per 1 acre of walking space is based on the recommendation of Charles Lay (1914) who estimated that all park facilities should meet the standard of one acre per 100 people (Butler, 1959, 1962). However, this general rule has been modified slightly given the increase in population and that more Australians walk more than three times each week. This is especially obvious in densely populated cities where one acre per 300 people has been recommended for cities with over a million inhabitants (Krizek et al., 2009).

Another direct management technique is through zoning schemes used by Australian park authorities to determine parkland for specific purposes (Fluker & Richardson, 2004). In BMNP, zoning can be used to delineate where certain activities are allowed and restricted. Zoning strategies can be enforced to regulate capacity at BMNP to limit off-trail behaviour through restrictions on types of equipment permitted (e.g., no BASE jumping equipment allowed in park), acceptable size of party groups (e.g., no more than 50 visitors in a group), permitted activities (e.g., dogs off leash area), and maximum length of stay allowed (e.g., overnight permits are valid only for two days). In relation to the non-compliant behaviour of venturing off-trail, the present study recommends the zoning of certain trails for light travel only, which means no bicycles, camping equipment, abseiling or canyoning apparatus would be allowed. This study also suggests a creative solution to divide existing walking paths into two separate parallel paths for clearer flow of traffic from opposite directions. In this way, visitors returning from their walk would not obstruct those eager walkers who had just started and were full of energy and might choose to venture off-trail to pick up momentum. Another suggestion is to provide a ‘fast lane’ designated for ‘experts’ or visitors with a high level of fitness who might see walking as a competitive sport.

This is recommended for trails at BMNP that have high visitor traffic such as Echo Point Lookout and Charles Darwin Walk. If visitors notice that certain trails that they would like to use to get their destinations are overcrowded, they might resort to taking short cuts to save time. This is reported in the present study of behavioural belief 4:  $\sum (BBi4 \times OEi4) - \text{Shorter route} (\beta = 0.297, p < 0.01)$ . The second zoning measure that could help to reduce off-trail walking is the zoning of dedicated areas for a closer view of nature. This is a significant contribution as reported in the present study, where visitors reported having intentions to venture off-trail to have a closer view of nature –  $\sum (BBi1 \times OEi1) (\beta = 0.192, p < 0.05)$ . For example, zoning could include having designated bird watching lookout points with binoculars along walking trails for visitors to have a closer view at endangered birds. Another suggestion is to have a collection of flora in a designated garden area where visitors could appreciate nature closely in a safe environment. A park ranger could also provide more information about the plants on a more personal level,

thus providing a safer and collective social platform for plants enthusiasts to take photos and exchange ideas.

Results in the present study about attitudes towards off-trail walking displayed similar trends to those in past TPB studies that investigated non-compliant behaviour in national parks. Past studies have reported the usefulness of attitudes in explaining non-compliant behaviour and intentions. For example, Lackey and Ham (2004) reported that campers perceived proper food storage as inconvenient and thus developed a negative attitude towards compliance. This resulted in campers choosing not to store their food properly and increased campers' intentions to illegally feed wildlife at national parks. The relaxed attitude of "It's Ok and not a big deal" mentality was also reported in several past TPB studies about non-compliance at national parks. For example, Ward and Roggenbuck (2003) reported that visitors perceived taking small pieces of petrified wood from national parks as an acceptable minor issue that would not hurt anyone. Similarly, Nesbitt (2006) reported the attitudes of dog owners to be the strongest motivator in letting their dogs off leash. They reported dog owners to have the strongest positive attitude ( $\beta = 0.592, p < 0.01$ ) towards "Sometimes it is OK if a dog runs off leash" and this attitude influenced their decision to let their dogs off leash. A similar study by Ham et al. (2008) reported that dog owners held strong attitudes about their dogs not having enough exercise if their dogs were kept on a lead, and that there was nothing wrong in letting dogs have a little fun. Thus, these strong behavioural beliefs helped shape and influence their non-compliant behaviour in letting dogs off leash. The relaxed attitude of visitors outlined above could be due to the lowering of self-consciousness that occurs when individuals participate in recreational activities (Espiner, 2001), as walking in parks is naturally seen as a leisure activity that embodies a sense of freedom and free choice in both thoughts and actions. In addition, these relaxed attitudes create higher expectations of visitors to rely on park authorities to inform and provide appropriate facilities for safe access as they take less responsibility for themselves (Bentley et al, 2001). Therefore, if there are no signs or park authorities informing visitors at BMNP that taking short cuts and getting too close to nature can be dangerous and result in accidents, visitors will assume that it is safe to do so. Espiner (2001) reported that most visitors believed that "we wouldn't be allowed to come here if it wasn't safe". This relaxed attitude influences

visitors to venture off-trails as the probability of getting injured or being caught by park enforcement in nation parks are often minimal. To a certain extent this is true, as BMNP has a large area of 1.03 hectares of bushland and therefore it is impossible to place signage and safety barriers throughout the Park. Further, the overuse of regulatory and safety barriers could contradict the nature recreation experience and create dissatisfaction among visitors (Frost & McCool, 1988; Duncan & Martin, 2002; Freuler & Hunziker, 2007). Therefore, there is a need to maintain a balance by lowering barriers and providing visitors with appropriate information and infrastructure to influence their attitudes towards non-compliant behavioural change.

