

PLACE MEANING AND ATTITUDES TOWARD IMPACTS  
ON MARINE ENVIRONMENTS

A Dissertation

by

CHRISTOPHER JAN WYNVEEN

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2009

Major Subject: Recreation, Park, and Tourism Sciences

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Approved by:

Chair of Committee,	Gerard Kyle
Committee Members,	David Scott
	C. Scott Shafer
	Robert Ditton
	Stephen Sutton
Head of Department,	Gary Ellis

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## ABSTRACT

Place Meaning and Attitudes toward Impacts on Marine Environments.

(August 2009)

Christopher Jan Wynveen, B.S., University of Illinois; M.S. Clemson University

Chair of Advisory Committee: Dr. Gerard T. Kyle

The study of place has been a component of the recreation literature for about three decades. Most researchers have sought to either describe the cognitive and evaluative beliefs (place meaning) recreational visitors ascribe to a setting or identify the intensity of the human-place bond (place attachment). Few have attempted to qualitatively investigate the meanings visitors ascribe to a setting and quantitatively measure the intensity of their attachment to that setting within the same study design. Nor has there been much work aimed at understanding these concepts in marine environments.

In this dissertation, I began to fill these gaps in the literature through the use of a three- phase multiple-method research design. In the first phase, I conducted 20 interviews to identify the meanings that recreational visitors ascribe to the Great Barrier Reef Marine Park (GBRMP) and to further explore how the symbolic interactionist framework can be used to understand place meanings. Ten place meaning themes emerged from the informants' statements.

The second phase used 34 items developed from the 10 meaning themes that emerged from the previous interviews and a place attachment scale to explore how recreational visitors' attachment to a marine resource was reflected in their depictions of why the resource is meaningful. Three hundred and twenty-four individuals, living in Queensland, Australia, responded to a postal/email survey conducted during January and February of 2009. The results indicated that all the meanings recreational visitors ascribe to the GBRMP provide context for the attachment they hold for the setting, however particular sets of meanings are important in differentiating between attachment intensity levels.

The final phase, which also used the postal/email survey described, identified how place attachment affected the relationship, identified by Stern et al. (1995), between the recreational visitors' environmental world view (EWV) and attitudes toward negative impacts on the reef ecosystem. I found that place attachment partially mediated the relationship between EWV and attitudes toward impacts. The conclusions presented in this dissertation filled in gaps in the recreation literature's understanding of place while providing further insight into how place meaning influences other constructs important to natural resource management.

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## CHAPTER I

### INTRODUCTION

Recently, the World Conservation Union (WCU) added several corals to its threatened species list (IUCN, 2007). Wilkinson (2004) reported that “24% of the world’s reefs are under imminent risk of collapse through human pressure; and a further 26% are under a longer term threat of collapse” (p.7). While the WCU cited climate change and coral bleaching as the most prominent threats to coral reefs around the world, many other natural and anthropogenic activities impact reefs to varying extents. Impacts on the health of reef ecosystems can originate in the water and on the shore. For example, development for agriculture and urban purposes can increase harmful runoff into the ecosystem and the introduction of carbon dioxide into the atmosphere raises water temperature and leads to ocean acidification (Hinrichsen, 1997). In the water, commercial fishing, aquaculture, and recreational uses can impact the health of the environment (Agardy, 2004).

The world’s largest mass of coral is the Great Barrier Reef (GBR). The reef stretches more than 2,300 km along the northeast coast of Australia. The corals that make up much of the GBR provide habitat for thousands of species of fish, birds, mammals, reptiles, and flora (CRC, 2004). The biodiversity of the reef ecosystem is important because coral reefs play an integral role in moving nutrients from mangrove swamps and sea grass beds to open-ocean fisheries. These fisheries are a source of food

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This dissertation follows the style of *Leisure Sciences*.

for many and a supply of other useful resources, such as potential pharmaceuticals (Hinrichsen, 1997). Lastly, the rich diversity of the GBR attracts millions of visitors each year to go SCUBA diving or snorkeling, participate in recreational fishing, or learn about this natural wonder.

### Problem Statement

Eight hundred registered recreation organizations operate 1,700 snorkeling, SCUBA diving, fishing, and sightseeing vessels within the Great Barrier Reef Marine Park (GBRMP) (a World Heritage Area, managed by the Great Barrier Reef Marine Park Authority, which includes most of the GBR). These organizations bring nearly seven million people to the reef each year (GBRMPA, 2007). Recreational visitors (i.e., local residents and tourists who use the reef for a recreational activity) contribute over one billion dollars annually to the Australian economy (Harriot, 2002). Given the sheer magnitude of recreational visitors and their contribution to the local and national economy, the Great Barrier Reef Marine Park Authority (GBRMPA) has identified these individuals as an important stakeholder group. Hence, information about the recreational visitors' views concerning the GBR and negative environmental impacts on the reef is needed. Through an increased knowledge of recreational visitors' thoughts and feelings toward impacts on the GBR, managers can develop a better understanding of the recreational visitors' attitudes toward the GBR. Specifically, managers can gain insight into the significance of the GBR as a setting supporting many different uses, a place to which visitors ascribe meanings, and a resource worth protecting from negative impacts. This knowledge will aid managers in making informed decisions that minimize the

negative impacts that affect the health of the reef, encourage stakeholders to actively support reducing impacts, and improve reef health.

