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## **The effect of place attachment on pro-environment behavioral intentions of visitors to coastal natural area tourist destinations**

### **Abstract:**

It has been hypothesized that as individuals become attached to a place, they are more likely to protect that place. Managers of natural area tourism destinations may be able to use this relationship to assist in sustainably managing such places. An on-site visitor survey was administered at Ningaloo Marine Park, Australia to examine the effect of a multi-dimensional conceptualization of place attachment on pro-environmental behavioral intentions. The behaviors encompassed three categories based on the perceived level of commitment and where the behaviors physically occur. They included on-site actions by visitors; visitors telling others how to act on-site; and off-site actions to conserve the Marine Park. Structural equation modeling revealed place identity directly affecting all three behavioral categories, the effect increasing with the level of commitment required to undertake the pro-environmental behaviors. This suggests a sophisticated understanding of place identity is essential for the management of natural area tourism destinations.

**Keywords:** coastal, natural area tourism destinations, place attachment, pro-environmental behaviors

## **Introduction**

Protected areas including national parks, marine parks and other conservation reserves have always been popular tourist destinations for those seeking natural experiences (Newsome, Moore and Dowling 2013). Increasing recognition of the damaging impacts caused by growing numbers of visitors to popular natural area tourism destinations has fostered research into the promotion of environmentally sustainable practices in these areas (Ramkissoon, Weiler, and Smith 2012). These practices can be facilitated and improved by encouraging pro-environmental or environmentally responsible behaviors among visitors to these types of tourism destinations (Ballantyne, Packer, and Hughes 2009; Halpenny 2010; Weaver 2013). Additionally, managers of these natural areas are more likely to be successful in fulfilling their mandate of environmental sustainability when visitors behave in an environmentally appropriate manner while on-site and when they return home (Weaver and Lawton 2011).

Encouraging environmentally sustainable practices is of great appeal to managers given the global trend of competition for limited public land, money and resources (Moore, Rodger, and Taplin 2013). As a result there has been an increased awareness of how visitors can act as a means for environmental enhancement of natural areas (Weaver 2013). This can be in the form of increased park revenue from park entrance fees or volunteering to assist with management actions (Moore, et al. 2013) as well as engendering broader societal and public support for the continued existence of protected natural areas (Weiler, Moore, and Moyle 2013).

Researchers in the fields of travel, leisure and tourism have shown that place attachment has value in both understanding visitor behavior and natural resource management (Warzecha and Lime 2001; Kyle, Graefe, Manning, and Bacon 2004; Kyle, Graefe, and Manning 2005). They have hypothesized that a 'field of care' develops for a place or destination through on-going interaction with it, with individuals possessing strong place attachment more likely to

oppose any degradation of that destination (Tuan 1977; Vorkinn and Riese 2001). As attachment or connection to a place increases, so does the probability that individuals will demonstrate behaviors to protect it (Walker and Chapman 2003; Halpenny 2010; Ramkissoon, et al. 2012). Therefore, managers of these natural area tourism destinations may be able to harness an individual's attachment to a destination in order to influence their behavior (Ramkissoon, Smith, and Weiler 2013 -a).

Some research into the relationship between place attachment and pro-environmental or place protective behaviors has been conducted, with the findings of these studies considered to be largely inconsistent due to variability in the definitions of the key constructs (Walker and Chapman 2003; Scannell and Gifford 2010; Ramkissoon, et al. 2012; Lopez-Mosquera and Sanchez 2013). The intent of the study presented here is to further progress this important area of research by focusing on the relationship between the multi-dimensional place attachment construct and on-site and off-site pro-environmental behaviors of visitors to an iconic World Heritage listed destination, the Ningaloo coast of north-western Australia.

### ***Place attachment***

Place attachment is generally construed as the positive emotional bond between an individual and a specific place (Manzo 2003). It can be described as both the process of attaching oneself to a place as well as the product of this process (Giuliani 2003). The resultant bond has an enduring quality that is directed towards a particular target or place and is not interchangeable (Giuliani 2003). Affect, emotion and feeling are central to the concept but it is also accompanied by cognition and practice (Low and Altman 1992; Vorkinn and Riese 2001). Some 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 (Hidalgo and Hernandez 2001; Lewicka 2010). As a result, places are not only the physical parameters

of a setting but also include social, psychological, historical and spiritual connotations as well (Knez 2014).

The concept has been increasingly embraced by researchers and managers of leisure and tourism destinations, particularly in natural areas, as a means to move from the traditional commodity and service view of management to a more encompassing view which includes the perceptions and emotions of visitors (Williams, Patterson, Roggenbuck, and Watson 1992; Trentelman 2009). This shift was in response to the realization that leisure settings were more than a set of useable physical attributes that could be substituted or replicated elsewhere (Williams, et al. 1992). Subsequent research has indicated that place attachment can influence visitors' perceptions of setting conditions (Kyle, et al. 2004), preferences for the spending of park fees (Kyle, Absher, and Graefe 2003) and satisfaction with and loyalty to a destination, with place attachment identified as an important antecedent to site loyalty (Prayag and Ryan 2012; Lee and Shen 2013).