### **4.3.2. Discussion: Research Objective 3 – Environmental values behind visitors' non-compliant behaviour of walking off-trail at BMNP.**

#### **4.3.2.1. Environmental Values (NEP) and Attitude**

Results in Table 4.18 revealed weak correlations between attitude (Att) and Summed NEP ( $r = 0.011$ ,  $p > 0.05$ ). In addition, the regression analysis between attitude (Att) and Summed NEP reported  $R^2 = 0.148$ ,  $p < 0.01$  towards non-compliant attitudes of venturing off-trail at BMNP. The total score of NEP items was 76.39, which demonstrated that respondents had a relatively high NEP score out of the maximum possible total NEP score of 105 (Dunlap et al., 2000). Upon checking the internal consistency of the NEP items in this study, it revealed highly reliable Cronbach's alpha readings of 0.902. This is consistent with past NEP studies reporting average Cronbach's alpha of 0.81 (Dunlap and Van Liere, 1978). The alpha readings of the NEP items also met the recommended threshold reliability for mature scales by Nunnally and Bernstein (1994) who recommended the minimum reliability of 0.8 for a mature scale. Therefore, while the NEP items in this study measured its intended measurement of pro-environmental values about the environment in general, these pro-environmental values did not translate into attitudes. One possible explanation for the low correlations between NEP and attitudes could be due to the usefulness of values in understanding general behaviour whereas attitudes are more useful in addressing specific behaviours (Rokeach, 1973; Ettinger et al., 1994; Feather, 1999; Vaughan & Hogg, 2013). Attitudes exert directive influence on



related situations and guide our choices and decisions for action (Allport, 1935; Ajzen, 2001; Hogg & Vaughan, 2013). Attitudes tend to be either positive or negative evaluations of something quite specific (Dietz, 2005, p. 346); hence, in this present study the focus is on off trail walking specifically and not about the general environment.

As defined by Stern et al. (1995), environmental values are general values that individuals refer to if they need them in a situation that concerns environmental issues or values that are specific to the environment topic of interest. For example, most of the studies cited in the literature review reported visitors having high NEP scores towards their perception of environmental issues in general, such as identifying different environmental groups (Silverberg et al., 1996; Floyd et al., 1997); environmental reasons for travelling (Beaumont, 2001; Lawton, 2001); and perceptions of environmental resources (Wanjobi, 2005; Wurzinger & Johansson, 2006; Luo & Deng, 2008). It is therefore not surprising that some studies in values and attitudes do not reach a common conclusion, and the values and attitudes influencing behaviours are as varied as the behaviour itself (Schwartz, 1992; Grube et al., 1994). In the situation of venturing off-trail at BMNP, although visitors reported a mid range NEP score of 76.39 out of 105, this may have meant that they had strong pro-environmental values about the environment in general but did not refer to these pro-environmental values when venturing off-trail. Alternatively, the present results could suggest that visitors do not see the act of walking off-trail as a violation of their pro-environmental values. This finding is different from the finding by Wurzinger and Johansson (2006) nature-based tourists had pro-environmental attitudes in participating in activities that benefited the ecosystem of the park.

A second possible explanation for the lack of correlations between Summed NEP and attitudes is due to the social environment where visitors seek approval about their non-compliant behaviour of venturing off-trail. Vaughan and Hogg (2013) stated that this social validation makes it difficult in values research to determine behaviour influenced by certain values, as well as the determination itself. In other words, the action to participate in pro-environmental behaviours could be due to or determined by the social groups rather than the individual's own values. This notion is possible as both direct ( $\beta =$

0.212,  $p < 0.01$ ) and indirect  $\sum(N_i \times M_i)(\beta = 0.229, p < 0.01)$  subjective norms in this study were significant in the prediction of non-compliant behavioural intentions of walking off-trail.

The third possible reason is the debatable question of whether the NEP scale measured a single construct or is inherently multidimensional, as heavily argued by Dunlap et al. (2000). Although the present study did not investigate if the NEP scales measured single or multidimensional constructs, as this was not the main objective of the thesis, past studies have reported that NEP items could be measuring more than one construct. For example, Gooch (1995), and Scott and Willits (1994) found the NEP items measured two constructs, Shetzer et al. (1991) reported three, Roberts and Bacon (1997), Furman (1998), and La Trobe and Acott (2000) identified four, and Geller and Lasley (1985) reported NEP items to be measuring five constructs of environmental concern. This meant that there could be a possibility that the NEP items measured other constructs besides pro-environmental behaviour, which could be a case of misinterpretation by visitors to BMNP due to the actual design of the NEP scale itself. Researchers (e.g., Kalof & Satterfield, 2005) have argued that the power of values in research can only be reliable if there is an equal understanding of the values in question between researchers and respondents.

The above contributes to the debate on whether environmental values or attitudes are more important in understanding behaviours. Results from this present study suggest that environmental values are important in understanding general environmental behaviours, and if the topic of study (in this case is venturing off-trail at BMNP) is not perceived as an environmental issue, the role of attitudes is more suitable in understanding a specific behaviour. As seen in this study, attitudes had a higher correlation score ( $r = 0.326, p < 0.01$ ) as compared to pro – environmental values ( $r = 0.002, p > 0.05$ ) with behavioural intentions. The results of this study also support the view that attitudes are more stable than values in predicting certain situations and behaviours more specifically, whereas values are based on principles about society in general (Rokeach, 1973; Ettinger et al., 1994; Feather, 1999; Vaughan & Hogg, 2013). This was evident in the high NEP score of 76.38 reported in the present study, which reflects respondents holding strong pro-

environmental values towards general environmental issues, even though these pro-environmental values were not significant in the prediction of the specific behavioural intention of off-trail walking. Pro-environmental values (NEP) reported a non-significant 0.000,  $p > 0.05$  change in  $\Delta R^2$  as seen in Table 4.19, which strongly suggests that pro-environmental values are not as important as attitudes in the prediction of off-trail walking behaviour. This is not surprising as Schwatz and Bardi (2003) stated that it has not yet been proven that values generally influence behaviours; rather only in some cases do values play a part in changing behaviours. According to Ajzen (2005), values influence behavioural intentions through indirect and direct measures and, ultimately, attitudes and other direct measures of the TPB are the main predictors of behaviours. This is important because it validates and supports researchers in social psychology who view attitudes as the main concept for predicting behaviours (Rohan, 2000; Vaughan & Hogg, 2013). Since values are translated into a set of attitudes as part of their definition, research about either attitudes or values can still overlap or be useful to the other (Chaiken et al., 2001). Findings of this present study reveal that although BMNP visitors held general pro-environmental values in terms of agreeing that humans are severely abusing the environment, they did not see the act of venturing off-trail as abusing the environment. This finding is important as it suggests two implications: 1) Visitors could be associating off-trail walking with normal behaviour and that it has limited impact on the environment; or 2) Visitors who were non-compliant and walked off-trail believed that as they were only slightly off the path, this was justifiable behaviour.