One way to understand recreational visitors' values, beliefs, and feelings toward the natural environment is to examine the place meanings they associate with the setting (Stokowski, 2002; Tuan, 1977). Place meanings are the cognitions and evaluative beliefs concerning a setting that reflect the value and significance of the setting to the individual (Stedman, 2002). Meanings are often assigned to important attributes in a setting that include both the physical characteristics of the setting and the social interaction that is experienced there (Eisenhauer, Krannich, & Blahna, 2000; Kyle & Chick, 2007). Because place meanings are an amalgamation of social, psychological, and cultural interpretations, they have a dynamic nature that is difficult to study. One way resource management researchers have sought to quantitatively explore the array and salience of the meanings people ascribe to the physical world is through the concept of place attachment (Altman & Low, 1992). Place attachment is "the extent to which an individual values or identifies with a particular environmental setting" (Kyle, Graefe, Manning, & Bacons, 2003, p. 250). The object of this attachment is the meaning (as expressed through the use of shared symbols, such as language) the individual ascribes to the setting, not the physical attributes of the setting (Stedman, 2002).

Meanings and subsequent attachment are created and maintained through interactions involving the setting, the individual, and the individual's social worlds. These interactions involve the assimilation of information stemming from sources external and internal to the individual. External information includes the popular media

(e.g., television programs and advertisements), tourist brochures, books, and friends and family who have previously visited the reef. For returning visitors and local recreationists, memories of past experience have the most profound impact on shaping place meaning. Past work has shown that the meanings people ascribe to a setting shape their attachment to that setting (Stedman, 2002). Furthermore, those who have close bonds with natural settings are more inclined to act as resource stewards (Stedman, 2002; Vaske & Kobrin, 2001). There is little work, however, that provides insight about the meanings people ascribe to marine environments and their attitudes toward impacts that affect the health of the resource. Research conducted in terrestrial settings has suggested that there is an association between the attachment an individual has to a setting and their perceptions of the negative effect of impacts on the landscape (Payton, Fulton, & Anderson, 2005; Stedman, 2003a, 2003b). However, the exact relationships between these constructs remain unclear. This area needs attention because identifying the relationships between the meanings and attachment recreational visitors have regarding the GBR will elicit a deeper understanding of their thoughts and feelings concerning the reef and their attitudes toward impacts that negatively affect the GBR. This knowledge will inform managers of ways to encourage recreational visitors to protect or improve the health of the reef ecosystem. This may include reducing the impact of their own recreational activities, encouraging others to reduce their impact, supporting management actions designed to limit human impacts on the reef, and supporting organizations that work to improve the health of the reef. Additionally, understanding the meanings that important stakeholders, such as recreational visitors,

ascribe to the GBR can aid managers in the decision making process by ensuring that groups with different meanings and intensities of attachment to those meanings are represented (Cheng & Daniels, 2003; Cheng, Kruger, & Daniels, 2003; Farnum, Hall, & Kruger, 2005; Warzecha & Lime, 2001). With this in mind, I investigated the relationship between a recreational visitor's place meaning and attachment concerning settings in the GBRMP and his/her attitudes toward impacts that affect the health of the reef system.

### Theoretical Framework

Place researchers have suggested that individuals attribute meanings to a setting that reflect their social and cultural experiences (Eisenhauer, Krannich, & Blahna, 2000; Kyle & Chick, 2007). To better understand the social construction of place meaning, several authors have used a symbolic interactionist framework (Greider & Garkovich, 1994; Milligan, 1998). Hence, the overarching framework chosen to understand the social nature inherent to sense of place was symbolic interactionism. The symbolic interactionist approach suggests that the meanings people associate with a setting are the product of processes involving the individual, the setting, and their social worlds (Kyle & Chick, 2007). Based on the work of Mead (1934) and Blumer (1998), Charon (2007) summarized symbolic interactionism in the following way. First, people are social and interact with one another when creating and ascribing meanings to places. Individuals not only interact with one another, but also with themselves; they respond to their own thoughts and emotions when ascribing meaning to a setting. Also, people define what is important about the environment that they are in. That is, the meanings people ascribe to

place are the product of ongoing social interaction and thinking. Furthermore, people consider past experiences, but their behavior and current salient place meanings are responses to present stimuli. Lastly, people are actively involved in the creation of their experiences; that is, individuals form their own place meanings rather than the physical environment suggesting meaning.