Place attachment has been traditionally measured by the dimensions of place identity and place dependence. The scales 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 and tourism settings (Trentelman 2009; Lewicka 2010). Place identity is based on the concept of a psychological investment an individual has with a setting (Proshansky 1978; Vaske and Kobrin 2001). The place or setting provides the individual with an opportunity to both express, affirm and reflect their identity (Kyle, et al. 2004; Prayag and Ryan 2012). There can also be symbolic links associated with place identity. For example, a place may have links to family or places of origin, be a sacred or spiritual site, or represent a pilgrimage or celebratory event that provides meaning for a person (Doresltis and Vignoles 2010). 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 dependence pertains to how well a setting serves to achieve an individual's goals given the existing range of alternative sites available (Kyle, et al. 2004; Prayag and Ryan 2012).

Visitors to a place may develop cognitive loyalty by associating it with the specific leisure or recreational experience that it offers (Lee and Shen 2013). It is an assessment of whether the function and physical features of a setting can satisfy recreational, self-enhancement or other psychological goals of an individual (Stokols and Shumaker 1981; Williams, et al. 1992; Ramkissoon, et al. 2012).

Other dimensions have also been developed in an attempt to better articulate the social and emotional aspects of place attachment (Ramkissoon, et al. 2012). This includes social bonding, which results from interactions with family and friends that are dependent on a place (Hidalgo and Hernandez 2001; Kyle, et al. 2005; Ramkissoon, et al. 2012). The importance of the setting is tied to the memories of experiences in the setting that were shared with significant others (Kyle, et al. 2005). Places can also provide the context to form social relationships, with individuals becoming attached to these social relationships and the sense of group belonging that can result (Low and Altman 1992).

Researchers have also tried to develop dimensions to better encapsulate the affective aspect of place attachment (Halpenny 2010; Ramkissoon, et al. 2012). Place affect describes the emotions or feelings of an individual towards a particular place (Halpenny 2010). Spending time in natural settings tends to increase the positive emotions in individuals about the setting, which can lead to the formation of emotional bonds with places to satisfy fundamental human needs (Relph 1976; Ramkissoon, et al. 2012). Recent place-based qualitative research at Ningaloo Marine Park in Western Australia has suggested another

aspect termed *everybody's happy* to assist in the understanding the affective aspect of place attachment (Tonge, Valesini, Moore, Beckley & Ryan 2013 -a; Tonge, Moore, Ryan & Beckley 2013 -b). This centers on an individual's perception that other members of their travel group are happy and enjoy staying and recreating at Ningaloo just as much as the individual. It is emotionally-based in terms of the heightened positive emotions (e.g. happiness, joy) expressed by an individual in knowing that they can achieve their own leisure goals and that others in their group can, and are, as well. Access to activities and desired social opportunities also contribute to this aspect of place attachment (Tonge, et al. 2013 -b).

### ***Pro-environmental behaviors and place attachment***

Pro-environmental behavior relates to any action that promotes or results in the sustainable use of natural resources (Sivek and Hungerford 1989/1990; Halpenny 2010). The aim of the behavior is to minimize the impacts of an individual's actions on the natural environment (Kim 2012). While some research has contributed to the understanding of place attachment's relationship to pro-environmental behaviors (Vaske and Kobrin 2001; Halpenny 2010; Ramkissoon et al. 2013 -a), the empirical evidence describing this relationship is far from definitive (Halpenny 2010; Scannell and Gifford 2010). These inconsistencies can be attributed to different conceptual definitions, populations under study (i.e. residents and their property or town, or visitors to particular places) and the types of behaviors measured (i.e. general pro-environmental behaviors such as recycling, or place specific behaviors such as picking up litter at a particular place).

Studies of residents and their properties or the towns they reside in have examined both general environmental behaviors and place specific behaviors. For example, Vorkinn and Riese (2001) identified the place attachment of residents of a rural Norway community as a better predictor of the negative attitudes towards a hydropower development than socio-demographic variables. Scannell and Gifford (2010) distinguished between two forms of

attachment of residents to their properties, a civic place attachment that related to social aspects, and a natural place attachment which related to natural, physical aspects of the environment. Natural place attachment was found to be a predictor of general pro-environmental behavior while civic place attachment was not.

Research from parks and other protected areas has also shown evidence of a relationship between place attachment and pro-environmental behaviors. Halpenny (2010) included both park-specific and general pro-environmental behaviors in her survey of visitors to a Canadian national park. A place identity/place affect hybrid was found to mediate the effects of place dependence on both types of behaviors. Walker and Chapman (2003) 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 (e.g. telling others not to feed wildlife, picking up litter left by others). They implied that the more demanding the behavior, the greater was the effect of place attachment.

Recently, Weaver (2013) examined visitors to national parks in Australia's Gold Coast and their willingness to participate in activities that would enhance the environmental integrity of these parks. Specifically investigated were the relationships between willingness to participate in activities, values-beliefs-norms, ecotourism affiliation, site loyalty and demographics. Site loyalty in Weaver's study was construed as behavioral and attitudinal loyalty, with attitudinal loyalty being the affective attachment dimension. The study identified that willingness to participate in the more conventional on-site volunteering activities was confined to a small cohort of visitors who tended to live in the local area, had characteristics of hard ecotourists, and displayed high levels of behavioral and attitudinal loyalty (or emotional attachment).