#### **4.3.2.1. Environmental Values (NEP), TPB Attitudes and Behavioural Intentions**

In addressing H8, results in Table 4.19 reveal correlations between Summed NEP and behavioural intentions of TPB ( $r = 0.002$ ,  $p > 0.05$ ) to be not significant. One possible reason for the non-significance in correlations between Summed NEP values and behavioural intentions is that attitudes are more specific (Fishbein, 1967) about a particular behaviour, whereas values are more useful in understanding general behaviour (Rokeach, 1973; Ettinger et al., 1994; Feather, 1999; Vaughan & Hogg, 2013). Likewise,

attitudes are more general than beliefs but more specific than values in understanding specific behaviours (Schwartz & Bilsky, 1987; Vaughan & Hogg, 2013).

It is interesting to note that the role of pro-environmental values in this present study did not demonstrate the overarching pyramid effect that Fulton et al. (1996) referred to in that values were fundamental cognitions that serve as a foundation and flow down to influence beliefs and attitudes. One could argue that perhaps the off-trailers in this present study held certain values in life and these values transcended attitudes towards specific situations other than walking off-trail at national parks. Nevertheless, results of the pro-environmental values in this study must not be dismissed completely.

In relation to this thesis, one could interpret from the results that BMNP visitors had strong pro-environmental values towards the general environment as demonstrated in their high NEP score of 76.38, and some of these pro-environmental values were related to their behavioural beliefs and attitudes toward venturing off-trail at BMNP. There is a possibility that some of the NEP specific items could be slightly related to attitudes or behavioural intentions. For example, Luo and Deng (2008) reported that tourists at national parks who had stronger pro-environmental values towards an eco-crisis tended to be more motivated to be close to and learn about nature. Other past studies that examined the NEP values towards National Parks have reported other pro-environmental values to be significant. For example, Silverberg et al. (1996), and Floyd et al. (1997) reported Balance of Nature, Anti-anthropocentrism and Limits to Growth as the main pro-environmental values in environmental worldviews towards national parks, and that those who held these values were less accepting of environmental impacts. Similarly, Wanjobi (2005), and Wurzinger and Johansson (2006) reported that visitors with higher NEP scores as 'eco-visitors' had stronger anthropocentric views on conservation activities at national parks. However, it is important to note that these studies utilised the NEP scale to measure pro-environmental values towards general environmental behaviour at national parks. Therefore, their concept of environmental values is more about general worldviews than investigating a particular behaviour.

It is also important to note that even though the results of this present study did not establish a significant positive relationship among values, attitudes and behavioural

intentions, nor a mediating relationship, as reported in table 4.17 and 4.18, it has added some clarity to the notion of dismissing the possibility of environmental values as an overall foundation for influencing beliefs and attitudes as suggested by Fulton et al. (1996). This provides an explanation for why the majority of environmental studies have chosen to investigate intentions and behaviours directly through values and attitudes rather than through pro-environmental values. However, the sole reliance on attitudes or values to predict behaviour is problematic as the measurement of the attitude – behaviour relationship may be only at the general level rather than target specific behaviours, as demonstrated by findings that NEP values constitute general worldwide views about the environment (Dunlap et al., 2000; Schaper & Carlsen, 2004; Ajzen, 2005). Due to the general nature of values, results in this study reveal that pro-environmental values were not useful in the prediction of off-trail walking, as visitors did not see the behaviour of venturing off-trail as a violation of their pro-environmental values. This strengthens the argument that some additional variables such as pro-environmental values may simply be background factors that predict the standard TPB model but do not tend to provide any unique explanatory power (Ajzen, 2005).

## 5. CONCLUSION AND IMPLICATIONS

This study demonstrated the usefulness of the Theory of Planned Behaviour (TPB) in explaining and predicting visitors' behavioural intentions towards engaging in non-compliant behaviour of walking off-trail at BMNP. Both direct and indirect measures of the TPB were used to predict the behavioural intentions of visitors in the present study, as recommended by Ajzen (1991). Direct measures explained 14.8 per cent ( $R^2 = 0.148$ ,  $p < 0.01$ ) of variance in the prediction of behavioural intentions to venture off-trail at BMNP, and indirect measures explained 21.7 per cent ( $R^2 = 0.217$ ,  $p < 0.01$ ). Indirect measures were better predictors of behavioural intentions as compared to direct measures. These findings are similar to those of past studies (Chan & Fishbein, 1993; Richardson et al., 1997; Fazekas et al., 2001; Goh, 2011). A possible explanation for direct measures being weaker predictors could be due to visitors' perceptions of simple direct measures, which could be too general in nature when compared to specific behavioural beliefs that are directly related to the behaviour. Therefore, this study adopted the view by Ajzen (1991) to use direct measures to explain behavioural intentions and the use of indirect measures to explain specific insights into beliefs influencing visitors' behavioural intentions to walk off-trail at BMNP.

Direct measures reported subjective norms (SN) ( $\beta = 0.212$ ,  $p < 0.01$ ) to be the strongest predictor of behavioural intentions over attitudes (Att) ( $\beta = 0.18$ ,  $p < 0.01$ ) and perceived behavioural control (PBC) ( $\beta = 0.082$ ,  $p > 0.05$ ). This suggests that visitors who ventured off-trail at BMNP were under volitional control, and that there were no perceived difficulties that significantly restricted their non-compliant behaviour of venturing off-trail. Among all three independent variables of TPB, subjective norms was the strongest key determinant of venturing off-trail, and can be linked to social norm violations as described by Gramann and Vander Stoep (1987). In examining the indirect measure of subjective norms, two social groups (friends and other visitors) were significant in the prediction of BI towards venturing off-trail.  $\sum (NBj2 \times MCj2)$  – My friends ( $\beta = 0.187$ ,  $p < 0.05$ ) was the strongest predictor, followed by  $\sum (NBj1 \times MCj1)$  – Other visitors ( $\beta =$

0.124,  $p < 0.05$ ). This suggests that when respondents saw other visitors and their friends going off-trail, they were motivated to do the same.