Although I used a symbolic interactionist framework as a guide to understand how individuals create and maintain the meanings they ascribe to the setting, I also relied on the findings of several authors who have concluded that an individual's Environmental World View (EWV) influences their place-specific attitudes and their attitudes toward impacts on the environment (Nilsson, von Borgstede, & Biel, 2004; Steg, Dreijerink, & Abrahamse, 2005; Stern, Kalof, Dietz, & Guagnano, 1995). Stern et al. posited that attitudes toward environmental impacts are the result of an intermixing of human values, information about attitude objects, and social interactions.

#### Purpose of the Study

Given the practical concerns of managing the GBRMP and the need to further develop the understanding of place meanings and attachment regarding marine settings, I developed a twofold purpose to guide this study: to identify the meanings recreational visitors ascribed to settings in the GBRMP and to explore how these meanings shape their attitudes toward impacts that negatively affect the health of the reef system.

#### Research Questions

Based on my purpose statement, I constructed three research questions that guided the data collection and analysis phases of my investigation.



1. What are the place meanings that recreational visitors ascribed to a marine setting?
2. How is the recreational visitors' attachment to a marine resource reflected in their depictions of why the resource is meaningful?
3. How does place attachment fit into the relationship, as conceived by Stern et al. (1995), between EWV and recreational visitors' attitudes toward negative impacts on the environment?

### Summary

Australia's Great Barrier Reef is the world's largest living natural feature. The GBR ecosystem's biodiversity is unmatched and provides numerous benefits to surrounding ecosystems and the people who live, work, and play along the reef. However, impacts (both human-induced and natural) that occur in the water and on land negatively affect the health of the GBR. Such impacts also have a negative effect on people who visit the reef for recreation by decreasing their satisfaction with their experience (Leung and Marion, 1999). Recreational visitors visit the reef for many reasons. One way to understand the recreational visitors' thoughts and feelings toward the GBR and the impacts of human activity is through the meanings they ascribe to the reef. Place research, in the recreation literature, has traditionally been confined to terrestrial environments; however Stedman (2003b) suggested that setting type may play a role in the meanings that people hold. Hence there is a need to describe the meanings people ascribe to less studied settings, such as the marine environments.

The following chapters describe the meanings that recreational visitors' ascribe to places in the GBRMP, use the meanings to understand how visitors' attachment to the resource is reflected in the meanings they ascribe to the setting, and identify the affect of the visitors' attachment on existing relationships involving their attitudes toward impacts that negatively affect the health of the GBR. My dissertation is only a small step in further understanding the interaction between humans and their environment. However, the knowledge gained from this investigation provides a better understanding of the meanings recreational visitors ascribe to marine environments. It is important to note, though, that this study did not attempt to explain or prove an attitude-behavior relationship. To do so was beyond the scope of this study. However, it is hoped that future research will incorporate the findings of this study concerning place meanings and attitudes as part of a larger model designed to predict behavior. This work furthered the recreation literature's understanding about how the visitors' attachment to place meanings shaped their attitudes toward impacts on the environment. Additionally, managers may use the discussion and findings of my project to identify new ways to manage the Great Barrier Reef and other resources.

CHAPTER II  
PLACE MEANING AND MARINE SETTINGS:  
THE CASE OF THE GREAT BARRIER REEF MARINE PARK

As part of the democratization of the decision making processes in agencies that manage natural resources for recreational uses, managers of these agencies have begun to embrace stakeholder (e.g., recreational visitors and residents of surrounding communities) involvement rather than relying upon traditional agency-driven decisions (Cortner & Moote, 1999; Williams & Stewart, 1998). One way to understand the attitudes stakeholders have toward the natural environment is to examine the meanings they associate with the setting. Stedman's (2002) conceptualized place meanings as beliefs and/or cognitions ascribed to a setting that reflects the value and significance of the setting to the individual. Place meanings manifest themselves in an individual's descriptive statements about 'what kind of place is this' (Stedman, 2008). Identifying the meanings that stakeholders, such as recreational visitors, ascribe to a place can aid managers in the decision making process by ensuring that diverse meanings are considered. This is important because decision making can inadvertently privilege one group of stakeholder's meanings over another (Cheng & Daniels, 2003; Farnum, Hall, & Kruger, 2005). Hence, it is in the managers' best interest to identify and understand the range of meanings that may be affected by their decisions.

