Understanding the place attachment of campers along the southern Ningaloo Coast, Australia

This thesis is presented for the degree of
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DECLARATION

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary education institution.

________________________    ___________________
Joanna M. Tonge      Date
Awards and conference presentations:

Awards

Best PhD Student Paper: 16th International Symposium on Society and Natural Resource Management: Tyranny of “Or”: Conservation or Development (ISSRM 2010)


Runner-up Best Student Paper: 48th Australian Marine Sciences Association Conference: Crossing Boundaries (AMSA 2011)

Runner-up 3MT Presentation: School of Environmental Science, Murdoch University 3 Minute Thesis Presentations (2011)

Conference presentations


Abstract

Place attachment and place related concepts were developed to examine bonds individuals form with places. Place concepts have been adopted by managers of natural areas to help refine their understanding of visitor preferences. These concepts, consisting predominantly of place meanings and place attachment, have been studied extensively in terrestrial natural areas with limited focus on marine and coastal areas. Therefore this study aimed to use a mixed-method approach to understand place meanings ascribed to coastal areas and the effect of place attachment on pro-environmental behaviours and support for management actions.

The qualitative method photo-elicitation was employed to ascertain meanings ascribed to Ningaloo Marine Park and its adjacent coastline. Analysis of participant photographs and interviews identified four categories of meaning – physical environment, recreational activities, social ties and emotional connections – with each nuanced by the presence of water. This analysis identified a new form of emotional connection – everybody’s happy – which described the enjoyment of all members of a group with a holiday to Ningaloo. This was included in a subsequent quantitative visitor survey along with more traditional dimensions of place attachment and questions pertaining to pro-environmental behaviours and management actions.

Structural equation modelling identified place identity as the only dimension to have a significant effect on on-site behaviours individuals would do themselves, telling others to do these same behaviours, and off-site conservation actions. To identify the relationships between dimensions of place attachment and support for management actions each dimension was clustered based on level of attachment, with these
clusters subjected to multivariate stepwise correlation modelling (via PRIMER) with the management actions. No significant relationships were found, other than with one cluster within the everybody’s happy place attachment dimension.

The thesis concludes with a research agenda suggesting further reflection on the construction of place identity and its influences on perceptions of leisure settings. Also required is consideration of the newly identified and reconceptualised construct – everybody’s happy – and its broader applicability beyond this coastal-based study.
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Chapter 1: Introduction

This thesis is presented as a series of manuscripts which is bookended with this Introduction chapter, a Research Design chapter and a Conclusion chapter (see Fig. 1.1). Chapter 2 – Research Design outlines the methodology used to address the research questions as well as an overview of the case study site. Chapter 7 – Conclusions overviews the key results in response to the research questions and provides recommendations to managers and further areas of research. There are a total of four manuscripts which answer the research questions posed in Chapter 2 – Research Design. Each manuscript has been submitted to a scholarly journal.

Figure 1.1: Diagram of thesis structure.
The remainder of this introductory chapter is devoted to exploring the phenomena under investigation – the concept of place attachment. A place is a physical space that has been infused with meaning by an individual or group (Farnum, Hall, & Kruger, 2005; Low & Altman, 1992; Tuan, 1977), with an attachment or emotional bond formed around these meanings (Scannell & Gifford, 2010; Trentelman, 2009). Place attachment has been explored in a variety of research areas including sociology, psychology and natural resource management, to investigate people’s relationship to their surrounding environment, including both urban and natural settings (Brandenburg & Carroll, 1995; Kruger & Jakes, 2003; Patterson & Williams, 2005; Trentelman, 2009). In natural resource management it has been seen as a way to include the human dimensions of recreational places into what was viewed as a resource commodity management regime (Farnum, et al., 2005; Trentelman, 2009; Williams, Patterson, Roggenbuck, & Watson, 1992; Williams & Vaske, 2003).

As will be detailed below, there is a wealth of information on place and place-related concepts for terrestrial protected areas, with a noticeable absence of studies in marine and coastal protected areas. This prompted the development of the following research questions to guide this study:

*What contributes to the place attachment of visitors to a coastal setting?*

*What is the relationship between place attachment, behavioural intentions and perceptions of management actions in a coastal setting?*

*How can an understanding of these relationships contribute to management of a coastal setting?*

Ningaloo Marine Park in north-western Australia was chosen as a case study site to explore the applicability of place attachment to a coastal setting. It is an iconic marine park in Western Australia receiving over 200,000 visitors per year (CALM &
MPRA, 2005) and was recently included on the World Heritage list for its outstanding natural beauty (UNESCO World Heritage Centre, 2011). A further description of Ningaloo Marine Park is provided in Chapter 2 – Research Design.

**Concepts of place**

A place is a geographic area that has value and meaning to an individual which has been created through continued experience with the area (Brown & Weber, 2012; Galliano & Loeffler, 1999; Trentelman, 2009; Tuan, 1977; Williams, et al., 1992). For the individual, their place is distinguishable from the general environment, whereby giving it meaning, the space is transformed into a defined and bounded place (Farnum, et al., 2005; Smaldone, Harris, & Sanyal, 2008). These places become locales where individuals find themselves, have experiences, interpret, understand and find meaning (Kaltenborn & Williams, 2002). Space was little more than a location until the individual began to fill it with events, memories and meanings (Williams, 2002).

Places are based on three broad but interrelated components – the physical setting or actual geographical location; the person, with psychological and social processes; and the activities or rituals undertaken at the place (Relph, 1976; Smaldone, et al., 2008; Stedman, 2002). This is not static, but a continual process as the emotional bond between a person and a place develops over time (Smaldone, et al., 2008). The critical factor is enduring involvement (Manzo, 2003), as places become repositories for emotions and social contexts (Low & Altman, 1992), and as a result, each place is unique from every other place (Williams, 2002).
Most scholars credit the initial development of place studies to the phenomenological\(^1\) geographers Tuan (1977, 1975) and Relph (1976). Historically, place was concerned with the home and sacred places, with a heightened interest in studies of affectively (or emotionally) laden places such as the home, childhood environments or other revered places (Low & Altman, 1992). This was in reaction to the overly positivistic or traditional views of places that dominated the field of geography in the 1950s and 1960s. The traditional view of place was not as a centre of meaning, but more simply a physical location in space (Kaltenborn & Williams, 2002; Low & Altman, 1992).

Early research by sociologists, social psychologists and others began to explore issues such as personal spacing, territoriality and group use of space (Beckley, 2003; Low & Altman, 1992). There was heightened interest in studies examining emotionally-laden places or places considered of central importance to the lives of individuals (Low & Altman, 1992; Williams & Patterson, 1996; Williams, et al., 1992). Urban studies considered the environs of the city and the neighbourhood as important to social interactions, with individuals viewed as both embedded in and actively defining and giving shape to the environment around them (Beckley, 2003; Trentelman, 2009; Williams & Patterson, 1996). Through the 1980s, place attachment increasingly became the object of study in fields such as environmental psychology, with efforts made to understand how people comprehended their connections with the natural environment (Williams & Roggenbuck, 1989; Eisenhauer, Krannich & Blahna, 2000; Beckley, 2003). Places became environmental settings to which people were emotionally and culturally attached, and

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\(^1\) Phenomenology is a branch of philosophy that focuses on the meanings and experiences of everyday life via a descriptive discovery of things in their own terms (Manzo, 2008; Patterson & Williams, 2005).
the focus was on the spatial and physical properties, the activities occurring there and the meanings places held for individuals (Beckley, 2003; Low & Altman, 1992; Trentelman, 2009).

Place has become one of the central concepts in human geography with a range of researchers from various disciplines interested in how places are formed and constructed, how place meanings develop, and how people then become attached to these meanings (Kaltenborn, 1997; Relph, 1976; Tuan, 1977; Williams, et al., 1992). Research disciplines such as sociology, psychology, landscape architecture, urban design and environmental psychology have all developed their own theoretical and research traditions through numerous revisions and evaluations of the concept (Farnum, et al., 2005; Kruger & Williams, 2007; Trentelman, 2009). A “messy literature” has resulted from the development of place-related terminology that suits the needs of the particular research area. Resulting concepts such as sense of place, place attachment and place meanings have slightly different interpretations depending on the researcher and their discipline of study (Trentelman, 2009). These concepts will be explored below in relation to their applicability and interpretation in natural resource management and how these terms will be used or interpreted in the study.

**Place concepts in natural resource management**

Throughout history, individuals have visited and experienced natural areas that embody their beliefs and values. However, traditional resource management has emphasised the economic or commodity values of natural areas, often neglecting to consider emotional, symbolic or intrinsic values of the environment (Brandenburg & Carroll, 1995). The goal of managers was to match settings to user types, with users
seen as resource commodity consumers rather than as part of the ecosystem or landscape (Galliano & Loeffler, 1999; Trentelman, 2009). This traditional approach perpetuated the notion that recreational settings in natural areas were interchangeable and reproducible elsewhere (Williams, et al., 1992).

It soon became clear to natural resource managers that the public valued natural areas in ways that did not correspond to commodity metaphors such as “use” and “yield” (Williams & Vaske, 2003). There was broad public dissatisfaction with the tendency of managers to reduce natural areas to mere resources or a selection of goods or products (Trentelman, 2009; Williams, 2008) rather than meaning-filled spatial contexts (Williams & Patterson, 1996). Place concepts were introduced into natural resource management as an attempt to encourage managers to look beyond commodity uses and include social, meaning-orientated or “human” dimensions into management decisions (Williams & Patterson, 1996).

Place concepts have provided natural resource managers with additional information as to how to provide optimal experiences and the possible reactions of visitors to management decisions (Farnum, et al., 2005). They provide an important contribution to understanding the preferences, values and beliefs of visitors in relation to how natural areas are used, and permit visitors to express their feelings about an area rather than responding to predetermined categories or groups devised by managers (Brandenburg & Carroll, 1995; Farnum, et al., 2005). Place concepts let the connections between visitors and natural areas be captured directly, rather than indirectly through use and user characteristics. They also provides a reminder to managers as to why some people care so passionately about a particular natural area (Williams, et al., 1992).
However, it should be noted that the incorporation of place concepts into natural resource management did not and will not necessarily end conflicts over use of areas (Brandenburg & Carroll, 1995). An area can carry a broad range of meanings which can vary widely between individuals (Williams & Patterson, 1996) and these meanings can often cause conflict (Farnum, et al., 2005). Nevertheless, place concepts do provide an avenue for discovering common values and meanings amongst different groups (Brandenburg & Carroll, 1995), potentially connecting and uniting different individuals or groups to play significant roles in the management of a particular area (Brandenburg & Carroll, 1995; Payton, Fulton, & Anderson, 2005).

**Sense of place**

Humanistic geographers consider sense of place as the universal affective tie that fulfils fundamental human needs (Relph, 1976; Scannell & Gifford, 2010). It can also include ancestral ties that relate to feeling like an “insider” or a desire to remain in that place (Scannell & Gifford, 2010). Sense of place is often used as a more encompassing term describing the range of cognition and affective sentiments an individual holds towards a particular geographic setting (Farnum, et al., 2005). These affective sentiments do not necessarily have to be positive (Trentelman, 2009).

While not the subject of this thesis, sense of place will be explored briefly here to provide context as it is often used interchangeably in the natural resource management literature with place attachment, resulting in a messy and overlapping spectrum of use. Some scholars use sense of place as an overarching term of which place attachment is one component or dimension (Jorgensen & Stedman, 2001), whereas others see sense of place as a separate concept of place (Kyle, Graefe, Manning, & Bacon, 2004a). Kyle et al. (2004a) provide a good distinction which was
used to guide this thesis. They note that sense of place studies typically involve residents who have a more extensive history with the place while place attachment is commonly used in studies concerning recreational or leisure contexts where the individual has a more sporadic interaction with the setting. Given that this study will focus on visitors to a coastal setting, place attachment, as per the distinction above, will be used to guide this investigation. Further differentiation between the two concepts will be explored throughout this chapter.

Sense of place is not thought to be instilled in the physical settings itself, but resides in how the individual interprets the setting (Jorgensen & Stedman, 2001). It is created through interaction with a setting, in addition to what the individual brings to it (Kaltenborn, 1997; Manzo, 2003; Williams & Patterson, 1996). As such, sense of place could be summarised as a collection of symbolic meanings, attachment and satisfaction with a setting that is held by an individual, or collectively as a group (Smaldone, et al., 2008; Stedman, 2003a).

**Place meanings**

Spaces become places as they are imbedded with meaning based on an individual’s lived experiences with the space (Stedman, 2003a; Tuan, 1977). Individuals assign meanings to the setting and in turn become attached to these meanings (Wynveen, Kyle, & Sutton, 2010). They are not inherent in the landscape but emerge through ongoing interaction, and can change and evolve over time (Farnum, et al., 2005; Kruger & Williams, 2007; Kyle & Chick, 2007; Stedman, 2003a). As an individual’s place attachment is in part founded on these meanings, it is therefore important to identify what the place means to the individual, in addition to how much it means (Smaldone, et al., 2008).
Meanings are created as people interact with a place and with others within a place, thereby developing important connections to the setting (Kruger & Williams, 2007). They reflect the value of the setting (Stedman, 2002; Wynveen, et al., 2010), what it signifies or what it stands for and can range from those that are personal to those that are publically shared among groups (Williams & Vaske, 2003). Meanings are a reflection of an individual’s cultural and social experiences and identity (Eisenhauer, et al., 2000; Kyle & Chick, 2007; Stedman, 2003a) and leave few if any physical indicators, behavioural evidence or markers within the setting to tell us they exist (Kruger & Williams, 2007).

Meanings are considered context specific (Cheng, Kruger, & Daniels, 2003) though some common patterns emerge. They are often composed of some reference to the natural environment, social relationships, activities undertaken and some form of affective or emotional aspect. As an example, Smaldone et al. (2008) described 16 categories of meaning that visitors ascribed to the Grand Teton National Park in Wyoming. These included the physical setting, emotional connection, outdoor recreation, social ties, special moments, escape, undeveloped and peaceful. Family camping groups described the meanings they experienced with forest camping as restoration, experiencing nature, spending time together as a family and teaching children new skills as well as the social interaction with other friends within the campground (Garst, Williams, & Roggenbuck, 2010). Gunderson and Watson’s (2007) study of meanings of the Bitterroot Forest identified ease of access to wild places, historical importance, naturalness and physical features of significance as key to participants. From these few examples, the themes of physical environment, activities, social and emotional aspects are clearly evident.
Qualitative research methods are helpful in exploring the unique qualities of an individual’s relationship to place and the meanings that evolve (Manzo, 2008). These methods extend beyond knowing how strongly someone is attached to a place to provide an examination of the nature of attachment relating to the values and meanings the place holds for the individual (Brandenburg & Carroll, 1995; Davenport & Anderson, 2005). A qualitative approach can provide a more complete picture given the phenomenological nature of place meanings (Patterson & Williams, 2005). Qualitative methods can provide a richness and depth to the data obtained, allowing for an understanding of the diversity of meanings held by individuals (Brandenburg & Carroll, 1995; Eisenhauer, et al., 2000; Manzo, 2008).

**Place attachment**

Place attachment represents the positive connection between a person and a particular place and is strongly associated with familiarity and the extent of contact with the setting (Low & Altman, 1992; Manzo, 2003; Moore & Graefe, 1994; Williams, et al., 1992; Williams & Vaske, 2003). It is an overarching concept, often used by environmental psychologists to consider the emotional or affective component of an individual’s relationship with a setting. It concerns the interconnections between biological, environmental, psychological and socio-cultural processes (Trentelman, 2009). At its core are affect, emotion and feeling (Kyle, Mowen, & Tarrant, 2004b; Low & Altman, 1992).

Emotion is considered to link all human experiences and as such, settings acquire meaning to an individual through a steady build-up of sentiment and feeling. This is a result of the activities occurring within the setting as well as other individuals who may also be present (Kyle, et al., 2004b; Tuan, 1977). These emotions and meanings
are typically positive (Farnum, et al., 2005), though can also be negative (Manzo, 2003). The expectation of these positive outcomes draws individuals to specific settings, and if these outcomes are fulfilled an attachment develops over time as the individual endows it with value (Kyle, Graefe, & Manning, 2005; Kyle, et al., 2004b; Relph, 1976).

Place attachment is shown via a positive attitude towards a place, extensive knowledge of the area and/or frequent visitation (Smaldone, 2006; Williams, et al., 1992; Williams & Vaske, 2003). Familiarity resulting from frequent visits can strengthen and enhance feelings of place attachment (Smaldone, Harris, Sanyal, & Lind, 2005; Williams & Vaske, 2003). The strength of attachment can also depend on the physical characteristics of the place, the social relationships present, the experiences of the individual as well as their own personal set of beliefs, values and preferences (Smaldone, et al., 2005; Stedman, 2003a; Williams & Vaske, 2003).

Early studies of place attachment were centred on the built environment and the home (Trentelman, 2009; Williams & Vaske, 2003). Recent efforts however, have examined the attachment of local residents to nearby special places (Eisenhauer, et al., 2000); attachments of resource or tourism dependent communities (McCool & Martin, 1994; Vorkinn & Riese, 2001); place attachment among second or seasonal home owners (Jorgensen & Stedman, 2001); and attachment of visitors to recreation and tourism destinations (Bricker & Kerstetter, 2000; Warzecha & Lime, 2001; Williams, et al., 1992). These additional areas of research have arisen, in part, from awareness that globalisation has caused individual-place bonds to become tenuous. This is as a result of increased mobility and environmental problems encroaching on, and threatening, the existence of important places (Giuliani, 2003; Scannell & Gifford, 2010).
Quantitative studies have been used in place attachment research to measure the strength of attachment via uni-dimensional scales. The predominant measure of place attachment have been the place identity and place dependence dimensions, which have been used as indicators to determine the strength of an individual’s attachment to place (Farnum, et al., 2005; Trentelman, 2009; Williams & Vaske, 2003). They have been used to examine attachment and aid in the development of predictive models which may be useful for natural area managers (Stedman, 2003b), such as predicting visitor loyalty (Yuksel, Yuskel, & Bilim, 2010), or the development of civic trust between individuals and agencies (Payton, et al., 2005). Quantitative methods have also been used to make place attachment knowledge more practical by mapping special places of public lands via Geographic Information Systems (Brown, 2004; Brown & Raymond, 2006; Brown & Weber, 2012).

The most common standardised measures of place attachment – place identity and place dependence scales – were initially developed by Williams and Roggenbuck (1989) (Farnum, et al., 2005; Williams, et al., 1992). These scales have been demonstrated as having good reliability and validity (Farnum, et al., 2005; Williams & Vaske, 2003), however some place scholars have suggested that the two dimensions do not adequately capture the complex nuanced nature of place attachment (Hidalgo & Hernandez, 2001; Kyle & Chick, 2007; Raymond, Brown, & Weber, 2010; Sampson & Goodrich, 2009).

**Place identity**

Place identity has been referred to as a component of self-identity and describes how a place becomes a repository for emotions, memories, ideas, values, preferences and relationships that are of importance to an individual as they give meaning and
purpose to their life (Smaldone, et al., 2005; Williams & Roggenbuck, 1989; Williams & Vaske, 2003). The place becomes important as it is viewed as an essential part of oneself, which may be based on personal emotional ties with the setting e.g. a favourite childhood holiday destination, or on a more abstract or symbolic level, e.g. the place forms part of how they want others to think of them (Trentelman, 2009; Williams, et al., 1992). An individual uses their place to confirm their identity to themselves as well as expressing it to others (Tmeer-Ross & Uzzel, 1996). As such, individuals will often seek out places that match their desired identity (Farnum, et al., 2005).

The place identity dimension has been credited to Prohansky, Fabian and Kaminoff (1983) who described it as an aspect of the self that defines an individual’s identity in relation to the physical environment. Interest in place identity resulted from increasing recognition of the importance of the physical environment in maintaining one’s identity. For natural resource managers, identity was recognised as a possible motivation for individuals to visit areas to participate in their desired outdoor recreational pursuits to express who they are, e.g. rock-climber, hiker (Williams, et al., 1992). It was also seen as enhancing self-esteem by increasing feelings of belonging to a “community” (Williams & Vaske, 2003), through participation with others in these recreational pursuits or having similar views as others in relation to their place. Evidence that a place has become part of one’s identity can been seen in the use of “I” and “we” statements when an individual discusses the place (Kyle, et al., 2004c).

The items used to measure place identity (and other place dimensions) usually involve the individual indicating their level of agreement with a value statement. The measurement items have been developed to reflect the emotional or psychological
component of place attachment rather than a functional component which is typical of place dependence statements (Table 1.1). These items include such aspects as the place being a part of an individual, the place being special to the individual and that they identify with the setting.

Table 1.1: Items commonly used to measure place identity and place dependence

<table>
<thead>
<tr>
<th>Place attachment dimension</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place identity</td>
<td>I find that a lot of my life is organised around this place</td>
</tr>
<tr>
<td></td>
<td>I am very attached to this place</td>
</tr>
<tr>
<td></td>
<td>This place means a lot to me</td>
</tr>
<tr>
<td></td>
<td>This place makes me feel like no other place can</td>
</tr>
<tr>
<td></td>
<td>I think a lot about coming here</td>
</tr>
<tr>
<td></td>
<td>I would prefer to spend more time here if I could</td>
</tr>
<tr>
<td></td>
<td>I identify strongly with this place</td>
</tr>
<tr>
<td></td>
<td>I feel like this place is a part of me</td>
</tr>
<tr>
<td></td>
<td>“X” is very special to me</td>
</tr>
<tr>
<td></td>
<td>Visiting “X” says a lot about who I am</td>
</tr>
<tr>
<td>Place dependence</td>
<td>“X” is the best place for what I like to do</td>
</tr>
<tr>
<td></td>
<td>No other place can compare to “X”</td>
</tr>
<tr>
<td></td>
<td>I get more satisfaction out of visiting “X” than any other</td>
</tr>
<tr>
<td></td>
<td>Doing what I do at “X” is more important to me than doing it in any other place</td>
</tr>
<tr>
<td></td>
<td>I would not substitute any other area for doing the types of things I do at “X”</td>
</tr>
<tr>
<td></td>
<td>The things I do at “X” I would enjoy doing just as much at a similar site</td>
</tr>
<tr>
<td></td>
<td>I cannot imagine a better place for what I like to do</td>
</tr>
<tr>
<td></td>
<td>The time I spent here could just have easily been spent elsewhere</td>
</tr>
<tr>
<td></td>
<td>If I had been in any other area my experience would have been the same</td>
</tr>
</tbody>
</table>

Sources: Williams & Roggenbuck (1989); Warzecha & Lime (2001); Williams & Vaske (2003)

Place dependence

Place dependence is a more functional attachment which reflects the importance of the place in providing the right setting, features or conditions to support specific goals or desired activities (Manzo, 2003; Stokols & Shumaker, 1981; Williams &
Roggenbuck, 1989; Williams & Vaske, 2003). It generally evolves from the individual’s consideration of two aspects:

1. The quality of the current place to support desired goals and activities; and
2. The quality of alternative places compared to the current one

(Payton, et al., 2005; Smaldone, et al., 2005)

It is based on purposeful and practical decision-making processes with little to no emotional involvement (Moore & Graefe, 1994; Smaldone, et al., 2005; Stokols & Shumaker, 1981). While some suggest that place dependence is purely based on the setting containing the right conditions to undertake specific activities (Williams et al., 1992), others have described it as the fit between how the individual wishes to use a setting (for activities or otherwise) and the setting’s ability to accommodate this use (Farnum, et al., 2005). The statements used to measure place dependence also reflect this functional attachment as well as the comparability to other similar places (Table 1.1).

There has been considerable research and debate as to the relationship between these two dimensions. Some place scholars have suggested that place dependence precedes place identity (Moore & Graefe, 1994; Vaske & Kobrin, 2001), with others demonstrating a very high correlation between the two which could suggest a single dimension (Jorgensen & Stedman, 2001; Moore & Scott, 2003). However, these dimensions have generally been hypothesised as being inter-related yet distinct, and there appears to be sufficient qualitative and quantitative evidence to maintain them as separate dimensions (Farnum, et al., 2005; Hammitt, Backlund, & Bixler, 2006; Hammitt, Kyle, & Oh, 2009; Kyle, et al., 2005; Williams & Vaske, 2003).
**Other place attachment dimensions**

Various place scholars have called for new integrated place attachment models that consider the natural and social aspects of place as well as how the setting supports self-identity and functional goals (Davenport, Baker, Leahy, & Anderson, 2010; Raymond, et al., 2010; Sampson & Goodrich, 2009). Several scholars have attempted to develop additional dimensions of place attachment which include social bonding (Kyle, et al., 2005; Kyle, et al., 2004b; Raymond, et al., 2010); nature bonding (Raymond, et al., 2010); place affect (Halpenny, 2010); place familiarity, place belongingness and place rootedness (Hammitt, et al., 2009). Items that have been developed to measure these dimensions are summarised in Table 1.2.

Social bonds have been noted as important for place attachment with several authors in the environmental psychology and natural resource management literature advocating the development and use of social ties or social bonding items (Hidalgo & Hernandez, 2001; Kyle, et al., 2005; Low & Altman, 1992; Mesch & Manor, 1998). They suggest that if meaningful social bonds occur and are sustained by a specific setting, then it should also be likely that these settings share some of this meaning, given that they provide the context for these bonds to occur (Kyle, et al., 2005; Ramkissoon, Weiler, & Smith, 2012). In some contexts, the social bonds may be a primary source of meanings attached to a setting, with the importance of the setting tied to the memories of experiences shared with significant others (Kyle, et al., 2005). People can become attached to places that facilitate these interactions with others as well as settings which foster group belonging and communal bonds (Hammitt, et al., 2006).
Table 1.2: Items used to measure other place attachment dimensions

<table>
<thead>
<tr>
<th>Place attachment dimension</th>
<th>Statement</th>
</tr>
</thead>
</table>
| Social bonding             | My family/friends would be disappointed if I were to start visiting other settings/facilities  
                             | If I were to stop visiting “X” I would lose contact with a number of friends  
                             | Many of my family/friends prefer “X” over other sites  
                             | I have a lot of fond memories of “X”  
                             | I have a special connection to “X” and the people who use/visit it  
                             | I do not tell many people about “X”  
                             | I will (do) bring my children to “X”                                                                                                      |
| Nature bonding             | When I spend time in the natural environment at “X”, I feel a deep feeling of oneness with the natural environment  
                             | I would feel less attached to “X” if the native plants and animals that lived here disappeared  
                             | I learn a lot about myself when spending time in the natural environment at “X”  
                             | I am very attached to the natural environment at “X”                                                                                      |
| Place affect               | I feel strong, positive feelings for “X”  
                             | I am fond of “X”  
                             | I feel relaxed when I am at “X”  
                             | “X” is my favourite place to be  
                             | I feel happiest when I am at “X”  
                             | I really miss “X” when I am away too long  
                             | “X” means a lot to me  
                             | I am very attached to “X”  
                             | I feel a strong sense of belonging to “X”  
                             | I have little, if any, emotional attachment to “X”                                                                                         |
| Place familiarity          | I could draw a rough map of “X”  
                             | I have been to “X” many times and I am quite familiar with it  
                             | I know “X” like the back of my hand                                                                                                         |
| Place belongingness        | I feel connected to “X”  
                             | I am fond of “X”  
                             | “X” makes me feel like no other place can  
                             | When I am at “X” I feel a part of it  
                             | I feel like I belong at “X”                                                                                                               |
| Place rootedness           | “X” is the only place I desire to do my favourite activity  
                             | I rarely, if ever, do my favourite activity at any other place than “X”  
                             | If I could not do my favourite activity at “X” I would stop doing it  
                             | I only consider “X” when I want to do my favourite activity                                                                                       |

Sources: Kyle et al. (2004b); Kyle et al. (2005); Hammitt et al. (2009); Halpenny (2010); Raymond et al. (2010)

In addition to social bonding, a dimension relating to affect or emotion has also been advocated for inclusion in place attachment research (Ramkissoon, et al., 2012).
Place affect or affective attachment has been defined as the emotions, feelings and bonds of an individual towards a particular place (Halpenny, 2010; Ramkissoon, et al., 2012; Rollero & De Piccoli, 2010) and has been the subject of increasing research attention. This is partly due to some researchers proposing that place attachment could be viewed as an attitudinal construct consisting of three components – affect, cognition and behavioural intention (Jorgensen & Stedman, 2001; Kyle, et al., 2004b). They note that place attachment involves the interplay of affect, emotions, knowledge, beliefs, behaviours and actions in reference to a place (Halpenny, 2010; Kyle, et al., 2004b). This therefore suggests that place identity forms the cognition component, place dependence and social bonding the behavioural intention and place affect as the affective component of place attachment when considered as an attitudinal construct (Kyle, et al., 2004b).

Other authors have suggested that individuals exhibit a need for the natural environment (Ramkissoon, et al., 2012). Through interactions with a natural location and development of an affective attachment, individuals are able to generate a sense of psychological well-being (Ramkissoon, et al., 2012; Tuan, 1977). Tuan (1974) coined the phrase “topophilia” or love of place to describe the accumulation of emotional sentiments regarding a setting (Ramkissoon, et al., 2012). All in all, scholars have felt the need to ensure that the importance of affect as an aspect of an individual’s attachment to a place, be they positive or negative emotions, should be recognised (Kals, Schumacher, & Montada, 1999; Low & Altman, 1992; Manzo, 2003, 2005).

Hammitt, Kyle and Oh (2009) tested a number of place models to determine the validity of a number of additional dimensions. These included the two-dimensional attachment model of place identity and place dependence as well as models with
three, four and five dimensions (Table 1.3). These included: place familiarity – pleasant memories, attributes and emotional meanings that result from associates and remembrances connected with the place; place belongingness – feeling of membership with a place or a social bond where individuals feel connected with the place; place rootedness – strong and focused bond, feeling completely at home or comfortable in the place; affective attachment – emotional bonding with a place; and social bonding – social investment with a place.