Of direct relevance to this study is the research by Cheng, Wu and Huang (2013) of visitors to the Penghu Islands in Taiwan. Here, the relationship between place attachment, in its more traditional form of place identity and place dependence, destination attractiveness and responsible environmental behavior was examined. The authors found the higher the level of place attachment, the higher the intention to undertake responsible environmental behaviors. While destination attractiveness was also found to influence responsible environmental behavior, this effect only existed as a result of the effect of place attachment acting as a mediating variable. Of the two dimensions, place identity was found to be the major contributor to place attachment in the measurement models.

Ramkissoon, Smith and Weiler (2013-a, b) also recently examined the relationship between place attachment and pro-environmental behaviors through two different analysis techniques using data from a survey of visitors to Dandenong National Park in Australia. Firstly, structural equation modeling examined the effect of place attachment (as a second order construct) on a set of behaviors categorized as those pertaining to high effort or low effort. Place attachment was found to have a direct positive effect on both categories of behaviors, with greater effect on the high effort pro-environmental behaviors (Ramkissoon, et al. 2013-a). Their second analysis involved multiple regression with place attachment conceptualized as a multi-dimensional construct. Place affect was found to have a significant positive relationship with low and high effort pro-environmental behaviors while social bonding had a positive relationship with high effort but a negative relationship with low effort pro-environmental behaviors. Place dependence was found to only have a significant negative relationship with high effort pro-environmental behaviors and place identity had no significant relationship with either type of behavior category (Ramkissoon, et al. 2013-b).

### *Contributions of this study*

Environmental behaviors can differ in terms of the effort required, resources needed, actions involved, the setting in which they occur, and the intended outcome (Thøgersen 2004). As such, it is critical to consider a broad range of behavioral intentions in place-directed research efforts (Dono, Webb and Richardson 2010). This paper contributes to place research by considering in detail this breadth of intentions, with a particular focus on the effort or commitment required. Behaviors are presented and analyzed as a range, from those requiring low levels of commitment from respondents, encapsulated as on-site behaviors, to those requiring higher commitment levels encapsulated as off-site behaviors. This adds to the work undertaken by others who have categorized pro-environmental behavioral intentions as low versus high effort behaviors (Ramkissoon, et al. 2013 –a, b) or requiring various levels of ‘investment’ (Weaver & Lawton 2011). The uniqueness of this study is coupling commitment with the location of the behavior to identify and explore a range of behavioral possibilities thereby providing further insights into the extent of influence of place attachment on pro-environmental behaviors.

Integral to this contribution is structural equation modeling, complementing other studies (e.g. Ramkissoon et al. 2013-a; Halpenny 2010) but adding novelty in its consideration of place attachment as a multi-dimensional construct. Considering place attachment as a multidimensional construct provides a richer description of its effects (Tonge et al. 2013-a), particularly whether the effects differ depending on the type and level of attachment (Kyle, et al. 2004; Scannell and Gifford 2010). This also allowed for the new affective dimension of everybody’s happy to be tested in relation to effects on pro-environmental behavior.

A final important contribution is conducting this research in a coastal/marine environment. Thøgersen (2004) called for such research in a range of settings, with marine and coastal place attachment poorly explored to date. An exception is the efforts by Wynveen and

colleagues on the Great Barrier Reef in northeastern Australia where they explored place attachment of day visitors to the Reef (Wynveen, Kyle and Sutton 2010). They were not able however, to analyze the deeper place attachments likely to develop when visitors stay overnight or longer. Understanding these deeper relationships is essential for the future management of coastal and marine settings when so much of the world's tourism and recreation activities occur here (Maguire, Miller, Weston and Young 2011). The study reported in this paper, based on campers on the Ningaloo coast, importantly reports on these relationships and the associated levels of commitment.

## **Method**

### ***Study site***

Ningaloo Marine Park was established in 1987 to protect Australia's largest fringing coral reef, the Ningaloo Reef (CALM and MPRA 2005). The 300km long reef supports a rich biodiversity including dugongs, marine turtles, whale sharks, manta rays as well as many species of corals, fishes and mollusks (Sleeman, et al. 2007; Cassata and Collins 2008). Due to these outstanding natural values, the Reef, Marine Park and adjacent coastline were listed as a World Heritage site in 2011 (UNESCO World Heritage Centre 2011). The Marine Park is located 1200km from the Western Australian capital city of Perth and receives a relatively stable figure of 200,000 visitors per annum (Tourism Research Australia 2013). Visitors can undertake a variety of nature-based tourism activities including fishing, snorkeling, swimming, surfing and wild-life tours (Smallwood, Beckley and Moore 2013). 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.

Ningaloo Marine Park and its hinterland provided an opportunity to examine place concepts in a marine setting, as previous visitor research had identified high site fidelity, with 44% of

repeat visitors regularly returning to the same site (Smallwood, et al. 2013). Such fidelity suggests place attachment may be evident and thus facilitated the investigation of this concept. The more remote southern half of the Park, where less is known about visitor use, was the study location. Respondents from three campsites were selected (Fig. 1): campers at caravan parks within the small township of Coral Bay and from two campgrounds on pastoral stations – 3 Mile Camp at Gnaraloo Station and 14 Mile Camp at Warroora Station.