After reviewing the previous research concerning place meanings, one of the gaps that became apparent was that there has been limited discussion of the meanings

recreational visitors ascribe to marine settings (Farnum et al., 2005). The studies that have referenced these settings are focused on coastal towns and beaches (Vanclay, Higgins, & Blackshaw, 2008) not on the marine resource itself. Marine settings are unique, as compared to terrestrial environments, because they often have greater abundance and diversity of wildlife (especially near reefs), have greater view distances at the surface, and the affects of weather change the surface environment of marine areas much more dramatically than terrestrial settings. Furthermore, with exception of coastal development, there is less evidence of the human-built environment and the social interaction that takes place between people recreating while underwater is more limited than most land-based activities. Because several authors have suggested that the meanings individuals ascribe to a place are the result of an interaction between the setting, the individual, and the individuals' social worlds (Eisenhauer, Krannich, & Blahna, 2000; Kyle & Chick, 2007); an understanding the meanings ascribed to differing settings is needed. Therefore, there is a need to identify and describe the meanings ascribed to places in the larger marine environment that includes underwater settings and uninhabited seascapes. Identifying and describing the place meanings stakeholders' ascribe to marine environments is useful because it may provide an understanding of the stakeholders' support for management decisions and their attitudes toward protecting the resource (Steadman, 2003).

Another gap in the literature involves the theoretical frameworks that have been applied to understanding the concept of place meaning. Several papers in the leisure literature on place have applied the symbolic interactionism theoretical framework to

social construction of place meanings (Greider & Garkovich, 1994; Milligan, 1998; Kyle & Chick, 2007). The papers that have applied symbolic interaction to understanding place meanings have done so appropriately, but their work has focused on one or two aspects of symbolic interactionism (based on work started by Mead and continued by Blumer and Goffman). For example, Milligan (1998) suggested that meaning is based on the interactional past (e.g., memories of past experiences) and potential (i.e., expectations for the setting) of a place. However, it does not appear that anyone has evaluated whether symbolic interactionism as a whole is useful to understanding place meaning. Doing so would suggest avenues for future research to better understand place meaning.

With this in mind, the purpose of this investigation was to identify and describe the place meanings that recreational visitors (i.e., local residents and tourists who use the reef for a recreational activity) ascribed to a marine setting and describe how these meanings influence their future actions; while considering the appropriateness of using symbolic interactionism as a framework for understanding the formation and maintenance of the meanings ascribed to the setting.

The marine environment that provided the setting for this investigation was Australia's Great Barrier Reef Marine Park (GBRMP). The GBRMP, a World Heritage Area, protects 345,400 km<sup>2</sup> of habitat, for thousands of species of flora and fauna, along the northeast coast of Australia (CRC, 2004). This biodiversity provides food for many people and attracts millions of recreational visitors each year. Recreational visitors contribute over one billion dollars annually to the Australian economy (Harriot, 2002).

Given the lack of information on the place meanings ascribed to marine environments and the importance of the GBRMP to many people, the GBRMP provided a suitable setting for this investigation.

### Literature Review

I begin with an overview of how the concept of place meaning fits into the larger literature on human-place bonding and further detail the definition of place meaning. This is followed by a discussion of the symbolic interactionist framework and how it may be used to inform the social constructivist orientation toward the formation of place meanings. I conclude with a review of past work that has sought to create a typology of the meanings people ascribe to natural environments.

#### *Place Meaning*

To understand the place meaning concept, it must first be situated in the broader literature on place. Studies concerning place meaning have often been situated in the literature along with place attachment (Farnum et al., 2005). Place meanings reflect the value of the setting whereas place attachment concerns the intensity of the human-place bond. Kyle and Chick (2007), wrote that “the leisure literature has been primarily concerned with the intensity of recreationists’ attachment and less so with the reasons for attachment.... It does not represent an understanding of human-place bonding reflected in the broader literature” (p. 209). As a result, the leisure literature has provided only limited insight on the socio-cultural process of place creation; the process that shapes the meanings individuals ascribe to places.

It is important not to neglect the meanings because, as Tuan (1977) suggested, an unknown physical setting is a “blank space” that only becomes a “place” as it is endowed with meanings through lived experiences. Hence, to understand an individual’s thoughts and feelings about a particular place, it is necessary to identify the meanings he/she ascribes to a setting while living, working, and recreating there. Meanings are formed through lived experiences (direct or indirect) as a product of the setting, the individual, and their social worlds (Kyle & Chick, 2007). Thus, the range of meanings ascribed to a place is constrained by the attributes of the setting, the individual’s cognitions and perceptions related to the setting, and the individual’s interaction with others in relation to the setting.

#### *Symbolic Interaction and the Formation of Place Meanings*

Researchers have suggested that individuals attribute meanings to a setting that reflect their social and cultural roots (Eisenhauer, Krannich, & Blahna, 2000; Kyle & Chick, 2007). This symbolic interactionist approach suggests that place meanings are the product of interactions involving the individual, the setting, and their social worlds (Kyle & Chick, 2007).