These authors employed structural equation modelling to examine the relationships among the multiple dimensions. The differences in predictive validity of the different models were not great and Hammitt, et al. (2009) found it difficult to convincingly recommend which model would be best to use. They noted that all the models tested had place identity and place dependence at their core, and therefore may be too similar to provide a more tangible result as to which model was best for measuring place attachment. As such, place identity and place dependence may be the more robust measures of place attachment given that they seem less dependent on the characteristics of the natural and social setting under investigation (Raymond, et al., 2010).
Table 1.3 Place models tested by Hammitt, Kyle and Oh (2009)

<table>
<thead>
<tr>
<th>Two dimensional model</th>
<th>1. Place identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>(conventional place attachment model as</td>
<td>2. Place dependence</td>
</tr>
<tr>
<td>suggested by Williams et al. (1992))</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Three dimensional model</th>
<th>1. Place attachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(as suggested by Jorgensen &amp; Stedman (2001)</td>
<td>2. Place identity</td>
</tr>
<tr>
<td>as their model for sense of place)</td>
<td>3. Place dependence</td>
</tr>
</tbody>
</table>

| Four dimensional model                         | 1. Social bonding   |
|                                               | 2. Affective attachment|
| (Kyle, Mowen & Tarrant, 2004b)                | 3. Place identity   |
|                                               | 4. Place dependence |

| Five dimensional model                         | 1. Familiarity      |
|                                               | 2. Belongingness    |
| (Hammitt, Backlund & Bixler, 2006)            | 3. Rootedness       |
|                                               | 4. Place identity   |
|                                               | 5. Place dependence |

Place meanings and place attachment in water-based environments

While a number of studies on place attachment and the meanings contributing to attachment have been conducted in water-based environments, these have predominantly been concentrated on recreation or economically-important rivers with only a few studies identified focusing on marine environments. Bricker and Kerstetter (2002) studied the meanings that whitewater rafters and kayakers attached to the American River. They asked respondents to elucidate what their favourite place on the River meant to them. Five types or categories of meaning were identified – environment/landscape – encompassing respect for natural features; beauty and serenity of the natural surroundings; human/social – social ties, interactions, relationships and personal growth of self and others; recreation – location of activity or where particular skill was developed or tested; heritage/historic – the gold rush history associated with the site; and commodity - facilities, services
and amenities located along the river. They further documented that for some respondents the activities, environment or social relationships were most important while for others it was a combination of some or all of these meanings.

There are differences between these meanings and those identified by Davenport and Anderson (2005) who examined the connections local residents had to Niobrara National Scenic River. When asked as to their connection to the River, respondents indicated four main themes. One was the river as sustenance, as a source of water and economic revenue. Second was the river as a tonic, seen as good for the mind, body and soul. Third was the river as nature and an appreciation of the ecology and natural character of the river. Finally, was the river as identity and how it contributed to the respondent’s identity as an individual, a family member and a community member. Although the perceptions of local residents compared to visitors to a recreational setting are different, it is evident that landscape characteristics are important in the production of place meanings (Davenport & Anderson, 2005).

Focusing on place attachment, Warzecha and Lime (2001) applied place identity and place dependence scales in a survey of river users in the Canyonlands National Park. They surveyed the users of two rivers – the Green River which is popular with canoers and kayakers, and the Colorado River which is predominantly used for white-water rafting. The application of the scales was effective with the mean scores for both place identity and place dependence higher for users of the Green River compared to the Colorado River. From these mean scores, they successfully clustered respondents based on the strength of the dimensions and applied these when comparing other aspects of interest to managers such as support for management actions, motives for undertaking trips and acceptable levels of other visitors encountered.
As demonstrated by these studies, the place attachment concept has assisted in the analysis of water-based environments, with the attraction of people to water well known (Newsome, Moore, & Dowling, 2002; Wynveen, et al., 2010). Therefore it is surprising that there is a lack of application of this concept to marine and coastal environments. In their study of meanings ascribed to the Great Barrier Reef Marine Park (GBRMP), Wynveen, et al. (2010) noted this lack of discussion of meanings attributed to marine environments. Their focus was on local residents who recreated within the GBRMP and through interviews with 20 participants identified 10 key themes. These included: aesthetic beauty; lack of built infrastructure creating a pristine environment; abundance and diversity of coral and other wildlife; unique natural resources not found elsewhere; facilitation of desired recreational activities; safety and ease of accessibility of the Reef; curiosity and exploration; connection to the natural world; escaping from the everyday; and family and friends.

As with terrestrially based studies, Wynveen et al. (2010) noted the importance of specific attributes are reflected in the meanings identified. However, they also pointed out that respondents in other studies on water-based environments often merely acknowledge the presence of water, whereas in their study, a rich description was provided of the particular water attributes such as its colour and clarity. Clearly, being immersed in the water, rather than just recreating on it, provides an additional facet and nuance to place attachment in marine and coastal settings.

**Relationships between place attachment and other variables**

Visitors often see their favourite places in natural areas as avenues of experience for the long term rather than a set of useful attributes, scenic areas or opportunities to enjoy the outdoors (Brooks, Wallace, & Williams, 2007). These experiences may not
be readily transferable to other locations perceived by managers to have similar conditions or attributes (Brooks, Wallace, & Williams, 2006). In order to provide these unique, quality recreational and leisure experiences, managers need to understand the values assigned to these settings and the attributes which attracted visitors in the first instance (Brooks, et al., 2006; Farnum, et al., 2005).

If people who are emotionally and functionally attached to a place feel it is under threat from either other users or as a result of management actions they may in turn act to protect that place (Halpenny, 2010). This is almost akin to developing a sense of possession or ownership of the place (Brooks, et al., 2006). However, this does not always have to be a negative by-product of attachment. There is the potential for place attachment to foster a sense of advocacy (Payton, et al., 2005), support for conservation efforts that protect or restore the setting (Halpenny, 2006; Halpenny, 2010) or identify key stakeholders to assist in planning efforts.

People who are more attached to natural areas tend to show greater concern regarding the management, ecological and social well-being of these areas. It has been demonstrated previously, and in this Chapter, that place attachment is positively related to the attitudes of visitors towards the management and protection of places (Farnum, et al., 2005; Kaltenborn & Williams, 2002; Kruger & Williams, 2007; Walker & Ryan, 2008). Those who value special places within public lands are more likely to be aware of critical management issues and possess greater concern regarding ecological issues (Smaldone, et al., 2005; Williams, et al., 1992).

Especially in places that seem to evoke strong emotional responses, managers need to be aware of how place attachment can influence the behaviours of visitors and their responses to management decisions.
The relationship between place attachment, particularly place dependence and place identity, and environmental and social setting conditions was investigated by Kyle, et al. (2004a) on the Appalachian Trail. The authors identified that as place identity increased, respondents were more inclined to indicate that social and environmental conditions they encountered were a problem. The reverse was found for place dependence, as this dimension increased, respondents were less inclined to rate conditions as a problem and were generally more accepting of the trail conditions they encountered.

Place identity was also found to have a mediating effect on the relationship between place dependence and environmentally responsible behaviour – as place dependence increased, place identity increased, and as place identity increased so did self-reported environmental behaviour. This relationship was found for both general and park specific behaviours (Halpenny, 2010; Vaske & Kobrin, 2001). Halpenny (2010) identified that the relationship with place identity was stronger for place specific behaviours (i.e. those relating to the park under investigation) than for general behaviours (i.e. talking about environmental issues, contributing money to environmental organisations, etc).

In another study of hikers on the Appalachian National Scenic Trail, visitors were surveyed as to their support for a list of 25 potential management actions with comparisons made based on their low, medium or high place attachment (Kyle, Graefe, & Manning, 2004c). Highly attached hikers were more inclined to support actions that restricted other uses and users’ impacts on the trail and were less supportive of actions that curbed their own access and choices. Less attached hikers were supportive of actions such as charging a fee for trail maintenance, requiring a permit for overnight use and requiring campers to use shelters or designated
campsites (Kyle, et al., 2004c). This was also shown in a survey of visitors undertaking boating trips on the Colorado and Green Rivers. Higher place-attached respondents were more inclined to support prohibition of motorised rafts on the rivers than having to reserve a campsite and maintain a predetermined itinerary (Warzecha & Lime, 2001).

**Knowledge gaps**

Limited research has been conducted into the concepts of place and their application in marine and coastal environments. A small number of studies have examined place concepts in water based settings such as rivers (Bricker & Kerstetter, 2002; Davenport & Anderson, 2005) or seaside towns (Garrod, 2008), with two studies examining place in a marine environment (see Moskwa, 2012; Wynveen, et al., 2010). Apparent is that none have examined place concepts at coastal settings, as an interface between land and sea, with visitors as the focus. In the context of this thesis, a visitor is a person who travels outside their usual environment for a period of time for leisure purposes (Eagles, McCool, & Haynes, 2002).

Understanding the social and environmental values of marine and coastal places is essential if the character and identity of the marine experiences available to visitors are to be maintained (Cessford, 2000; Shafer & Inglis, 2000). This is especially important for Australian coastlines given that 56% of international tourists visit coastal areas during their trip to Australia (Harvey & Caton, 2003; Maguire, Miller, Weston, & Young, 2011) and for Western Australia in particular with over 80% of tourism activities occurring in coastal areas (Priskin, 2003). On a global context, coastal and marine areas are increasing in popularity as tourism destinations (Bell, Needham, & Szuster, 2011; Hall & Page, 2006), with this increase in visitation
potentially impacting on the quality of these tourist and visitor experiences (Bell, et al., 2011). Therefore it would seem prudent to understand place attachment and other place concepts as they apply to coastal and marine areas.

Place concepts provide critical insights into the requirements of visitors for favourable recreation experiences and their likely responses to management decisions (Farnum, et al., 2005). This is crucial in settings that evoke strong emotional responses in visitors, with place analyses helping to understand the behaviours of visitors and their support or otherwise for management decisions (Farnum, et al., 2005). A limited number of investigations into the relationships between place attachment and variables such as pro-environmental behaviours and management decisions have been undertaken (e.g. Halpenny, 2010; Kyle et al., 2004c; Vaske & Kobrin, 2001), with none focusing on coastal or marine environments. As such, the attribution of place meanings in coastal settings is critical to documenting the values of such places and the imbued relationships for those visiting, as a basis for more detailed place attachment and to provide baseline information for managers.

Recent research demonstrates a growing interest in the effects of place attachment on pro-environmental behaviours (Halpenny, 2010; Vaske & Kobrin, 2001; Walker & Chapman, 2003). This study contributes to these efforts by examining the relationship between the dimensions of place attachment and place-specific pro-environmental behaviours with differing levels of perceived commitment, relating to intentions that could be undertaken both on-site and off-site. Pro-environmental behaviours both on and off-site are critical for the endurance of natural areas into the future.
Also important for the future of natural areas is the link between place attachment and management actions. Research to-date has produced variable results with some focusing on place attachment as holistic construct (Kyle, et al., 2004c) and others examining the separate dimensions of place attachment (Warzecha & Lime, 2001). This study draws on specific management actions pertaining to both land and sea settings to ascertain if visitors with strong place attachment prefer differing management actions to those with weaker or lower levels of attachment. Additionally, is the consideration of whether the level of support for particular actions changes according to the level of place attachment of visitors to coastal areas. All are important aspects to consider in the management of recreation and leisure settings in natural areas and informed the research focus of this thesis.
Chapter 2: Research Design and Ningaloo Coast study site

This study employed a mixed method research approach through the application of qualitative and quantitative methods followed by an integration of results. Authors within the place literature (Beckley, Stedman, Wallace, & Ambard, 2007; Farnum, et al., 2005; Williams & Patterson, 2007) have advocated the use of a mixed method research approach in order to fully understand the complex nuances that comprise place attachment. This chapter begins with a synopsis of the mixed method research design for this research, followed by the research questions and the qualitative and quantitative methods used to answer these questions. The specifics of the data collection and analysis used are provided in the subsequent chapters that address each research question. This chapter concludes with an overview of the case study site – the Ningaloo coast and limitations to the study.

Research approach

The use of mixed methods has developed rapidly in recent years (Denscombe, 2008) with major areas of social and behavioural research employing mixed or multiple methods as standard (Tashakkori & Teddlie, 1998). Mixed method approaches involve the use of both quantitative and qualitative data in a single study or programme of inquiry as a way of establishing relationships between variables and exploring the reasons behind these relationships (Woolley, 2009). Research questions generally involve “what” and “where” or “how” and “why”. The defining characteristics of mixed methods research include quantitative and qualitative methods used within the same study, a research design that clearly specifies the sequencing and priority given to each method during data collection and analysis, an
explicit account of the manner in which the methods relate to each other, and has pragmatism as the philosophical underpinning of the research (Denscombe, 2008).

This research draws on two dominant research paradigms: positivist and constructivist (Table 2.1). The positivist paradigm is the traditional science model that uses a deductive logic of investigation (Maxim, 1999). Generally, hypotheses are generated from an existing body of knowledge and tested through careful analysis of data, with the objective to test or verify a theory rather than develop it (Creswell, 1994; Neuman, 2003). The aim of this form of research is to provide information about the type of relationship within the data to enable the discovery of natural laws that enable researchers to predict and control events (Creswell, 1994; Maxim, 1999; Neuman, 2003). The most common methods used for this research paradigm are experiments, surveys and statistics (Neuman, 2003). For this aspect of the study, a survey based approach was undertaken with the associated ontological and epistemological assumptions of the researcher being independent of those being researched (Table 2.1).

The other dominant research paradigm is the constructivist or qualitative paradigm, which has also been called interpretive, post-positivist or post-modern (Creswell, 1994; Denzin & Lincoln, 2000; Neuman, 2003). This paradigm involves the detailed study of “text” to make the obscure clear and enable an understanding and description of social action (Neuman, 2003). The use of theory in this paradigm is less clear as it often emerges from within the data during data collection or analysis. Constructivist research uses inductive methods such as participant observation and field research (Creswell, 1994; Neuman, 2003). For this study, semi-structured
 interviews were employed to allow the researcher to interact with those being researched.

**Table 2.1:** Summary of positivist and constructivist research paradigms (Creswell, 1994; Denzin & Lincoln, 2000; Neuman 2003)

<table>
<thead>
<tr>
<th>Item</th>
<th>Positivist (Quantitative) Paradigm</th>
<th>Constructivist (Qualitative) Paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ontology</strong></td>
<td>Objective, independent of researcher</td>
<td>Reality constructed by individuals involved in research situation</td>
</tr>
<tr>
<td><strong>Epistemology</strong></td>
<td>Researcher is independent of those being researched</td>
<td>Researcher interacts with those being researched</td>
</tr>
<tr>
<td><strong>Role of values</strong></td>
<td>Value free, unbiased</td>
<td>Value-laden, biased</td>
</tr>
<tr>
<td><strong>Methodology</strong></td>
<td>Deductive, cause and effect, generalisations lead to prediction, explanation and understanding</td>
<td>Inductive process, simultaneous shaping of factors emerging design, theories developed for understanding</td>
</tr>
<tr>
<td><strong>Nature of problem under study</strong></td>
<td>Previously studied by others, body of knowledge exists, known variables and existing theories</td>
<td>Explanatory research, values unknown, context important, may lack theory base</td>
</tr>
<tr>
<td><strong>Key aspects</strong></td>
<td>Measures objective facts, Focus on variables, Reliability is key</td>
<td>Construction of social reality, Focus on processes/events, Authenticity is key, Measures created in ad-hoc manner, specific to setting, Few cases or subjects, Data in form of words, images from documents or observations, Thematic analysis</td>
</tr>
<tr>
<td></td>
<td>Measures systematically created before data collection, Many cases or subjects</td>
<td>Data in form of numbers from precise measurement, Statistical analysis</td>
</tr>
</tbody>
</table>

By using mixed methods and their associated paradigmatic qualities, this study aimed to fully explore and comprehend the aspects of place attachment at Ningaloo. Mixed method research designs provide the best opportunity to address research questions and objectives using both qualitative and quantitative approaches. Such a design and associated methods provides differing perspectives of the concept under investigation (Woolley, 2009), essential to fully comprehending the phenomena of place.
This study employed the sequential type of mixed method research where a qualitative method (semi-structured interviews) generated a rich understanding of place meanings and informed the development of a quantitative method (survey). However both methods were afforded equal status in answering the research questions in this study (Fig. 2.1).

Figure 2.1: Diagram of sequential exploratory research design guiding this study (derived from Creswell, 2009).

Sequential research designs seek to elaborate and expand on the findings of the initial method with the other. As undertaken in this research, the qualitative interview method contextualised the study and helped to refine and adapt the content and scales used in the subsequent quantitative survey method (Creswell, 2009; Tashakkori & Teddlie, 1998). This design was used here as it is suited to research seeking to explain and interpret the relationships under investigation. The primary focus of sequential research designs is to explore the phenomenon through a qualitative method of inquiry (e.g. interviews) and then testing and refining during the quantitative method (e.g. survey) (Creswell, 2009).

Research questions and associated objectives

This study explored the place attachment of campers to Ningaloo Marine Park. It also examined the relationship between this attachment and visitors’ behavioural intentions and support for management actions associated with the Marine Park. The study was informed by the place literature and previous research on spatial patterns
of visitors to Ningaloo Marine Park undertaken by Smallwood and Beckley (2012),
Smallwood, Beckley and Moore (2012), and Smallwood, Beckley, Moore and
Kobryn (2011).

The research questions and associated objectives are as follows:

1. What contributes to the place attachment of visitors to a coastal setting?
   
   Objective:
   Identify and describe the meanings associated with the place attachment of
campers adjacent to Ningaloo Marine Park.

2. What is the relationship between place attachment, behavioural intentions and
   perceptions of management actions in a coastal setting?
   
   Objectives:
   Identify and explore the relationship(s) between place attachment and
   behavioural intentions.
   Identify and explore the relationship(s) between place attachment and support
   for management actions.

3. How can an understanding of these relationships contribute to management of a
   coastal setting?
   
   Objectives:
   Use results obtained to provide a series of recommendations to managers as
   they relate to place attachment and pro-environmental behaviours and support
   for management actions.
   Identify gaps in knowledge and opportunities for future research as to the
   relationships between place attachment, pro-environmental behaviours and
   support for management actions.

Table 2.2 outlines these questions and associated objectives as well as where these
questions are addressed in this thesis.
### Table 2.2: Research questions, associated objectives and method of investigation

<table>
<thead>
<tr>
<th>Research question</th>
<th>Associated objective</th>
<th>Corresponding chapter of thesis that addresses research question</th>
<th>Method of investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>What contributes to the place attachment of visitors to a coastal setting?</em></td>
<td>Identify and describe the meanings influencing the place attachment of campers adjacent to Ningaloo Marine Park.</td>
<td>Chapter 3: Place meanings of camping tourists along Ningaloo coast, Australia</td>
<td>Qualitative</td>
</tr>
<tr>
<td><em>What is the relationship between place attachment, behavioural intentions and perceptions of management actions in a coastal setting?</em></td>
<td>Identify and explore the relationship(s) between place attachment and behavioural intentions.</td>
<td>Chapter 4: The effect of place attachment on pro-environment behavioral intentions of visitors to Ningaloo Marine Park</td>
<td>Quantitative</td>
</tr>
<tr>
<td></td>
<td>Identify and explore the relationship(s) between place attachment and support for management actions.</td>
<td>Chapter 5: Place attachment and management preferences of visitors to a coastal World Heritage site, Australia</td>
<td>Quantitative</td>
</tr>
<tr>
<td><em>How can an understanding of these relationships contribute to management of a coastal setting?</em></td>
<td>Use results obtained to provide a series of recommendations to managers as they relate to place attachment and pro-environmental behaviours and support for management actions. Identify gaps in knowledge and opportunities for future research as to the relationships between place attachment, pro-environmental behaviours and support for management actions.</td>
<td>Chapter 6: The place attachment of visitors to natural areas: A review and research agenda Chapter 7: Conclusion</td>
<td>Analysis and integration of literature, qualitative and quantitative data</td>
</tr>
</tbody>
</table>
Qualitative approach

The qualitative research method, photo-elicitation, was used to address Research Question 1. Campers were provided with a digital camera and an Instruction Sheet (App. 1A) and asked to take photographs of what was special to them about Ningaloo. An interview was undertaken following the return of the cameras which was predominantly auto-driven by the discussion of photographs. The interview was centred on the photographs and an associated series of questions acted as probes to garner deeper meaning or understanding as well as other questions related to on-site behaviours and perceptions of management (App. 1B). Although these questions were established a priori, the interview was semi-structured in format and guided by discussion of the photographs and the researcher. On return from the field, the interviews were transcribed verbatim for subsequent analysis.

When using photo-elicitation, it is important to consider that the short time period in which participants are asked to take photographs means they may not be able to capture images representing long-held meanings. For example, it would not be possible to capture the moment that they first surfed a particular surf-break, or even another significant event that contributed to the meanings they ascribe to Ningaloo as the event happened on a previous visit. Additionally, the limitation of the cameras themselves also needs to be acknowledged. Not being water-proof, water-based meanings would not be able to be captured completely. To try and overcome these limitations, the following question was included in the survey to try and obtain information on these ‘un-photographable’ meanings “is there anything that you wanted to capture but couldn’t?”.
Photo-elicitation was first mentioned in a published paper examining mental health issues in the maritime provinces of Canada (Collier, 1957). The technique generally involves inserting a photograph or picture into an interview, which then forms the basis of discussion (Harper, 2002; Jacobsen, 2007; Loeffler, 2004; Rose, 2007). There are generally three ways of employing photographs in a study. The first involves photographs provided by the researcher as a means to induce a response from the participant. The second also involves photographs provided by the researcher with this generally for the purpose of sorting them according to the concept or aspect under investigation. Finally, there is “subject employed”, whereby the study participant takes or provides their own photographs according to instructions from the researcher (Jacobsen, 2007).

Subject-employed photographs allows participants to provide responses to the concept under investigation while they are actually experiencing it (Jacobsen, 2007), making it the appropriate use of photographs for this study given the experiential and personal nature of place attachment. This technique has gained standing in place research and has been used in a number of studies to investigate the meaning contributing to place attachment (Amsden, Stedman, & Kruger, 2011; Beckley, et al., 2007; Farnum, et al., 2005; Stedman, Beckley, Wallace, & Ambard, 2004). Simply asking a participant “why are you attached to Ningaloo?” may not produce the breadth of information that went into forming the attachment (Beckley, et al., 2007). The photographs taken by participants act as drivers of the accompanying interviews providing the researcher with a clearer indication of the attributes participants considered had a positive, or sometimes negative, influence on their attachment (Garrod, 2008; Stedman, et al., 2004). The use of a camera implicitly or explicitly forces the participant to decide what is to be included or excluded from the
A photograph (Garrod, 2008), potentially helping to articulate the complex and multi-faceted aspects of their attachment to Ningaloo (Beckley, et al., 2007).

Photographs can induce deeper elements of an experience than words alone (Harper, 2002; Loeffler, 2004), and as applied in this study, they can be used to encourage participants to talk about aspects that may not have been possible without the use of the images (Rose, 2007). Pictures can also preserve a moment in time to allow for subsequent examination of the psychological and highly emotive elements and symbols (Collier & Collier, 1986; Loeffler, 2004). The subsequent accompanying interviews assist the participant to clarify these emotions, symbols or elements, while providing the researcher with an opportunity to pose questions to probe the participant to gain deeper insights into the meanings contained in the photographs (Stedman, et al., 2004). This was considered to be the most appropriate method for this type of research at Ningaloo as it fits in with the holiday activity of taking photographs and was not as intrusive as other methods.

**Quantitative approach**

A survey (App. 2) was used to obtain the necessary data to address Research Question 2 and its two associated objectives relating to the relationships between place attachment, pro-environmental behaviours and support for management actions. The methods and data analysis employed to address each objective are described in greater detail in Chapter 4 and Chapter 5.

The survey contained 20 questions (Table 2.3). Questions were included to measure place attachment, perceptions of management actions and intentions to undertake three differing categories of pro-environmental behaviours. Also included were a
series of questions to obtain background information about the visitor, their visit, how familiar they were with the site and whether the site was special.

In January 2010, the Ningaloo coast was nominated for inclusion on the World Heritage List and was subsequently ratified in June 2011. At the request of the management authority, Western Australian Department of Environment and Conservation (WA DEC), questions were included to ascertain level of knowledge of visitors regarding the nomination and what potential effects on their future experiences would be if the area was listed. These results were included in a subsequent report of the survey data provided to WA DEC and are not included in this thesis.

Table 2.3: Number and type of questions included in visitor survey

<table>
<thead>
<tr>
<th>Topic or intent of question</th>
<th>Purpose</th>
<th>Question number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitation frequency</td>
<td>Background information</td>
<td>1</td>
</tr>
<tr>
<td>Location of stay (same, different)</td>
<td>Background information</td>
<td>2</td>
</tr>
<tr>
<td>Main and additional reasons for visiting</td>
<td>Tie in with results from interview data</td>
<td>3 and 4</td>
</tr>
<tr>
<td>Scale of familiarity with site</td>
<td>Background information</td>
<td>5</td>
</tr>
<tr>
<td>Whether they considered site special</td>
<td>Background information</td>
<td>6</td>
</tr>
<tr>
<td>Place attachment items</td>
<td>Measure place attachment</td>
<td>7</td>
</tr>
<tr>
<td>List of hypothetical management actions</td>
<td>Measure research objective relating to management actions</td>
<td>8</td>
</tr>
<tr>
<td>Questions relating to behavioural intentions</td>
<td>Measure research objective relating to pro-environmental behaviours</td>
<td>9, 10 and 11</td>
</tr>
<tr>
<td>Questions relating to World Heritage nomination</td>
<td>Request from WA DEC*</td>
<td>12, 13 and 14</td>
</tr>
<tr>
<td>Visit and visitor characteristics</td>
<td>General information, same format as WA DEC visitor survey questions</td>
<td>15-20</td>
</tr>
</tbody>
</table>

*WA DEC = Western Australian Department of Environment and Conservation

Pre-testing of the survey instrument was undertaken prior to data collection. A total of 19 participants who had previously visited Ningaloo Marine Park, including those who had visited only once and more than once, completed the pilot test. These participants included post-graduate and under-graduate students from the
researcher’s university as well as academic staff. The survey was also provided to others outside of the university environment. Once participants had completed the survey, they were asked by the researcher how long it took them to complete it, whether there were any questions that they did not understand or whether they had any other comments regarding the survey. In addition to this pilot-testing, the survey was also sent to a number of staff within WA DEC for comment. This included the Marine Policy and Planning Branch, the Principal Research Scientist for the Marine Science Program, the Social Research Unit Coordinator and the Visitor Services Coordinator of the WA DEC Exmouth District Office. All comments provided were taken into consideration and resulted in slight modifications to the survey instrument.

Surveys have been widely used in protected area and natural resource management to collect information on visitors, including their activities, expectations and satisfaction with natural areas (Newsome, et al., 2002). They have also been utilised in place attachment research to determine the strength of attachment via place identity and place dependence measurement scales, as well as testing for relationships between place attachment and visitor characteristics or other variables of interest (Bricker & Kerstetter, 2002; Trentelman, 2010; Moore & Graefe, 1994; Williams & Roggenbuck, 1989).

Most place attachment research involving surveys has utilised mail-back approaches, either with visitors given a questionnaire on-site to mail back to the researchers (e.g. Eisenhauer et. al (2000)) or a mail-out to residents surrounding a protected area (e.g. Wynveen, et al., 2010)). A survey completed on-site was the preferred method for this study. Reasons include the high response rates associated with on-site methods
The nature of visitors to Ningaloo makes mail-back approaches unfeasible as the initial population is diverse and not confined to a particular region or location with many originating from interstate or overseas (Beckley, et al., 2010). On-site methods lets these visitors be included in this research by allowing them to complete the survey on-site, coupled with the advantage of not requiring these visitors to remember to return the survey at the conclusion of their camping holiday or upon arrival home.

Integration of qualitative and quantitative results

Following review of the results obtained from the qualitative and quantitative data collection and analyses, clear issues and questions for future research became apparent. This set the tone for the fourth and final manuscript within Chapter 6 which outlines an agenda for future research, determined from examination of results presented in this thesis and similar questions raised from other studies from the wider place attachment literature. Chapter 7 – Conclusion summarises the results obtained for each research question and associated objectives as well as suggesting recommendations for managers and research that have arisen from this study.
Case study site description – Ningaloo Marine Park and surrounds

Ningaloo Marine Park contains Ningaloo Reef, Australia’s largest fringing reef system (Cassata & Collins, 2008). A short description of Ningaloo Reef, establishment and management of Ningaloo Marine Park as well as an overview of surrounding land-uses and tourism and visitor use of the region follows. The intention is not to provide a comprehensive overview but to present the necessary context as to the attractions of the region and patterns of visitation. For a more comprehensive review, readers are referred to Beckley and Lombard (2012), Smallwood et al. (2011), and Beckley et al. (2010).

Ningaloo Reef

Ningaloo Reef is Australia’s largest fringing reef system at 300 km long (Cassata & Collins, 2008) and is internationally known, particularly among scuba divers and naturalists for its whale-shark congregations, one of the few that are readily accessible to people (Catlin, Jones, & Jones, 2012; Mau, 2008; Wood & Glasson, 2005). It is one of a declining number of major coral reefs of the world in good condition, with its condition potentially a result of its remote location at 1200km north of Perth, the capital of Western Australia (Cassata & Collins, 2008).

The Reef encloses a narrow lagoon which varies in width from 200 m to 7.5 km with the average distance of 2.5 km. It is composed of complex intertidal and sub-tidal geomorphology which provides the foundation for a variety of marine habitats including rocky shores, beach flats, mudflats and reef (Cassata & Collins, 2008; Kobryn, Wouters, & Beckley, 2011) The regional oceanography is dominated by the Leeuwin Current. This is a warm, low salinity current that flows southwards during
the Austral winter close to the Reef and the Western Australian coast (Weller, Holliday, Feng, Beckley, & Thompson, 2011).

These unique biophysical conditions support a diverse array of organisms that are both tropical and temperate (Sleeman, Meekan, Wilson, Jenner, Jenner, Boggs, Steinberg, & Bradshaw, 2007). Large fauna found along the Reef include whale sharks, manta rays, dolphins, whales and turtles (CALM & MPRA 2005; Mau, 2008; Sleeman, et al., 2007). Tropical and sub-tropical fishes, molluscs and corals are also found as well as a high number of sponge species and previously unidentified echinoderm species (Storrie & Morrison, 1998). These organisms, particularly the larger species such as whale-sharks and manta rays, have come under increasing focus from the tourism industry (Catlin, et al., 2012; Mau, 2008; Sleeman, et al., 2007).