With regards to attitudes, the indirect measures reported two significant behavioural beliefs (Shorter route; Closer view of nature) in the prediction of BI towards venturing off-trail.  $\sum (BBi4 \times OEi4)$  – Shorter route ( $\beta = 0.297$ ,  $p < 0.01$ ) was the strongest predictor, followed by  $\sum (BBi1 \times OEi1)$  – Closer view of nature ( $\beta = 0.192$ ,  $p < 0.05$ ). This suggests that visitors strongly associated venturing off-trail with the perception that it would shorten their walking route and allow them to have a closer look of nature. Thus, these two indirect measures of attitudes need to be further addressed by park authorities through social marketing to help develop positive attitudes and motivate respondents to stay on-trail at BMNP.

Although the direct measure of PBC was not significant, the indirect measures of PBC revealed three control beliefs (lack of access to park facilities; lack of signage; challenging terrains) that were perceived as difficulties and motivated visitors to non-comply and venture off-trail. Firstly,  $\sum (CBk3 \times PFk3)$  – Lack of access to park facilities ( $\beta = 0.133$ ,  $p < 0.05$ ) was the strongest predictor for motivating visitors to venture off-trail at BMNP. This was followed by Lack / no signage  $\sum (CBk1 \times PFk1)$  and Challenging terrains  $\sum (CBk6 \times PFk6)$ , with both having a significant beta value ( $\beta = 0.129$ ,  $p < 0.05$ ). This suggests that visitors perceived some difficulties in staying on designated trails and were motivated to venture off-trail to search for park facilities, to avoid challenging terrains, and if signage was unclear.

This study also explored the relationship between pro-environmental values (NEP), TPB attitudes, and behavioural intentions of visitors towards venturing off-trail at BMNP. A major contribution of this research is the discovery of the limited linkage between visitors' pro-environmental values (NEP) towards the general environment and their attitudes towards venturing off-trail at BMNP. Although the total score of NEP items was relatively high (76.39 out of 105) with highly reliable Cronbach's alpha readings of 0.902, the correlations between NEP and attitudes was very weak and not significant ( $r = 0.011$ ,  $p > 0.05$ ). With regards to the relation between values and behavioural intentions, the role of pro-environmental values was not significant in the prediction of behavioural

intentions. This is consistent with past studies that have reported values to be more useful in understanding general behaviour, whereas beliefs and attitudes are more useful in addressing specific behaviour (Rokeach, 1973, Feather, 1999; Vaughan & Hogg, 2013). This strongly implies that environmental values are general values that individuals refer to if they need them in a situation that concerns environmental issues. In this study, even though visitors had strong pro-environmental values towards the environment in general, they simply did not associate venturing off-trail at BMNP as a violation of their pro-environmental values and thus did not refer to them when making the non-compliant decision.

## **5.1. Theoretical and Practical Implications**

Results from this study reveal theoretical and practical implications for various stakeholders such as academics, government agencies, park authorities, and businesses. Firstly, this study employed an established theoretical framework, Theory of Planned Behaviour, to systematically explain non-compliant behaviour in venturing off-trail at BMNP. This present study fills an important research gap, as while past studies have attempted to determine visitor reasons behind non-compliant behaviour, many of these studies were conducted independently of a theoretical framework. The lack of a theoretical framework may present many difficulties in the future use of the results of these studies, such as the inability to develop intervention programs. Based on this present study, future researchers and park authorities will be able to utilise the Theory of Planned Behaviour framework to work towards better park design and better identify predictive variables to prevent non-compliance and motivate visitors to stay on designated trails.

Secondly, this study has added to the limited number of TPB studies supporting subjective norms as the strongest predictor among the three TPB independent variables. While many researchers have conducted meta-analysis of TPB studies (Ajzen & Fishbein, 1980; Miniard & Cohen, 1981; Triandis, 1994; Sheppard et al., 1988; Godin & Kok, 1996; Armitage & Conner, 2001) and reported attitudes to be the strongest predictor in



explaining most behaviours, few studies have identified normative driven behaviours. Some of the normative driven behaviours reported in past studies include spending time on schoolwork (Miller & Grush, 1984), going into debt on credit card (Trafimow & Finlay, 1996), sun protective behaviour (Terry & Hogg, 1996), and binge drinking (Latimer & Ginis, 2005). In this present study, results show that venturing off-trail is a normative driven behaviour that is significantly motivated by friends and other visitors.

Thirdly, this study has added knowledge and insights to the literature on environmental values, beliefs and attitudes where there is a clear division among academics with regards to the actual predictive role of environmental values in behavioural studies. Although researchers have utilised NEP research in understanding different environmental visitor segments (Silverberg et al., 1996; Floyd et al., 1997), environmental reasons for travelling (Beaumont, 2001; Lawton, 2001), and perceptions of environmental resources (Wanjobi, 2005; Wurzinger and Johansson, 2006; Luo and Deng, 2008), none have examined the role of NEP in association with beliefs and attitudes towards the behaviour of venturing off-trail. Even though results in this present study report correlations among NEP, beliefs and attitudes to be not significant, the results provide an important contribution to non-compliance research where visitors' pro-environmental values are irrelevant to their off-trail behaviour. In other words, even if visitors possess positive general environmental values, these positive NEP values are not referred to or associated strongly when they decide to non-comply and venture off-trail because visitors do not associate venturing off-trail as an environmental issue. In addition, this study provides evidence that values using NEP items are most useful for understanding general environmental behaviour, whereas beliefs and attitudes are more useful in addressing specific behaviours such as non-compliant behaviour of venturing off-trail.