Based on work started by George Herbert Mead (1934) continued by Herbert Blumer (1998) and Erving Goffman (1958), symbolic interactionism has a large literature devoted to it. In sum, the symbolic interactionism suggests that people are social and interact with one another when creating and ascribing meanings (Mead, 1934). Individuals also interact with themselves; they respond to their own thoughts and emotions when ascribing meaning (Blumer, 1998). A significant implication of self-

interaction is that individuals have the ability to discern when the perspective of a particular reference group (e.g., social world) is germane to the current setting with which the individual is interacting (Wallace & Wolf, 2006). This allows the individual to take on “the role of the generalized other” while ascribing meanings. Also, people define what is important about the environment that they are in (Blumer, 1998). More precisely, the meanings people ascribe to objects are the product of their ongoing cognitive consideration of their social interaction and the setting in which these interactions occur. The context of the setting, which the individual defines as important, helps define the meanings that are ascribed to the setting. Hence, it is necessary to investigate place meanings in a wide range of settings. Furthermore, people consider past experiences, but their behavior and current salient meanings are responses to present stimuli (Mead, 1934). Lastly, people are actively involved in the creation of their experiences (Blumer, 1998). That is, individuals form their own meanings rather than the physical environment suggesting meaning. Symbolic interactionism treats stimuli (e.g., past motives, emotions, other people, society, and physical attributes of the environment) as social objects that individuals incorporate into their definition (Charon, 2007). This is an important distinction, because although symbolic interactionism contends that the physical environment does not suggest meaning, it does allow for the consideration of a place’s physical attributes, as objects with which the individual interacts, which constrain or allow for various experiences (Milligan, 1998).

In sum, I suggest that symbolic interactionism provides a framework for understanding how individuals ascribe and maintain meanings tied to place and how



these meanings influence their future actions. As I discuss in the next section, there are a wide range of meanings that people have generally ascribed to natural resource recreation places.

### *Place Meaning Typologies*

The types of meanings associated with a setting are often associated with the attributes that characterize the place. Nassauer (1995) posits that people ascribe meanings to the attributes and then interact with the setting while considering the newly defined meanings. This interaction contributes to the repertoire of experiences the individual has with the setting. In turn, these new experiences then redefine the meanings ascribed to the setting. Humans are especially attracted to natural environments. Manzo (2005) observed that people generally ascribed meanings of privacy, introspection, and self-reflection to natural settings. Manzo also determined that the natural settings individual's identified as important were often near their home, thus convenient to visit and that the places were different from work or home (e.g., open spaces with scenic views rather than confined spaces and office views). Finally, Manzo indicated that favorite places often provided people a different setting to explore.

Beyond the meanings that people ascribe to natural environments generally, there are meanings that are specific to protected natural resource areas. These meanings may be influenced by culturally defined images that are symbolized by labels such as "National Park," "National Forest," and "wilderness" (Kyle, Mowen, & Tarrant, 2004). Gunderson and Watson (2007) identified seven primary types of meanings that individuals ascribed to frequently visited natural areas in Montana's Bitterroot National

Forest. Visitors cited the ease of access to wild places and the naturalness/roadlessness of the setting. The respondents also indicated that the places were a unique contrast to settings in their daily lives. Furthermore, meanings that dealt with the familiarity and/or the historic or traditional importance of the setting to their family or social network were cited. Also, the places were scenically attractive and contained physical features of significance (e.g., a unique geologic formation). In a recreation-specific context, Bricker and Kerstetter (2002) reported on the meanings river rafters' associated with the South Fork of the American River in California. Their respondents indicated that the river's beauty, their shared experiences with friends, and the joy of running the river were important meanings.

### Methods

To describe the meanings recreational visitors' ascribed to the GBRMP, I collected data through 20 semi-structured key informant interviews. The initial informants were chosen because they were known to have an extensive association with the GBRMP and recreational uses of the waters surrounding the reef. At a minimum, I sought out a pool of key informants that included at least one of each of the following groups: tourist industry representatives; managers from local, state, and federal agencies who work on or near the GBR; and recreational visitors, both local resident users and tourists. To identify subsequent informants, I used a snowball technique where I asked the initial informants to suggest others that met the criteria above. This sampling method was designed to elicit informants that were able to describe their attitudes and the place meanings they ascribed to the reef in rich detail (Merriam, 1998). As suggested by

Creswell and Plano Clark (2006), subsequent interviews were conducted until the data obtained reached the saturation point. That is, no additional ideas and information were being revealed in successive interviews.

Although the interviews were purposively designed to be as conversational as possible, two prompts were adapted from Schroeder (1996) to ensure that discussion stayed relevant to the place meanings each informant ascribed to the GBRMP. After describing the boundaries of the GBRMP, the first prompt asked informants to give a physical description of a place that stood out in their “mind as being important, memorable, meaningful or special” to them personally. The second prompt asked them to “describe the thoughts, feelings, memories, and associations that come to mind when you think about this place....” With the informants’ permission, each interview was recorded using a digital audio recorder. As Merriam (1998) suggested a reflexive journal was also kept to record the researchers’ thoughts about the interview process. This allowed me to evaluate and update the interview process between interviews. As a result of this record keeping, the only change made to the interviews during the process was to fine tune the way in which I probed informants to encourage them to give further details in their responses to the prompts.