Establishment and management of Ningaloo Marine Park

The conservation significance of Ningaloo Reef was recognised as early as the 1960s and was gazetted as a Marine Park in 1987. Then, 260 km of the Reef and waters, as well as a 40 m strip above high water mark, were gazetted by the State government, with Ningaloo Marine Park (Commonwealth Waters) also gazetted around this time (Commonwealth of Australia, 2002; CALM & MPRA 2005). Ningaloo Marine Park is vested in the Marine Parks and Reserves Authority in accordance with the Conservation and Land Management Act 1984 (WA). It is managed on their behalf by the Western Australian Department of Environment and Conservation (WA DEC), with the Department of Fisheries (DoF) responsible for the management of fisheries resources. The Commonwealth Waters are vested with the Commonwealth.
Government of Australia and are managed by DEC and DOF according to a memorandum of understanding.

The boundary of the Marine Park was amended in 2004 to include the entire 300 km stretch of the Reef and now extends from Bundegi in the north to Red Bluff in the south (Fig. 2.2). It extends out to three nautical miles of State waters and covers an area of approximately 263 343 hectares. The landward boundary is defined as the high water mark except for the following: adjacent to any pastoral lease where it is 40m above the high water mark; adjacent to the Commonwealth Department of Defence land where it is the low water mark; excludes the Navy Pier at Point Murat which is owned by the Commonwealth Department of Defence; and between Red Bluff and Amherst Point where it is the low water mark.
Figure 2.2: Ningaloo Marine Park with designated zones (CALM & MPRA, 2005).
The initial management plan for the Marine Park was approved in 1989, which was followed by its designation as an “A” Class Reserve in 1990. There is a current management plan that was approved in 2005. This outlines the designated sanctuary, recreation and general use zones within the Marine Park. There are also special purpose zones relating to shore-based fishing and benthic protection (Fig 2.2). Certain activities, compatible with conservation values, are permitted (or not permitted) according to the zoning (Table 2.4).

Table 2.4: General description of zone type used in Ningaloo Marine Park (adapted from CALM & MPRA 2005)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Description</th>
<th>Percentage of Park area</th>
<th>IUCN Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>General use</td>
<td>Commercial fishing, pearling and aquaculture may be permitted</td>
<td>50</td>
<td>VI</td>
</tr>
<tr>
<td>Sanctuary</td>
<td>Protection and conservation of marine biodiversity with specified passive recreational activities permitted</td>
<td>34</td>
<td>II</td>
</tr>
<tr>
<td>Recreation</td>
<td>Providing opportunities for recreation, commercial fishing, pearling, aquaculture. Petroleum drilling and production not permitted</td>
<td>14</td>
<td>VI</td>
</tr>
<tr>
<td>Special purpose</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benthic protection</td>
<td>Conservation of benthic (substrate) habitat, trolling by recreational fishers permitted</td>
<td>2</td>
<td>VI</td>
</tr>
<tr>
<td>Shore-based activities</td>
<td>Managed for particular purpose or use, allows for recreational shore-based fishing</td>
<td>0.3</td>
<td>VI</td>
</tr>
</tbody>
</table>

Adjacent land uses

Adjacent towns and cities

There are three adjacent towns and cities that service visitors to the Ningaloo Marine Park – Carnarvon, Exmouth and Coral Bay (Fig. 2.3). A brief description of the first two will be provided here and the description of Coral Bay can be found under the Description of study sites later in this chapter. Carnarvon is the largest of these urban centres with over 5,700 residents (Australian Bureau of Statistics, 2011). The town
acts as the local government centre for the surrounding Gascoyne Region with a number of government facilities and services, as well as commercial enterprises. It is not reliant on tourism with the Carnarvon area having a heavy focus on agriculture, particularly bananas and other vegetables. It is located approximately 120 km from the southern tip of the Ningaloo Reef. Exmouth is a smaller town than Carnarvon and is situated around the North-west Cape on the northern tip of the Ningaloo Reef. The town is dominated by tourism and hospitality industries including hotels, campgrounds and nature-based tourism businesses. The town generally has a population around 2,200 people (Australian Bureau of Statistics, 2011) however this can swell to over 6,000 during the peak tourism season from April to October (WAPC 2004).

**Pastoral leases**

There are currently five pastoral leases adjacent to the Ningaloo Marine Park – Ningaloo, Cardabia, Warroora, Gnaraloo and Quobba (Fig. 2.3). These are leased under the *Land Administration Act 1997(WA)* with the current leases due to expire in 2015. The primary income from these leases is rangeland grazing comprised of sheep and goats for wool and meat (WAPC, 2004). Some leaseholders are currently making a transition to tourist accommodation which has provided a valuable alternative income stream (Jones, Ingram, & Kingham, 2007). The opportunities provided to visitors by the leaseholders range from homestead-style accommodation and eco-chalets to coastal campsites.
Figure 2.3: Ningaloo Marine Park, settlements, adjacent land tenures and major travel networks.

These coastal campsites are spread across 200 km of coastline, but they tend to cluster in popular nodes such as 3 Mile Campsite at Gnaraloo Station, 14 Mile Campsite at Warroora Station or the five campsites at Ningaloo Station. The campsites at Gnaraloo and Quobba are more developed and have showers and toilets as well as cabins and chalet-style accommodation. At the remaining stations,
camping and station-stays are offered, however minimal facilities are provided with visitors required to bring their own portable toilet if they wish to camp. Access to most of these campsite requires a four-wheel drive or off-road vehicle (Jones, et al., 2007).

*Cape Range National Park*

Located adjacent to the northern end of the Marine Park is Cape Range National Park (Fig. 2.3 and 2.4). This Park protects a land area of approximately 50,581 hectares and is valued for a range of ecological values including subterranean fauna, karst systems and its arid limestone environment. Other features include Shothole Canyon Road and Charles Knife Road as well as tropical and end-of-range flora which include several mangrove species. There are a number of walking trails, and the Park has a total of 13 camping areas which provide a total of 109 sites. Fees are applicable to these campsites and they have a maximum length of stay of 28 days (DEC & CCWA 2010).

*World Heritage Listing*

On the 24th June 2011, the Ningaloo Coast (Fig. 2.4) was added to the World Heritage list under two criteria: (vii) contains superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance; and (x) contains the most important and significant natural habits for *in situ* conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

The area listed includes the Ningaloo Marine Park (both State and Commonwealth Waters), Muiron Islands Marine Management Area, Jurabi Coastal Park, Bundegi
Coastal Park, Cape Range National Park and Learmonth Air Weapons Range (Fig 2.4). Important considerations mentioned by the World Heritage Committee included the large aggregations of whale sharks that visit the area on a regular basis, mass coral spawning and seasonal upwellings, high number of sponge species, new species of echinoderms and aquatic species in flooded caves that are rare, taxonomically diverse and not found elsewhere in the southern hemisphere (UNESCO World Heritage Centre, 2011).

Figure 2.4: Ningaloo Coast World Heritage Area (source: www.environment.gov.au)
Tourism and visitor use in the region

Although isolated from larger population centres, Ningaloo Marine Park still attracts over 200,000 visitors annually (CALM & MPRA 2005; Smallwood, et al., 2011). Visitors undertake a wide variety of activities including swimming, fishing, snorkelling and sunbathing as well as nature-based tourism activities such as snorkel and reef tours and interactions with manta rays and reef sharks (CALM & MPRA 2005; Smallwood & Beckley, 2012; Smallwood, et al., 2011; Wood & Glasson, 2005). The highest numbers of visitors occur between April and October due to the milder air temperatures (<30°C compared to >30°C in November to March) and less risk of cyclonic activity (BoM 2011; Smallwood, et al., 2011).

Tourism along the Ningaloo coast was restricted for many years due to limited coastal access. It was not until the early 1990s that tourism experienced significant and steady growth. Previous to this, the area was dominated by pastoral activities and military presence, with some fishing, whaling and pearling boats during the early 1900s (Jones, et al., 2007; Smallwood, 2009). The first urban settlement of Exmouth was established 1967 to support the joint Australian Navy and United States Navy wireless communications station that was developed at this time.

Access to the region and the reef was improved in the early 1980s following the sealing of the main road to Exmouth, which was extended further north around the North-West Cape during the 1990s (Jones, et al., 2007). The nature-based tourism industry that established itself during this time allowed the town of Exmouth to survive following the withdrawal of the United States Navy and downgrading of the military base (Jones, et al., 2007; Smallwood, 2009; Wood & Glasson, 2005).
Currently, the tourism industry is based on fishing charters, diving, coral viewing, whale watching and animal interaction experiences (GDC 2006; Smallwood, 2009).

The majority of this tourism development is concentrated at Exmouth and Coral Bay to the south (Fig. 2.3). By 2004, Coral Bay had some 25 tourism businesses serviced by approximately 150 staff (Jones, et al., 2007). Additionally, tourists visiting Exmouth spend in excess of $85 million per annum in the local area, with an additional $42 million spent getting there, visiting other places and people in the region and supplying themselves with necessary provisions and equipment (Wood & Glasson, 2005).

A comprehensive study of human usage of the entire length of the Ningaloo Marine Park was undertaken in 2007 (Beckley, et al., 2010; Smallwood, et al., 2011). These researchers used aerial surveys totalling 34 flights and a shore-based survey of 1208 Marine Park users over a 12 month period to document visitor numbers, location, and activity. The studies showed that peak visitation for the Marine Park was during July and of those visitors surveyed, 55% had visited previously, and 44% of this repeat percentage always stayed in the same location. These figures indicate high site fidelity and such fidelity would suggest these visitors are exhibiting strong attachment to Ningaloo.

**Description of study sites**

Due to the large size and the distances required to travel to sites within the Ningaloo Marine Park, three study sites were chosen within geographical proximity of each other in the southern section to allow comprehensive collection of data within time and budgetary constraints. Sites in the southern part of the Marine Park were chosen given it has received less research focus due to its remoteness and limited
accessibility, particularly to the southern pastoral stations which require a four-wheel drive vehicle. The sites were 3 Mile Campsite at Gnaraloo Station, 14 Mile Campsite at Warroora Station and the coastal town of Coral Bay (Fig. 2.5). The sites are not intended to be representative of the entire Marine Park, rather they were chosen as they had some of the highest instances of repeat visitation in the southern section (Beckley, et al., 2010).

Campers at the pastoral stations are predominantly older visitors from within the state of Western Australia, except for Gnaraloo which gets a number of younger visitors and tourists due to its surf breaks (Jones, et al., 2007; Jones, Hughes, Wood, Lewis, & Chandler, 2009). Visitors to the pastoral stations tend to stay longer than other visitors to Ningaloo Marine Park as there are generally no restrictions on length of stay, such as in Cape Range National Park (Smallwood, 2009). Visitors bring with them a considerable amount of expensive equipment including large four-wheel drive vehicles, boats and caravans with most being fairly self-sufficient in bringing supplies with them rather than purchasing them at Coral Bay or Exmouth. The campers here value the isolation and natural environment, with these trips representing the quintessential Australian outdoor holiday generally involving camping, fishing and snorkelling on the reef (Jones, et al., 2007).

Coral Bay is a small coastal town site that is almost totally reliant on tourism. As the only tourism node or town directly adjacent to the Ningaloo Reef, it is a very popular destination (WAPC Jones, et al., 2007; 2004). In Coral Bay, there have been recent infrastructure developments including water and waste-water treatment facilities and a new power station including installation of wind turbines (Jones, et al., 2009). These have improved conditions for both visitors and residents. Visitors to Coral Bay tended to be younger with a higher proportion of families. Their length of stay is
generally of shorter duration than those on the pastoral stations due to the very high
demand for campsites and accommodation (Jones, et al., 2009).

**Figure 2.5**: Ningaloo Marine Park showing three study site locations.
3 Mile Campsite – Gnaraloo Station

The 3 Mile Campsite is located on the Gnaraloo Pastoral Station (Fig 2.5) and contains approximately 50 unpowered campsites (Plate 2.1). The campsite offers beachside camping with bore water showers and toilets, with basic laundry and cleaning facilities (Gnaraloo Station, 2009). These facilities blend in well with the natural environment through the use of local materials and colouring. Notable landscape features include the rugged coastline and a sheltered lagoon adjacent to the campsite in addition to the nearby surf breaks known colloquially as Fencelines and Tombstones (WAPC 2004).

Plate 2.1 – 3 Mile Campsite (clockwise) typical camp, sheltered lagoon, refuse collection provided by Station managers and Fencelines surf break.

There is a shop with basic supplies and pay telephones which is located at the top of the ridge. Dogs and campfires are permitted though firewood must be brought in and not collected from the Station. The campsites themselves are well defined with rocks
or wire roping marking the boundaries of each site and all are clearly marked with site numbers. The sites are relatively well spaced apart with the surrounding medium-sized shrubs providing some privacy for a number of sites, however there are few trees or large shrubs to provide natural shade. The ocean immediately adjacent to the campsite is within the 3 Mile Sanctuary Zone, with small boats (e.g. tinnies or dinghies) able to be launched from the northern end of the lagoon.

14 Mile Campsite – Warroora Station

The 14 Mile Campsite is located on a dune and cuspate pit coast (Short & Woodroffe, 2009) of the Warroora Pastoral Station (Fig. 2.5). Much of the camping actually occurs on the beach and immediate foredune which is technically within the Marine Park (WAPC 2004) as the boundary extends 40m inland from the hide tide mark on pastoral stations (CALM & MPRA 2005). It is a very popular destination for long term visitors but all must be self-sufficient as the sites are unpowered and there are no water facilities or shops. A portable chemical toilet is required for all visitors (Warroora Station, 2009) with refuse locations for rubbish and toilet waste the only facilities provided by the Station. Dogs are permitted with permission from the Station and campfires are also allowed. The campsites themselves are marked and numbered with camping allowed only in designated areas (Warroora Station, 2009). There are four distinct areas of camping – the ridge, the northern beach, the southern beach and behind the foredune (see Plate 2.2). The campsites on the southern beach are more disperse with dune vegetation providing some shelter and privacy, which also occurs for the campsites behind the foredune. There are a greater number of campsites on the northern beach and these are located closer together than those on the southern beach. On the ridge, campsites vary in location from those immediately on the crest of the ridge to those located further back from the crest.
Many visitors utilise varying sources of power generation including solar panels, wind turbines and diesel generators.

Plate 2.2: - 14 Mile Campsite (clockwise) typical campsite on ridge including solar panels for energy generation, camping and recreating on north beach, view from crest to campsites on ridge and foredune campsite

_Coral Bay_

Coral Bay has developed as a tourism settlement in a relatively _ad hoc_ manner since the 1990s (WAPC 2004). There are two main accommodation suppliers – the People’s Park Caravan Village and the Bayview Coral Bay. Both offer an array of accommodation including ocean front caravan sites, villas, chalets and cabins as well as a number of powered and unpowered camping sites (Bayview Coral Bay, 2009; People's Park Caravan Village, 2009). The People’s Park Caravan Village offers barbeque facilities, camp kitchens and has freshwater showers, toilets and laundry facilities. This caravan park does not allow pets or open fires (People's Park Caravan Village, 2009). Entry to the campsite is via a security boom gate with an access card.
obtained upon check-in. The campsites are situated on grassy banks and are close together with the surrounding vegetation comprised of planted palms and peppermint trees (Plate 2.3).

The Bayview Coral Bay has a limited number of campsites allocated for guests with dogs. Facilities at Bayview include a swimming pool, tennis courts, playgrounds, camp kitchens, toilets, showers and laundry facilities (Bayview Coral Bay, 2009). Again, the campsites are situated close together on sand with some grassed areas near the children’s playgrounds (Plate 2.3). There is some native vegetation though the majority consist of planted palms.

Plate 2.3 – Coral Bay (clockwise) typical campsite at People’s Park Caravan Park, typical campsite at Bayview Caravan Park, new boat launching facility and grass area near fish cleaning station immediately adjacent to Coral Bay beach.

The town of Coral Bay itself has a number of amenities including two small supermarkets, a petrol station, a bakery and small shops selling souvenirs, clothing
and jewellery items. There are several grassy park-like areas around the town with a set of public toilets and a fish cleaning station located between the main road and the Bay (Plate 2.3). A new boat launching facility (Plate 2.3) was opened in 2007 which is tarred and has two boat ramps for the launching of boats and a jetty that is also used by the boat charter companies to pick-up and drop-off passengers. This new facility replaced the previous method of launching boats straight off the beach by either four-wheel drive or tractor.

**Study limitations**

Two limitations to this study were identified pertaining to the choice of study sites and the limited temporal extent of the study. Three campsites along the Ningaloo coast were chosen as the sites for this study for a number of reasons. At 300 km long, it would not have been feasible to conduct detailed investigation of the place meanings and place attachment of all visitors along this coastline. The costs and logistics in undertaking remote research are considerable (the nearest major town was either Exmouth or Carnarvon - each approximately 100-200km from ends of Reef, see Fig. 2.4). The main form of transport required to visit campgrounds and campsites along this coastline is a four-wheel drive vehicle with substantial travel times between destinations. It was considered prudent to have a concentrated focus on three sites, rather than a dispersed focus on the entire stretch of coast. The three study sites in particular were chosen as they had some of the highest levels of repeat visitation in the southern section of the Ningaloo coast (Beckley, et al., 2010). In addition, they provided three levels of camping and a diverse range of activities and therefore potentially a diverse range of participants.
The second potential limitation was the limited temporal extent of this study. The June-July period was chosen to conduct this research as this is when the highest visitor numbers for the Ningaloo coast have been recorded (Beckley, et al., 2010), allowing for maximum number of participants within a minimum amount of time. This time of year also has the largest proportion of visitors from Western Australia (Jones, et al., 2011), who would more likely be repeat visitors and therefore potentially exhibit place attachment. Outside of the peak season, the proportion of international visitors is greatest, with these visitors unlikely to be repeat visitors or likely to possess significant levels of place attachment (Jones, et al., 2011).

However, the peak visitation for the region extends from April to October each year. It is likely that visitors to the Ningaloo coast at these other times of the year may ascribe different meanings to visitors during June/July. For example, the meaning relating to the warm climate may not be as crucial to visitors in April or October as warmer weather is experienced in Western Australia during this time. Also, the types of activities participated in may also change, with Gnaraloo Station popular for surfing during the winter months, and windsurfing and kitesurfing during the spring months (September to October) due to the prevailing wind conditions.

It is considered however, that the majority of the place meanings identified would remain the same. The physical environment does not change in terms of its structure and composition throughout the year; therefore the meanings ascribed to it such as providing an opportunity to escape or marvel at the wonders of nature are also unlikely to change. While the type of activities undertaken may change during the year, the ability to participate in any number of terrestrial and marine-based activities is also unlikely to change.
The approach undertaken in this study, of surveying or interviewing visitors at one period of time, is common in place research (Halpenny, 2010; Kyle, et al., 2004a, 2005; Stedman, et al., 2004; see for example Williams, et al., 1992). Most, if not all, place attachment studies involve collecting data at a single point in time. It is acknowledged among place researchers that meanings could potentially change and be altered over extended periods of time (Farnum, et al., 2005; Gustafson, 2001; Stedman, 2003a), and there is also debate over whether place dependence is a precedent to place identity (Farnum, et al., 2005; Kyle, et al., 2005; Vaske & Kobrin, 2001). This has led to the call for more longitudinal studies over periods of time (e.g. a lifetime) to determine whether the meanings ascribed and the types of attachment do evolve with continual and ongoing interactions with a place (Farnum, et al., 2005). However, longitudinal studies are beyond the scope of PhD research and therefore not undertaken here.
Chapter 3: Using photo-elicitation to explore the place meanings of campers along the Ningaloo Coast, north-western Australia

This chapter addresses Research Question 1 by examining the meanings contributing to the place attachment of campers to the southern Ningaloo coast. Photo-elicitation, was employed to ascertain these meanings. The following manuscript has been submitted to *Australian Geographer*.

J. Tonge wrote all sections of this manuscript as well as collecting and analysing the data. S. Moore provided comprehensive feedback on drafts as well as separately coding interview text to ensure inter-coder reliability. M. Ryan and L. Beckley provided comments and input on drafts of this manuscript as well as the development of the interview questions.

Using photo-elicitation to explore the place meanings of campers along the Ningaloo Coast, north-western Australia

*Abstract:*

Although there have been numerous studies of the meanings ascribed to terrestrial places, their applicability or otherwise to coastal and other marine places has received limited attention. Through the process of photo-elicitation, this paper explores the meanings associated with place attachment in a remote coastal camping environment. Ningaloo Marine Park in north-western Australia provided the focus for this study. Thirty participants were provided with digital cameras and the meanings associated with place were explored when their photographs were discussed in subsequent in-depth interviews. Key meanings related to the physical environment included providing opportunities for escape, participating in multiple marine-based activities, bonding with family and like-minded people, and providing a challenging but rewarding experience that makes everybody happy. This paper concludes with a comparison to other water and terrestrial based studies to identify
similarities and differences in how place meanings are formed and expressed in differing environmental contexts.

Introduction

Coastal areas are popular settings for tourism and recreation activities (Needham & Szuster, 2011), which is particularly true in Australia given that it has one of the longest coastlines of any country (Maguire, Miller, Weston & Young, 2011). Coastal areas and beaches are seen as Australian national icons, embodying natural places of sun, sea, surf and sand (James, 2000). Not only do the majority of Australians live within 50 km of the coast, they are also one of the favourite locations for annual holidays and recreational activities (Harvey & Caton, 2003; Maguire, et al., 2011). While most recreation activities take place at local beaches, Australians will travel hundreds of kilometres to distant beaches as their favourite holiday destinations (Maguire, et al., 2011). Coastal recreation is not just confined to Australian coastlines, with coastal recreation visitation levels increasing worldwide (Moskwa, 2012; Needham, 2010; Needham & Szuster, 2011).

The challenge for managers of coastal areas is that this increase in use can result in degradation of these natural areas and the diminishing of the recreational and aesthetic quality that attracted visitors in the first place (Bell, Needham & Szuster, 2011; Petrosillo, Zurlini, Corliano, Zaccarelli & Dadamo, 2007). Ways to plan and manage these experiences is required (Shafer & Inglis, 2000) leading to a need for research examining the social and environmental values of recreational settings and the intersecting of these values with visitor activities (Cessford, 2000) There is little research into this important socio-cultural relationship between visitors and marine and coastal environments, which is surprising in itself given the values that visitors often place on these settings (Moskwa, 2012).
Managers of terrestrial recreational areas have relied on place concepts for the last three decades as part of efforts to include socio-cultural, meaning-orientated dimensions into natural resource management (Farnum, Hall, & Kruger, 2005; Trentelman, 2009; Williams, Patterson, Roggenbuck, & Watson, 1992). Place concepts allow managers to refine their understanding of visitors’ setting preferences, management preferences and activity participation (Kyle, Graefe, Manning, & Bacon, 2004). By including place concepts, management decisions and strategies may become more responsive to visitor experiences and needs (Manzo, 2008). A focus on place concepts in coastal environments seems prudent given the fast and recent growth of marine tourism and the special management challenges faced by managers of coastal settings of incorporating terrestrial and water-based activities (Moskwa, 2012).

The term “place” describes a geographic area that has been given value or meaning by someone, with personal experience being what distinguishes place from ordinary space (Brown & Weber, 2012; Galliano & Loeffler, 1999; Trentelman, 2009; Tuan, 1977). Over time, these geographic spaces become infused with a complex knitting of material, biophysical, social and meaning-rich elements, created and maintained though peoples’ interactions with the setting (Cheng, Kruger, & Daniels, 2003; Trentelman, 2009). These interactions are complex, multi-faceted and packed with meaning (Cheng, et al., 2003). Place meanings articulate the values an individual ascribe to a setting. They develop over continual experiences with the place and are personified by the characteristics of the setting (Manzo, 2008; Stedman, 2008). Over time, people develop attachments to these meanings and continually rely on a place to foster and support these meanings and their subsequent place attachment during repeat visits (Stedman, 2008).
The majority of place meaning research has been conducted in terrestrial environments, focusing on how natural areas influence feelings of residents and visitors towards the environment or attitudes towards tourism developments within natural areas (Beckley, Stedman, Wallace, & Ambard, 2007; Davenport & Anderson, 2005; Stedman, Beckley, Wallace, & Ambard, 2004; Wyman & Stein, 2010). This singular focus has resulted in limited research on the place meanings ascribed to coastal areas or other marine environments (Garrod, 2008; Wynveen, Kyle, & Sutton, 2010 are exceptions). There is also an apparent lack of research in relation to remote coastal settings where visitors are not necessarily from adjacent towns or cities, but travel vast distances to stay and recreate at these settings.

The value and attraction of aquatic environments is well known (Bricker & Kerstetter, 2002; Wynveen, et al., 2010) with a number of place meanings studies conducted on rivers of economic importance and high tourist visitation (Bricker & Kerstetter, 2002; Davenport & Anderson, 2005). Davenport and Anderson (2005) studied place meanings the local community assigned to the Niobrara Scenic River in central Nebraska and found the local community viewed the river as “a tonic”, “nature”, “identity”, and “sustenance”. Bricker and Kerstteter (2002) focused on watercraft users of the South Fork of the American River in California who identified five themes of meanings – environment and landscape; human and social; heritage and historic; commodity and facilities; and recreation.

Wynveen et al. (2010) shifted the focus from rivers to marine environments by identifying and documenting the place meanings recreational visitors ascribed to the Great Barrier Reef Marine Park in north-eastern Australia. Ten meaning themes were identified including abundance and diversity of wildlife and coral, unique natural resource, experiences with family and friends, and sense of connection to the natural
world. The physical attributes of the marine setting significantly contributed to the participants’ place meanings. They further noted that while in terrestrial settings the mere presence of water is important, rarely has its importance been described in such detail as in their marine study.

Given the limited focus on place meanings attributed to coastal areas, the aim of the research reported here was to explore the place meanings visitors ascribed to the land and sea interface along the remote Ningaloo coast.

**Study site**

Three coastal campsites associated with Ningaloo Marine Park were chosen as the study sites. A recently completed human usage study in this Marine Park identified 55% of respondents had visited previously, with 44% of these always staying at the same location (N= 1207) (Beckley, Smallwood, Moore, & Kobryn, 2010). This is high site fidelity and suggests strong place attachment. The Marine Park is part of the recently World Heritage listed Ningaloo Coast and is located 1,200 km north of Perth, the capital of Western Australia (Fig. 1). The Marine Park was originally established in 1987, with the boundaries extended in 2004 to encompass the entire 300 km length (CALM & MPRA, 2005). Ningaloo Reef is one of the largest fringing coral reef systems in the world (Cassata & Collins, 2008; Wilkinson, 2008) with only a shallow lagoon separating the Reef from the Australian mainland (Collins, Zhu, Wyrwoll, & Eisenhauer, 2003). It supports a diverse array of marine life including whale sharks, dugongs, manta rays, sharks, migrating humpback whales and several species of turtles (Sleeman et al., 2007). The Ningaloo coast receives over 200,000 visitors per year with a range of nature-based tourism activities available including swimming, snorkeling, fishing, boating and diving (Beckley, et
al., 2010; CALM & MPRA, 2005). Visitors can camp along the coast at Cape Range National Park and at a number of pastoral stations (where the main land use is rangeland grazing) (Smallwood, Beckley, Moore, & Kobryn, 2011).

Three study sites with high repeat visitation were selected in the southern section of the Marine Park coastline (Fig. 1). This section was chosen as few studies have been undertaken here as most places are accessible by four-wheel drive only. Additionally, a number of sites in this southern section have high repeat visitation (Beckley, et al., 2010). The first study site was Coral Bay, which provides camping and hotel-based accommodation with facilities including a petrol station, supermarkets, bakery and nature-based tourism businesses. The other two study sites were located on pastoral stations abutting the coastline boundary of the Marine Park. The 14 Mile Campsite on Warroora Station provides unpowered sites and no other facilities (other than a refuse dump point) with 3 Mile Campsite on Gnaraloo also providing unpowered campsites but also had simple facilities which include showers and toilets.
Figure 1: Ningaloo Marine Park, reef crest and study site locations.

Methods

This study used photo-elicitation, where participants take their own photographs which are discussed as part of an in-depth interview (Jacobsen, 2007; Loeffler, 2004). Pictures or images can evoke emotion and capture vast amounts of information within a single representation. When used as part of the research process they can allow participants to reflect on aspects of their lives or prod underlying memories. Photographs can also induce deeper aspects of an experience than words alone, stimulating the release of emotional thoughts and statements about a concept (Harper,
Given the paucity of information on the meanings ascribed to coastal and marine environments, a qualitative method was used in order to fully explore the complexity of the place meanings ascribed to Ningaloo.

Photo-elicitation has been widely applied in terrestrial place studies (see Amsden, Stedman, & Kruger, 2011; Beckley, et al., 2007; Garrod, 2008; Kerstetter & Bricker, 2009) and was suitable for this study given the potential participants were on holidays and taking photographs is integral to such experiences. Asking them to take photographs reduces the perception of research-related intrusion (Garrod, 2008) as photographs taken by participants may have been images they would have taken anyway. Also, because the focus of the interview is on the photographs rather than the respondents, they should feel more at ease and provide deeper insights on the subject in question (Garrod, 2008; Loeffler, 2004).

**Data collection**

During July 2009, which is peak visitation for the region (Smallwood, et al., 2011), the next available visitor at each of the three study sites were asked to participate in the study if they had camped at the site at least twice previously. It has been suggested that an attachment to a setting begins to develop after one or more visits (Gunderson & Watson, 2007). Participants were selected at each study site to provide a cross-section of visitors with respect to age, group type and gender.

Participants meeting the previous visit criterion were provided with a digital camera and asked to take up to eight photographs of why they liked visiting the site and/or what is was that made them return. An interview was arranged for several days (typically 2-4 days) after camera distribution to allow participants time take
photographs while not allowing so much time that the novelty of taking photographs had subsided and they became disengaged (Stedman, et al., 2004).