## FIGURE 1

### *Survey development and design*

Place attachment was conceptualized in this study as a multi-dimensional construct consisting of place identity, place dependence, social bonding and everybody's happy. Williams and Roggenbuck's (1989) work provided the identity and dependence dimensions and associated scales underpinning this study. Social bonding and everybody's happy were included based on the results from a qualitative study of visitors to southern Ningaloo (Tonge, et al. 2013 -b). Measures of social bonding adapted from Kyle, Mowen and Tarrant (2004) 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. Items were developed for the affect-based everybody's happy from the results of the preceding qualitative work and were phrased to capture the perception of enjoyment of the travel group. These were developed according to standard scale development procedures (Churchill 1979) and were included in this study to determine the contribution of everybody's happy to visitors' leisure and travel experiences and its effects on pro-environmental behaviors.

Twenty items were included 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 of the survey 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, Bain, Anderson, and 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 (Walker and Chapman 2003; Hunt 2008; Halpenny 2010). 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 and 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 and to ensure their applicability to a marine setting.

The behaviors were grouped into three categories, each with a suggested increased level of commitment and location of behavior (e.g. on-site or off-site), to examine the extent or amount of commitment individuals were likely to enact to protect their place. The three categories were: on-site behaviors they would do themselves (e.g. picking up litter, conserving water, not feeding wildlife) ('low' commitment); whether they would tell others to (or not to) undertake these same behaviors ('medium' commitment); and off-site actions to support the conservation of Ningaloo Reef (e.g. signing of petitions, donating money, volunteering) ('high' commitment). These three sets of questions used a five point Likert scale ranging from 'wouldn't consider it' = 1 to 'already do' = 5.

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

### ***Data collection***

The surveys were distributed to adult camping visitors at the three study sites during a four week period (July 2010) coinciding with the peak visitation period (Smallwood, Beckley, Moore, and Kobryn 2011). Given the costs of research in the remote location, off peak surveys were not feasible. 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 survey was restricted to campers as most visitors to the Ningaloo coast camp. While walking around each of the campsites, the 'next available visitor' was asked to contribute and provided with a survey to complete. 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%. While debates continue regarding the ideal sample size, a sample comprised of approximately 400 respondents is widely regarded as providing an acceptable level of error (Babbie 2005).

### ***Data analysis***

Exploratory factor analysis (EFA) was used to check the validity of the place attachment scales as 8 of the 20 items had been developed specifically within the context of this study. The social bonding items were adapted from two separate studies and the everybody's happy items had not been previously examined in terms of their underlying structure. As such, EFA using maximum likelihood extraction and oblique rotation was undertaken to determine the extent to which the everybody's happy and the social bonding items measured their intended factors (Byrne 2010). A degree of correlation was likely to exist between the items given the

nature of place attachment, 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 EFA provided the hypothesized relationships that were explored through structural equation modeling (SEM) as this allows both observed and unobserved (latent) variables to be statistically analyzed (Byrne 2010). Although the data were ordinal rather than categorical given the use of Likert scales as per other place attachment studies (e.g. Halpenny 2010; Kyle, et al. 2005; Walker and Chapman 2003), there is evidence suggesting that ordinal variables with five or more categories can be treated as continuous without significant impact on results (Johnson and Creech 1983).

In AMOS (Version 18.0) (Arbuckle 2009) confirmatory factor analysis (CFA) for each of the identified 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 first considered for their conceptual contribution to the overall model and then either deleted or retained for further analysis. 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, which 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 were part

of a family group and had tertiary or university level of education. 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

The highest mean was recorded for the place dependence item '*Ningaloo is the best place for what I like to do*' with 3.74 (Table 2). The social bonding dimension contained the place attachment items with the lowest mean values, 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). All four of the place attachment dimensions had acceptable levels of reliability as they were above 0.7 (Table 2) (Nunnally 1978; Hair, et al. 2006). This included everybody's happy which produced a Cronbach Alpha of 0.84 (Table 2). The means for the individual items in this dimension ranged from 2.75 to 3.57.

#### TABLE 2

The pattern matrix from the EFA for the place attachment items indicated a three factor solution (Table 2). 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 onto other items, the place identity factor contained five items, and the place dependence factor contained 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 was termed 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.

TABLE 3

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.

TABLE 4

### ***Structural models***

Following CFA, the three place attachment dimensions and each category of behavioral intentions were placed into separate structural models (Fig 2a, b &c). 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 (Jorgensen and Stedman 2001; Williams

and Vaske 2003; Hammitt, Kyle, and Oh 2009). 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, and 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.

#### TABLE 5 AND FIGURE 2

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). The place identity regression coefficient for the category of behavioral intentions that participants would do themselves was 0.16 ( $p < 0.00$ ), for telling others to undertake these same actions it was 0.24 ( $p = 0.01$ ) and for off-site conservation actions it was 0.55 ( $p < 0.00$ ) (Fig 2a, b & c; Table 5). It can therefore be suggested that the effect of place identity increases with increasing levels of commitment required to undertake the pro-environmental behaviors.