Next, this study adds to the few extant studies that have dismissed the mediation relationship between pro-environmental values on behavioural intentions through the indirect and direct measures of the TPB. This is evidenced by results showing a non-significant relationship in the mediation testing conducted between pro-environmental values, behavioural beliefs / attitudes, and behavioural intentions. This adds to the body of knowledge regarding TPB studies, following Ajzen (2005) who called for future

researchers to investigate background factors of the TPB. This study proposes that pro-environmental values may simply be background factors that predict the standard TPB model but do not tend to provide any unique explanatory power. This clearly explains why the general nature of pro-environmental values in this study was correlated with behavioural beliefs but did not add any predictive power of off-trail walking intentions.

This present study also has practical managerial implications for park authorities and government agencies. Findings from the TPB study reveal both attitudes and subjective norms to be significant predictors of visitors' behavioural intentions to venture off-trail at BMNP. Given that subjective norms have the strongest impact on behavioural intentions, park authorities should focus their social marketing campaigns on targeting the two social groups, friends and other visitors, to discourage non-compliant behaviours in BMNP, such as "Real mates stick to the path" or "Visitors go home safely if they stick to the path". Park authorities should also focus on key attitudinal factors such as helping visitors to understand that venturing off-trail is dangerous and does not necessarily equate to a shorter route or a closer look at nature. One creative way to do this is to show the breakdown of time and distance at the start of walking trails from point A to B and the availability of lookout points along the walk. With regards to perceived difficulties by visitors, this will be one of the key challenges facing park authorities given the limited resources available and budget constraints. Visitors in the present study revealed that due to certain perceived difficulties (such as lack of signage, lack of park facilities and challenging constraints) faced during their walking journey, they were motivated to venture off-trail. Park authorities must ensure that adequate signage is displayed at the entrance of the Park and at respective intervals along the walking path, especially at crucial intersections where paths intersect with other walking trails. More importantly, park authorities need to ensure that there are enough rest points throughout the walking trail for visitors to revive and to relieve themselves. More often, the perceptions of challenging trails are due to fatigue and lack of rest; therefore visitors may become desperate and want to complete their walking journey by venturing off-trail in search of alternative 'easier' paths.

Lastly, park authorities can use a mixture of direct and indirect management strategies to minimise off-trail behaviour at BMNP. Direct management technique is a good way to enforce and regulate visitor management, as there is a high degree of control. The first direct management strategy recommended is to manage the site capacity of BMNP to prevent overcrowding by limiting walking trails to a maximum number of not more than 300 visitors per 1 acre of walking space (especially for popular walks such as Charles Darwin and Echo Point), as recommended by Butler (1962). Another direct management strategy is to implement zoning schemes to allow or restrict certain activities to regulate capacity, especially on high traffic walking trails such as those at Charles Darwin and Echo Point. These directives might include light travel only, with restrictions on pets, bicycles, camping equipment, abseiling and canyoning apparatus. In addition, site restrictions and designated paths need to be more obvious by providing ropes along the sides of the walking trail as a guide or using low fencing to deter off-trail behaviour at popular non-compliant sites such as Giant Staircase and Zig Zag Walk. Using ropes and low fences also act as protective barriers from rocks and landslides but still allow visitors to enjoy uninterrupted scenic views. The final recommendation of direct management is through economic enforcement by having entry fees at popular sites such as Echo Point and Charles Darwin.

As part of indirect management techniques, park authorities could implement interpretive programs by educating visitors about the impact and damage towards the flora and fauna due to off-trail walking. Next, BMNP could create a designated area near the entrance of walking trails showing samples of flora and fauna as well as possible environmental impacts, with a tour guide disseminating information about the impact of off-trail walking on both the environment and the visitors. Another indirect technique is the recommended use of clear signage positioned at strategic locations. For high exposure, this signage must be positioned prominently at the entrance of the walking trail and at strategic intervals of the walking trail, especially at off-trail 'hotspots' to warn non-compliers of their non-compliance.

## **5.2. Limitations**

Four limitations were evident in the present study. First, there was the lack of measurement of actual off-trail behaviour. Due to the sensitivity of the research topic, most visitors were quite reluctant to provide any contact details for fear of future prosecutions. Therefore, this study narrowed the research to visitors' off-trail behavioural intentions. Nevertheless, past meta-analysis (Ajzen, 1988; Godin & Kok, 1996; Armitage & Conner, 2001; Sheeran et al., 2001) has reported that behavioural intentions to predict actual behaviour differed significantly across different behavioural domains.

The second limitation was the collection of data through self-reports, which opened a possibility of visitors answering in a socially desirable way (Arnold & Feldman, 1981; Wright, 2013). Hence, the possibility exists that visitors in this present study provided answers they believed to be most acceptable by others.

The third limitation was the behavioural topic of venturing off-trail as a non-compliant behaviour. The perception of what is considered as off-trail walking could have different meanings among visitors ranging from stepping aside slightly from the designated path to address toilet needs to 'walking off the map'. Thus, among the off-trail respondents, there could be different categories of off-trail visitors ranging from 'light' off-trailers to 'heavy' off-trailers.

Finally, the study of values, beliefs and attitudes is often blurred in research (Chaiken et al., 2000) and can overlap with one another. Therefore, it would not be surprising if respondents in this present study had treated values, beliefs and attitudes in the same manner.

## **5.3. Future Research**

The present study reveals five significant research areas for future non-compliant off-trail behavioural studies.

First, the role of perceived behavioural control should be examined more closely to ensure that the items used are relevant perceived difficulties, and be conducted on a

larger sample size to determine its significance before its importance is dismissed. In particular, the role of perceived efficacy (Bandura, 1989) needs to be explored further, as results of factor analysis in this present study reveal control beliefs being loaded onto two separate factors. Therefore, it is possible that visitors who ventured off-trail at BMNP felt that it was easy to do so, and were confident in performing the off-trail behaviour. Past meta-analysis studies have reported the usefulness of perceived self-efficacy in adding 2 percent of explained variance towards behavioural intentions (Armitage & Conner, 2001).