As photo-elicitation uses photographs as the driver for obtaining in-depth information, semi-structured interviews were undertaken. A list of questions and probes were established \textit{a priori} to guide the interviewer as required. The digital photographs were loaded on to a laptop computer for ease of viewing and general questions relating to visit and visitor characteristics (for example type of travel group, life-cycle stage, how often visited) were asked at the start of each interview. Discussion of the photographs followed, specifically the intention behind the images and their value or contribution to the participant’s experience. Interviews lasted between 30 to 60 minutes and at the conclusion, a CD containing a copy of their photographs was provided to the participants.

\textit{Analysis}

Each interview was transcribed verbatim, with the participants’ description of their photographs in the interview text used to label what each photograph represented or was intended to represent. Once the photographs were labelled, these were assigned to a series of broad categories based on textual analysis of the interviews and previous place studies to allow for the initial exploration of the meanings associated with place attachment. The photographs were assigned an additional label if they contained a marine element (e.g. seascape) or pertained to a marine activity (e.g. photograph of fishing rods). This was to assist in determining the extent of the influence of the marine aspect of the coastal setting.

The interviews were coded for content with key blocks of text assigned codes. Following the initial coding, interview transcripts were re-read to ensure consistency.
across all transcripts and to adjust, expand and condense categories as required. Coding was undertaken using the QSR N’Vivo software program (Version 2.0), a qualitative data analysis tool that allows for the creation of code trees, or grouping together of like/similar codes into hierarchical structures. Two of the researches coded and re-coded using a shared set of codes until they achieved 85% inter-coder reliability. Finally, the coded blocks of interview text and photograph labels were re-examined to ensure there was a reflection and consistency in meanings between the two approaches.

Results

Thirty participants across the three study sites contributed to the study. Theoretical saturation (Bowen, 2008) was reached with this number, with no new themes or further explanation of existing themes provided by the last few respondents. The visit and visitor characteristics of these participants are summarised in Table 1.

Table 1: Visit and visitor characteristics of study participants at Ningaloo (n = 30)

<table>
<thead>
<tr>
<th>Visit Characteristics (%)</th>
<th>Visitor Characteristics (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lifecyle stage:</td>
</tr>
<tr>
<td>Visitation frequency:</td>
<td></td>
</tr>
<tr>
<td>More than once per year</td>
<td>Raising children, 0-5years</td>
</tr>
<tr>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>Once per year</td>
<td>Raising children, 6-12 years</td>
</tr>
<tr>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td>Once every 2 years</td>
<td>Raising children, 13-17 years</td>
</tr>
<tr>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Group type:</td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>Independent adult child at home (18+)</td>
</tr>
<tr>
<td>47</td>
<td>6</td>
</tr>
<tr>
<td>Friends</td>
<td>Married or de facto, no children</td>
</tr>
<tr>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>Adult couple</td>
<td>Young single independent adult (18-35 years)</td>
</tr>
<tr>
<td>33</td>
<td>6</td>
</tr>
<tr>
<td>First visit:</td>
<td>Older single independent adult (35+ years)</td>
</tr>
<tr>
<td>1980s</td>
<td>3</td>
</tr>
<tr>
<td>1990s</td>
<td>Empty nest (all children have left home)</td>
</tr>
<tr>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>2000s</td>
<td>Gender:</td>
</tr>
<tr>
<td>60</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>47</td>
</tr>
</tbody>
</table>

The participants took a total of 206 photographs, with a mean of 7 photographs per participant (range 3-16). Similarly to previously identified meanings associated with place attachment (see Eisenhauer et al., 2000; Smaldone et al., 2008), the photographs were assigned to three broad categories – physical environment (34%),
recreational activities (29%) and social situations (37%). Also identified were those that featured marine aspects or elements (Fig. 2). Apparent from Figure 2 is the dominant marine influence on the physical environment category. There was a more equal split between marine and terrestrial focus for recreational activities and social situations, suggesting the importance of the coastal hinterlands for these participants – they need and use both terrestrial and marine environments.

![Figure 2: Categories assigned to photographs taken by study participants at Ningaloo and an indication of those that were deemed to feature a marine aspect (n=207).](image)

When the photographs and the interviews were analysed together, because the meaning behind the photographs is in the accompanying stories (Stedman, et al., 2004; Williams & Patterson, 2007), four broad categories of place meanings emerged. These centred on those identified from the photograph analysis as well as a fourth category – emotional connection. This category was evident from the interviews as emotions were revealed by the participants through their reference to the photographs and were not self-evident from the photographs themselves. The quotes below have been selected as representations of the concepts describing the four categories.
Physical environment - providing an opportunity to escape

For many participants, camping along the Ningaloo coast provided an escape, from the cold of winter, to more beautiful and natural surroundings and to geographical isolation. The sheer size of Western Australia meant that participants could drive for a day within a single state and reach a warmer climate than the one they left at home:

*The biggest main reason is that in one day you drive from Perth [capital of Western Australia] and you go from winter to summer, that is pretty cool. I don’t know how many places you could do that in the world, especially towing a boat. But 1200km and you are in summer, shorts, t-shirt...drinking a beer.*

The beauty of the physical environment provided an opportunity to escape through the wonder of nature. Participants’ imaginations were captured by changing tides, creatures in rock pools and the array of colours surrounding them.

*They like looking at the hermit crabs in the water and other things in the rock pools. It was just a wonderful little spot, it is an artist’s pallet really, all these colours and you are sitting there and everywhere you look, like we were sitting on these rocks and the water was coming underneath and was coming out into little water features and there was blowholes and blowing up air every time a wave came through.*

The ocean and associated coastline created a feeling of seclusion and isolation, particularly the expansiveness of the physical environment. Rather than being a negatively perceived landscape devoid of human life, this was seen as a positive, as a way to escape and enjoy unspoilt beauty and wilderness that seemed to extend forever.

*That one I love (Fig. 3) because of the rugged coastline and just how it disappears off in to the horizon and it is empty. Just being able to be access something so wild and expansive and kilometres of coastline – you just can’t beat it.*
Recreational activities – lots to do, easily accessible

A number of marine and terrestrial based activities are available along the Ningaloo coast, including fishing, surfing, snorkelling, four-wheel driving, walking or just relaxing. This diversity in activities was a key attraction for a number of participants:

*It has snorkelling, surfing, fishing, it has got everything*

*It is like you can always go walking, there’s bocce, they play mah-jong, the boys go out fishing...*

Additionally, being able to conduct multiple marine-based activities in the one location was seen as something that could not be readily found elsewhere.

*You have got options here because it is just like a big swimming pool, you can snorkel and you have got the fish, where else can you do that. Even the Great Barrier Reef you have got to get on a boat and go out a long way...*

Some, however, relied on the Ningaloo coast to provide the right conditions for surfing each time they visited.

*The surf, if there wasn’t surf here we wouldn’t come here, because the surfers in the family wouldn’t be interested.*
Social ties – re-establishing bonds with family and creating communities

Holidays to Ningaloo coast provided families with the opportunity to reconnect and strengthen bonds. Many participants, who were parents, mentioned they looked forward to “just be with the kids, as parents who are time poor at home”. It provided parents with an opportunity to spend a significant amount of time with their children rather than being at work.

This is a photo (Fig. 4) with my daughter’s first fishing rod and it is pink and Dad is teaching her fishing. Dad’s massive flannelette shirt, it is very cute. We both work, I don’t work full time but I still work, and it is awesome just to spend the two weeks with the kids, just full-time together and enjoying it.

Figure 4: Participant’s photograph of father and daughter at Ningaloo with her first fishing rod.

A significant portion of time was spent reconnecting with children through teaching them skills specific to the marine environment. Learning responsibilities such as boat handling, working the radio and how to clean fish provided a unique opportunity for parents to pass on skills while spending quality time with their children.

There is a lot of bonding with the kids and teaching them as well, like boat handling, how to catch fish, how to clean fish, skills that they don’t often need but they keep up when they come up here. Like we were saying the other night, tying knots with the kids, how to do the boat radio...
Other participants commented that trips to Ningaloo allowed them to meet like-minded people, who share similar interests.

Yeah, people are just really nice because you meet like souls. Because people who like camping and are living this type of life, they are the only ones who come here.

Over time, these like-minded people form important friendship groups. Many participants commented that they visited the study sites at the same time each year as they know that others in their friendship group will do the same.

Because we come in July every year, over the years we have made quite a few friends, like we had a sundowner here last Wednesday with about 40 people... But that is why we don’t change the two weeks, because there are others that come up for the same two weeks. There are about six boats and there is a bit of camaraderie between us all out on the water.

They start to look out for one another, on the water and around the campsites. This feeling of community is created by like-minded people recreating and enjoying the coastal environment. It was enhanced by the number of participants who come back every year to the same camping spot. Living in such close quarters means that everyone “keeps an eye” on everyone else and is quick to lend a hand when a “neighbour” is in trouble.

I mean everyone knows everyone – how many years have people been coming here and nothing gets flogged, nothing gets stolen. If someone has a problem everyone rallies around and fixes it up and that sort of thing and helps out. It is a good community...
Emotional connection – challenging but rewarding experience where everyone’s happy

Participants emphasised the uniqueness of their experiences at Ningaloo. They described an emotional connection fostered through the challenge of preparing and getting to Ningaloo. They also mentioned significant rewards enjoyed by all members of a family or travel group once they had arrived. A considerable amount of planning and preparation goes into holidays along the Ningaloo coast. Due to the distance, isolation and cost of supplies, visitors need to ensure they are well prepared and have everything they need.

I think the people come here, they come here well-prepared to camp, like we still had to bring up our Engel [portable refrigerator] and freeze everything. You think ahead, it is a holiday you plan. You don’t just say “oh, let’s go to Coral Bay”, like it has taken us 15 months to get this unit [caravan]... That is part of the fun of it, not knowing what each day is going to be like, like no milk today, or that sort of thing. That probably adds to the experience that you have to plan ahead.

Rather than detracting from the experience, it seems to add to it. The rewards that come from all that planning and preparation are too good to miss.

It is a bit of a mission to get here so it is a bit more rewarding when you do and then you get big waves.

...holidays here are hard work getting here and all the rest of it, but the best holidays we have ever had have been here.

Indeed, it seems holidays at Ningaloo are enjoyed by all family members as the coast has it all. One parent could go surfing, the children play nearby on the beach while the other parent could relax on the shore – all in the one convenient location.
Yeah, my husband likes to surf, so it is important to find somewhere where the surf breaks aren’t too far away and with the nice swimming beach and a nice camping area. So this place really has it all and everybody is happy. Mum is happy with the beach, the kids are happy with the beach and the surfing is just around the point and that is pretty important for our family, as surfing is a real major aspect... And also, the snorkelling is just fantastic.

Having a number of activities available in one setting results in “everyone’s happy” with a holiday at Ningaloo. Everybody gets to partake in their own activities without impacting upon the experience of others. It is a safe environment for children to play, and there are also activities to entertain adults. As a result children enjoying the holiday just as much as the adults – something a number of participants indicated was hard to find elsewhere.

**Discussion**

For participants in this study along the Ningaloo coast, being at the interface of land and sea was obviously significant in meaning creation. The importance of being located at this geographical junction was evident from both the photographs and interviews. By being at this place, both marine and terrestrial activities were possible, people bonded over common activities, and most importantly, being able to undertake these activities led to everybody being happy. This reaffirmed a strong emotional connection with Ningaloo as a place.

The marine environment was clearly important to participants, as evidenced through the analysis of the photographs. The high percentage of “physical environment” photographs with a marine influence indicated the importance of the marine environment. This was not surprising given the known attraction of water and the essentiality of its presence for many highly-valued activities (e.g. surfing and fishing). The lower percentage of the “recreational activities” photographs with a
marine element may be attributed to the camera type. If the cameras had been water-
proof, there may have been more photographs taken by participants while fishing, 
surfing or snorkelling.

From analysis of the interviews and photographs together, the meanings ascribed to 
this coastal setting share many similarities and illustrate some marked differences 
with those previously identified for terrestrial settings. Firstly, the importance placed 
on physical and environmental features of a site are well known and play a crucial 
role in forming an attachment (Amsden, et al., 2011; Beckley, et al., 2007;
Eisenhauer, et al., 2000; Smaldone, et al., 2008). Also known to be important are the 
recreational activities and opportunities available at a setting (Eisenhauer, et al., 
2000; Farnum, et al., 2005; Smaldone, et al., 2008). Indeed, it is often these two 
factors that first draw visitors to the setting and play an early role in forming place 
meanings associated with the setting (Farnum, et al., 2005; Manzo, 2008; Smaldone, 
et al., 2008). For Ningaloo, water-based activities were particularly important.

While specific, discrete meanings may differ from place to place, individual to 
individual, the basis of the meanings - physical environment, recreational activities, 
social ties and emotional connections - remain similar. This has been found in other 
aquatic- and marine-based studies (Bricker & Kerstetter, 2002; Wynveen, et al., 
2010). Aesthetic beauty, facilitation of desired recreational activities, escape from 
the everyday and experiences with family and friends were all key meanings 
identified by Wynveen et al. (2010) in their study of recreational visitors to the Great 
Barrier Reef, which share similarities to those identified here. A review of coastal 
camping in New Zealand identified the ability of undisturbed beaches to evoke 
feelings of awe, inspiration and fostering a sense of wonder. This is a similar 
sentiment to that expressed by participants in this study in their description of the
colours of the rock pools or the vast expanse and kilometres of coastline.
Additionally was the sense of community that developed when regular campers returned to the same campground each time, thereby renewing acquaintances (Collins & Kearns, 2010) and forming important friendship groups based on shared experiences of camping and boating, as indicated by participants here.

Marked differences and new contributions to our understanding of place meanings, here attributable to the land-sea interface but potentially with broader applicability, include the notion of “everybody’s happy” and the contribution of climate.

“Everybody’s happy” is a new place meaning evident from this study and one which helps explain emotional connections to a place based on feeling positive emotions due to individual and collective group enjoyment. This meaning has many facets to it. Part of it pertains to social bonding with groups (family, friends) spending time together in a place that they all enjoy visiting. Part of it is activity-based in that there are many activities for group members to partake in without inconveniencing others as activities are all centrally located. Lastly is the emotional aspect relating to positive emotions associated with achieving or participating in pleasant and goal compatible events (Hosany & Gilbert, 2010). These positive emotions can include enjoyment of their own chosen activity or goal and feeling guilt-free in knowing that group members are free and able to choose whichever path, activity or goal gives them greatest pleasure (Duncan, 2005).

Climate has been little mentioned to date in place studies although other aspects of the physical environment have been explored (Beckley, et al., 2007; Bricker & Kerstetter, 2002; Wynveen, et al., 2010). In this study, it is one of the chief determinants for visiting the Ningaloo coast during the Austral winter. Participants became dependent on Ningaloo to allow them to escape the cold and have ‘some fun
in the sun’. However, visitors to the area during other seasons may not allocate as much importance to the climate as these participants.

Knez (2005) is the only other author who has examined this connection between place and climate or weather. He suggested climate is encased in places and instinctively influences the way people interact, experience and remember a place. He further hypothesized that where an individual was raised may influence their recreational site choices, with individuals raised in towns or cities in warmer climates seeking warm places to recreate. Western Australia’s relatively warm Mediterranean climate may explain participants pursuing warmer winter conditions for their recreational activities. This finding regarding climate and place is probably not specific to coastal settings, however, warmth may be more important where water-based activities are involved.

**Conclusion**

Through photo-elicitation this study identified four broad categories of meanings visitors ascribe to the Ningaloo coast. First, the physical environment fostered feelings of escape through warm weather, beauty and isolation. Second is an appreciation of multiple marine-based recreational activities that are convenient and easily accessible. Third was the maintenance of social ties between parents and children through spending time together and the teaching of new skills, additionally making and reaffirming friendships with like-minded people. Finally, the experience cultivates a multi-faceted emotional connection. Overcoming the challenges to get there provided experiential rewards which were able to be enjoyed by everyone within a group (everybody’s happy).
Photo-elicitation proved to be a successful method for exploring the place meanings of this land-sea interface. Visitors were receptive to the idea of taking photographs, probably as this is often an activity undertaken while on holiday. In addition, scheduling interviews a few days after the cameras were distributed appeared to keep the purpose of the study in the participant’s mind, resulting in in-depth discussion of photographs. Taking advantage of modern technology such as digital cameras and laptop computers made this research technique feasible given the isolated study location.

Other researchers (Farnum, et al., 2005; Manzo, 2008; Trentelman, 2009; Williams, et al., 1992) have emphasised the need to include place concepts in management strategies so they are more responsive to visitor needs. Armed with the understanding the meanings visitors ascribe to a place, coastal managers can identify potential issues or even stakeholders that should be accounted for and included in planning processes (Moskwa, 2012). Through the identification of place meanings ascribed to Ningaloo, this study has provided a valuable first step in understanding place concepts as ascribed by visitors to a remote coastal setting.

References


Chapter 4: The effect of place attachment on pro-environment behavioral intentions of visitors to Ningaloo Marine Park

This chapter addresses Research Objective 2.1 by examining the relationship(s) between place attachment and pro-environmental behaviours. The following manuscript has been re-submitted to Environment and Behavior following comments from reviewers.

J. Tonge wrote all sections of this manuscript and carried out the survey distribution, collection and initial data analysis. M. Ryan assisted J. Tonge with the AMOS structural equation modeling analysis as well as contributing to subsequent versions of the draft manuscript, particularly the drafting of the methodology and results sections. S. Moore and L. Beckley provided feedback on various drafts. S. Moore, L. Beckley and M. Ryan also assisted in the initial development of the survey instrument. Advice was also sought on the development of the survey instrument from Ryan Admiraal (School of Chemical and Mathematical Sciences, Murdoch University).

The effect of place attachment on pro-environment behavioral intentions of visitors to Ningaloo Marine Park

Abstract:

It has been hypothesized that as individuals become attached to a place, they are more likely to act to protect it. An on-site visitor survey was used at Ningaloo Marine Park, Australia to examine the effect of place attachment on pro-environmental behavioral intentions. The behaviors encompassed three categories: on-site actions by visitors; visitors telling others how to act; and off-site actions to conserve the Marine Park. Factor analysis of item responses reduced four place attachment dimensions to three – place identity, place dependence and a new
affective dimension – everybody’s happy. Structural equation modeling found the place identity dimension directly affected all behavioral categories, with this increasing with the level of commitment required to undertake the pro-environmental behaviors. Future research can profitably focus on further developing and measuring this new affective dimension and understanding what other factors, additional to commitment, help explain the differences in the pro-environmental behaviors undertaken.

Introduction

Place scholars have long hypothesized that a ‘field of care’ develops for a place through on-going interaction with it, with individuals possessing strong place attachment more likely to oppose any degradation of their area (Bonaiuto, Bilotta, Bonnes, Ceccarelli, Martorella, & Carrus, 2008; Tuan, 1977; Vorkinn & Riese, 2001). As attachment or connection to a place develops and knowledge about a place increases, so does the probability that individuals will demonstrate behaviors to protect it (Halpenny, 2010; Ramkissoon, Weiler, & Smith, 2012; Walker & Chapman, 2003). Despite this, research focusing on place attachment and place protective or pro-environmental behaviors has been limited, with findings largely inconsistent (Halpenny, 2010; Scannell & Gifford, 2010; Walker & Chapman, 2003). As a way to better understand these limited findings, this paper examines the relationship between place attachment and on-site and off-site pro-environmental behaviors in a coastal camping setting.

Place attachment

Place attachment is a positive (generally) emotional bond between an individual and a specific place (Bonaiuto, Carrus, Martorella, & Bonnes, 2002; Hidalgo & Hernandez, 2001; Manzo, 2003, 2005). It can be described as both the process of attaching oneself to a place as well as the product of this process (Devine-Wright,
The resultant bond has an enduring quality that is directed towards a particular target or place that is not interchangeable (Giuliani, 2003), with affect, emotion and feeling central to the concept but also accompanied by cognition and practice (Low & Altman, 1992; Vorkinn & Riese, 2001). Some individuals may feel attached to a place because of the close social ties or other social factors, while for others the attachment is directed to the physical aspects of a place (Fried, 2000; Hidalgo & Hernandez, 2001; Lewicka, 2010; Mesch & Manor, 1998). A distinctive feature of place attachment is a prolonged association between the individual and the place allowing for accumulation of sentiment (Giuliani, 2003).

Place related concepts first appeared in the 1960s (see Fried, 1963) and have been studied in a number of research fields including environmental psychology, sociology, human geography, urban studies, leisure sciences, ecology, architecture and planning (Brandenburg & Carroll, 1995; Lewicka, 2010; Patterson & Williams, 2005; Trentelman, 2009). Accordingly, a number of contexts and scales have been focused on, from the early studies on the home to neighborhoods, sacred sites, communities, to second homes, holiday homes, and recreational and leisure settings (Lewicka, 2010; Trentelman, 2009). A recent review has summarized place attachment and place research over the last 40 years, covering research tradition, contexts and theoretical foundations (see Lewicka, 2010).

Place attachment is traditionally conceptualized as a positive connection with familiar locations such as the home or neighborhood (Devine-Wright, 2009; Manzo, 2003, 2005), correlating with the length of dwelling within the place and featuring social and physical sub-dimensions (Devine-Wright, 2009; Hidalgo & Hernandez, 2001). However, place attachment has been increasingly embraced by researchers and managers of leisure settings, particularly in natural areas, as a means to move
from the traditional commodity and service view of management of recreational and leisure settings to a more encompassing view including the perceptions and emotions of visitors (Trentelman, 2009; Williams & Patterson, 1996; Williams, Patterson, Roggenbuck, & Watson, 1992). This change in settings has seen an adaptation in place attachment from examining residents’ attachment to their homes or community (e.g. Bonaiuto, et al., 2002; Hidalgo & Hernandez, 2001) to focusing on visitors’ attachment to a leisure or recreational setting (e.g. Hunt, 2008; Kyle, Graefe, & Manning, 2005).

In the last three decades, place research has moved into the fields of leisure, park and natural resource management. This movement was in response to the realization that leisure settings were more than a set of usable physical attributes that were substitutable and replicable elsewhere (Trentelman, 2009; Williams, et al., 1992). Leisure and park research has subsequently shown that attachment can influence the acceptability or otherwise of decisions regarding the management of natural resources (Kyle, Absher, & Graefe, 2003; Williams, et al., 1992) and visitors’ perceptions of setting conditions (Kyle, Graefe, Manning, & Bacon, 2004a).

The dimensions of place identity and place dependence, and associated scales, initially developed by Williams and Roggenbuck (1989) and subsequently tested and elaborated by Williams and Vaske (2003), have become the most widespread tool for measuring place attachment in leisure setting contexts (Lewicka, 2010; Trentelman, 2009). The dimension of place identity is based on the concept developed by Proshansky (1978) which refers to the psychological investment an individual has with a setting (Fried, 2000; Vaske & Kobrin, 2001). The place provides the individual with an opportunity to both express and affirm their identity (Kyle, et al., 2004a; Williams & Patterson, 1996). Repeated interactions with a place may assist in
the development of emotional ties providing an anchor for nurturing a sense of self, self-esteem and belonging (Ramkissoon, et al., 2012; Williams & Vaske, 2003).

Place dependence, the second dimension developed and tested in leisure settings by Williams and Roggenbuck (1989), involves how well a setting serves to achieve an individual’s goals given the existing range of alternative sites (Hammit, Kyle, & Oh, 2009; Kyle, et al., 2004a). It is an assessment of whether the functional and physical features of a setting can satisfy recreation, self-enhancement or other psychological and spiritual needs of an individual (Ramkissoon, et al., 2012; Stokols & Shumaker, 1981; Williams, et al., 1992). The place becomes important to an individual due to its unique ability to facilitate these needs (Halpenny, 2010; Kyle, et al., 2004a).

Other dimensions have also been developed in an attempt to better capture the social and emotional aspects of place attachment. These include social bonding, which results from interactions with family, friends, neighbors, colleagues and others that are bounded by a place (Hammit, Backlund, & Bixler, 2006; Hidalgo & Hernandez, 2001; Kyle, et al., 2005; Ramkissoon, et al., 2012). Places provide the context to form social relationships (Mesch & Manor, 1998) with individuals becoming attached to these social relationships (Low & Altman, 1992; Mesch & Manor, 1998).

Place affect has been developed to describe the emotional bonds that individuals share with places, particularly positive ones (Halpenny, 2010; Manzo, 2003; Ramkissoon, et al., 2012). The importance of emotion in the formation of an attachment to place has been noted in the broader environmental psychology research field (Giuliani, 2003; Halpenny, 2010; e.g. Low & Altman, 1992; Manzo, 2003) with the suggestion that emotional bonds develop to satisfy fundamental human needs, such as a general sense of well-being (Ramkissoon, et al., 2012). This
emotional dimension of place attachment has been explored by a number of scholars in leisure setting management and other community-environment studies (Halpenny, 2010; Hammitt, et al., 2009; Manzo, 2003; Ramkissoon, et al., 2012; Rollero & De Piccoli, 2010).

**Pro-environmental behavior and place attachment**

Pro-environmental behavior relates to any action that promotes or results in the sustainable use of natural resources (Halpenny, 2010; Sivek & Hungerford, 1989/1990). The aim of the behavior is to minimize the impacts of an individual’s actions on the natural or built environment (Kim, 2012). In environmental psychology, there has been a particular focus on the relationship between environmental attitudes and pro-environmental behaviors (de Groot & Steg, 2007; Halpenny, 2010; Kals, Schumacher, & Montada, 1999; Kim, 2012) but these have been modest in their results (19-40% of variance explained) (see Bamberg, 2003; Halpenny, 2010; Ramkissoon, et al., 2012 for reviews). Experiences in nature have been found to correlate with some pro-environmental behaviors, for example, the frequency of visits to natural areas has been linked to contributing money to environmental organizations (Hinds & Sparks, 2008). Also identified was that the more a person has an affective or emotional connection with the natural environment, the greater their intention to engage with it (Hinds & Sparks, 2008; Kals, et al., 1999).

While some place attachment research has contributed to our understanding of pro-environmental behavior (see Halpenny, 2010), the empirical evidence surrounding this relationship is far from absolute (Halpenny, 2010; Scannell & Gifford, 2010). Scannell and Gifford (2010) distinguished between two forms of attachment, a civic
place attachment that related to social aspects and a natural place attachment which related to physical aspects. Natural place attachment was found to be a predictor of pro-environmental behavior, once other demographic-related variables were controlled for, while civic place attachment was not found to be predictive.

Vorkinn and Riese (2001) identified that the place attachment of residents of a rural Norway community was a better predictor of the negative attitudes towards a hydro-power development than socio-demographic variables. A survey of youths participating in a conservation work program showed that as place attachment, specifically place identity, increased so did the youths’ self-reporting of general pro-environmental behavior such as learning how to solve environmental issues, sorting trash for recyclables, and conserving water (Vaske & Kobrin, 2001). Gosling and Williams (2010) aimed to explore the relationship between pro-environmental behavior of farmers and two types of emotional association – place attachment and connectedness to nature. Results indicated that attachment did not appear to relate to on-farm pro-environmental behavior, while modest correlations were found between connectedness to nature and how farmers managed on-farm vegetation.

Park or protected area studies have also demonstrated relationships with place-specific behaviors. Halpenny (2010) included both park-specific and general pro-environmental behaviors in her survey of visitors to a Canadian national park. Place attachment was found to have an effect on both types of behaviors. Walker and Chapman (2002) surveyed visitors to another Canadian park, and examined the relationship between place attachment (which they termed sense of place), perspective taking, empathy and pro-environmental behavior. Both empathy and place attachment were found to have a significant effect on volunteering, poaching
reduction and other-focused depreciative intentions. They implied that the more demanding the behavior, the greater was the effect of place attachment.

**Aims of the paper**

More research is needed at this interface between place attachment and pro-environmental behaviors (Halpenny, 2010; Scannell & Gifford, 2010). This paper extends research at this interface through testing relationships between the dimensions of place attachment and both on-site and off-site place-specific pro-environmental behaviors. Dimensions of place attachment were used, rather than a single place attachment construct, to further clarify the contribution(s) of each dimension to pro-environmental behavior. Three categories of behaviors based on differing levels of investment or effort were tested – on-site actions individuals would undertake themselves, whether they would tell others to undertake the same actions, and off-site conservation actions to protect and preserve their recreational place.

As such, the following hypotheses guided this study:

H1: One or more dimensions of place attachment have a positive effect on the behavioral intentions of individuals regarding on-site actions they would undertake themselves.

H2: One or more dimensions of place attachment have a positive effect on the behavioral intentions of individuals regarding on-site actions they would tell others to undertake.
H3: One of more dimensions of place attachment have a positive effect on the behavioral intentions of individuals regarding conservations actions they would undertake off-site.

Method

Study site

Ningaloo Reef, a World Heritage site based on its outstanding natural values (UNESCO World Heritage Centre, 2011), is located 1200 km from the Western Australian capital city of Perth. At 300 km long, it is Australia’s largest fringing coral reef with a rich biodiversity including dugongs, marine turtles, whale sharks, manta rays as well as many species of corals, fishes and mollusks (Cassata & Collins, 2008; Sleeman, Meekan, Wilson, Jenner, Jenner, Boggs, Steinberg, & Bradshaw, 2007). Due to this high species diversity and relatively pristine state, Ningaloo Reef was declared as a Marine Park in 1987 (CALM & MPRA, 2005). It receives over 200,000 visitors per annum (Smallwood, Beckley, Moore, & Kobryn, 2011) and visitors can undertake a variety of activities including fishing, snorkeling, swimming, surfing and wild-life tours. Camping is available in the adjacent pastoral stations (rangelands), the nearby Cape Range National Park, the towns of Exmouth and Carnarvon and the small township of Coral Bay.

The Park was selected because of limited previous research on place concepts in coastal settings and previous research at Ningaloo identifying high site fidelity, with 44% of repeat visitors regularly returning to the same site (Beckley, Smallwood, Moore, & Kobryn, 2010). Such fidelity suggests strong place attachment (Williams & Vaske, 2003) and thus facilitates the investigation of this concept. We located our study in the southern half of the Park given that less is known about visitor use of
this more remote part (most of the hinterland to this part of the Park is only accessible by four-wheel drive or off-road vehicle). Three study sites were selected: a caravan park within the small township of Coral Bay and two campgrounds on pastoral stations – 3 Mile Camp at Gnaraloo Station and 14 Mile Camp at Warroora Station.