### **Discussion**

This research has provided important insights into the relationship between place attachment and pro-environmental behaviors. Differing relationships were found between the individual dimensions of place attachment and pro-environmental behaviors as they ranged in the level of commitment required to undertake the action and whether they occurred on- or off-site. Place identity, place dependence and everybody's happy produced good reliability with the three behavior categories also producing acceptable reliability coefficients. Of the three identified place attachment dimensions, place identity had a statistically significant effect on

all three behavior categories. This effect increased with increasing commitment required to undertake the behaviors.

Place identity was the only place attachment dimension to have a significant 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. 2004). These results suggest similar place responses in terrestrial and marine settings, although the variability in the results strongly suggests further research is needed. Deconstructing the place attachment dimensions, the approach taken in this study, seems particularly fruitful given the place identity – pro-environmental behavior nexus.

At Ningaloo the effect of place identity increased with increasing commitment required to undertake the behaviors. This is in contrast to the findings from Ramkissoon, et al. (2013 -b) where no significant relationship was found between place identity and low or high effort behaviors using regression analysis. However, significant relationships were identified between the composite second order place attachment construct and both behavior types (Ramkissoon, et al. 2013 –a). These disparate results again suggest rich opportunities for further research and emphasize the value of continuing to investigate the individual effects of each of the dimensions of place attachment as well as those of the composite place attachment construct, on a range of behavioral intentions.

In this study, the conservation actions undertaken off-site had the highest coefficient, with these activities requiring greater effort or commitment – beyond the duration of the holiday – than the site-based pro-environmental behaviors. Sustained effort and 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). Walker and Chapman (2003) reported a similar finding. They identified that for behaviors requiring a longer-term commitment 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, et al. (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). As commented earlier, the responses, in this case the expressed behavioral intentions again seem very similar in both terrestrial and marine settings.

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 of an impact than place attachment (Halpenny 2010). This was especially relevant here as social norms and group cohesion were significant aspects that also underpin the affective dimension, everybody's happy. Individuals have societal obligations and recognize that they should behave in a particular manner (Heywood 2002; Gockeritz, Schultz, Rendon, Cialdini, Goldstein and Griskevicius 2010). 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 behaviors (Heywood 2002). For example, individuals are often taught that littering is 'bad' and will also conform to expected behaviors in an effort to be accepted by others (Gockeritz, et al. 2010).

Several closing comments can also be made on the other two place attachment dimensions – everybody's happy and place dependence. Exploring the dimension everybody's happy has addressed Halpenny's (2010) suggestion regarding the need for additional research into the affective dimensions of place attachment. Although not found to have a statistically significant effect on any of the three behavioral categories using a 95% confidence interval, the effect of everybody's happy on off-site behavioral intentions produced a p-value of 0.07. Further testing and refinement of everybody's happy may result in the detection of a significant relationship between affective aspects of place and behavioral intentions in travel, tourism and leisure settings.

In terms of place dependence, the non-significant relationship between this place dimension and pro-environmental behaviors may be explained by individuals who are more place dependent than place identity orientated tending to overlook negative conditions or behaviors encountered at a place. They may not feel the need to undertake pro-environmental behaviors as long as the place still continues to provide unique opportunities to enjoy their travel, tourism and leisure related experiences (Kyle, et al. 2004; Ramkissoon, et al. 2013 –b). That is, as long as their goals are being met, these other issues are less important. This may also be true for everybody's happy. Individuals may not be concerned about inappropriate behaviors or environmental conditions if they are able to retain, as a group, the same levels of experiential enjoyment based on their social interactions and recreational activities.

### ***Management implications***

The implications of this research for managers of natural areas tourism destinations are threefold. First, it is essential that managers of such destinations consider the effects of proposed changes on visitors' place identity as well as the more traditional widespread focus on the potential effects on visitors' travel and leisure resources and associated activities. For example, new facilities or regulations that may negatively impact on how individuals express,

construct and reconstruct their identity through activities and social interactions at chosen tourism destinations are unlikely to receive widespread support.

Second, as place identity involves the symbolic, spiritual, psychological and emotional aspects of place, weaving these into communication strategies for visitors is likely to enhance their effectiveness. Using local place names in interpretative material and “we” in communicating management actions both acknowledge the collaborative nature of management and the central role of visitors in such collaboration. These approaches also potentially add collaboration to the self-identity of visitors. And, visitors may respond positively because they are caring for and protecting a part of themselves.

Third, a fruitful area for future research is investigating whether visitors progress from lower to higher effort behaviors. In the conclusion to their study of visitors to Dandenong National Park, Ramkissoon, et al. (2013-a) suggest such a progression can occur, noting that it may be worthwhile for managers to try and encourage engagement in low effort behaviors while at the destination at the same time as promoting to engage in off-site higher effort behaviors. Although no such conclusions can be drawn from this study, it does suggest interesting possibilities in terms of facilitating increased environmental concern and care, beginning with on-site actions, which could potentially be positively influenced by information provided on-site.

## **Conclusion**

In conclusion, this study contributes to a rapidly growing interest in both place attachment and its influence on visitor leisure and tourism experiences in natural areas, and the associated influences on pro-environmental behaviors. Its emphasis on understanding place attachment as a multi-dimensional construct has illuminated the significant contributions of place identity to pro-environmental behaviors. The relationship between place identity and

increasing commitment to pro-environmental behavior is also evident from the results.