Second, while the subjective norm construct within the TPB reflects injunctive norms as the focus on perceived social pressure from significant others, this construct needs to be further explored with descriptive norms. Descriptive norms are the perceptions of the influence of important others' behavioural performance on an individual's action (Rivis & Sheeran, 2003). This is important, as while the results of this present study reveal that social groups such as other visitors and friends are important in determining behavioural intentions, the role of descriptive norms could strengthen the prediction of off-trail walking if these groups' own behavioural performance were known. Past meta-analysis has reported that this inclusion adds an additional 5 percent of explained variance of individuals' intentions over attitudes, subjective norms and perceived behavioural control (Rivis and Sheeran, 2003).

Third, the possibility of additional TPB variables such as self-identity, past behaviour and anticipated regret should be explored to see if they add to the prediction of off-trail walking behaviour. The role of self-identity is conceptualised as the salient part of an individual's self that relates to a particular behaviour (Stryker, 1968; Stryker & Burke, 2000), and past meta-analysis has reported self-identity to account for an additional 1 percent of variance in behavioural intentions (Conner & Armitage, 1998). In relation to the present study, there could be a possibility that visitors to BMNP possess multiple identities that comprise their self-concepts, which are linked to their strong pro-environmental values, and which in turn translate into reducing off-trail behaviour. For example, visitors with strong pro-environmental values could have salient identities such as being a responsible member of public protecting their homeland. Thus, when an individual identifies strongly as a person who performs a particular behaviour, the

behaviour becomes an important part of their self-concept and motivates them to stay on-trail.

Next, the role of past behaviour and loyalty could add to the prediction of off-trail behaviour. As reported by Parkin (2003), regulars at national parks perceived walking off-trail as part of their normal walking routine and saw nothing wrong with it. Therefore, future studies could determine if the frequency or nature of visitors' past experiences at national parks have any implications on their future non-compliant behaviour. The role of past behaviour could be an important predictor of future behaviour, and might even be a better predictor than attitudes and subjective norms, with average correlations of  $r = 0.21$  as reported in past meta-analysis studies (Ouellette & Wood, 1998).

The next possible additional variable that should be explored in the future is anticipated regret, which looks at an individual's motivation to perform or not perform a behaviour in order to avoid negative emotions of feeling bad (Sheeran & Orbell, 1999). The role of anticipated regret has demonstrated significant contributions to predictive power ( $B=0.27$ ,  $p<0.01$ ) of intentions and added an additional 5 percent of variance in TPB studies (Abraham & Sheeran, 2004). Therefore, in the context of off-trail behaviour, visitors might choose to stay on-trail if their anticipated regret was strong enough to make them feel bad and guilty about leaving the walking path.

Fourth, this study did not determine the efficacy of actual behaviour derived from behavioural intentions due to time constraints and the reluctance of respondents to be involved in a follow-up study. Therefore, it would be useful to conduct future research with a population of visitors at BMNP to include measurement of their actual off-trail behaviour.

Finally, the role of pro-environmental values (NEP) must be further examined with other non-compliant behaviour besides off-trail walking, such as littering, illegal hunting, and other activities that can have a negative impact on the environment at BMNP. NEP could provide further insights into non-compliant behaviours such as the above to establish whether visitors perceive them to be harmful to the environment.

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# Appendices

## Appendix 1: Invitation E-mail for experts to participate in interview



THE UNIVERSITY  
OF QUEENSLAND  
AUSTRALIA

School of Tourism

Name of Project: Understanding Visitors' non-compliant behaviour to venture off-trail in national parks – A Focus on Blue Mountains National Park

Investigator: Mr Edmund Goh (Doctoral Research, University of Queensland)

Dear Respondent,

I am a Doctoral student at The University of Queensland investigating visitors' non-compliant behaviour when visiting Blue Mountain National Park. Non-compliant behaviour in this research refers to visitors venturing off-trail and not staying on designated paths. I am writing to ask you for your help in identifying why visitors choose to venture off-trail through your participation in a short personal interview for my study. I am looking for respondents who have experience in national parks to participate including management from national park agencies, representatives from tourism organisations, and academics with expertise in relevant fields. Please note that your participation in this project is entirely voluntary.

All I need is about 20 minutes of your time to discuss four questions:

Q1). The BMNP likes visitors to stay on the designated paths at all times, but sometimes people need to go off-trail. What might be some of the reasons visitors have for leaving the path?

Q2). What problems are faced by BMNP when visitors leave the designated path?

Q3). Who do you think are the people who influence visitors' decision to think about walking off-trail? Do their opinions matter to the visitors? Whose opinions matter the most?

Q4). What are some of the difficulties visitors face when trying to stay on-trail?

At no time during or after the survey will any individual response be identified. Your confidentiality is assured throughout the process. This research has been reviewed and approved by the University of Queensland, School of Tourism. If you have any further questions or concerns with this project, please feel free to contact me or my supervisor. Your help is greatly appreciated.

### Principal Researcher

Mr. Edmund Goh

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## Appendix 2: Quantitative Questionnaire

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THE UNIVERSITY  
OF QUEENSLAND  
AUSTRALIA

School of Tourism

### Questionnaire survey about visitors' off-trail behaviour in Blue Mountains National Park

Dear Respondent,

The aim of this questionnaire is to ask your perceptions about the possibility of venturing off-trail in National Parks in Australia, and your opinions on the factors that influence off-trail behaviour when visiting Blue Mountains National Park.

Non-compliant behaviour can be described as decisions to not comply with protective recommendations by Park management. This can be seen as actions and practices that do not adhere to the rules and regulation of national parks such as venturing off-trail that are calculated actions taken in expectation of some outcome or reward associated such as time saved. Venturing off-trail can be described as not following the designated pathway as marked in the National Park. This is normally done intentionally despite knowing that it's against the regulations of Park management.