**Survey development and design**

An on-site survey was administered to determine visitors’ attachment to Ningaloo and its relationship to behavioral intentions. Place attachment has been noted as responsive to psychometric scaling in social surveys (Jorgensen & Stedman, 2001; Kyle, et al., 2005; Williams, et al., 1992; Williams & Vaske, 2003). As a latent or theoretical construct, place attachment is not directly measurable but can be inferred from measured responses to place attachment scales (Jorgensen & Stedman, 2001). Williams and Roggenbuck’s (1989) work provided the identity and dependence dimensions and associated scales underpinning this study. These scales are widely regarded as providing a valid, reliable measure of place attachment in recreation and leisure settings (Halpenny, 2010; Hammitt, et al., 2009; Kyle, Mowen, & Tarrant, 2004b; Williams, et al., 1992; Williams & Vaske, 2003).

The third dimension tested was social bonding. A qualitative study of visitors consisting of in-depth interviews using photo-elicitation techniques was conducted to investigate the meanings they ascribed to southern Ningaloo (authors, under review)². Analysis of interview transcripts confirmed the presence of identity and dependence dimensions but also emphasized the importance of bonding with family and like-minded people and creating ‘communities’ of friends. As such, measures of social

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² Examiners note: This relates to the manuscript presented in Chapter 3.
bonding, adapted from Kyle, et al. (2004b) and sense of community adapted from Wilkinson (2008), were included in the survey as the social bonding dimension as they best reflected the sentiments expressed in the qualitative study.

Also evident from the qualitative study was a new affective or emotional dimension of place attachment termed ‘everybody’s happy’. The quote below is indicative of the sentiment:

Yeah, my husband likes to surf, so it is important to find somewhere where the surf breaks aren’t too far away and with the nice swimming beach and a nice camping area. So this place really has it all and everybody is happy...

This fourth dimension of place attachment – everybody’s happy – was included in the survey. It centered on Ningaloo providing activities and experiences enjoyable to all members of a group without impinging on the enjoyment of others. It incorporates facets of social bonding (spending time with others), activities and positive emotions relating to enjoyment and feeling at ease that all members of the group are enjoying themselves. Items for this dimension were developed to reflect these social, activity-based and emotional aspects. A scale was developed and tested in this study to determine the contribution of the dimension to visitors’ recreational experiences.

We included 20 items in the survey to encompass place attachment, six items each to measure place identity and place dependence, and four items each to measure social bonding and everybody’s happy. The items were listed in random order and administered via a five-point Likert scale asking respondents to indicate their level of agreement (1 = ‘strongly disagree’ to 5 = ‘strongly agree’). Pilot-testing, involving 20 participants with a similar profile to intended survey respondents, indicated that
all items should be retained given they had acceptable Cronbach Alpha scores (Nunnally, 1978) (place identity items = 0.93; place dependence items = 0.81; social bonding items = 0.71; and everybody’s happy items = 0.67). Although the everybody’s happy items were less than 0.7, values above 0.6 have been suggested as acceptable in exploratory research (Hair, Black, Babin, Anderson, & Tatham, 2006) and so they were retained.

As measuring the actual behavior of visitors is difficult, many researchers use behavioral intentions as an appropriate, acceptable substitute (Halpenny, 2010; Hunt, 2008; Walker & Chapman, 2003). Such acceptability relies on the theory of reasoned action which posits that one of the best predictors of behavior is the intention to perform that behavior (Fishbein & Ajzen, 1975). Behaviors were selected and adapted from those used by Halpenny (2010) and Walker and Chapman (2003) as well as others developed by the researchers based on their detailed knowledge of the study sites.

The behaviors were grouped into three categories, each with a differing level of personal commitment or investment, to examine to what extent or amount of effort individuals were likely to enact to protect their place. Pro-environmental behaviors can conform to differing types depending on the type of physical act performed, where and when the behaviors are performed, the amount of effort or resources expended and specific outcomes that can be obtained (Thogersen, 2004). The intent here was to categorize the behaviors based on the perceived amount of effort or investment and where the behaviors were to take place. The three categories were: on-site behaviors they would do themselves (picking up litter, conserving water, not feeding wildlife); whether they would tell others to (or not to) undertake these same behaviors; and off-site actions to support the conservation of Ningaloo Reef (signing
of petitions, donating money, volunteering). These three sets of questions used a five point scale ranging from ‘wouldn’t consider it’ = 1 to ‘already do’ = 5.

Questions were also included on visitor characteristics (gender, age group, level of education and their usual place of residence) and visit characteristics (visitation frequency and type of travel group).

**Data collection**

The surveys were distributed to adult visitors at the three study sites during a four week period (July 2010) coinciding with the peak visitation period (Smallwood, et al., 2011). Each of the sites was visited at least once each week at differing times with greater sampling effort at 3 Mile Camp and Coral Bay given their higher numbers and greater turnover of visitors (Smallwood, et al., 2011). The researcher systematically moved through each site using quota sampling based on the site population present at the time of the survey. The small size of the sites enabled the researcher to seek respondents from all parts of the campground or caravan park. The ‘next available visitor’ was provided with a survey to complete and the researcher returned after a 10-15 minute period to collect the completed survey. A total of 389 visitors were approached with 372 usable surveys obtained, resulting in a response rate of 96%.

**Data analysis**

The validity of the place items was tested via exploratory factor analysis using maximum likelihood extraction and oblique rotation. Given the nature of the place attachment items, a degree of correlation existed between the items; as such, oblique rotation was used during factor analysis. The minimum accepted factor loading for
items was set at 0.5 and the maximum cross-loading was 0.25 (DeVellis, 1991; Hair, et al., 2006).

The hypothesized relationships were explored through structural equation modeling (SEM) as this allows both observed and unobserved (latent) variables to be statistically analyzed (Byrne, 2010). Before undertaking SEM, missing values were estimated using maximum likelihood estimation. In the SEM program AMOS (Version 17.0) (Arbuckle, 2009) confirmatory factor analysis (CFA) for each of the place attachment dimensions and the behavioral intention categories was undertaken to validate and refine the factors. For each CFA, items with low factor loadings (using cut-off values above) or items with multiple intra-item correlations were removed. CFA models were deemed to have acceptable fit according to the following: Chi-squared / degrees of freedom, $\chi^2 / df < 3.0$; goodness of fit index (GFI) > 0.90; normed fit index (NFI) > 0.90; and root mean-square error of approximation (RMSEA) < 0.08 (Kline, 2005). The relationships between the place attachment dimensions and each of the behavioral categories were tested via structural models. The models were assessed according to the fit statistics outlined above.

**Results**

Of the 372 survey participants, 60% were female and 40% male, with the 35-44 age group having the highest representation (29%, Table 1). Just over half of the participants had a tertiary or university level of education and were part of a family group. The highest visitation frequency was ‘once a year’ followed by ‘first visit’. Nearly three quarters of survey participants had visited Ningaloo at least once.
previously (Table 1). Over half of all participants travelled from Perth to Ningaloo, with another third from elsewhere in Western Australia.

**Table 1:** Summary percentages of visit and visitor characteristics of Ningaloo survey participants (n=372)

<table>
<thead>
<tr>
<th>Visitor Characteristics (%)</th>
<th>Travel Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>40</td>
</tr>
<tr>
<td>Female</td>
<td>60</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>11</td>
</tr>
<tr>
<td>25-34</td>
<td>14</td>
</tr>
<tr>
<td>35-44</td>
<td>29</td>
</tr>
<tr>
<td>45-54</td>
<td>25</td>
</tr>
<tr>
<td>55-54</td>
<td>11</td>
</tr>
<tr>
<td>65 or older</td>
<td>10</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Primary/some secondary</td>
<td>3</td>
</tr>
<tr>
<td>Secondary</td>
<td>24</td>
</tr>
<tr>
<td>Vocational/Technical</td>
<td>18</td>
</tr>
<tr>
<td>Tertiary/University</td>
<td>55</td>
</tr>
<tr>
<td>Place of residence</td>
<td></td>
</tr>
<tr>
<td>Perth (metropolitan area)</td>
<td>60</td>
</tr>
<tr>
<td>Regional Western Australia</td>
<td>33</td>
</tr>
<tr>
<td>Other states of Australia</td>
<td>4</td>
</tr>
<tr>
<td>International</td>
<td>3</td>
</tr>
</tbody>
</table>

The means for the place attachment items varied according to each dimension (Table 2). The lowest means were recorded for the items under the social bonding dimension with the item ‘*If I were to stop coming here to Ningaloo, I would lose contact with a number of friends*’ recording the lowest mean of 1.85 (Table 2). The highest mean was recorded for the place dependence item ‘*Ningaloo is the best place for what I like to do*’ with 3.74. All four of the place attachment dimensions had acceptable levels of reliability as they were above 0.7 (Table 2) (Hair, et al., 2006; Nunnally, 1978). This included the new dimension of everybody’s happy which produced a Cronbach Alpha of 0.84 (Table 2). The means for the individual items in this new dimension ranged from 2.75 to 3.57.
Table 2: Means, standard deviations and reliability estimates for place attachment items from survey of Ningaloo visitors (n=372)

<table>
<thead>
<tr>
<th>Place attachment item</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Cronbach Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Place Identity</strong></td>
<td>3.05</td>
<td>1.16</td>
<td>0.92</td>
</tr>
<tr>
<td>I feel that Ningaloo is a part of me</td>
<td>2.80</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>I am very attached to Ningaloo</td>
<td>2.98</td>
<td>1.16</td>
<td></td>
</tr>
<tr>
<td>I identify strongly with Ningaloo</td>
<td>3.02</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>Ningaloo is very special to me</td>
<td>3.32</td>
<td>1.15</td>
<td></td>
</tr>
<tr>
<td>Visiting Ningaloo says a lot about who I am</td>
<td>2.82</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>Ningaloo means a lot to me</td>
<td>3.38</td>
<td>1.16</td>
<td></td>
</tr>
<tr>
<td><strong>Place Dependence</strong></td>
<td>2.92</td>
<td>1.24</td>
<td>0.86</td>
</tr>
<tr>
<td>Ningaloo is the best place for what I like to do</td>
<td>3.74</td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td>The things I do at Ningaloo I would enjoy doing just as much at a similar place</td>
<td>2.71</td>
<td>1.18</td>
<td></td>
</tr>
<tr>
<td>No other place can compare to Ningaloo</td>
<td>3.20</td>
<td>1.27</td>
<td></td>
</tr>
<tr>
<td>Doing what I do here is more important to me than doing it at any other place</td>
<td>2.67</td>
<td>1.17</td>
<td></td>
</tr>
<tr>
<td>I wouldn’t substitute any other area for doing the type of things I do at Ningaloo</td>
<td>2.59</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>I get more satisfaction from visiting Ningaloo than any other place</td>
<td>2.60</td>
<td>1.20</td>
<td></td>
</tr>
<tr>
<td><strong>Social Bonding</strong></td>
<td>2.48</td>
<td>1.31</td>
<td>0.75</td>
</tr>
<tr>
<td>My family and friends would be disappointed if I were to start visiting other coastal places rather than Ningaloo</td>
<td>1.96</td>
<td>1.17</td>
<td></td>
</tr>
<tr>
<td>A feeling of community runs between me and the other campers here at Ningaloo</td>
<td>3.34</td>
<td>1.11</td>
<td></td>
</tr>
<tr>
<td>If I were to stop coming here to Ningaloo, I would lose contact with a number of friends</td>
<td>1.85</td>
<td>1.18</td>
<td></td>
</tr>
<tr>
<td>The friendships and associations I have with other people here at Ningaloo mean a lot to me</td>
<td>2.77</td>
<td>1.16</td>
<td></td>
</tr>
<tr>
<td><strong>Everybody's Happy</strong></td>
<td>3.20</td>
<td>1.24</td>
<td>0.84</td>
</tr>
<tr>
<td>Ningaloo is important to me because my family/group of friends enjoy it</td>
<td>3.43</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>I rely on Ningaloo to provide an enjoyable experience for my family/group of friends</td>
<td>3.06</td>
<td>1.27</td>
<td></td>
</tr>
<tr>
<td>There is no place like Ningaloo where member of my family/group of friends can enjoy their own experiences in the one place</td>
<td>2.75</td>
<td>1.27</td>
<td></td>
</tr>
<tr>
<td>Holidays to Ningaloo are important to us as a family/group of friends because everyone can enjoy themselves</td>
<td>3.57</td>
<td>1.14</td>
<td></td>
</tr>
</tbody>
</table>

Measured on a 5-point scale, 1 = “strongly disagree” and 5 = “strongly agree”
The pattern matrix from the EFA for the place attachment items indicated a three factor solution (Table 3). These related to the traditional place identity and place dependence dimensions as well as the emergence of a social bonding/everybody’s happy hybrid. After removing items with low factor loadings and/or those that cross-loaded on to other items, the place identity factor contained five items, and the place dependence factor containing six items, which included one of the everybody’s happy items. Finally, the third factor contained three items, one item from the social bonding dimension and two from the everybody’s happy dimension. This new factor retained the name everybody’s happy.

Confirmatory factor analysis conducted via measurement models in AMOS reduced the number of items per factor as a result of low standardized regression weights and multiple intra-item correlations. All produced acceptable model fit statistics and Cronbach Alpha scores (Table 3). The amount of variance explained by the factors was not affected by the removal of the items. The removed items are shown in italics in Table 3.
Table 3: Results of exploratory and confirmatory factor analysis models for each of the three place attachment dimensions

<table>
<thead>
<tr>
<th>Dimension/Model code</th>
<th>Item</th>
<th>Exploratory Factor Analysis</th>
<th>Confirmatory Factor Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Factor 1</td>
<td>Factor 2</td>
</tr>
<tr>
<td>Place identity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P1I</td>
<td>I feel that Ningaloo is a part of me</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>P1II</td>
<td>I am very attached to Ningaloo</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>P1III</td>
<td>I identify strongly with Ningaloo</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Ningaloo is very special to me</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Ningaloo means a lot to me</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place dependence</td>
<td></td>
<td>1.95(2)</td>
<td></td>
</tr>
<tr>
<td>PD1</td>
<td>Doing what I do here at Ningaloo is more important to me than doing it at any other place</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td>PD2</td>
<td>I wouldn’t substitute any other area for doing the type of things I do at Ningaloo</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td>PD3</td>
<td>I get more satisfaction from visiting Ningaloo than any other place</td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td>PD4</td>
<td>There is no place like Ningaloo where members of my family / group of friends can enjoy their own experiences in the one place</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The things I do at Ningaloo I would enjoy doing just as much at a similar place*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No other place can compare to Ningaloo*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everybody’s happy</td>
<td></td>
<td>0.25(1)</td>
<td></td>
</tr>
<tr>
<td>E1</td>
<td>Ningaloo is important to me because my family / group of friends enjoy it</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td>E2</td>
<td>Holidays to Ningaloo are important to us as a family / group of friends because everyone can enjoy themselves</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>E3</td>
<td>The friendships and associations I have with other people here at Ningaloo mean a lot to me</td>
<td>0.53</td>
<td></td>
</tr>
</tbody>
</table>

*Items in italics were removed during confirmatory factor analysis. Good model fit = $\chi^2$/df < 3.0; GFI > 0.90; NFI > 0.95; RMSEA < 0.08; Cronbach Alpha > 0.7 (Kline, 2005)
The means for the behavioral intentions varied between the categories (Table 4). The overall mean for on-site behaviors that individuals would do themselves was the highest at 4.46. Telling others to perform behaviors had an overall mean of 3.78 (Table 4). Off-site conservation actions had the lowest overall mean of 2.90.

ANOVA results indicated the means of the behavioral intentions were statistically different (F-statistic = 41.89; p-value <0.001). Cronbach Alpha coefficients for telling others to undertake the behaviors and the off-site conservation behaviors were acceptable (0.93 and 0.86, respectively) (Nunnally, 1978). The Cronbach Alpha coefficient for the behaviors the visitors would do themselves was low but considered acceptable following the outcome of CFA (italicized in Table 4).
Table 4: Mean, standard deviations and reliability estimates for three categories of pro-environmental behavioural intentions (n = 372)

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Behavioral Intention</th>
<th>Mean</th>
<th>SD</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Do yourself</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DY1</td>
<td>Learn more about Ningaloo Reef’s natural environment</td>
<td>4.05</td>
<td>0.76</td>
<td>0.60 (0.64)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>DY2</td>
<td>Consciously conserve water in my daily activities</td>
<td>4.63</td>
<td>0.67</td>
<td>0.93 (0.90)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>DY3</td>
<td>Restrict my vehicle movements to designated access tracks</td>
<td>4.66</td>
<td>0.75</td>
<td>0.93 (0.90)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>DY4</td>
<td>Place my cans and glass bottles in campsite recycling bins (if provided)</td>
<td>4.67</td>
<td>0.58</td>
<td>0.93 (0.90)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td><em>Pick up litter</em></td>
<td>4.54</td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Not feed wildlife</em></td>
<td>4.19</td>
<td>1.23</td>
<td></td>
</tr>
<tr>
<td><strong>Tell others</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TO1</td>
<td>Not feed wildlife</td>
<td>3.80</td>
<td>1.15</td>
<td>0.93 (0.90)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>TO2</td>
<td>Learn more about Ningaloo Reef’s natural environment</td>
<td>3.57</td>
<td>1.10</td>
<td>0.93 (0.90)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>TO3</td>
<td>Consciously conserve water in their daily activities</td>
<td>3.79</td>
<td>1.17</td>
<td>0.93 (0.90)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>TO4</td>
<td>Restrict their vehicle movements to designated access tracks</td>
<td>3.73</td>
<td>1.21</td>
<td>0.93 (0.90)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td><em>Place their cans and glass bottles in campsite recycling bins (if provided)</em></td>
<td>3.87</td>
<td>1.15</td>
<td>0.93 (0.90)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td><em>Pick up litter</em></td>
<td>3.92</td>
<td>1.20</td>
<td></td>
</tr>
<tr>
<td><strong>Conservation actions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CON1</td>
<td>Work as a volunteer on conservation projects in this area</td>
<td>2.75</td>
<td>1.25</td>
<td>0.86 (0.77)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>CON2</td>
<td>Sign petitions in support of the conservation of Ningaloo Reef</td>
<td>3.68</td>
<td>1.01</td>
<td></td>
</tr>
<tr>
<td>CON3</td>
<td>Write letters in support of the conservation of Ningaloo Reef</td>
<td>2.80</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>CON4</td>
<td>Donate money to conservation projects to help protect Ningaloo Reef</td>
<td>2.92</td>
<td>1.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Participate in public meetings about managing Ningaloo Reef</em></td>
<td>2.42</td>
<td>1.21</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Circulate petitions in support of the conservation of Ningaloo Reef</em></td>
<td>2.81</td>
<td>1.21</td>
<td></td>
</tr>
</tbody>
</table>

* Items in italics were removed during confirmatory factor analysis

* Cronbach Alpha coefficients following removal of italicised items

**Structural models**

Following CFA, the three place attachment dimensions and each category of behavioral intentions were placed into separate structural models (Fig 1, 2 & 3). All three models produced good fit (Table 5) and provided adequate explanatory power of the categories of behavioral intentions. The correlations between the three place attachment dimensions were considered acceptable (place identity and place
dependence = 0.78; place dependence and everybody’s happy = 0.79; place identity and everybody’s happy = 0.79) as place constructs are known to be highly correlated with each other (Hammitt, et al., 2009; Jorgensen & Stedman, 2001; Williams & Vaske, 2003). Discriminant validity was also determined by holding each latent factor correlation to 1 which led to deterioration in the model and the significance of this confirmed via Chi-squared difference tests (Bagozzi, Yi, & Phillips, 1991; Kyle, et al., 2005)(App. 1). The structural model for off-site conservation actions had the highest percentage of variance explained with 22.0%. For telling others it was 10.1% and for the behavioral intentions that participants would do themselves, the structural model explained 9.5% of the variance.

As to the relationships between the place attachment dimensions and behavioral intentions, for all three models place identity was the only dimension that had a statistically significant positive effect (Table 5). As such, H1-H3 hold for the relationship between place identity and the behavioral intentions but not for place dependence or everybody’s happy. The direct relationships between these other two dimensions and the three behavior categories were also tested through correlations and were found to be low (range for place dependence: 0.14 – 0.26; range for everybody’s happy: 0.11 – 0.22). The place identity regression coefficient for the category of behavioral intentions that participants would do themselves was 0.16, for telling others to undertake these same actions it was 0.24 and for off-site conservation actions it was 0.55 (Fig 1, 2 & 3; Table 5). It can therefore be suggested that the effect of place identity is greatest for behavioral intentions undertaken off-site with the perceived greatest level of effort or investment.
Table 5: Structural model results for the three categories of behavioral intentions

<table>
<thead>
<tr>
<th>Place attachment dimension</th>
<th>Regression coefficient</th>
<th>Standard error</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Do yourself model</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place identity</td>
<td>0.16</td>
<td>0.05</td>
<td>0.00</td>
</tr>
<tr>
<td>Place dependence</td>
<td>-0.02</td>
<td>0.04</td>
<td>0.74</td>
</tr>
<tr>
<td>Everybody’s happy</td>
<td>-0.08</td>
<td>0.06</td>
<td>0.21</td>
</tr>
<tr>
<td><strong>Tell others model</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place identity</td>
<td>0.24</td>
<td>0.10</td>
<td>0.01</td>
</tr>
<tr>
<td>Place dependence</td>
<td>-0.06</td>
<td>0.10</td>
<td>0.54</td>
</tr>
<tr>
<td>Everybody’s happy</td>
<td>0.11</td>
<td>0.14</td>
<td>0.40</td>
</tr>
<tr>
<td><strong>Conservation actions model</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place identity</td>
<td>0.55</td>
<td>0.11</td>
<td>0.00</td>
</tr>
<tr>
<td>Place dependence</td>
<td>0.07</td>
<td>0.09</td>
<td>0.45</td>
</tr>
<tr>
<td>Everybody’s happy</td>
<td>-0.23</td>
<td>0.13</td>
<td>0.07</td>
</tr>
</tbody>
</table>

**Fit statistics:**
- Do yourself model: \( \chi^2 = 125.5, df = 69; \chi^2/df = 1.82; GFI = 0.95; NFI = 0.95; RMSEA = 0.04 \)
- Tell others model: \( \chi^2 = 155.8, df = 69; \chi^2/df = 2.26; GFI = 0.95; NFI = 0.96; RMSEA = 0.06 \)
- Conservation actions model: \( \chi^2 = 128.9, df = 68; \chi^2/df = 1.90; GFI = 0.95; NFI = 0.95; RMSEA = 0.05 \)

**Figure 1:** Structural model of behavioral intentions participants would do themselves at Ningaloo (bolded item indicates statistically significant, p<0.05).
Figure 2: Structural model of behavioral intentions participants would tell others to do at Ningaloo (bolded item indicates statistically significant, p<0.05).

Figure 3: Structural model of the conservation behavioral intentions participants would undertake off-site from Ningaloo (bolded item indicates statistically significant, p<0.05).
Discussion

The four initial place attachment dimensions were reduced to three following factor analysis. Place identity, place dependence and everybody’s happy produced good reliability with the three behavior categories also producing acceptable reliability coefficients. Of the three place attachment dimensions, place identity was found to have a statistically significant effect on all three behavior categories. This effect was strongest for off-site actions with the perceived greatest level of effort or investment. The role of effort or investment and other possible influences on the categorization of pro-environmental behaviors used in this study are explored further below.

The structural models for each category of behavioral intentions showed good model fit and had acceptable explanatory power (9-22%). The explanatory power of our models is slightly lower than other models that have examined the influence of place attachment on pro-environmental behavior elsewhere (19-40%, Vaske & Kobrin, 2001; Halpenny, 2010). Lower percentages for variance explained for the models presented here is not surprising given the nature of the concepts under investigation. The models in our study included the untried affective dimension, everybody’s happy, as well as three categories of behavioral intentions that were constructed using the pre-existing literature and researcher knowledge. Although they tested well in the pilot test and subsequent analysis in this study, further refinement of these concepts, particularly with reference to everybody’s happy, would potentially see an increase in the amount of variance explained by each of the models.

Place identity was the only place attachment dimension to have an effect on pro-environmental behavioral intentions at Ningaloo. Halpenny (2010) found a hybrid place identity/affect dimension had a significant effect on both park and general pro-
environmental behavioral intentions. Vaske and Kobrin (2001) also found a similar relationship; as place identity increased, so too did the intention to undertake the pro-environmental behavior. Place identity also had a positive influence on support for the spending of fees on facilities and services, and environmental protection (Kyle, et al., 2003). Additionally, individuals with higher scores for place identity items were more critical of environmental and social conditions encountered on the Appalachian Trail in the United States (Kyle, et al., 2004a). Local identity processes were also among factors thought to prompt concern for the conservation of limited natural resources relating to water consumption (Bonaiuto, et al., 2008). This clearly reinforces the need for further research specifically examining the formation and composition of place identity in leisure and recreation settings and its relationship with visitation frequency and other place attachment dimensions.

Place identity involves a place becoming part of the self (Trentelman, 2009). Knowingly or unknowingly, we regard possessions and places as an extension of our own identity when we invest effort, time and attention into a place. Incorporating a place into our identity sees us wanting to maintain and care for the setting (Belk, 1988). Potentially, for those who have a strong sense of place identity, environmental degradation or inappropriate behavior at their place is viewed as an offence to themselves. Place identity is the internalized, emotional dimension, and emotion appears to play a significant part in the retrieval of information and motivating individuals to act for an issue or place that is of importance to them (Devine-Wright, 2009; Halpenny, 2010; Hinds & Sparks, 2008; Kals, et al., 1999).

Results from this study suggest that individuals who are more place dependent rather than place identity orientated may overlook negative conditions or behaviors encountered at a place and thus not feel the need to undertake pro-environmental
behaviors, as long as the place still continues to provide unique opportunities to enjoy their experiences (Kyle, et al., 2004a). That is, as long as their goals are being met, these other issues are less important. This may also be true for the everybody’s happy affective dimension tested. Individuals may not be concerned about inappropriate behaviors or environmental conditions if they are able to retain the same levels of experiential enjoyment based on their social interactions and recreational activities.

Place identity had a greater effect on the off-site conservation actions and a lesser effect on actions that individuals would undertake themselves on-site. Walker and Chapman (2003) reported a similar finding. They identified that for behaviors requiring a longer-term investment or greater effort, the greater the effect of sense of place. To illustrate, in their study, picking up litter had the lowest regression coefficient, with volunteering the highest. Additionally, Dono, Web and Richardson (2010) found social identity had the greatest effect on behaviors relating to environmental citizenship (requiring greatest investment) and least effect on behaviors relating to consumer behavior (requiring least investment). A similar outcome was demonstrated in this study with conservation actions undertaken off-site having the highest coefficient, with these activities requiring greater commitment – beyond the duration of the holiday – than the other two site-based pro-environmental behaviors. Commitment over a period of time is required by the participant to undertake volunteer projects when compared to saving water or placing recyclables in appropriate refuse containers (or telling others to do so).

A possible explanation for the lower level of influence of place identity on actions participants would do themselves at Ningaloo could be that social obligations and norms may have more effect than place attachment (Halpenny, 2010). This was
especially relevant here as the social norms and group cohesion were significant aspects that probably also underpin the new affective place attachment dimension, everybody’s happy. Individuals have societal obligations and recognize that they should behave in a particular manner (Gockeritz, Schultz, Rendon, Cialdini, Goldstein, & Griskevicius, 2010; Heywood, 2002). Humans are social in nature and are highly susceptible to social influence (Gockeritz, et al., 2010) and through the encouragement or discouragement of significant others, individuals are taught these social or societal standards as to what are acceptable or unacceptable behaviours (Heywood, 2002). For example, individuals are often taught by significant others (e.g. family, friends) that littering is ‘bad’ and will also conform to expected behaviours in an effort to be accepted by others (Gockeritz, et al., 2010).

The new affective dimension, everybody’s happy, developed and tested in this study emphasizes that the meanings individuals associate with places extend well beyond the physical environment (Kyle, et al., 2005) and into experiential and emotional matters (Low & Altman, 1992; Relph, 1976). Interestingly, Halpenny (2010) noted the need for an additional affective dimension, (such as everybody’s happy) that might help to better understand people’s pro-environmental behavioral intentions. From this study, it appears that everybody’s happy importantly adds to current, ongoing research efforts to develop more nuanced understandings of recreation places and why these types of settings are important (Hammitt, et al., 2009). The accrualment of sentimental feelings towards these settings is likely to be different to the feelings generated at places encountered on a more regular or even daily basis, making it imperative that new dimensions and their relationships with visitors’ behaviors and preferences continue to be actively researched. This study makes an important contribution to these ongoing efforts.
The categories of behaviors tested here show good reliability in comparison to other studies, although these other studies have used differing forms of categorization so caution should be taken in comparing methods and results. Some have used the types of activities to perform the categorization, for example responsible consumerism, resource conservation, use of nature, antitoxic, waste handling or healthy consumer (Karp, 1996; Olli, Grendstad, & Wollebaek, 2001). Others have grouped on issues such as good citizen, activist, willingness to pay, private-sphere environmentalism or non-activist public sphere (Dono, Webb, & Richardson, 2010; Homburg & Stolberg, 2006). These studies have produced mixed results with Cronbach Alpha coefficients ranging from 0.39 (Olli, et al., 2001) to 0.78 (Homburg & Stolberg, 2006). In this study the reliabilities ranged from 0.60 to 0.90. Clearly, further research into the categorization of pro-environmental behaviors is warranted.

This study has shown that place identity influences place specific pro-environmental behaviors. It also lends support to the notion that off-site pro-environmental behavioral intentions that seem to require greater effort are more affected by place identity than on-site behaviors. Finally, it highlights further areas of research. First and foremost, affective dimensions of visitors’ attachment to leisure settings in natural places continue to be investigated and developed. Our new everybody’s happy dimension adds to this vibrant and on-going research area. Further development and testing of the categories and associated scale items of pro-environmental behaviors in natural areas is another high priority. An important part of this development is consideration and further investigation of the role of commitment and other factors in differentiating between the behavioral intentions. This list of research needs is indicative of a vibrant, dynamic research area, with this leisure-focused research building on a rich history of place research in environmental
psychology while at the same time making its own way in describing how place is perceived by visitors (i.e. non-residents) and how these visitors act regarding natural areas and their future.