Identifying and exploring everybody's happy as part of place attachment has helped to further address the affective aspects of place attachment with its almost significant relationship ( $p=0.07$ ) with off-site conservation behavioral intentions providing an interesting hypothesis for further study.

Further research attention must now be directed to further developing and testing a stable, robust set of items outside of the Ningaloo context for everybody's happy to replicate and compliment the long history of research effort directed to the place identity, place dependence, and more recently social bonding, dimensions. More research is also required to determine if differences in place attachment do exist between terrestrial and marine settings. To date the variability of results across studies as explored in this paper make it impossible to draw robust conclusions about the difference between the two domains. The final research challenge is to examine place identity more fully in order to identify how to transfer the behavioral intentions of place identified visitors into pro-environmental action.

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

Visitor characteristics (%)	
Gender	
Male	40
Female	60
Age group	
18-24	11
25-34	14
35-44	29
45-54	25
55-64	11
65 or older	10
Education	
Primary/some secondary	3
Secondary	24
Vocational/Technical	18
Tertiary/University	55
Place of residence	
Perth (metropolitan area)	60
Regional Western Australia	33
Other states of Australia	4
International	3
Travel Group	
By yourself	3
Family	51
Friends	13
Family and friends	33
Visitation frequency	
First visit	26
Once every 3 to 5 years	19
Once every 1 to 2 years	18.5
Once a year	28
2 to 5 times per year	3
More than 5 times per year	0
On a weekly basis	0.5
Other	5

**Table 2.** Means, standard deviations, reliability estimates and exploratory factor analysis results for place attachment items (n=372)

Place attachment item	Mean	SD	Cronbach Alpha	Factor 1	Factor 2	Factor 3
Place identity	3.05		0.92			
I feel that Ningaloo is a part of me	2.80	1.10		0.89		
I am very attached to Ningaloo	2.98	1.16		0.78		
I identify strongly with Ningaloo	3.02	1.10		0.69		
Ningaloo is very special to me	3.32	1.15		0.65		
Visiting Ningaloo says a lot about who I am	2.82	1.19				
Ningaloo means a lot to me	3.38	1.16		0.68		
Place dependence	2.92		0.86			
Ningaloo is the best place for what I like to do	3.74	0.90				
The things I do at Ningaloo I would enjoy doing just as much at a similar place	2.71	1.18			0.54	
No other place can compare to Ningaloo	3.20	1.27			0.61	
Doing what I do here is more important to me than doing it at any other place	2.67	1.17			0.61	
I wouldn't substitute any other area for doing the type of things I do at Ningaloo	2.59	1.25			0.87	
I get more satisfaction from visiting Ningaloo than any other place	2.60	1.20			0.81	
Social bonding	2.48		0.75			
My family and friends would be disappointed if I were to start visiting other coastal places than Ningaloo	1.96	1.17				
A feeling of community runs between me and other campers here at Ningaloo	3.34	1.11				
If I were to stop coming here to Ningaloo I would lose contact with a number of friends	1.85	1.18				
The friendships and associations I have with other people here at Ningaloo mean a lot to me	2.77	1.16				0.53
Everybody's happy	3.20		0.84			
Ningaloo is important to me because my family/group of friends enjoy it	3.43	1.14				0.71
I rely on Ningaloo to provide an enjoyable experience for my family/group of friends	3.06	1.27				
There is no place like Ningaloo where members of my family/group of friends can enjoy their own experiences in the one place	2.75	1.27			0.69	
Holidays to Ningaloo are important to us as a family/group of friends because everyone can enjoy themselves	3.57	1.14				0.76

Table footnote: Measured on a 5-point scale, 1 = "strongly disagree" and 5 = "strongly agree"

**Table 3.** Results of confirmatory factor analysis models for each of the three place attachment dimensions and reliability estimates

Item	Standardised $\beta$ coefficient	Goodness of fit	Cronbach Alpha
Place identity			0.88
I feel that Ningaloo is a part of me	0.83	$\chi^2/df$ (1.16/1) = 1.16; GFI=0.99; NFI=0.99 RMSEA=0.02	
I am very attached to Ningaloo	0.86		
I identify strongly with Ningaloo	0.85		
Place dependence			0.90
Doing what I do here at Ningaloo is more important to me than doing it at any other place	0.77	$\chi^2/df$ (1.95/2) = 0.98; GFI=0.99; NFI=0.99 RMSEA=0.00	
I wouldn't substitute any other area for doing the type of things I do at Ningaloo	0.88		
I get more satisfaction from visiting Ningaloo any other place	0.86		
There is no place like Ningaloo where members of my family/group of friends can enjoy their own experiences in the one place	0.84		
Everybody's happy			0.79
Ningaloo is important to me because my family/group of friends enjoy it	0.71	$\chi^2/df$ (0.25/1) = 0.25; GFI=1.00; NFI=0.99 RMSEA=0.00	
Holidays to Ningaloo are important to us as a family/group of friends because everyone can enjoy themselves	0.80		
The friendships and associations I have with other people here at Ningaloo mean a lot to me	0.72		