Interviews were conducted between July and August of 2008. All of the individuals contacted agreed to participate in an interview. Participants ranged in age from 24 to 70 ( $M=46$ ) and 13 were male. The informants’ length of interaction with the reef ranged from three years to a lifetime, while most respondents been recreating within

the GBRMP for 20 to 25 years. See Table 1 for more information on the informants (pseudonyms were used to protect confidentiality).

Analysis of the data obtained through the key informant interviews began immediately after the first interview. Using transcriptions of the interviews and field notes, myself and a colleague coded the key informants' statements and sorted them into discrete elements that represented different ideas. Following the open coding of respondents' transcripts, we evaluated the list of ideas using constant comparison to

**Table 1**

*Key informant descriptions*

Informant	Pseudonym*	Description
1	Ms. Uno	Ms. Uno is about 40. She is employed as researcher for one of the governmental resource management agencies and enjoys recreational fishing in the GBRMP.
2	Mr. Too	Mr. Too is in his fifties and has a life-long interaction with the GBR. He works as a community representative for a management agency. He enjoys boating in the GBRMPA with his family.
3		This 55 year old informant enjoys sailing his yacht with his wife along the coast for about 6 months every year.
4	Mr. Forte	Mr. Forte and his wife (both in their sixties) live aboard their motor-yacht. They are originally Americans.
5		This informant has been working in the GBRMP area his entire adult life in commercial diving and shipping. He is about sixty and enjoys yachting (motor) in his free time.
6	Ms. Cease	Ms. Cease is a 45 year old SCUBA diver who has diving on the GBR for twenty years.
7	Ms. Sven	Ms. Sven is 24 and employed by an environmental NGO. She self-describes as a greenie and enjoys snorkeling.
8	Mr. Ohh	Mr. Ohh, an avid snorkeler, is in his early thirties. He has visited the reef since his early teens.
9		This informant, in his late fifties, is an elected official who enjoys recreational fishing in the GBRMP.

**Table 1 continued**

Informant	Pseudonym*	Description
10	Mr. Dee	Mr. Dee is in his late thirties. He is employed by a management agency and enjoys recreational fishing. He is of Torres Strait Islander descent and has interacted with the reef his entire life.
11	Ms. Elv	Ms. Elv is in her thirties and is an avid SCUBA diver. She has been diving the GBR for over 5 years.
12	Mr. Tweet	Mr. Tweet is about 40 and is a journalist who occasionally writes about the reef. He has enjoyed recreational fishing his entire life.
13	Mr. Thirt	Mr. Thirt is a manager in a government environmental agency. He has enjoyed snorkeling and island camping most of his 50 years.
14		This informant is an environmental activist who participates in SCUBA diving. She is about 30.
15		This 70 year old informant has been recreationally fishing the GBR for most of his adult life.
16		This 38 year old informant has recreated on the reef his entire life. He has also worked in research and commercial fishing.
17	Mr. Stein	Mr. Stein is about 40 and operates a sail boat charter business.
18	Mr. Eten	Mr. Eten is a member of a GBR citizen's advisory group. He is in his sixties and yachts (sail) in his free-time.
19	Ms. Night	Ms. Night is about 45 and grew up in the Townsville area. However she now lives in South Australia and was visiting the GBRMP as a tourist.
20	Mr. Vingt	Mr. Vingt is about 50 and manages a dive shop. He has been leading dive trips to the reef his entire adult life.

\*Pseudonyms only assigned to informants cited in this paper

identify similarities and distinctions by comparing one segment of data (from the open coding) with another (Merriam, 1998). Specifically, we each, individually, grouped the ideas identified in the open coding together to form categories of similar ideas and assigned each category a title consistent with the theme of the ideas reflected therein. Once data were coded, Holsti's inter-rater reliability test was conducted. The inter-rater

reliability between the two researchers for the themes identified from this data was 90.9%, indicating an acceptable level of reliability (Miles & Huberman, 1994). Also, as Merriam recommend, to insure the validity of the themes identified, I sought feedback on the themes identified from colleagues knowledgeable with place meaning.

### Findings

I started each interview by asking the participants to identify their important, favorite, or special place within the GBRMP. All of the informants identified a place quickly and then most proceeded to give a physical description of the setting. Beyond pure physical descriptions, the interviews were designed to elicit the meanings that the informants ascribed to settings in the GBRMP. To facilitate my description of the meanings the key informants held, I identified ten themes from the interviews. The themes were: *aesthetic beauty*; *lack of built infrastructure/pristine environment*; *the abundance and diversity of coral and other wildlife*; *a unique natural resource*; *facilitation of desired recreation activity*; *safety and accessibility*; *curiosity and exploration*; *a sense of connection to the natural world*; *escape from the everyday*; and *experiences with family and friends*. These themes represent the meanings the informants ascribed to places in the GBRMP that developed, as will be evident, as the informant considered the setting, themselves, and their social worlds. A description of each theme follows.