References


Authors (under review a) Using photo-elicitation to explore the place meanings of campers along the Ningaloo Coast, north-western Australia. Submitted to *Australian Geographer*
### Appendix – Results of chi-squared tests demonstrating discriminant validity

<table>
<thead>
<tr>
<th>Place attachment dimension correlation</th>
<th>Chi squared (df)</th>
<th>Difference in Chi squared (df)</th>
<th>P-value of difference in Chi squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full model</td>
<td>93.5 (30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place identity and place dependence</td>
<td>97.2 (29)</td>
<td>3.7 (1)</td>
<td>0.05</td>
</tr>
<tr>
<td>Place identity and everybody’s happy</td>
<td>104.3 (30)</td>
<td>10.8 (1)</td>
<td>0.00</td>
</tr>
<tr>
<td>Place dependence and everybody’s happy</td>
<td>99.6 (30)</td>
<td>6.1 (1)</td>
<td>0.01</td>
</tr>
</tbody>
</table>
Chapter 5: Place attachment and management preferences of visitors to a coastal World Heritage site, Australia

This chapter addresses Research Objective 2.2 through examining the relationship(s) between place attachment and level of support for management actions associated with Ningaloo Marine Park and adjacent coastline. Like Chapter 4, it draws on the results of the visitor survey conducted at the three study sites. In this manuscript PRIMER was used to undertake the multivariate analysis. Analysis of the results was attempted through AMOS as per Chapter 4 above, however the analysis did not produce tangible or reliable results; therefore further analysis using PRIMER was undertaken. The dimensions of place attachment identified through the exploratory factor analysis documented in Chapter 4 where used as initial dimensions for further analysis in this manuscript. This manuscript has been submitted to Visitor Studies.

J. Tonge wrote all sections of the manuscript with assistance from F. Valesini (Centre for Fish and Fisheries Research, Murdoch University), for the PRIMER analysis. F.Valesini, S. Moore, M. Ryan and L. Beckley contributed to drafts of this manuscript.

Place attachment and management preferences of visitors to a coastal World Heritage site, Australia

Abstract

This paper investigates the place attachment of visitors to Ningaloo World Heritage coastline, north-western Australia, and the influences of this attachment on their management preferences. An on-site survey explored the place attachment of visitors using the dimensions of place identity, place dependence, social bonding and a new affective dimension – everybody’s happy. The survey results enabled an exploration of the relationships between a modified set of dimensions and preferences for...
management actions, ranging from zoning of motorised recreational water craft, providing information to reduce impacts of snorkelling, to development of sea-kayaking interpretive trails. Within each dimension, the multivariate statistical package PRIMER, applied here for the first time in place attachment research, produced significantly different clusters based on strength of attachment. The results indicated a weak relationship between only one of the clusters and management actions with no other significant relationships identified. The paper concludes with a discussion of the implications of these results for future research on place and associated preferences for management actions.

Introduction

When an individual visits a recreational or leisure setting, they instil a significance and importance to it due to the characteristics of the setting, and through the process of experiencing it (Smith, Davenport, Anderson & Leahy, 2011). This process can foster the development of strong emotional ties or bonds, which is termed place attachment. As a result of these attachments, individuals are often unwilling to substitute the setting for another and have an increased level of concern regarding how it is used and managed (Williams, Patterson, Roggenbuck & Watson, 1992; Farnum, Hall & Kruger, 2005). Therefore, managers of these settings need to consider the effects of their decisions on individual visitors as well as on the setting resources. It is the attachments to place expressed by visitors that makes such considerations essential for effective, well-informed management (Williams et al., 1992; Brandenburg & Carroll, 1995; Eisenhauer, Krannich & Blahna, 2000; Smith et al., 2011).

Through an understanding of how visitors perceive, choose, relate or bond to settings, managers also have crucial information for providing quality experiences (Moore & Graefe, 1994; Warzecha & Lime, 2001). They are equipped with a comprehension of the complex emotional bonds individuals form with settings and how these bonds
and attachments can affect beliefs about management of the setting. This information can then enable managers to be more proactive in the development of socially acceptable management strategies (Smith et al., 2011). Importantly, this place attachment approach encapsulates the bonds between individuals and a setting directly, rather than by establishing these connections indirectly through visit and visitor characteristics (Williams et al., 1992).

People who are more place attached are likely to: exhibit greater concern over the ecological well-being of a setting (Vorkinn & Riese, 2001); be more sensitive to recreational impacts (Williams et al., 1992); have preferences regarding environmental attributes (Kaltenborn & Williams, 2002) and setting conditions (Kyle, Graefe & Manning, 2004a); and express particular motives, levels of acceptability of encounters, and support for some management actions (Warzecha & Lime, 2001). Therefore it would seem prudent for managers of recreation and leisure settings to understand and identify highly attached individuals in order to effectively communicate public benefits in the planning process (Moore & Graefe, 1994; Kil Holland & Stein, 2010). Additionally, once plans have been established, communicating these plans by appealing to individuals’ sense of attachment may help with the palatability or acceptance of management plans (Warzecha & Lime, 2001). The level (or strength) and type of attachment could also provide a useful indicator of whom managers could count on for support of actions, while also identifying those who may be most affected by management decisions and actions (Kaltenborn, 1998).

As such, this paper has two aims. The first is to determine if distinct groups of visitors to the World Heritage listed Ningaloo coast in north-western Australia exist in relation to the type and strength of attachment formed with the place. This is
achieved through employing cluster analysis to differentiate strengths of attachment specifically for several dimensions of place attachment. Rather than simply determining the strength of attachment for a composite place construct, the intention of this study is to provide a richer description through individually exploring the multiple dimensions of place attachment – rather than for the overarching construct of place attachment with this latter approach widely applied in previous studies (e.g. Kyle et al., 2004a; Kil et al., 2010). The second aim is to examine the potential relationships between these clusters and support or otherwise for management actions. The associated analysis relies on PRIMER, a multivariate statistical package that has been widely used in ecology but not previously applied in place research. It is used here because of its robust and analytical quality in providing the ability to explore potential relationships between variables without employing \textit{a priori} assumptions. That is, it allows for the exploration of potential relationships rather than pre-determining the types of relationships present. Given the aims of this research and data format, this form of analysis was considered appropriate.

\textit{Conceptualisation of place attachment}

The conceptualisations of place attachment used in this study were generated from the place literature, predominantly research on leisure and recreation settings in natural areas. It has also been informed by recent qualitative and quantitative research examining place attachment at Ningaloo, specifically the place meanings ascribed to Ningaloo (authors, under review a)\textsuperscript{3} and the relationship between place attachment and pro-environmental behaviours (authors, under review b).\textsuperscript{4}

\textsuperscript{3} Examiners note: See manuscript in Chapter 3
\textsuperscript{4} Examiners note: See manuscript in Chapter 4
Place attachment research in natural areas has primarily relied on the explanatory dimensions of place identity and place dependence (Williams & Vaske, 2003; Kyle, Graefe & Manning, 2005; Trentelman, 2009; Kil et al., 2010). Place identity describes the symbolic or emotional aspects of a connection to place (Williams & Roggenbuck, 1989; Warzecha & Lime, 2001). It relates to the set of memories, connections and feelings about the setting that give rise to how an individual sees the setting as part of themselves (Proshansky, 1978; Williams & Roggenbuck, 1989; Williams et al., 1992; Warzecha & Lime, 2001). Place dependence describes the functional aspect of place attachment (Williams & Roggenbuck, 1989; Warzecha & Lime, 2001). How the physical setting meets the needs and goals of an individual and whether it is superior to other available places in terms of the achievement of these goals are central concerns (Stokols & Shumaker, 1981; Williams & Roggenbuck, 1989; Williams et al., 1992; Warzecha & Lime, 2001).

On their own, these two dimensions have proved limiting in their capacity to capture the complexities of the place attachment construct. Researchers have posited social relationships as a crucial part of developing an attachment to a setting (Low & Altman, 1992; Kyle et al., 2005). Social bonding is now widely accepted as an additional dimension of place attachment that captures the relationships that form between visitors at a place (Kyle et al., 2005; Kyle & Chick, 2007; Smith et al., 2010). This dimension is particularly important in understanding leisure and recreation behaviour as settings facilitate and maintain social relationships (Kyle et al., 2005; Smith et al., 2010).

Affective-based dimensions are still being researched in leisure contexts (Kil et al., 2010; Ramkissoon, Weiler & Smith, 2012). Others forms of this dimension have been suggested in recent research, including familiarity, belongingness and affective
attachment (Kyle, Mowen & Tarrant, 2004b; Hammit et al., 2006; Ramkissoon et al., 2012). None however have been universally accepted or comprehensively empirically validated. Place-based qualitative research at Ningaloo suggests a fourth dimension to help further develop these affective components of place attachment – a dimension labelled “everybody’s happy” (authors, under review a)\(^5\). This dimension centres on visitors expressing great satisfaction that they and all members of their group can happily undertake activities in one place that collectively suits all group members.

Strength of attachment provides managers with important context for their decisions regarding the management of settings. The other critically important part is the effect of this attachment on the perceptions and needs of current and potential future users (Smith et al., 2011). Kyle et al. (2004a) examined the relationship between place attachment and management actions through a survey of hikers on the Appalachian National Scenic Trail. Hikers in the high attachment cluster were more inclined to support actions restricting other uses or other users’ impacts on the trail. Hikers in the low attachment cluster were supportive of actions that sought to charge a fee for trail maintenance, require a permit to be obtained for overnight use of the trail, or required campers to use shelters and designated campsites. Warzecha and Lime’s (2001) study of visitors undertaking boating trips (both floating and motorised) on the Colorado and Green Rivers similarly found that highly attached visitors were more inclined to support restrictions, in this case the prohibition of motorised rafts on the rivers. They were less supportive of curbs on their own access and choices such as having to reserve a campsite and maintain a predetermined itinerary.

\(^5\) Examiners’ note: This relates to the manuscript presented in Chapter 3
Kil et al. (2010) surveyed visitors to a national forest in Canada with the higher attached group more likely to rate scenery, peacefulness and abundance of flora and fauna more positively, while they placed greater importance on natural features and natural areas with few signs of development. Lower attached respondents were more sensitive to recreation fee costs and preferred facilities for comfort and convenience. Overall, the authors noted that the identified clusters preferred contrasting setting preferences, with higher attached visitors preferring natural features and the lower attached visitors favouring facilities for convenience.

Previous research on this relationship has explored place attachment as a single construct (e.g. Kyle et al., 2004a; Kil et al., 2010) with few exceptions, such as Warzecha and Lime (2001) who looked at differences in preferences for both place identity and place dependence high and low cluster groups. There is extensive research (see Williams & Vaske, 2003; Kyle et al., 2005) indicating that place attachment is a complex construct including a number of dimensions. Given the increasing robustness of these dimensions and their contributions to explaining attachment, investigating the relationships between the individual dimensions and support for management actions is timely and warranted. As such, this study determines the strength of attachment for the dimensions of place attachment and then analyses how these dimensions relate to management actions. This further assists in understanding how to effectively communicate management policies and plans.
Methods

Study site

The iconic Ningaloo Reef, World Heritage listed in 2011 for its outstanding natural values, is located off the north-west coast of Australia. These values include the annual migration of whale sharks as well as other iconic fauna such as turtles, whales and sharks, unique geological formations and the 300km reef itself (CALM & MPRA, 2005; UNESCO World Heritage Centre, 2011). Its choice as a study location was based on a recent study which identified high repeat levels of visitation (55%) (Beckley et al., 2010), suggesting strong place attachment. Ningaloo Marine Park, which encompasses the entire 300km length of the fringing reef, attracts about 200 000 visitors annually who participate in a wide variety of activities which include fishing, swimming, snorkelling and sunbaking on the beach (CALM & MPRA, 2005; Wood & Glasson, 2005; Smallwood et al., 2011).

Due to the great length and logistics required to survey the whole coastline of the Marine Park, three coastal sites were chosen in the southern section (Fig. 1). This section was selected as a number of studies have examined the management of the Cape Range National Park (located adjacent to the northern section of the Marine Park) and surrounding areas (e.g. Mason & Moore, 1998; Wood, 2003; Moore & Polley, 2007) however, the southern section has not been subject to the same research intensity. The three sites include the small township of Coral Bay and two camping areas on the adjacent pastoral stations (rangeland grazing) – 3 Mile Camp at Gnaraloo Station and 14 Mile Camp at Warroora Station. Coral Bay has a range of accommodation available from unpowered campsites through to chalets and a small
resort. The camping areas on the pastoral stations consist of unpowered coastal campsites with minimal facilities.

**Figure 1:** Ningaloo Marine Park, reef crest, adjacent land uses and the three study locations.

*Survey development and distribution*

A survey based on the four dimensions described above (place identity, place dependence, social bonding and everybody’s happy) was the principal data collection method for this study. The items to measure place identity and place
dependence were based on those developed by Williams and Roggenbuck (1989),
which have been validated and used in a numerous place attachment studies
(Warzecha & Lime, 2001; Williams & Vaske, 2003; Kyle et al., 2004a; Kyle et al.,
2004b; Kyle et al., 2005). The items for social bonding were derived from Kyle et al.
(2004b) and Wilkinson (2008) to reflect the community feel and friendship aspects
described by respondents during the qualitative study of place meanings at Ningaloo
(authors, under review a).6

As the everybody’s happy dimension had not been documented previously, items
were developed by the authors based on the previously mentioned qualitative
research. All place attachment items were measured on the same five-point Likert
scale with 1 representing “strongly disagree” and 5 “strongly agree”. The scale items
were developed in accordance with standard scale development procedures
(Churchill, 1979). In addition, the survey was pretested to ensure wording and
comprehension acceptability.

The list of potential management actions were derived from current policy and
management documents pertinent to the Ningaloo coast and the surrounding region.
Documents included the management plan for the Ningaloo Marine Park (CALM &
MPRA, 2005), the Ningaloo Coast Regional Strategy (WAPA, 2004) and relevant
literature pertaining to management actions in marine and coastal protected areas
(Shafer & Inglis, 2000; Mangi & Austen, 2008; Lai et al., 2009). Most of the listed
management actions were kept generic (i.e. non-site specific), where possible, to
ensure applicability to all three of the survey sites (Table 2). Two were retained as
site specific to reflect the intentions of the Ningaloo Coast Regional Strategy (Table

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6 Examiners’ note: This relates to the manuscript presented in Chapter 3
2, actions 12 & 13). Respondents were asked to indicate their level of agreement via a five-point Likert scale anchored with 1 representing “strongly disagree” and 5 “strongly agree”. Other questions within the survey included visitation frequency and visitor socio-demographics.

**Data analysis**

The validity of the place attachment dimensions was tested via exploratory factor analysis using maximum likelihood extraction and oblique rotation. The minimum accepted factor loading for items was set at 0.5 and the maximum cross-loading was 0.25 (DeVellis, 1991; Hair et al., 2006). Following this, cluster analysis was performed for each identified dimension using the following suite of routines in the PRIMER v.6 multivariate statistics package (Clarke & Gorley, 2006). An Euclidean distance matrix, containing the pairwise distances between all respondents, was calculated and then subjected to hierarchical agglomerative clustering using average-group linkage. A Similarities Profile (SIMPROF) permutation test was used in conjunction with the CLUSTER routine to statistically identify the true ‘natural groupings’ within each dimension across the full range of respondents. That is, by performing a test for any significant internal grouping structure at each successive node of the cluster dendogram, the SIMPROF routine determines those points in the clustering procedure at which further division of respondents is unnecessary (Clarke et al., 2008). The null hypothesis was that there were no significant differences between respondents if the significance level (p-value) was <0.05. First time visitors were removed before the CLUSTER and SIMPROF analyses were undertaken as these respondents were unlikely to have formed a significant level of place

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7 Examiners’ note: This is the same EFA procedure as used in Chapter 4.
attachment during their initial visit. Additionally, repeat visitors would be more familiar with current management regimes.

The BVSTEP routine was used to identify, within each dimension, which subset of management actions were most highly correlated with the cluster groups identified by the CLUSTER and SIMPROF routines. The null hypothesis that there were no similarities in the underlying patterns between the complementary place attachment dimensions and management action data was rejected if the p-value was <0.05. The extent of any significant correlation between these data sets was determined by the magnitude of the test statistic (rho), i.e. values close to 0 indicate little correlation, while those close to +1 indicate near perfect agreement (Clarke et al., 2008). This analysis was performed for each cluster group within each place attachment dimension. The results of this analysis are discussed in the following paragraphs.

Results

Visit and visitor characteristics

A total of 389 visitors were approached with 372 agreeing to complete the survey, resulting in a response rate of 95%. Of these, 74% were repeat visitors and 60% were female (Table 1). The 35-44 age group had the highest percentage of respondents (29%) with respondents aged 65 or older the lowest percentage (10%). Over half (55%) of all respondents had a tertiary or university level of education.
Table 1: Visitor and visit characteristics of survey respondents (n = 372)

<table>
<thead>
<tr>
<th>Visitor Characteristics</th>
<th>(%)</th>
<th>Visit Characteristics</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td>Travel Group</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>40</td>
<td>By yourself</td>
<td>3</td>
</tr>
<tr>
<td>Female</td>
<td>60</td>
<td>Family</td>
<td>51</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>11</td>
<td>Family and Friends</td>
<td>33</td>
</tr>
<tr>
<td>25-34</td>
<td>14</td>
<td>Visitation Frequency</td>
<td></td>
</tr>
<tr>
<td>35-44</td>
<td>29</td>
<td>First visit</td>
<td>26</td>
</tr>
<tr>
<td>45-54</td>
<td>25</td>
<td>Once every 3-5 years</td>
<td>19</td>
</tr>
<tr>
<td>55 or older</td>
<td>11</td>
<td>Once every 1 to 2 years</td>
<td>18.5</td>
</tr>
<tr>
<td>65 or older</td>
<td>10</td>
<td>Once a year</td>
<td>28</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary/some secondary</td>
<td>3</td>
<td>More than 5 times per year</td>
<td>0</td>
</tr>
<tr>
<td>Secondary</td>
<td>24</td>
<td>On a weekly basis</td>
<td>0.5</td>
</tr>
<tr>
<td>Vocational/Technical</td>
<td>18</td>
<td>Other</td>
<td>5</td>
</tr>
<tr>
<td>Tertiary/University</td>
<td>55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Exploratory factor analysis of place attachment dimensions and management actions**

The means and standard deviations for the place attachment items and construct validity (Cronbach alpha) results for the four initial place attachment dimensions are presented in Table 2. The exploratory factor analysis identified a three-factor solution thereby reducing the original four place attachment dimensions to three (Table 2). The first factor contained five place identity items and so was determined place identity. The second factor had five place dependence items and one item from everybody’s happy, and was labelled place dependence. The final factor contained one social bonding and two everybody’s happy items, this factor was named everybody’s happy.
Table 2: Results from exploratory factor analysis of place attachment items (n = 372).  

<table>
<thead>
<tr>
<th>Place attachment item</th>
<th>Mean</th>
<th>SD</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place Identity (Cronbach alpha = 0.92)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ningaloo means a lot to me</td>
<td>3.38</td>
<td>1.16</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ningaloo is very special to me</td>
<td>3.32</td>
<td>1.15</td>
<td>0.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I identify strongly with Ningaloo</td>
<td>3.02</td>
<td>1.10</td>
<td>0.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am very attached to Ningaloo</td>
<td>2.98</td>
<td>1.16</td>
<td>0.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visiting Ningaloo says a lot about who I am</td>
<td>2.82</td>
<td>1.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel that Ningaloo is a part of me</td>
<td>2.80</td>
<td>1.10</td>
<td>0.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place Dependence (Cronbach alpha = 0.86)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ningaloo is the best place for what I like to do</td>
<td>3.74</td>
<td>0.90</td>
<td></td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>No other place can compare to Ningaloo</td>
<td>3.20</td>
<td>1.27</td>
<td></td>
<td></td>
<td>0.54</td>
</tr>
<tr>
<td>The things I do at Ningaloo I would enjoy doing just as much at a similar place</td>
<td>2.71</td>
<td>1.18</td>
<td></td>
<td></td>
<td>0.61</td>
</tr>
<tr>
<td>Doing what I do here is more important to me than doing it at any other place</td>
<td>2.67</td>
<td>1.17</td>
<td></td>
<td></td>
<td>0.61</td>
</tr>
<tr>
<td>I get more satisfaction from visiting Ningaloo than any other place</td>
<td>2.60</td>
<td>1.20</td>
<td></td>
<td></td>
<td>0.81</td>
</tr>
<tr>
<td>I wouldn’t substitute any other area for doing the type of things I do at Ningaloo</td>
<td>2.59</td>
<td>1.25</td>
<td></td>
<td></td>
<td>0.87</td>
</tr>
<tr>
<td>Social Bonding (Cronbach alpha = 0.75)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A feeling of community runs between me and the other campers here at Ningaloo</td>
<td>3.34</td>
<td>1.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The friendships and associations I have with other people here at Ningaloo mean a lot to me</td>
<td>2.77</td>
<td>1.16</td>
<td></td>
<td></td>
<td>0.53</td>
</tr>
<tr>
<td>My family and friends would be disappointed if I were to start visiting other coastal places rather than Ningaloo</td>
<td>1.96</td>
<td>1.17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I were to stop coming here to Ningaloo, I would lose contact with a number of friends</td>
<td>1.85</td>
<td>1.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everybody’s Happy (Cronbach alpha = 0.84)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holidays to Ningaloo are important to us as a family/group of friends because everyone can enjoy themselves</td>
<td>3.57</td>
<td>1.14</td>
<td></td>
<td></td>
<td>0.76</td>
</tr>
<tr>
<td>Ningaloo is important to me because my family/group of friends enjoy it</td>
<td>3.43</td>
<td>1.14</td>
<td></td>
<td></td>
<td>0.70</td>
</tr>
<tr>
<td>I rely on Ningaloo to provide an enjoyable experience for my family/group of friends</td>
<td>3.06</td>
<td>1.27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is no place like Ningaloo where member of my family/group of friends can enjoy their own experiences in the one place</td>
<td>2.75</td>
<td>1.27</td>
<td></td>
<td></td>
<td>0.69</td>
</tr>
</tbody>
</table>

* Factor 1 = place identity; Factor 2 = place dependence; Factor 3 = everybody’s happy

---

8 Examiners note: These are the same results obtained from the EFA as in Chapter 4. Unlike the AMOS analysis, all items identified for each factor were retained in the subsequent PRIMER analysis as the items had acceptable factor loadings. As this analysis aimed to determine the number of clusters within each place attachment dimension, all items within each dimension (factor) were retained.
The mean and standard deviation was calculated for each management action (Table 3). The action that received the highest level of support was Action 1 – *Provide signs and information to educate visitors about how to snorkel with minimum impact* (4.16). The action receiving the lowest level of support was Action 13 - *Develop an eco-resort at Gnaraloo Bay* (2.36). Those actions related to restrictive zoning for motorised watercraft and the provision of additional infrastructure or facilities were not widely supported with means below 3 (Table 3, actions 10-13).

**Table 3:** List of management actions and mean level of agreement (n = 372)

<table>
<thead>
<tr>
<th>No.</th>
<th>Management action</th>
<th>Mean</th>
<th>Std Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Provide signs and information to educate visitors about how to snorkel with minimal impact</td>
<td>4.16</td>
<td>0.96</td>
</tr>
<tr>
<td>2.</td>
<td>Provide signs with information on the marine and terrestrial environment of Ningaloo Reef</td>
<td>4.01</td>
<td>0.97</td>
</tr>
<tr>
<td>3.</td>
<td>Provide clearer markers for the sanctuary zone boundaries</td>
<td>3.98</td>
<td>1.03</td>
</tr>
<tr>
<td>4.</td>
<td>Access to certain turtle-nesting beaches during the breeding season is by guided tour only</td>
<td>3.72</td>
<td>1.37</td>
</tr>
<tr>
<td>5.</td>
<td>Appoint honorary rangers to help with education</td>
<td>3.57</td>
<td>1.16</td>
</tr>
<tr>
<td>6.</td>
<td>Increase the frequency of visits by rangers to sites along Ningaloo Reef</td>
<td>3.44</td>
<td>1.23</td>
</tr>
<tr>
<td>7.</td>
<td>Create designated zones for no interaction between humans and manta rays</td>
<td>3.36</td>
<td>1.27</td>
</tr>
<tr>
<td>8.</td>
<td>Develop sea-kayaking trails along Ningaloo Reef</td>
<td>3.24</td>
<td>1.24</td>
</tr>
<tr>
<td>9.</td>
<td>Create designated zones for non-motorised recreational activities such as windsurfing and kitesurfing</td>
<td>3.28</td>
<td>1.32</td>
</tr>
<tr>
<td>10.</td>
<td>Create designated zones for motorised recreation water craft such as jetskis</td>
<td>2.97</td>
<td>1.59</td>
</tr>
<tr>
<td>11.</td>
<td>Provide moorings for recreational boats over 5m at specific sites</td>
<td>2.61</td>
<td>1.39</td>
</tr>
<tr>
<td>12.</td>
<td>Provide 2WD access to Warroora and/or Gnaraloo</td>
<td>2.46</td>
<td>1.43</td>
</tr>
<tr>
<td>13.</td>
<td>Develop an eco-resort at Gnaraloo Bay</td>
<td>2.36</td>
<td>1.37</td>
</tr>
</tbody>
</table>

**Strength of attachment for derived dimensions**

From the non-metric multi-dimensional scale plots, five clusters each were ascertained for place identity and place dependence, with three clusters identified for everybody’s happy (Fig. 2). These clusters were differentiated on the level or strength of attachment. For each of these dimensions, Cluster A had the lowest means for each item within the dimension and Cluster E (or Cluster C for
everybody’s happy) had the highest means (Table 4). The only exception was Cluster B for place dependence, this had a mean of 4.08 for the item - *The things I do at Ningaloo I would enjoy doing just as much at a similar place*, whereas the other items in this cluster recorded means of 2.00 or below (Table 4). Which could potentially be attributed to the wording of the item or that it is reverse coded.
Figure 2: Non-metric multi-dimensional scale plots of clusters derived from PRIMER per each place attachment dimensions for visitors to Ningaloo.
Table 4: Means for items within each cluster for participants at Ningaloo (n=219)

<table>
<thead>
<tr>
<th>Place identity item</th>
<th>Cluster A (n=15)</th>
<th>Cluster B (n=16)</th>
<th>Cluster C (n=85)</th>
<th>Cluster D (n=75)</th>
<th>Cluster E (n=28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel that Ningaloo is a part of me</td>
<td>1.27</td>
<td>2.19</td>
<td>2.61</td>
<td>3.31</td>
<td>4.86</td>
</tr>
<tr>
<td>I am very attached to Ningaloo</td>
<td>1.13</td>
<td>2.19</td>
<td>2.74</td>
<td>3.84</td>
<td>4.86</td>
</tr>
<tr>
<td>I identify strongly with Ningaloo</td>
<td>1.27</td>
<td>2.31</td>
<td>2.87</td>
<td>3.72</td>
<td>4.71</td>
</tr>
<tr>
<td>Ningaloo is very special to me</td>
<td>1.73</td>
<td>1.94</td>
<td>3.00</td>
<td>3.72</td>
<td>4.93</td>
</tr>
<tr>
<td>Ningaloo means a lot to me</td>
<td>1.67</td>
<td>2.00</td>
<td>3.26</td>
<td>4.24</td>
<td>4.86</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Place dependence item</th>
<th>Cluster A (n=25)</th>
<th>Cluster B (n=13)</th>
<th>Cluster C (n=65)</th>
<th>Cluster D (n=85)</th>
<th>Cluster E (n=31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The things I do at Ningaloo I would enjoy doing just as</td>
<td>1.29</td>
<td>4.08</td>
<td>2.23</td>
<td>3.27</td>
<td>3.84</td>
</tr>
<tr>
<td>much at a similar place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No other place can compare to Ningaloo</td>
<td>1.46</td>
<td>2.00</td>
<td>2.74</td>
<td>3.91</td>
<td>4.97</td>
</tr>
<tr>
<td>Doing what I do here is more important to me than doing</td>
<td>1.38</td>
<td>1.62</td>
<td>2.38</td>
<td>3.12</td>
<td>4.61</td>
</tr>
<tr>
<td>it at any other place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I wouldn’t substitute any other area for doing the type</td>
<td>1.13</td>
<td>1.62</td>
<td>2.22</td>
<td>3.24</td>
<td>4.65</td>
</tr>
<tr>
<td>of things I do at Ningaloo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I get more satisfaction from visiting Ningaloo than any</td>
<td>1.13</td>
<td>1.69</td>
<td>2.28</td>
<td>3.27</td>
<td>4.77</td>
</tr>
<tr>
<td>other place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is no place like Ningaloo where member of my</td>
<td>1.33</td>
<td>1.62</td>
<td>2.32</td>
<td>3.48</td>
<td>4.71</td>
</tr>
<tr>
<td>family/group of friends can enjoy their own experiences</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in the one place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Everybody’s happy item</th>
<th>Cluster A (n=46)</th>
<th>Cluster B (n=134)</th>
<th>Cluster C (n=39)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The friendships and associations I have with other</td>
<td>1.80</td>
<td>2.84</td>
<td>4.54</td>
</tr>
<tr>
<td>people here at Ningaloo mean a lot to me</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ningaloo is important to me because my family/group of</td>
<td>2.24</td>
<td>3.77</td>
<td>4.77</td>
</tr>
<tr>
<td>friends enjoy it</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holidays to Ningaloo are important to us as a family/</td>
<td>2.59</td>
<td>3.88</td>
<td>4.90</td>
</tr>
<tr>
<td>group of friends because everyone can enjoy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>themselves</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In order to describe the resultant clusters, a range of visit and visitor characteristics were examined, with gender, education and visitation frequency providing the best illustration of the differences between the clusters (Table 5). First, for all three dimensions, as the strength of attachment increased so did the percentage of visitors who visited at least once per year. Another pattern related to the tertiary education level, with increasing strength of attachment, the percentage of respondents with a tertiary level of education decreased. Finally, the percentage of female respondents showed a number of interesting results. Cluster A for place identity and Cluster B for place dependence both had over 80% female respondents, while the remaining clusters had the female representation around 50-65%. For all of the clusters, the female representation was always higher than males.