Table footnote: Good model fit =  $\chi^2/df < 3.0$ ; goodness of fit index (GFI)  $> 0.90$ ; normed fit index (NFI)  $> 0.95$ ; root mean square error of approximation (RMSEA)  $< 0.08$ ; Cronbach Alpha  $> 0.7$  (Kline 2005)

**Table 4.** Mean, standard deviations and reliability estimates for three categories of pro-environmental behavioral intentions (n = 372)

Behavioral Intention	Mean	SD	Cronbach Alpha
Do yourself	4.46		0.60 (0.64) <sup>a</sup>
Learn more about Ningaloo Reef's natural environment	4.06	0.76	
Consciously conserve water in my daily activities	4.63	0.67	
Restrict my vehicle movements to designated access tracks	4.66	0.75	
Place my cans and glass bottles in campsite recycling bins (if provided)	4.67	0.58	
Pick up litter*	4.54	0.81	
Not feed wildlife*	4.19	1.23	
Tell others	3.78		0.93 (0.90) <sup>a</sup>
Not feed wildlife	3.80	1.15	
Learn more about Ningaloo Reef's natural environment	3.57	1.10	
Consciously conserve water in my daily activities	3.79	1.17	
Restrict their vehicle movements to designated access tracks	3.73	1.21	
Place their cans and glass bottles in campsite recycling bins (if provided)*	3.87	1.15	
Pick up litter*	3.92	1.20	
Conservation actions			0.86 (0.77) <sup>a</sup>
Work as a volunteer on conservation projects in this area	2.75	1.25	
Sign petitions in support of the conservation on Ningaloo Reef	3.68	1.01	
Write letters in support of the conservation of Ningaloo Reef	2.80	1.25	
Donate money to conservation projects to help protect Ningaloo Reef	2.92	1.15	
Participate in public meetings about managing Ningaloo Reef*	2.42	1.21	
Circulate petitions in support of the conservation of Ningaloo Reef	2.81	1.21	

Table footnote: \* Items removed during confirmatory factor analysis

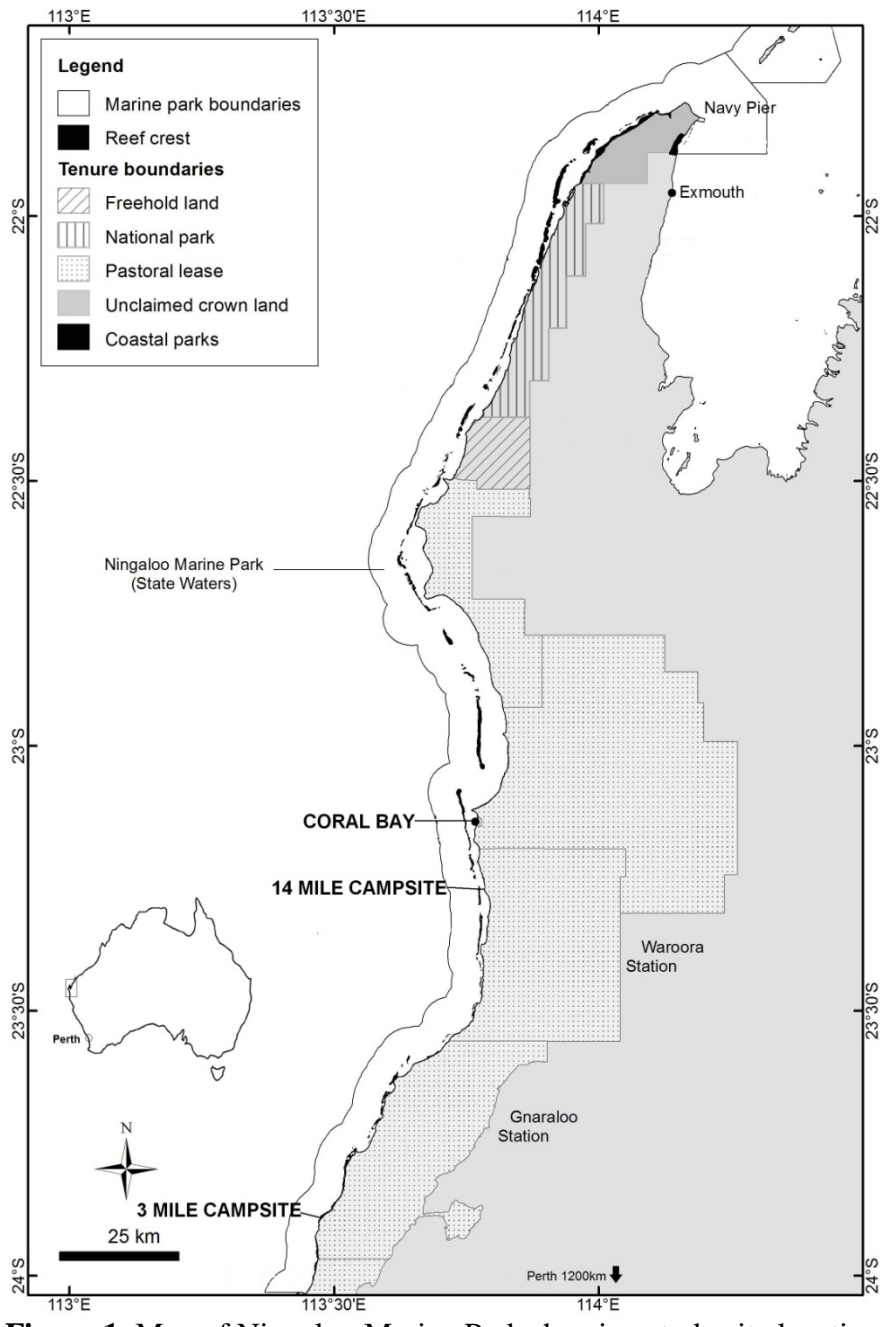
Table footnote: <sup>a</sup> Cronbach Alpha coefficients following removal of italicized items