#### *Aesthetic Beauty*

The first several place meaning themes that I identified were defined, in part, by the informants' interaction with the physical attributes of the setting. The theme that

arose in all the interviews was the *aesthetic beauty* of the land and seascapes within the GBRMP. The participants used several common descriptors to illustrate the visual appeal of the places they discussed. For example, Ms. Uno, a social scientist who studies in the GBR and enjoys recreational fishing, highlighted *aesthetic beauty*:

Just as you go up the hill and around the corner to get to Airlie Beach you get the first glimpse of the harbor and the marina and water there is azure. It's the most amazing color and I have not seen it before or since. I mean I have been to Tahiti and Fiji and various other places and nowhere has this amazing color. That and of course all the islands. And the boats are all moored on the fabulous marina and the amazing water. And I think that to me is a special place partly because of how visually spectacular it is and partly because that is now my ancestral home because that is where my family is now.

By using words such as “amazing,” “fabulous,” and “spectacular” in reference to Airlie Beach’s physical attributes, Ms. Uno underscores the importance that she assigns to each of the attributes (e.g. water color) of the setting that she uses in creating and ascribing a meaning of *aesthetic beauty* to the place. Also, she communicates that the set of attributes in this place are unique; they cannot be found elsewhere. The scarcity of this set of attributes likely increases the value Ms. Uno places on this setting and the likelihood that she will visit this place in the future. Although Ms. Uno’s description does not indicate how the presence of her family has affected the thoughts and feelings she ascribes to the Airlie Beach area, the fact that she mentions them suggests that her family (i.e., a salient social world) plays a role in the meanings she ascribes to the place.

Moreover, the *aesthetic beauty* meaning that she and her family ascribe to Airlie Beach has caused her to consider the place as home, even though she grew-up elsewhere. This has implications for her future interaction with the setting and her social world at the setting, most notably that she feels comfortable there and will more than likely make many return visits.

Other interviews revealed that the participants' perceptions of the aesthetics of their place were also influenced by the coral and other wildlife and the vastness of the view. A thirty year old recreational SCUBA diver, Ms. Elv, described the meanings she ascribed to an island she dives near in this way:

[Lady Musgrave Island] is beautiful, absolutely stunningly beautiful. Peaceful, that's quite bizarre saying peaceful because of the raucous of the bloody birds nesting, smelly from them. Yeah, its isolation, tranquility, looking out at nothing, no mainland, just the water. And the coral, the fringing coral, the lagoon, the fish. Space, heaps of space. Open space in front of the islands that are quite small.

Similar to Ms. Uno, Ms. Elv uses "stunningly" to express the value she places on the aesthetics of Lady Musgrave Island. Furthermore, the language Ms Elv used to describe the vastness of the view suggested that this attribute is important to her conception of the *aesthetic beauty* of the place. Not only did she use descriptive wording (e.g., "heaps"), but she also referred to the vastness of the view in three of the six sentences in the passage. Clearly, the openness of the views was important for Ms. Elv to describe to me when asked to talk about the meanings she ascribed to this setting. It appears that the open view-scape also suggested to Ms. Elv that this place is a place that



she can go to relax because of its “tranquility.” This behavioral response (i.e., to go to places that the individual finds relaxing) to meanings ascribe to the GBRMP will be repeated in several of the themes.

These two passages exemplify the interviews with all of the key informants. That is, several common elements of the physical setting were included in everyone’s description of the meanings they associated with places in the GBRMP. Most informants indicated that several of the following were important to their concept of the *aesthetic beauty* of the setting they described: the clarity and color of the water, sandy beaches, the beauty of the coral reef structures, the openness of the views, and/or the sounds of the waves and wildlife. Also, many of the informants indicated that they sought out places with high *aesthetic beauty* while recreating.

#### *Lack of Built Infrastructure/Pristine Environment*

Although one informant discussed some evidence of built structures in a positive way, most of the informants did not include a discussion of built structures in the places to which they recognized as important or special to themselves. In fact, many participants highlighted that the lack of a built environment suggested that the setting was pristine. Since the key informants often linked the lack of built structures with descriptors such as undeveloped, pristine, wilderness, et cetera, the theme that emerged from these ideas was labeled *lack of built infrastructure/pristine environment*. Mr. Too, an avid recreational boater, reported that the unaltered environment of the place he described caused him to perceive the place in terms of scales that are different from those he observes in developed settings. He said:

You have a 360 degree ocean horizon without built infrastructure sticking into it. It's about a sense of being away from the world. Distance and space, it's got a big scale to it. It also has a small scale in that you are living in a part of that; especially on an island, that's very focused. These islands are teeming with life under the water and in the air and on the land. They're teeming with life as little dense hotspots of diversity in this vast sea or ocean. It's very clean.