Table 5: Defining characteristics of clusters for place attachment dimension

<table>
<thead>
<tr>
<th>Place attachment dimension cluster</th>
<th>Gender</th>
<th>Education level</th>
<th>Visitation frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>female (%)</td>
<td>tertiary (%)</td>
<td>once per year (%)</td>
</tr>
<tr>
<td><strong>Place identity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster A (n=15)</td>
<td>80</td>
<td>67</td>
<td>13</td>
</tr>
<tr>
<td>Cluster B (n=16)</td>
<td>50</td>
<td>62</td>
<td>31</td>
</tr>
<tr>
<td>Cluster C (n=85)</td>
<td>62</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Cluster D (n=75)</td>
<td>52</td>
<td>56</td>
<td>44</td>
</tr>
<tr>
<td>Cluster E (n=28)</td>
<td>64</td>
<td>25</td>
<td>68</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Place dependence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster A (n=25)</td>
<td>60</td>
<td>56</td>
<td>20</td>
</tr>
<tr>
<td>Cluster B (n=13)</td>
<td>85</td>
<td>84</td>
<td>15</td>
</tr>
<tr>
<td>Cluster C (n=65)</td>
<td>57</td>
<td>62</td>
<td>30</td>
</tr>
<tr>
<td>Cluster D (n=85)</td>
<td>60</td>
<td>52</td>
<td>46</td>
</tr>
<tr>
<td>Cluster E (n=31)</td>
<td>52</td>
<td>35</td>
<td>87</td>
</tr>
<tr>
<td><strong>Everybody’s happy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster A (n=46)</td>
<td>65</td>
<td>70</td>
<td>22</td>
</tr>
<tr>
<td>Cluster B (n=134)</td>
<td>56</td>
<td>59</td>
<td>40</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster C (n=49)</td>
<td>64</td>
<td>23</td>
<td>76</td>
</tr>
</tbody>
</table>
**Relationship between strength of attachment for derived dimensions and proposed management actions**

Non-significant relationships were evident between place identity, place dependence and everybody’s happy clusters and the proposed management actions (Table 6).

The only exception was for everybody’s happy, where there was a weak relationship between Cluster B (moderate attachment strength) and eight of the listed management actions (Table 6, Cluster B rho = 0.149, sig. at 1% level). These actions included the provision of additional information regarding the natural environment, clearer demarcation of the sanctuary zones, restricting access to turtle-nesting beaches, appointing honorary rangers, zoning of non-motorised recreational activities and establishing a sea-kayaking trail. A number of these actions potentially facilitate use.

**Table 6:** Test statistics and significance levels for BEST analysis for all place attachment dimensions clusters for visitors to Ningaloo

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Rho value</th>
<th>Sig level</th>
<th>Management action(s)(^+)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Place identity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster A</td>
<td>0.147</td>
<td>0.85</td>
<td>6, 10</td>
</tr>
<tr>
<td>Cluster B</td>
<td>0.078</td>
<td>0.98</td>
<td>3, 13</td>
</tr>
<tr>
<td>Cluster C</td>
<td>0.148</td>
<td>0.13</td>
<td>1, 2, 4, 5, 9, 10, 12</td>
</tr>
<tr>
<td>Cluster D</td>
<td>0.153</td>
<td>0.12</td>
<td>2, 7, 8</td>
</tr>
<tr>
<td>Cluster E</td>
<td>0.106</td>
<td>0.88</td>
<td>3</td>
</tr>
<tr>
<td><strong>Place dependence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster A</td>
<td>0.171</td>
<td>0.63</td>
<td>2, 5, 6, 9, 12</td>
</tr>
<tr>
<td>Cluster B</td>
<td>0.418</td>
<td>0.17</td>
<td>2, 7, 8, 11</td>
</tr>
<tr>
<td>Cluster C</td>
<td>0.078</td>
<td>0.53</td>
<td>4, 6, 7, 8, 10, 12</td>
</tr>
<tr>
<td>Cluster D</td>
<td>0.099</td>
<td>0.40</td>
<td>4, 9, 10</td>
</tr>
<tr>
<td>Cluster E</td>
<td>0.226</td>
<td>0.35</td>
<td>2, 3</td>
</tr>
<tr>
<td><strong>Everybody’s happy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster A</td>
<td>0.169</td>
<td>0.28</td>
<td>7, 8</td>
</tr>
<tr>
<td>Cluster B</td>
<td>0.149</td>
<td>0.01**</td>
<td>2, 3, 4, 5, 7, 8, 9, 13</td>
</tr>
<tr>
<td>Cluster C</td>
<td>0.125</td>
<td>0.48</td>
<td>3</td>
</tr>
</tbody>
</table>

\(^+\) Numbers in Management actions column relates to the Action No. in first column in Table 2

**\(^{**}\) Significant at the 0.01 level**
Discussion

*Strength of attachment reflected through derived clusters*

From this study, three dimensions of place attachment were delineated. Two pertained to the traditional place attachment dimensions of place identity and place dependence, while the third is a social/affective hybrid, labelled ‘everybody’s happy’. The analysis tools within PRIMER allowed analytically robust clusters to be generated within these dimensions without imposing a number or form on the resultant clusters thereby letting the “natural groupings” emerge from the data. Descriptive or subjective decision rules are not part of the PRIMER analysis classification process (Valesini et al., 2010). This form of analysis is a useful methodological contribution to place research, given its objectivity (Travers et al., 2010) and ongoing discussions about how to best understand and research place attachment dimensions within the complex place construct (Kyle et al., 2005; Hammitt et al., 2009; Trentelman, 2009).

The resulting three dimensions of place attachment suggest avenues for further research, including additional efforts to characterise and understand place attachment at a dimension (as well as construct) level and further efforts to describe and understand the proposed new dimension – everybody’s happy. As per previous studies, place identity and place dependence were again clearly measurable and differentiable from other place attachment dimensions (Kyle et al., 2003; Hammitt et al., 2006; Hammitt et al., 2009). The everybody’s happy dimension provides an important contribution to ongoing efforts to develop an affective place attachment dimension for refinement and testing in other natural areas.
The characteristics of the clusters described in this study share some similarities with the findings from other studies. First, other studies have similarly shown that the medium or moderate strength clusters have the greatest number of respondents, with smaller numbers of respondents in the low and high strength clusters (Kyle et al., 2004a; Ednie et al., 2010; Kil et al., 2010). Also, lower attached groups generally contain respondents with a higher level of education (e.g. tertiary or graduate degrees), and higher attached groups contained respondents with lower levels of education (vocational or two-year college degrees). Kil et al. (2010) in their study of recreationists to a national forest in Florida had a similar finding. Differences between this study and others exist, however, when examining gender. High and mid attachment groups have previously been shown to contain greater proportions of males to females (Kyle et al., 2004a). This was not evident in any of the clusters from this study with the proportion of female respondents always larger than males. This result can be attributed, in part, to more females (60%) than males (40%) agreeing to complete the survey. This strong deviation towards females was also found in a survey of visitor-use of the Ningaloo Marine Park, especially in the southern coastal sites where this study is situated (Beckley et al., 2010).

**Linking attachment and management actions**

This study revealed non-significant relationships between the place attachment dimensions of place identity, place dependence and everybody’s happy, and a suite of management actions. A weak relationship was apparent between the moderate strength cluster of the last dimension and the more educational, communication-orientated management actions. This could have been due to this cluster containing two-thirds of the survey respondents, therefore providing more statistical power for the identification of a significant result.
Another possible explanation for this relationship is that these actions are palatable as they are unlikely to impinge on group enjoyment. In fact, they might enhance it. Group enjoyment, where all group members can happily undertake their preferred activities in the same place, underpins the ‘everybody’s happy’ dimension. Providing additional information, including sanctuary zone markers, and restrictive zoning making it clearer as to what are acceptable activities and where they can be undertaken, could allow group members to better determine the activity options available and enhance the collective quality of the group members’ experiences at Ningaloo.

These results relating to group enjoyment could also be attributed to the female participants who completed the survey. The everybody’s happy dimension was particularly pertinent among the female respondents of the earlier qualitative study where this affective-based aspect was identified (authors, under review a). Females, in general, are often more motivated to participate in leisure and recreation activities that are accompanied by the possibility of social interaction or experiencing nature (Manning, 2011). Additionally, culture and opportunities for family bonding are other strong motivators for females to participate in leisure activities (Meng & Uysal, 2008). These are clearly reflected in the types of management actions that were found to have a significant (although weak) relationship with the moderate everybody’s happy cluster. Potentially, examining place attachment in concert with socio-demographic variables such as gender may produce more meaningful results.

Overall, the strength of attachment seemed to have little bearing on the responses to management actions obtained in this study. This inconclusiveness reflects conclusions from previous studies. Kyle et al. (2004a) analysed the level of support for 25 management actions based on whether respondents were assigned to the high,
medium or low place attachment cluster group. For the 10 actions that were found to be statistically different between the attachment clusters, none had a change in the level of support between the groups. For example, the action “charge a fee to help pay for trail maintenance and hiker education” was found to have statistically significant differences between the three clusters (F = 5.60, p-value <0.01). This action had a mean of 2.40 for the high clusters, 2.64 for the medium cluster and 2.65 for the low cluster, however, all were still within the scale interval of “2” indicating opposition to the action.

Warzecha and Lime (2001) differentiated between high and low clusters for both place identity and place dependence and their relationships with two management actions: prohibiting motorised rafts from the Colorado and Green Rivers, and reserving campsites and maintaining a predetermined itinerary. While no statistically significant differences were found in the responses for the high and low place dependence clusters and the management actions, differences were found for place identity. The low place identity cluster opposed prohibiting motorised rafts (mean of 2.5 with 2 indicating opposition on 4-point scale) and the high cluster supported this action (mean of 3.5 with 3 indicating support on 4-point scale).

In contrast to the inconclusiveness regarding the relationship between place attachment and visitors’ preferences for management actions is research into the relationships between the strength of place attachment and the perceptions of benefits. These may be benefits to visitors or for the natural areas. Highly attached visitors generally disagree with plans for developing or changing the natural environment (Vorkinn & Riese, 2001; Davenport & Anderson, 2005). They also tend to view natural areas with few signs of human development to be more important to their experience than other types of settings (Kil et al., 2010). Additionally, Kyle et
al. (2003) identified that place attached visitors were more supportive of park entrance fees being used to maintain conditions, facilities and services, rather than to improve them.

Several authors (Jacobs & Buijs, 2011; Smith et al., 2011) have recently investigated meanings and underlying beliefs that contribute to the expression of place attachment, with an emphasis on the emotional aspects of place. Smith et al. (2011), researching management of the Kaskaskia River Watershed, found that the key drivers of how individuals would like to see a place managed are the distinct types of meanings they associated with the setting. The meanings they tested included community identity, self-efficacy, economy and ecological integrity, which were shown to have relationships with ecological, economic, lifestyle and social solidarity management outcomes. Jacobs and Buijs (2011) in their study of water management interventions, propose that if a management agency suggests an intervention or management action, individuals will form an attitude towards that action based on their beliefs, and these beliefs are firmly entrenched in the meanings assigned by the individuals to the places in question.

It appears easier to establish relationships between place attachment and these broader, often non-site specific benefits and outcomes, than it is between place and management actions. Searching for such relationships may be even more problematic, as it was in this study, where some of the management actions are specific to a particular site and may not be relevant to visitors at other sites. There are clear research opportunities to better understand what other factors and visitor attributes influence their preferences for management actions and how place might be involved in influencing these factors or mediating between them and management preferences. It would also be useful to continue efforts to develop and test a widely
applicable survey instrument for describing management actions. However, this may prove challenging given the wide diversity of natural settings in which leisure pursuits take place.

The lack of significant relationships in this study may also be explained by a large, but unknown influence of potential self-displacement by these visitors. Visitors to Ningaloo may have sufficient self-efficacy that they will voluntarily displace to other sites if they do not like proposed management changes at Ningaloo. Arnberger and Haider (2007), in their study of trail users in a recreational area in Vienna, Austria, describe the complex influences on visitors’ intention to displace, including high visitor numbers and face-to-face encounters. The responses of visitors in this study to the proposed management actions may be more of a reflection of self-efficacy, a response potentially confounding any apparent relationship between place attachment and management preferences. Displacement intentions offer a fruitful research area, when combined with place studies, to better understand what visitors do when attachment is no longer desirable or possible.

**Conclusion**

For managers, understanding the bonds visitors have with a place is essential, especially if proposed management actions are likely to be contentious or result in visitor conflict (Yung et al., 2003). Identifying the strength or level of place attachment expressed by visitors, for the three dimensions explored in this study, can help managers understand what characterises these differing levels of attachment. For example, highly attached individuals visit once per year and have lower levels of tertiary education. Knowing these visit and visitor characteristics can help managers tailor their communication and consultation programs accordingly if and when developments or changes to site management are proposed.
Given the non-significant relationships between place attachment and management actions found in this study and inconsistencies evident in these results and ones from previous studies, it seems critical to continue developing a scale(s) that can be developed and tested for measuring management actions. The river-based research by Warzecha and Lime (2001), plus the more generic items from this study, provide a valuable starting point for generating items for future research attention. These quantitative efforts should be accompanied by qualitative research investigating how visitors perceive proposed management actions and the extent to which their perceptions influence their professed future behaviour. The concept of self-displacement, linked to better understanding visitors’ sense of self-efficacy, also seems a fruitful area for further investigation. This paper and its suggestions regarding future research, adds further to the richness of our knowledge and understanding of place, a fundamental concept in providing meaningful experiences for visitors while at the same time protecting the natural environment.

References


Authors (under review a) Using photo-elicitation to explore the place meanings of campers along the Ningaloo Coast, north-western Australia. Submitted to *Australian Geographer*

Authors (under review b) The effect of place attachment on pro-environment behavioral intentions of visitors to Ningaloo Marine Park. Submitted to *Environment and Behavior*
Chapter 6: Place attachment of visitors to natural areas: A review and future research directions

The manuscript comprising this chapter addresses Research Question 3 relating to the review and synthesis of the data and findings from this study to provide recommendations for the management of natural areas for tourism, leisure and recreation. It also sets an agenda for future research. This manuscript has been submitted to the Journal of Leisure Sciences as a research note.

J. Tonge wrote all sections of this manuscript. S. Moore provided significant feedback on drafts of this manuscript. M. Ryan and L. Beckley also provided feedback on drafts.

Place attachment of visitors to natural areas: A review and future research directions

Abstract
Place continues to be a conceptually contested concept while increasingly providing insights for natural area managers regarding the incorporation of meaning-orientated aspects in decision making. This paper reviews place research to-date with respect to visitors to natural areas, such as national parks and wilderness areas, and proposes a research agenda. Two areas are identified as fruitful for further research attention. The first addresses place identity, which is clearly driving how visitors behave both on and offsite and their responses to proposed management changes. The second is the urgent need to analyse affective aspects of place. Both have great potential to improve our understanding of place as a complex, multi-faceted construct.

Introduction
This paper reviews research on place concepts associated with visitors to natural areas for recreation and leisure purposes, with a particular focus on place attachment. It then provides two directions for future research emphasising the importance of
understanding place identity and the strong emotional ties that visitors can forge with a place. Such a review and future research directions are critically important given the increasing research focus on the visitor experience and in particular on the holistic nature of this experience (Coghlan, 2012). Place and other affective-based concepts can provide important insights to experience and as such are attracting renewed research interest (Lopez-Mosquera & Sanchez, 2012).

Place attachment and other concepts have been studied in a diversity of research disciplines including environmental psychology, sociology, urban planning and natural resource management (Brandenburg & Carroll, 1995; Kruger & Jakes, 2003; Trentelman, 2009). However, rather than covering this diverse research field (for a detailed review of place research over the last forty years see Lewicka, 2010) this article focuses on concepts of place as they relate to visitors to natural environments. While some research has focused on the place attachment of residents living nearby or adjacent to natural areas (e.g. Eisenhauer, Krannich & Blahna, 2000; Stedman, Beckley, Wallace & Ambard, 2004), the focus here is on visitors to natural protected areas such as national parks, state forests, wild and scenic rivers, and wilderness areas.

The notion of place derives from the concept that settings are more than simply geographic sites with definitive physical and textual attributes (Stokowski, 2002; Trentelman, 2009). They are fluid, changeable and dynamic contexts of social interactions with others, layered with memories of experiences, indeed, space becomes place when it is endowed with meaning (Tuan, 1975; Low & Altman, 1992; Stokowski, 2002). Place concepts have been studied in the management of recreation and leisure experiences in natural settings in two key ways – place meanings and place attachment. Places meanings describe what the place means to an individual or
group, whereas place attachment describes how much the place means (Smaldone, Harris, Sanyal & Lind, 2005). Generally, qualitative methods, such as interviews, have been used to ascertain place meanings, while quantitative methods, in particular surveys coupled with statistical analysis, have been employed to explore place attachment (Farnum, Hall & Kruger, 2005; Trentelman, 2009).

**Place research and visitors to natural areas**

Traditional approaches to the management of recreation and leisure settings involved viewing them as commodities or resources that could be interchanged or replicated elsewhere given the same set of attributes (Williams, Patterson, Roggenbuck & Watosn, 1992; Williams & Patterson, 1996). However, this traditional view was often seen as creating uncertainty between visitors and managers (Cantrill & Senecah, 2001) as it did not take into account that settings were places, filled with memories, emotion and meanings (Williams & Patterson, 1996; Cheng, Kruger & Daniels, 2003; Trentelman, 2009). A new perspective of recreation and leisure setting management based on the concepts of place has emerged over the last two decades, one that encompasses the variety of values a setting holds beyond resource extraction or pristine preservation to acknowledge that humans have a presence and a memory within these settings (Cantrill & Senecah, 2001). These place concepts acknowledge that people have a history with a setting, they care about the setting and that these settings can embody a sense of belonging for some visitors which gives purpose and meaning to life (Williams et al., 1992; Williams & Patterson, 1996).

While the development of scales to measure place attachment contributed greatly to the initial surge of place research in natural areas, the need for examining meanings visitors ascribed to places soon became apparent. Numerous studies identifying the meanings ascribed by visitors to special places have been conducted in varying
environments. These have ranged from campers in national forests (Gunderson & Watson, 2007), to rafters on rivers (Bricker & Kerstetter, 2002), to recreational visitors to the Great Barrier Reef (Wynveen, Kyle & Sutton, 2010) and more recently, campers in remote coastal settings (authors, under review a).\(^9\)

Place meanings give a setting value to an individual (Bricker & Kerstetter, 2002), and can help managers and researchers comprehend how an individual generates understanding of their own connections with such settings (Eisenhauer et al., 2000). They can encompass both instrumental or utilitarian values as well as intangible values that cannot be seen or measured (Cheng et al., 2003). The same setting will not have the same meaning to every person or individual who visits, however, there is likely to be some degree of commonality among people who interact with the setting in similar ways such as rock climbers or campers (Stedman, 2008). Meanings of places often comprise of the biophysical attributes of the setting (physical features and processes), social and cultural meanings (personal ideas, beliefs, values relating to the setting) and social processes (types of human interaction within and about the setting) (Cheng et al., 2003).

Meanings are created as people interact with a place and with others there, allowing for the development of connections to it (Kruger & Williams, 2007). The meanings may range from the very personal (i.e. favourite childhood holiday destination) to the publically shared (popular hiking spot or ideal of a national park) (Williams & Vaske, 2003). However, the idea of a place is ultimately constructed around what it means to an individual and how that individual evaluates the place based on those meanings. Being aware of what a place means and why it is important can help in the

\(^9\) Examiners’ note: This relates to the manuscript presented in Chapter 3
understanding of why people care so much for a setting that they act to protect it (Amsden et al., 2011).

In contrast, early studies of place attachment of visitors to natural areas concerned the development of scales in order to measure and provide tangible verification to managers for incorporation of place concepts into management considerations relating to leisure and recreational settings. Place attachment describes the emotional connection or bond that forms between an individual and a place (Low & Altman, 1992; Manzo, 2003; Stedman, 2003a; Williams & Vaske, 2003). It evolves from the conditions and attributes of the setting and the characteristics of the individual (Stedman, 2003a), and is associated with familiarity and the extent of contact or interactions with the setting (Williams et al., 1992; Williams & Vaske, 2003). Place attachment is often demonstrated through unwillingness to substitute or move from their recreational or leisure setting and an increased level of concern regarding how the place is cared for and managed (Williams et al., 1992). Typically, it can be measured through the intensity of individual-place bonds across dimensions that relate to identity, dependence or functional utility, emotional connection and social interaction (Wynveen et al., 2011).

Place identity and place dependence have been widely used as two dimensions for describing and measuring the construct of place attachment when applied to visitors to natural areas (Farnum et al., 2005; Trentelman, 2009). Although they have been shown to be highly correlated in some studies (Jorgensen & Stedman, 2001; Kyle, Graefe & Manning, 2005), there is sufficient documented evidence to retain them as two separate dimensions (Williams & Vaske, 2003; Kyle et al., 2005; Hammitt et al., 2006; Hammitt et al., 2009). Other dimensions relating to social interaction and
emotional connection are continually being developed and tested by researchers in the hope that these additional dimensions will help more comprehensively describe and measure place attachment (see Research Directions).

Place identity, the first of the two well-known place attachment dimensions, is a psychological investment with a place as a receptacle of emotions and relationships that occur in the place (Halpenny, 2010; Williams & Roggenbuck, 1989; Williams & Vaske, 2003). These may be based on personal emotional ties, or on more intangible and symbolic meanings that visitors associate with a natural area (Williams et al., 1992). Visitors importantly can often use places to confirm who they are and their identity to themselves, as well as using a place to express this identity to others, e.g. I am a hiker, I am a surfer (Twigger-Ross & Uzzel, 1996; Lewicka, 2010; Wynveen et al., 2011). The importance of the natural areas in constructing and re-constructing identity has long been recognised as a significant motivation for participation in leisure and outdoor recreation (Williams et al., 1992).

Place dependence, the second well-known attachment dimension in place research is based on functionality and reflects the importance of a place in providing the necessary features and conditions that support specific goals or desired activities (Stokols & Shumaker, 1981; Williams & Roggenbuck, 1989; Manzo, 2003; Smaldone et al., 2005). It reflects the overall necessity attached to a specific place for enjoying a specific leisure pursuit. Place dependence is an assessment of how the current place compares with others that are also currently available and may satisfy the same needs and goals (Williams et al., 1992; Smaldone et al., 2005). Dependence is a judgement by the visitor that no other place will do as well as this one in satisfying personal needs and goals (Trentelman, 2009).
These two dimensions have helped partially, but not completely, explain and measure place attachment (Farnum et al., 2005; Hammitt, et al., 2009). As such, researchers over the last decade have investigated other dimensions relating to social and emotional aspects. Social bonding has been a dimension of particular interest, with it described as resulting from meaningful interactions with family, friends or significant others at a particular place (Kyle et al., 2005; Hammitt et al., 2006; Ramkissoon, Weiler & Smith, 2012). Memories are part of this social bonding, with a setting providing a place where experiences and hence memories have been created with significant others (Kyle et al., 2005).

Affective attachment, with its focus on the emotional bonds that individuals form with a place, has been another avenue explored in the efforts to better understand and measure place attachment (Kyle, Mowen & Tarrant, 2004a; Halpenny, 2010; Ramkissoon et al., 2012). The importance of emotions in forming and maintaining attachment was noted in the initial development of place attachment (Low & Altman, 1992) and has been discussed by a number of researchers (Giuliani, 2003; Manzo, 2003; Halpenny, 2010). It contributes to but is not fully explained by place identity. Ramkissoon et al. (2012) suggests that these emotional bonds develop to satisfy fundamental human needs, such as a general sense of well-being.

**Research directions**

Two decades of place research associated with visitors to natural areas provides an opportune time for reflection and consolidation. Such research, predominantly undertaken in terrestrial areas in North America and Australia, consistently reveals the possibilities for moving forward in this field through better understanding of place identity and the related concern of developing more robust affective
dimensions to accompany the well-tested and know dimensions of identity and dependence. A brief review of research around these two themes follows with the associated research agenda, again focused on these two themes.

**Place identity and visitor perceptions and behaviours**

Researchers in recreation and leisure settings in natural areas, as well as describing and analysing place meanings and place attachment, have had an ongoing interest in how place attachment in particular, affects visitors’ perceptions and behaviour. The place dimensions of identity and dependence have been central to these efforts. However, place dependence items, compared to place identity items, consistently have lower ratings and overall means (Williams & Vaske, 2003). Researchers have investigated the relationship between place attachment and fee expenditure (Kyle et al., 2003), social and environmental conditions of a setting (Kyle, Graefe, Manning & Bacon, 2004b) and pro-environmental behaviours (Halpenny, 2010; authors, under review b). Place identity has proved particularly influential in its effect on visitors’ perceptions and behaviours.

Four studies of visitors to natural areas conducted over the last decade illustrate this influence. Kyle et al. (2003) examined the relationships between place attachment and visitor preferences regarding the expenditure of park entrance fees. Place identity had the greatest effect on visitors’ preferences for fee expenditure on facilities and service development, environmental protection and environmental education. As place identity increased, so did the support for this expenditure. Place dependence, however, contributed little to any of these relationships.

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10 Examiners’ note: This relates to the manuscript presented in Chapter 4
Kyle et al., (2004b) tested the effects of place identity and place dependence on hikers’ perceptions of social and environmental conditions encountered on the Appalachian Trail. Respondents oriented to place identity were more critical of the social and environmental conditions encountered, while place dependent orientated respondents were less discerning. The authors offered reasons for this result, suggesting that the setting, regardless of its condition, allows individuals the opportunity to enjoy certain leisure and tourism experiences that they have become dependent on the place to provide. So condition matters less to these place-dependent individuals. Alternatively or additionally, there may be other areas available that facilitate their goals and needs as well as the current place (Kyle et al., 2003). Therefore, they can choose to displace elsewhere with no detrimental loss in experience. Again, condition doesn’t matter, but for a different reason: they can readily re-locate elsewhere if the conditions become concerning.

Similar results were identified by Halpenny (2010) in her study of the relationship between place attachment and park-specific and general pro-environmental behaviours of visitors to Point Pelee National Park in Canada. Her models indicated that a place identity/place affect hybrid dimension had stronger relationships with both types of pro-environmental behaviours. There was no significant relationship between the place dependence/place affect hybrid and these behaviours, with any effects of the place dependence hybrid mediated by place identity.

Lastly, a recent study of visitors to Ningaloo Marine Park in Western Australia, (authors, under review b)11 identifies place identity as having a significant relationship with three categories of behavioural intentions relating to on-site

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11 Examiners’ note: This relates to the manuscript presented in Chapter 4
behaviours, telling others to perform these on-site behaviours and off-site conservation actions. Place dependence, and a new affective dimension, were also tested and neither were found to have a significant effect.

These findings suggest a need for a renewed emphasis on describing and understanding place identity, including the unpacking of its formation and affirmation and how it affects visitors’ preferences and behaviours. Aspects relating to self and identity appear to play a key role in visitors’ behaviour and their perceptions of the management of natural areas. Thus, such information, captured through place identity is critical for managers. The on-going focus on place dependence is understandable, given that the attributes and activities available within a recreational setting are easier for managers to manipulate and change. Given the challenges in understanding identity, combined with its criticality to those managing recreation and leisure opportunities in natural settings, the research agenda that follows sets the emphasis on better understanding, operationalising, and measuring this dimension.

Understanding a concept can always be enhanced by re-engaging with its origins. For place identity, in the context of natural areas, its earlier conceptualisation in environmental psychology provides a logical starting point. Proshansky, Fabian and Kaminoff (1983) proposed place identity as a sub-structure of self-identity consisting of cognitions and perceptions about the physical world in which an individual lives. These cognitions and perceptions represent the memories, ideas, feelings, attitudes, preferences, meanings and conceptions of behaviour and experience that relate to the complexity of the physical world. It is a personal construction, one which grows out of direct experience with the physical world (Proshansky et al., 1983).
Another concept worthy of pursuit to improve our understanding of place in natural places is a form of place identity termed leisure identity. This can be described as short-term leisure and tourism experiences distinctly bounded and structured with specific beginning and end points (Stein, 2011). Individuals can act and behave through choice rather than obligation, highlighting their own personal style rather than just conforming to social obligations associated with everyday routines (Stein, 2011; Jun et al., 2012). Individuals may feel that they have a relative degree of autonomy because they are in a leisure setting which allows them to project the identity they want to be (Williams, 2002; Stein, 2011). Leisure is now viewed as something “consumed” through choice and therefore connects with the body of literature on this choice process, reflecting the extended self in consumer research (Belk, 1988).

Improved understanding of place identity is also possible through elaborating on its facets of particular relevance to visitors to natural areas. Place identity can be created, constructed and maintained through engaging in experiences and behaviours (by visitors to natural areas) that connect an individual to a particular place (Sampson & Goodrich, 2009). Such places can contribute to affirming and upholding individuals’ identities (Jun et al., 2012). Visiting natural areas, through the twin processes of doing and remembering, connects place and identity and fashions an articulate narrative of the self (Dixon & Durrheim, 2004). The leisure destination then has the ability to signify an individual’s identity by acting as a stable reference point for experiences, values, relationships and actions (Twigger-Ross & Uzzel, 1996).

Another powerful way of improving our understanding of place identity is to revisit and further clarify the measurement scales currently in use. Traditionally, the place
identity expressed by visitors to natural settings has been measured using six items developed by Williams and Roggenbuck (1989) (Table 1). Although these have been used and validated in a number of subsequent studies as a reliable measure of place identity (Williams & Vaske, 2003; Kyle et al., 2005), researchers are still experimenting with other measurement items. Halpenny (2010), for example, included two differing items and removed two of the more traditional measures (Table 1) which were subsequently incorporated into the place identity/affect hybrid used in her subsequent model.