Please read each question carefully and answer it to the best of your ability. At no time during or after the survey will any individual response be identified. Your confidentiality is assured throughout the process. Before you proceed to the start of the questionnaire survey, please answer the following questions:

Q1). Will you be walking on any of the trails in Blue Mountains National Park in the next 7 days?

Yes       No

Q2). Which trail(s) do you intend to walk in Blue Mountains National Park in the next 7 days?

**SECTION A: Your general opinions about venturing off-trail in National Parks**

These questions will be used to get a better understanding of the influence of the psychological factors on why visitors venture off-trail. Please circle the number that best describes each statement.

SECTION A: Your general opinions about venturing off-trail in National Parks									
For me to venture off-trail at National Parks is desirable.	<b>Strongly disagree</b>	1	2	3	4	5	6	7	<b>Strongly agree</b>
For me to venture off-trail at National Parks is good.		1	2	3	4	5	6	7	
For me to venture off-trail at National Parks is wise		1	2	3	4	5	6	7	
For me to venture off-trail at National Parks is favourable		1	2	3	4	5	6	7	
I feel under social pressure to venture off-trail at National Parks.		1	2	3	4	5	6	7	
Most of the people who are important to me think that I should to venture off-trail at National Parks.		1	2	3	4	5	6	7	
It is expected of me to venture off-trail at National Parks.		1	2	3	4	5	6	7	
I am confident that if I wanted to I could venture off-trail at National Parks.		1	2	3	4	5	6	7	
Whether or not I venture off-trail at National Parks is completely up to me.		1	2	3	4	5	6	7	
For me to venture off-trail at National Parks is easy.		1	2	3	4	5	6	7	



**SECTION B: Detailed measures of attitudes about venturing off-trail in Blue Mountains National Park**

These questions will be used to get a better understanding of your attitudes towards venturing off-trail at Blue Mountains National Park. Please circle the number that best describes each statement.

<b>Attitudes about venturing off-trail in Blue Mountains National Park</b>									
If I venture off-trail at Blue Mountains National Park, it will enable me to have a closer view of nature.	<b>Strongly disagree</b>	1	2	3	4	5	6	7	<b>Strongly agree</b>
If I venture off-trail at Blue Mountains National Park, it will enable me to be more adventurous.		1	2	3	4	5	6	7	
If I venture off-trail at Blue Mountains National Park, it will enable me to have a different walking experience.		1	2	3	4	5	6	7	
If I venture off-trail at Blue Mountains National Park, it will enable me to use a shorter route.		1	2	3	4	5	6	7	
If I venture off-trail at Blue Mountains National Park, it will enable me to have more freedom.		1	2	3	4	5	6	7	

<b>Outcomes of your attitudes about venturing off-trail in Blue Mountains National Park</b>									
Venturing off-trail at Blue Mountains National Park that enables me to have a closer view of nature is _____.	<b>Extremely unimportant</b>	1	2	3	4	5	6	7	<b>Extremely important</b>
Venturing off-trail at Blue Mountains National Park that enables me to be more adventurous is _____.		1	2	3	4	5	6	7	
Venturing off-trail at Blue Mountains National Park that enables me to have a different walking experience is _____.		1	2	3	4	5	6	7	
Venturing off-trail at Blue Mountains National Park that enables me to use a shorter route is _____.		1	2	3	4	5	6	7	
Venturing off-trail at Blue Mountains National Park that enables me to have more freedom is _____.		1	2	3	4	5	6	7	

**SECTION C: Detailed measures of social groups about venturing off-trail at Blue Mountains National Park**

These questions will be used to get a better understanding of your social groups towards venturing off-trail at Blue Mountains National Park. Please circle the number that best describes each statement.

<b>Social groups about venturing off-trail in Blue Mountains National Park</b>									
Other visitors to Blue Mountains National Park think I should venture off-trail at Blue Mountains National Park.	<b>Strongly disagree</b>	1	2	3	4	5	6	7	<b>Strongly agree</b>
My friends think I should venture off-trail at Blue Mountains National Park.		1	2	3	4	5	6	7	
My family think I should venture off-trail at Blue Mountains National Park.		1	2	3	4	5	6	7	
Tour guides that I know think I should venture off-trail at Blue Mountains National Park.		1	2	3	4	5	6	7	
Park rangers at Blue Mountains National Park think I should venture off-trail at Blue Mountains National Park.		1	2	3	4	5	6	7	
Celebrities think I should venture off-trail at Blue Mountains National Park.		1	2	3	4	5	6	7	

<b>Outcomes of your social groups about venturing off-trail in Blue Mountains National Park</b>									
How much do you care what other visitors think you should do with regards to venturing off-trail at Blue Mountains National Park?	<b>Not at all</b>	1	2	3	4	5	6	7	<b>Very much</b>
How much do you care what your friends think you should do with regards to venturing off-trail at Blue Mountains National Park?		1	2	3	4	5	6	7	
How much do you care what your family thinks you should do with regards to venturing off-trail at Blue Mountains National Park?		1	2	3	4	5	6	7	
How much do you care what tour guides that you know think you should do with regards to venturing off-trail at Blue Mountains National Park?		1	2	3	4	5	6	7	
How much do you care what Park Rangers at Blue Mountains National Park think you should do with regards to venturing off-trail at Blue Mountains National Park?		1	2	3	4	5	6	7	
How much do you care what celebrities think you should do with regards to venturing off-trail at Blue Mountains National Park?		1	2	3	4	5	6	7	

**SECTION D: Detailed measures of perceived difficulties about venturing off-trail at Blue Mountains National Park**

These questions will be used to get a better understanding of your perceived difficulties towards venturing off-trail at Blue Mountains National Park. Please circle the number that best describes each statement.