**Table 5.** Structural model results for the three categories of behavioral intentions

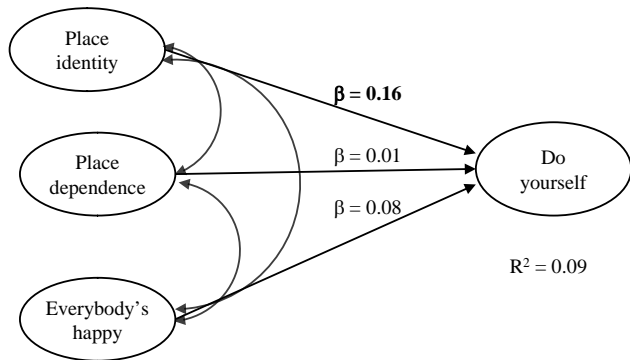
Place attachment dimension	Regression coefficient	Standard error	P-value
<b>Do yourself model</b>			
Fit statistics: $\chi^2=125.5$ , $df=69$ ; $\chi^2/df=1.82$ ; GFI=0.95; NFI=0.95; RMSEA=0.04			
Place identity	0.16	0.05	0.00
Place dependence	-0.02	0.04	0.74
Everybody's happy	-0.08	0.06	0.21
<b>Tell others model</b>			
Fit statistics: $\chi^2=155.8$ , $df=69$ ; $\chi^2/df=2.26$ ; GFI=0.95; NFI=0.96; RMSEA=0.06			
Place identity	0.24	0.10	0.01
Place dependence	-0.06	0.10	0.54
Everybody's happy	0.11	0.14	0.40
<b>Conservation actions model</b>			
Fit statistics: $\chi^2=128.9$ , $df=68$ ; $\chi^2/df=1.91$ ; GFI=0.95; NFI=0.95; RMSEA=0.05			
Place identity	0.55	0.11	0.00
Place dependence	0.07	0.09	0.45
Everybody's happy	-0.23	0.13	0.07

## Appendix – Results of chi-squared tests demonstrating discriminant validity

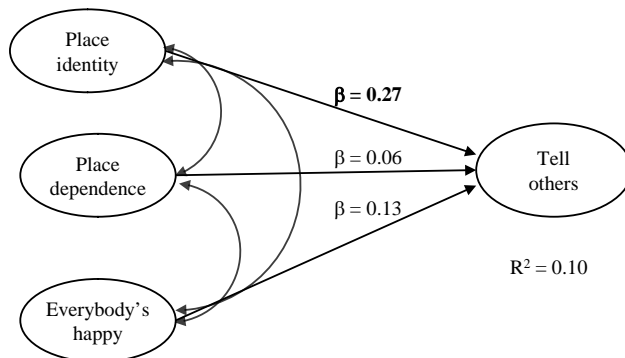
Place attachment dimension correlation	$\chi^2$ (df)	Difference in $\chi^2$ (df)	P-value of difference in $\chi^2$ (df)
Full model	93.5(29)		
Place identity-place dependence	97.2(30)	3.7(1)	0.05
Place identity-everybody's happy	104.3(30)	10.8(1)	0.00
Place dependence-everybody's happy	99.6(30)	6.1(1)	0.01



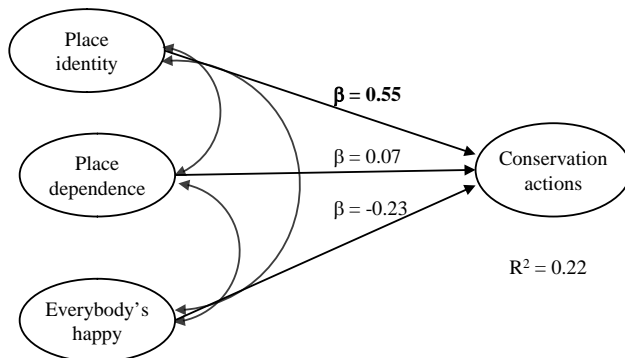
**Figure 1.** Map of Ningaloo Marine Park showing study site locations, adjacent land tenure and extent of fringing reef crest (adapted from Smallwood et. al (2011)).



a) Behavioral intentions participants would do themselves



b) Behavioral intentions participants would tell others to do



c) Conservation behavioral intentions participants would undertake off-site

**Figure 2.** Structural models of relationships with standardized regression coefficients between place attachment and behavioral intentions a) participants would do themselves, b) would tell others to do' c) conservation actions undertaken off-site.