**Table 1**: Items used to measure place identity from Williams and Roggenbuck (1989) and Halpenny (2010)

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel that X is a part of me</td>
<td>I feel that X is part of me</td>
</tr>
<tr>
<td>I identify strongly with X</td>
<td>I identify strongly with X</td>
</tr>
<tr>
<td>Visiting X says a lot about who I am</td>
<td>Visiting X says a lot about who I am</td>
</tr>
<tr>
<td>X means a lot to me</td>
<td>X means a great deal to me</td>
</tr>
<tr>
<td>X is very special to me</td>
<td>I feel I can really be myself in X</td>
</tr>
<tr>
<td>I am very attached to X</td>
<td>When I visit X, others see me the way I want them to see me</td>
</tr>
</tbody>
</table>

In the original Williams and Roggenbuck (1989) study another four items relating to place identity were also tested – “I find that a lot of my life is organised around this place”, “This place makes me feel like no other place can”, “I think a lot about coming here” and “I would prefer to spend more time here if I could” but have not been included in subsequent studies. These four items cross-loaded on two factors that represented place identity and place dependence, and this may be a reason for them not being adopted in other studies. However, given the increased focus on the place attachment of visitors to natural areas, and place identity’s significant relationship with a number of management variables, it seems timely to revisit how place identity is operationalised and measured to gain a more nuanced understanding of it.
**Affective dimensions of place attachment of visitors to natural areas**

Another fruitful area for research attention is the affective component of place attachment. As mentioned previously, researchers, including those working with visitors to natural areas, continue to search for ways to include affective and emotional dimensions in their place attachment research. Jorgensen and Stedman (2001) in their related study of lake-front second-home owners conceptualised sense of place as being composed of place identity, place dependence and place attachment, with place attachment explained as explicitly containing some form of emotional content. Their measures of place attachment (or place affect) related to specific emotions such as feeling relaxed, happy and missing the place when away, all emotions that could be experienced by visitors to natural areas. Kyle, et al. (2004a) examined the influence of trip motivations of visitors to an urban park on four dimensions of place attachment. This included a dimension termed affective attachment (which included two items that have been traditionally used to measure place identity). They found that affective attachment was influenced by motivations relating to autonomy, nature and health.

Halpenny’s (2010) study is one of relatively few that have examined the effect of an affective dimension on a variable relevant to management, namely pro-environmental behavioural intentions. She measures place affect using items drawn from scales documented by Williams and Roggenbuck (1989), Jorgensen and Stedman (2001) and Walker and Chapman (2003). As noted above, distinction between the three dimensions Halpenny (2010) used to measure place attachment failed to materialise, with the items used to measure place affect loading onto the place identity and place dependence factors during the exploratory factor analysis. While the identity/affect hybrid was found to have a significant relationship with...
pro-environmental behaviours, the author suggests that alternative measures could be identified and drawn on to improve the content and composition of place affect.

Efforts in examining affective dimensions have resulted from a continued call in research that has focused on the place attachment of visitors to natural areas, to improve our understanding of the construct by better recognising and including the emotional elements of such experiences (Manzo, 2008; Ramkissoon et al., 2012). Recent qualitative research by the current authors (authors, under review a)\textsuperscript{12} describes a new affective dimension identified from research on place attachment of visitors to the Ningaloo coastline, part of a World Heritage site in north-western Australia. This affective dimension – \textit{everybody’s happy} – describes the feeling of enjoyment and contentment that an individual feels as a result of them and members of their group undertaking their own activities and experiences in the one place, a place which collectively suits all members of the travel group. Individuals feel relaxed and happy knowing that all members of their group share the same enthusiasm and enjoyment with a camping holiday on the Ningaloo coast.

Four items were developed and tested in the Ningaloo study to measure this \textit{everybody’s happy} dimension (authors, under review b)\textsuperscript{13} incorporating social bonding, activities and positive emotions that were expressed and described in the original place meaning qualitative research. This dimension proved to have reasonable construct reliability (Cronbach alpha of 0.79). It was also able to be successfully integrated into structural equation models to test the relationship between dimensions of place attachment and pro-environmental behavioural intentions, although no statistically significant relationships were evident.

\textsuperscript{12} Examiners’ note: This relates to the manuscript presented in Chapter 3
\textsuperscript{13} Examiners’ note: This relates to the manuscript presented in Chapter 4
The next step in developing a place affect dimension or dimensions is testing in other contexts and settings. Development of a robust measurement scale must accompany any moves to multiple contexts. Qualitative research, based on unstructured or semi-structured interviews with visitors and experts at various sites and ideally including photo-elicitation, is important in accessing the affective relationships visitors have with a place and each other. The emotions and feelings associated with a place could include happiness, relaxation, enjoyment and satisfaction. There are on-going concerns regarding whether or not place affect is context dependent or independent (Halpenny, 2010), with the development, testing and implementation of a robust scale helping to answer this question. Testing should ideally take place in a number of differing contexts including a range of experiential opportunities (e.g. camping, hiking, fishing) and natural settings (e.g. terrestrial, coastal, marine).

**Conclusion**

In many researchers’ and managers’ minds, place attachment provides the key to understanding the preferences, perceptions and behaviours of visitors. We now have over two decades of research, beginning with the publication of Williams and Roggenbuck’s influential paper in 1989. As such, it is timely in recreation and leisure research that focuses on visitors to natural areas, to reflect on what we still need to know. This paper importantly highlights two areas for attention. The first of these is gaining a better understanding of place identity given its proven, strong influences on visitors’ preferences and behaviours. The second is the still researched field of affective domains, with its overlaps with place identity, and concerns that it may be highly context specific, making it somewhat difficult to develop and widely apply a robust measurement scale.
Place research is worth the effort. Recent research of visitors to a protected area in South Carolina linked positive place identity with visiting again, referring the site to others, and engaging in advocacy for protected areas (Weaver & Lawton, 2011). All three of these behavioural intentions are pivotal to loyalty, and noted as generating a virtuous cycle of support and care for such areas (Yuksel et al., 2010; Weaver & Lawton, 2011). Natural areas, such as national parks and wilderness, rely for their future on broader societal support and funding. The imperative to generate visitor loyalty and hence the protection and retention of natural areas into the future is further evidence of the importance of place and of the future directions for research presented here.

References


Authors (under review a) Using photo-elicitation to explore the place meanings of campers along the Ningaloo Coast, north-western Australia. Submitted to *Australian Geographer*

Authors (under review b) The effect of place attachment on pro-environment behavioral intentions of visitors to Ningaloo Marine Park. Submitted to *Environment and Behavior*
Chapter 7: Conclusions

This chapter reviews the Research Questions and Objectives outlined in Chapter 2 – Research Design and how they were addressed throughout this thesis. Included is a discussion of the implications for managers of coastal and marine environments where camping and other nature-based activities are a priority. The chapter concludes with directions for future research.

Addressing research questions and associated objectives

Three research questions guided this research. How they were addressed through this thesis are described below.

1. What contributes to the place attachment of campers adjacent to the Ningaloo Marine Park?

   Objective:

   Identify and describe the meanings associated with the place attachment of campers adjacent to Ningaloo Marine Park.

Through a process of photo-elicitation, four place meaning themes ascribed to the Ningaloo Marine Park and associated coastline were identified. These included meanings relating to the physical environment, recreational activities, social ties and bonds and emotional connections. Similar categories were identified by Smaldone, et al. (2008), Bricker and Kerstetter (2002) and Eisenhauer et.al (2000) in their research of visitors to natural settings. Central to the meanings identified in this study was the influence of the sea and the marine environment. Being a coastal location, the interface between land and sea played a crucial role in fostering these meanings by
allowing individuals to remain close to these marine environments on the adjacent hinterlands, thereby maintaining and cementing their relationships to place.

A key meaning from the emotional connection theme that was identified and investigated further throughout the remainder of the study was everybody’s happy. This meaning related to the feeling expressed by a number of respondents regarding Ningaloo being a destination that all members of a group enjoyed. Central to this was that many activities could be undertaken in the one location without other members of the family being inconvenienced. Pforr, Macbeth, Clark, Fountain and Wood (2007) noted a similar sentiment in their examination of the perceptions and attitudes of individuals to a proposed development at Coral Bay (one of the three study sites in this research).

2. What is the relationship between place attachment, behavioural intentions and perceptions of management actions in a coastal setting?

Objectives:

Identify and explore the relationship(s) between place attachment and behavioural intentions.

Identify and explore the relationship(s) between place attachment and support for management actions.

The first objective was addressed in Chapter 4. Data obtained through the visitor survey, with structural equation modelling, was used to investigate the relationships between three dimensions of place attachment and three categories of pro-environmental behaviours. While four dimensions were included in the initial survey (place identity, place dependence, social bonding and everybody’s happy), these were reduced to three following exploratory factor analysis. The three resulting
dimensions included the two traditional dimensions of place identity and place dependence. The third was a hybrid of the social bonding dimension and the new affective dimension everybody’s happy. Items were developed from the results of the preceding qualitative research of meanings to capture the sentiment of everybody’s happy (as described above) with these items having acceptable internal consistency in both the pilot-testing and subsequent full survey. One of the social bonding items also contributed to this new everybody’s happy construct. This indicates that further refinement of items to measure this affective dimension is warranted.

Place identity was the only dimension with a significant positive relationship with each of the three behavioural intention categories. These behavioural categories of on-site behaviours visitors would do themselves; would tell others to do; and off-site conservation actions. Each category had acceptable internal consistencies. The regression coefficient was smallest for on-site behaviours individuals would do themselves and highest for off-site conservation actions to protect Ningaloo. As such place identity had the strongest relationship with those actions that require continued commitment and effort.

The second objective was addressed in Chapter 5. The relationships between the dimensions of place attachment and the level of support for a list of management actions were tested using the visitor survey data. The three dimensions of place attachment were those identified in Chapter 4, with cluster analysis used to identify natural groupings within each dimension. The multivariate statistical programme PRIMER was used to conduct the cluster analysis and to examine the relationships between the place attachment dimensions and the management actions. It was used
in this study as it does not rely on *a priori* assumptions about the nature of the data or the number of clusters to be determined.

Statistically different clusters based on strength of attachment were determined for each place attachment dimension. For place identity and place dependence, five clusters were identified for each dimension, while for everybody’s happy three clusters were determined. The low attachment clusters were characterised by low percentages of visitors who visited once per year, with the high attachment clusters having large percentages of this visitation frequency. Similarly, education levels differed between the clusters, with high attachment clusters having smaller percentages of respondents with a tertiary level of education.

Other than the weak relationship identified for the moderate (Cluster B) everybody’s happy cluster, the subsequent BEST analysis did not identify any significant relationships between these clusters and the list of management actions. The management actions which it related to included providing additional signage on the environment, providing clearer markings of sanctuary zone boundaries, and development of sea-kayaking trails and an eco-resort at Gnaraloo Bay. Given this lack of significant relationships, suggestions for further research were provided. These included a shifting of focus from management actions to broader management outcomes or visitor benefits as well as the potential for the occurrence of some form of self-displacement of visitors from their place should they not like proposed management changes.
3. How can an understanding of these relationships contribute to management of a coastal setting?

Objectives:

- Review existing literature and summarise results to provide a series of recommendations to managers as they relate to place attachment and pro-environmental behaviours and support for management actions.
- Identify gaps in knowledge and opportunities for future research as to the relationships between place attachment, pro-environmental behaviours and support for management actions.

Chapter 6 provides directions for future research with a focus on the place identity and affective components of place attachment. Recommendations for managers plus a review of these directions and other research recommendations are given in the following two sections. A brief conclusion completes this thesis.

**Recommendations for managers**

Three recommendations for managers of coastal and marine areas are provided. While these are discussed specifically as they relate to camping along the Ningaloo coast, they are applicable to managers of any coastal or marine natural area for leisure and recreation purposes.

i. Camping at the interface of land and sea means more to visitors than merely enjoying the physical environment and undertaking activities.

Chapter 3 clearly indicates to managers of the Ningaloo coast that camping at the interface of land and sea is important to visitors. The value assigned to this camping experience, however, is not confined to the physical environment, with emotional and social aspects playing a key role in visitors’ attachment to the Ningaloo coast. While the physical environment and activity aspects are easy to manage and control,
to some degree, thought is still needed regarding how to manage the social and emotional contexts. It could be as simple as campsite placement, with some located close together to allow for social interaction, with others more secluded or out-of-the-way to evoke a sense of solitude and geographical isolation from other campers and visitors.

Caution, however, should be applied in potentially setting back campsites from the coastline. Moving campers back from coastlines could potentially cause conflict as a result of changes to an individual’s experience. Being at the interface between land and sea is integral to development of meanings for coastal campers, and potentially for other nature-based coastal activities.

ii. Invoking environmental stewardship in visitors towards the Ningaloo coast, through appealing to their sense of identity.

Visitors not only consider Ningaloo as part of their identity, they also take their bonds and affection for Ningaloo with them when they leave, as place identity had the strongest relationship with off-site conservation actions. These results could be used by managers of coastal areas in two ways. First, this aspect can be used in communications (e.g. signs, brochures, maps, etc) with visitors and the public about Ningaloo. Sentiments can be included about how the area is special to them as visitors, and that they ought to care and protect the area as they would care and protect themselves. These communications could also include aspects about how to care for the area after they leave, or, how they could become ambassadors for precious coastal areas.

Second, managers should acknowledge that visitors do care and act in an environmentally responsible way while camping along the Ningaloo coast. Managers
could then use this aspect to their advantage; Ningaloo is situated along a very long coastline (300 km) so use these pockets of caring individuals as assets. Rangers may not have to visit these pockets as often as other areas, safe in the knowledge that the individuals camping there do care for Ningaloo and will act in an environmentally responsible manner. Alternatively, a number of individuals camp at these coastal campsites again and again, year after year, and these individuals could be potentially trained as “honorary rangers” providing information as needed to newcomers and report key information back to management. This latter approach has been used at campsites within the Cape Range National Park with some visitors acting as “camp hosts” with some degree of success.

iii. Be cognizant of the potential effect of place attachment on the responses of visitors to management actions.

Although it was not apparent from the results presented in Chapter 5, the influence of place attachment on management actions should still be considered by managers of coastal and marine areas. Place attachment has been shown to increase visitors’ concern regarding how places are managed (Williams et al., 1992; Vorkinn & Riese, 2001), and may become more apparent when management decisions are regarded as controversial in nature (Yung et al., 2003).

An alternative may involve incorporating place issues into the managerial decision making process. Some members of the public may be wary as to whether management agencies understand the values they place on landscapes and settings and are often uncertain about how this knowledge and information may be incorporated into decision making (Gunderson & Watson, 2007). Incorporating visitors’ values into the decision making process could increase trust between management agencies and the public (Payton et al., 2005) and can offer a way to
anticipate, identify and respond to the attachments people form with places, which can be at the core of some management issues (Kyle, et al., 2004a).

**Recommendations for future research**

Four recommendations for future research are provided here, covering the two research directions proposed in Chapter 6 and two research avenues identified in Chapter 5.

i. **Re-examination of the construction and measurement of place identity in leisure and recreation settings in natural areas.**

As identified in this study (Chapter 4) and others relating to place attachment and pro-environmental behaviour and setting conditions and preferences, place identity is the principal dimension demonstrating a positive effect on the variables of interest, including social and environmental setting preferences, and park and general pro-environmental behavioural intentions. Given this dimension continually produces significant effects, a qualitative examination of how identity is constructed in leisure environments and empirical investigations of other items to measure this dimension more effectively seems warranted. This aspect was discussed in Chapter 6 and focused on re-examining how place identity in constructed as well as how it is operationalised and measured in relation to visitors to natural areas.

ii. **Continual development of the affective dimension of place attachment, including consideration of the everybody’s happy dimension**

Current and previous investigations of an affective dimension of place attachment were discussed in Chapter 6. Included were comments on the feasibility and applicability of the *everybody’s happy* dimension identified in this study to other
settings, outside of a coastal context. While not likely to be specific to coastal environments, it is likely to be somewhat context dependent in terms of places that are able to provide a number of differing activities and experiences to groups of individuals. Part of the further investigation of this affective dimension could also focus on determining whether everybody’s happy is influenced by or related to gender. While the sentiment was expressed by both males and females, it was most apparent in the interviews with female participants. Additional analysis (beyond the scope of this PhD study) examining the relationship between everybody’s happy (or other affective-based dimensions) and gender would seem an initial logical step.

iii. Are place attached visitors more likely to self-displace if they do not like management actions applied to their place?

As mentioned in Chapter 5, one area of future research in examining the relationship between place attachment and management of special places was the self-displacement of visitors. Self-displacement describes the potential voluntary movement of visitors to other sites if proposed changes are likely to have a negative effect on their experience. While there is the potential for visitors to exhibit self-efficacy and move to another location along Ningaloo Marine Park given its 300km coastline, visitors to other marine and coastal areas may not be so fortunate. The first logical starting point for this research area would be focusing on the level of attachment, given that early definitions of place attachment describes visitors’ unwillingness to substitute their place for another with similar attributes (Williams et al., 1992).

iv. Examining the relationship between place attachment and site-specific management actions or broader scale management intentions.
Part of the discussion in Chapter 5 centred on whether research should focus on site-specific management actions or broader management intentions or outcomes.
Specificity of management actions may be required to ensure visitors completely consider the effect of possible management actions on their experiences. However, the cost of this type of approach is potentially alienating visitors who do not visit that particular site or who do not participate in a particular activity. Researchers such as Smith, Davenport, Anderson and Leahy (2011) have begun examining the relationships between place meanings and broader management outcomes and have produced some palpable results that could provide the impetus needed in this growing research area.

**Conclusion**

Place research is continuing to evolve in its endeavour to inform managers’ and researchers’ understanding of the relationship between visitors and natural areas. This study has contributed to this development by revealing and beginning the process of testing a new affective dimension – everybody’s happy. It has also demonstrated a relationship between place identity and pro-environmental behaviours, whereby the greater the perceived level of commitment, the greater the effect of place identity. Less clear was the relationship between the dimensions of place attachment and management actions, a finding suggesting future research opportunities. Other opportunities for research focus on place identity and better understanding the emotional connection and re-connections of visitors to places. Lastly, and of equal interest, this study has added to our limited knowledge to-date about the relationships people form with coastal places, as the interface between land and sea. It has importantly both advanced place knowledge and suggested fruitful avenues for future research.
References

These are references cited in the text of this thesis and may not include the references from the manuscripts. The references for each manuscript are provided at the end of the corresponding chapter.


Rose, G. (2007). Chapter 11: Marking photographs as part of a research project - Photo-elicitation, photo-documentation and other uses of photos *Visual


Appendices

Appendix 1A

Holidaying on the coast next to Ningaloo Reef

Thank you very much for agreeing to take part in this study. I’m studying why people return year after year to visit and stay at this place. What I am asking you to do is take photos with the digital camera I have provided and then we’ll sit down and have a chat about these particular photos. So how do we go about this:

1. Please use the digital camera to **take 10 photos of what is special to you about this place** (may be the land, sea, people...)
2. I’ll call by your camp at an agreed time to **collect** the camera and upload the photos on to my laptop.
3. I’ll arrange a time with you to discuss these photos. This should take about 45mins.
4. I’ll give you a CD with the photos on it plus my contact information.
5. I can provide you with a summary of my research findings in early 2010. If you’d like a copy, please provide me with your contact details.

Again, thank you for agreeing to take part in this study. Should you have any questions please don’t hesitate to contact me on (08) 9360 6079 or 0412 254 674. Alternatively you can contact my principal supervisor, A/Prof Sue Moore on (08) 9360 6484 or S.Moore@murdoch.edu.au.

If you wish to talk to an independent person about this research you can contact Murdoch University’s Human Research Ethics Committee on 9360 6677 or email ethics@murdoch.edu.au.

Kind regards,

Joanna Tonge
PhD Candidate
Project information
Thank you very much for agreeing to take part in my PhD study. I’m studying why people return year after year to visit and stay at this place. What I am asking you to do is take photos with the digital camera I have provided and then we’ll sit down and have a chat about these photos.

The research is being supervised by A/Profs Sue Moore and Lynnath Beckley, School of Environmental Science, Murdoch University. Should you have any questions A/Prof Moore, the principal supervisor, can be contacted on (08) 9360 6484 or S.Moore@murdoch.edu.au or alternatively you can contact me (Joanna Tonge) on 0412 254 674 or J.Tonge@murdoch.edu.au

If you are willing to participate, could you please complete the details below. We are happy to discuss with you how this study is being conducted. If you wish to talk to an independent person about this research you can contact Murdoch University’s Human Research Ethics Committee on 9360 6677 or email ethics@murdoch.edu.au

Consent
1. I agree voluntarily to take part in this study.
2. I agree to have my comments recorded.
3. I agree that the photographs that I have taken may be used in any professional publication resulting from this study.
4. I have read the above information and been given a full explanation of the purpose of this study, of what is involved and what is expected of me. The researcher has answered all my questions.
5. I understand I am free to withdraw from the study at any time without needing to give any reason.
6. I understand I will not be identified in any publication arising out of this study.
7. I understand that my name and identity will be stored separately from the data, and these are accessible only to the investigators. All data provided by me will be analysed anonymously using code numbers.
8. I understand that all information provided by me is treated as confidential and will not be released by the researcher to a third party unless required to do so by law.

Signature of Participant: _________________________________
Date: ……/……/…….

Participant Name: _______________________________________

Participant Email: _______________________________________

Signature of Investigator: _________________________________
Date: ……/……/…….

Investigator Name: _______________________________________

This study has been approved by the Murdoch University Human Research Ethics Committee (Approval No. 2009/119)
Appendix 1B

INTERVIEW QUESTIONS

For each photo

1. Tell me about this photo…..
   Probe on: scenery, people (relationships), activities, structures, importance, feelings

   Ocean photos: why the ocean, what part it plays in their holiday, how they “use” the water, if they had an underwater camera, would there be any differences in the pictures taken?

General discussion

2. How important is this place to you?
   Probe on: contribution of the natural environment, influence of “social group”, only place where a certain activity can be done, what part or role does it play in your life?

3. What are the “dos and don’ts” about camping here?
   Probe on: what sorts of things annoy you, about how other people behave here

4. Is this place being managed well?
   Probe on: does it meet your expectations, what might “badly managed” look like, how do you help with management of this place, marine activities

5. What do you see as a major threat to this place?

6. What do you think about the management of the Marine Park?
   Probe on: knowledge of Marine Park, do they know who manages what

7. Lastly, is there anything that you wanted to photograph but couldn’t? What was it and how important is it to your stay here?
   Probe on: Marine Park, social aspect, a feeling that you have about this place
Appendix 2

Visitor Survey
We value your feedback

Dear Visitor,

This survey asks for your views on camping and holidaying at Ningaloo Reef.

Once completed, please return to the Murdoch University researcher.

Thank you for sharing your thoughts and ideas

This study has been approved by the Murdoch University Human Research Ethics Committee (Approval 2009/119). If you have any reservation or complaint about the ethical conduct of this research, and wish to talk with an independent person, you may contact Murdoch University's Research Ethics Office (Tel. 08 9360 6677 (for overseas studies, +61 8 9360 6677) or e-mail ethics@murdoch.edu.au). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Q1. How often do you visit Ningaloo Reef?
[∗] one box only.

☐ First visit (Go to question 3) ☐ 2 to 5 times a year
☐ Once every 3 to 5 years ☐ More than 5 times a year
☐ Once every 1 to 2 years ☐ On a weekly basis
☐ Once a year ☐ Other: ________________

Q2. Do you always stay at the same location?
[∗] one box only.

☐ Always same ☐ Sometimes ☐ Always different

Q3. What is your main reason for staying at this place
[∗] one box only.

☐ Enjoy outdoor environment ☐ Do my favourite activity ☐ Spend time with family and/or friends
☐ Feel a connection to this place ☐ Other: (please add)

Q4. Are there any other reasons for staying at this place?
[∗] more than one box.

☒ Enjoy outdoor environment ☒ Do my favourite activity ☒ Spend time with family and/or friends
☒ Feel a connection to this place ☒ Other: (please add)

Q5. How well do you know this place?
please circle one number only

Not at all  Somewhat  Extremely well
1 2 3 4 5 6 7 8 9

Q6. Is Ningaloo Reef a special place for you?
[∗] one box only

☐ Yes ☐ No
Q7. Please indicate your level of agreement with the following statements regarding your time here along Ningaloo Reef. Please answer all questions by circling the number.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ningaloo is the best place for what I like to do</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>I feel that Ningaloo is a part of me</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>My family and friends would be disappointed if I were to start visiting other coastal places rather than Ningaloo</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>I am very attached to Ningaloo</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>The things I do at Ningaloo I would enjoy doing just as much at a similar place</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>A feeling of community runs between me and the other campers here at Ningaloo</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>No other place can compare to Ningaloo</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Ningaloo is important to me because my family / group of friends enjoy it</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>I identify strongly with Ningaloo</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Doing what I do here at Ningaloo is more important to me than doing it at any other place</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>If I were to stop coming here to Ningaloo, I would lose contact with a number of friends</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Ningaloo is very special to me</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>I wouldn’t substitute any other area for doing the type of things I do at Ningaloo</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>The friendships and associations I have with other people here at Ningaloo mean a lot to me</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>I get more satisfaction from visiting Ningaloo than any other place</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>There is no place like Ningaloo where members of my family / group of friends can enjoy their own experiences in the one place</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Visiting Ningaloo says a lot about who I am</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>I rely on Ningaloo to provide an enjoyable experience for my family / group of friends</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Ningaloo means a lot to me</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Holidays to Ningaloo are important to us as a family / groups of friends because everyone can enjoy themselves</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>
Q8. Please indicate your level of agreement with the following possible management actions at Ningaloo Reef.  
*Please answer all questions by circling the number.*

| Strongly disagree | | Strongly agree |
|-------------------|-------------------|
| Provide signs with information on the marine and terrestrial environment of Ningaloo Reef | 1 | 2 | 3 | 4 | 5 |
| Provide signs and information to educate visitors about how to snorkel with minimum impact | 1 | 2 | 3 | 4 | 5 |
| Provide clearer markers for the sanctuary zone boundaries | 1 | 2 | 3 | 4 | 5 |
| Create designated zones for motorised recreational watercraft such as jetskis | 1 | 2 | 3 | 4 | 5 |
| Create designated zones for non-motorised recreational activities such as windsurfing and kitesurfing | 1 | 2 | 3 | 4 | 5 |
| Create designated zones for no interaction between whale sharks and humans | 1 | 2 | 3 | 4 | 5 |
| Provide 2WD access to Warrroora and/or Gnaraloo | 1 | 2 | 3 | 4 | 5 |
| Provide moorings for recreational boats over 5m at specific sites | 1 | 2 | 3 | 4 | 5 |
| Access to certain turtle-nesting beaches during the breeding season is by guided tour only | 1 | 2 | 3 | 4 | 5 |
| Increase the frequency of visits by rangers to sites along Ningaloo Reef | 1 | 2 | 3 | 4 | 5 |
| Appoint honorary rangers to help with education | 1 | 2 | 3 | 4 | 5 |
| Develop an eco-resort at Gnaraloo Bay (max 100 people) | 1 | 2 | 3 | 4 | 5 |
| Develop sea-kayaking trails along Ningaloo Reef | 1 | 2 | 3 | 4 | 5 |
Q9. During this trip, or on previous trips here, would you be prepared to do any of the following?
*Please answer all questions by circling the number.*

<table>
<thead>
<tr>
<th>Activity</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pick up litter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not feed wildlife (including fish)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learn more about Ningaloo Reef’s natural environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consciously conserve water in my daily activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restrict my vehicle movements to designated access tracks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place my cans and glass bottles in campsite recycling bins (if provided)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q.10 Would you tell others to do the following?
*Please answer all questions by circling the number.*

<table>
<thead>
<tr>
<th>Activity</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pick up litter</td>
<td></td>
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<td>Not feed wildlife (including fish)</td>
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<td></td>
<td></td>
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<tr>
<td>Learn more about Ningaloo Reef’s natural environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consciously conserve water in their daily activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restrict their vehicle movements to designated access tracks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place their cans and glass bottles in campsite recycling bins (if provided)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Q11. Would you consider undertaking the following actions to help protect Ningaloo Reef?**
*Please answer all questions by circling the number.*

<table>
<thead>
<tr>
<th>Action</th>
<th>Wouldn't consider it</th>
<th>Would consider it</th>
<th>Already do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work as a volunteer on conservation projects in this area</td>
<td>1</td>
<td>2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Participate in public meetings about managing Ningaloo Reef</td>
<td>1</td>
<td>2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Sign petitions in support of the conservation of Ningaloo Reef</td>
<td>1</td>
<td>2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Circulate petitions in support of the conservation of Ningaloo Reef</td>
<td>1</td>
<td>2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Write letters in support of the conservation of Ningaloo Reef</td>
<td>1</td>
<td>2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Donate money to conservation projects to help protect Ningaloo Reef</td>
<td>1</td>
<td>2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

**Q12. Did you know that in January 2010 the Ningaloo Coast was nominated for World Heritage Listing?**
[^1] one box only

- Yes
- No

If Yes, please go to Q13
If No, please go to Q14

**Q13. Did this influence your decision to visit this time?**
[^1] one box only

- Yes
- No

**Q14. If the Ningaloo Coast does become a listed as a World Heritage Site, what effect might this have on your future visits?**
[^1] one box only

- Positive
- None
- Negative
Q15. Your gender?
[•] one box only

☐ Male
☐ Female

Q16. Which age group do you belong to?
[•] one box only

18-24  25-34  35-44  45-54  55-64  65 or older

☐ ☐ ☐ ☐ ☐ ☐

Q17. What is the highest level of education you have completed?
[•] one box only

☐ Primary/some secondary  ☐ Secondary  ☐ Vocational/Technical
☐ Tertiary/University

Q18. How many people in your group (including yourself)?

Adults ____________________________ Children (under 18 y/o) ____________________________

Q19. Which best describes your travel group?
[•] one box only

By yourself  Family  Friends  Family and friends  Tour group  Business associates  School/university group

☐ ☐ ☐ ☐ ☐ ☐ ☐

Q20. Where is your usual place of residence?

☐ Australian Postcode  ☐ Overseas (Please state which country)

__________________________  ____________________________

THANK YOU FOR YOUR INPUT

Office Use only:

Date: ____________________________

Site: ____________________________  Survey number: ____________________________

Composite number: ____________________________  Group number: ____________________________