<b>Perceived difficulties about venturing off-trail in Blue Mountains National Park</b>									
If I feel that there is a lack / no signage to visitors at Blue Mountains National Park, it would make it more difficult for me to stay on the designated walking trail.	<b>Strongly disagree</b>	1	2	3	4	5	6	7	<b>Strongly agree</b>
If I feel that the walking trails are damaged / unclear at Blue Mountains National Park, it would make it more difficult for me to stay on the designated walking trail.		1	2	3	4	5	6	7	
If I don't have access to park facilities such as toilets at Blue Mountains National Park, it would make it more difficult for me to stay on the designated walking trail.		1	2	3	4	5	6	7	
If I feel pathways are overcrowded at Blue Mountains National Park, it would make it more difficult for me to stay on the designated walking trail.		1	2	3	4	5	6	7	
If I feel that I lack food and water at Blue Mountains National Park, it would make it more difficult for me to stay on the designated walking trail.		1	2	3	4	5	6	7	
If I feel terrains are too challenging at Blue Mountains National Park, it would make it more difficult for me to stay on the designated walking trail.		1	2	3	4	5	6	7	

<b>Outcomes of your perceived difficulties about venturing off-trail in Blue Mountains National Park</b>									
How often do you feel that there is a lack / no signage to visitors at Blue Mountains National Park?	<b>Very rarely</b>	1	2	3	4	5	6	7	<b>Very frequently</b>
How often do you feel that the walking trails are damaged / unclear at Blue Mountains National Park?		1	2	3	4	5	6	7	
How often do you feel that you don't have access to park facilities such as toilets at Blue Mountains National Park?		1	2	3	4	5	6	7	
How often do you feel that pathways are overcrowded at Blue Mountains National Park?		1	2	3	4	5	6	7	
How often do you feel that you lack food and water at Blue Mountains National Park?		1	2	3	4	5	6	7	
How often do you feel that terrains are too challenging at Blue Mountains National Park?		1	2	3	4	5	6	7	

**SECTION E: Willingness to venture off-trail in Blue Mountains National Park**

These questions will be used to get a better understanding of your willingness towards venturing off-trail at Blue Mountains National Park if the situation arises (such as due to overcrowding or damaged designated pathway). Please circle the number that best describes each statement.

<b>Willingness to walk off-trail in Blue Mountains National Park</b>									
I would be willing to walk off the designated trail at Blue Mountains National Park in the next 7 days if the trail was very crowded.		1	2	3	4	5	6	7	
I would be willing to walk off the designated trail at Blue Mountains National Park in the next 7 days in order to take some nice pictures.		1	2	3	4	5	6	7	
I would be willing to walk off the designated trail at Blue Mountains National Park in the next 7 days in order to avoid challenging terrains.		1	2	3	4	5	6	7	
I would be willing to walk off the designated trail at Blue Mountains National Park in the next 7 days in order to access park facilities such as toilets.	<b>Strongly disagree</b>	1	2	3	4	5	6	7	<b>Strongly agree</b>
I would be willing to walk off the designated trail at Blue Mountains National Park in the next 7 days in order to access food and water.		1	2	3	4	5	6	7	
I would be willing to walk off the designated trail at Blue Mountains National Park in the next 7 days if I the signage was missing or confusing.		1	2	3	4	5	6	7	

**SECTION F: Measuring your behaviour after your visit to Blue Mountains National Park**

We would like to follow up with you after your visit to Blue Mountains National Park to ask you 1 question. This would take less than 2 minutes. If you are willing for us to contact you, please leave your contact details below. Thank you.

Name: \_\_\_\_\_

Contact number: \_\_\_\_\_

Email: \_\_\_\_\_

**SECTION G: Measures of your beliefs and values towards the global ecological environment**

These questions will be used to get a better understanding of your beliefs and values towards a more global ecological environment. Please circle the number that best describes each statement.

Beliefs and values towards the global ecological environment									
We are approaching the limit of the number of people the earth can support.	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
Humans do not have the right to modify the natural environment to suit their needs.		1	2	3	4	5	6	7	
When humans interfere with nature, it often produces disastrous consequences.		1	2	3	4	5	6	7	
Human ingenuity will insure that we make the earth unlivable		1	2	3	4	5	6	7	
Humans are severely abusing the environment.		1	2	3	4	5	6	7	
The earth has limited natural resources even if we just learn how to develop them.		1	2	3	4	5	6	7	
Plants and animals have as much right as humans to exist.		1	2	3	4	5	6	7	
The balance of nature is not strong enough to cope with the impacts of modern industrial nations.		1	2	3	4	5	6	7	
Despite our special abilities, humans are still subject to the laws of nature		1	2	3	4	5	6	7	
The so-called “ecological crisis” facing humankind has not been greatly exaggerated		1	2	3	4	5	6	7	
The earth is like a spaceship with only limited room and resources.		1	2	3	4	5	6	7	
Humans were not created to rule over the rest of nature.		1	2	3	4	5	6	7	
The balance of nature is very delicate and easily upset		1	2	3	4	5	6	7	
Humans will eventually not learn enough about how nature works to be able to control it.		1	2	3	4	5	6	7	
If things continue on their present course, we will soon experience a major ecological catastrophe.		1	2	3	4	5	6	7	

**SECTION H: Demographic Information**

**Q1). What is your gender?**

Male  Female

**Q2). What is your age group?**

Below 20  21-30  31-40  41-50  51-60  61 and above

**Q3). What is the highest level of education you have attained?**

Primary  Secondary  TAFE or Diploma  Bachelor  Master  Doctorate

**Q4). Please select the category that best describes your family life cycle?**

Single  Married  Married with kids  Divorced  Others (\_\_\_\_\_)

**Q5). What is your job classification?**

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**Q6). Please indicate your personal annual income?**

No income  Below \$6000  \$6001-\$30000  \$30001-\$75000  
 \$75000-\$150000  Above\$15000

**Q7). Are you an Australian resident?**

Yes  No

**Q8). What language(s) do you speak at home?**

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**Q9). On average, how many times have you been to Blue Mountains National Park in the last 5 years?**

None  Once  Less than 10 times  More than 10 times

**Q10). On average, how often do you walk in National Parks?**

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***THANK YOU FOR COMPLETING THE SURVEY***