Mr. Too's thoughts also suggested that the abundance of flora and fauna and the cleanliness of most of the marine park are opposed to that of a built landscape predominant in other settings. Taken in its entirety, Mr. Too's statement illustrates that the differences in experiences he has while in the Marine Park versus his daily life (i.e., a resident of an urban area) contributed to the meanings he ascribes to the setting in the marine park. Mr. Too uses the lack of built infrastructure to help create and maintain meaning for a specific marine setting. Furthermore, the narrative indicates that as Mr. Too reflects on the meaning he ascribes to the reef, he also considers his role in the larger environment.

Beyond encapsulating a physical description of the setting, the *lack of built infrastructure/pristine environment* meaning can also contain an emotional component important to some individuals. Mr. Stein told me that his customers perceive places within the GBRMP as wilderness settings. The lack of a built environment suggests solitude. He described the uniqueness of the Palm Island area in the Marine Park in this passage:

Wilderness is also a physical description and it embodies an emotional response. One of the key selling points of our business is that we are selling the seclusion, the solitude, that you can't experience in most of the bare boating places in the world. You certainly don't get that in the Florida Keys, Caribbean, Greece, or anything like that.

The definition of "wilderness" has a contentious history (Callicot & Nelson, 1998); however Mr. Stein's uses the term "wilderness" to be symbolic of the unique level of seclusion and solitude that he identifies with the Palm Islands. Clearly, he feels that "wilderness" is commonly understood in this way to the people interested in charter sailing. This illustrates how meanings can be shared among members of a social world (i.e., sailing enthusiasts). Furthermore, the fact that Mr. Stein used "wilderness" to describe an important setting and defined it as implying both a physical description and emotional response has an important implication. That is, Mr. Stein's narrative demonstrated that place meanings are based on the physical attributes of the setting, the individual's experiences, and definitions provided by salient social worlds. Lastly, Mr. Stein also uses this meaning to influence others behaviors—to attract customers to his sailboat charter operation.

Mr. Too and Mr. Stein's narratives illustrate that, for the informants in this study, meanings that were included in the *lack of built infrastructure/pristine environment* theme were constructed from a combination of cognitive (e.g., the categorization of similarities and differences between a specific setting in the marine park and other settings in the informants' lives) and emotional (e.g., the enjoyment of solitude)

responses to interacting with the physical attributes of the setting and understanding the symbols (i.e., the term “wilderness”) others have ascribed to important or special natural environments. This theme, along with others, helped the participants differentiate places in the GBRMP from other settings. In doing so, the meanings also influenced the behavior of visitor’s as they maintained the meanings they ascribed to the setting.

#### *Abundance and Diversity of Coral and Other Wildlife*

Besides the inanimate objects that comprise the setting, the participants also indicated that their interaction with wildlife contributed to the creation of meanings that they ascribed to the setting they identified in the GBRMP. Several people expressed their excitement toward the wildlife by quickly listing all the species with which they have come into contact. For example, Ms. Sven, a snorkeler and environmental activist, said “I just love the ocean more than any other environment. The Great Barrier Reef is accessible to me. It offers a high chance to see marine wildlife. I consider marine wildlife to include corals, fish, other invertebrates, whales, dolphins, sharks, sea snakes.” From this statement and the context of the surrounding conversation, I understood that the meanings Ms. Sven ascribed to this place had some basis in the past experiences she has had with marine environments and she thinks that this place has potential for creating fulfilling future expectations—seeing wildlife. Although the informants each mentioned a range of wildlife, all of them specifically identified the quantity and diversity of coral as important features of their setting. Mr. Vingt, one of the diver operators interviewed, described “the exceptional coral cover” of his favorite setting when he said:

It is an exceptionally pretty reef. It is the only reef in the central section of the GBR that has a sand cay. It has good coral cover, good fish life.... The visibility there is consistently better than other reefs because it is a small reef. It's spectacular because it has had little or no impact from crown of thorns starfish. While there is some bleaching, there has been no significant coral death as a result of coral bleaching. It is one of the best reefs in the central section, probably one of the best in the whole Great Barrier Reef.

From these statements and others, I learned that the participants valued the interaction with the diversity of wildlife in the GBRMP for many different reasons. Some enjoyed just watching the fauna, while others sought to fulfill their angling pursuits by catching different species. However, most informants told me that they valued interacting with wildlife in the setting they described for multiple reasons. They enjoyed watching the wildlife while fishing, and also valued the wildlife for the role it played in the ecosystem. Although all of the meanings identified in this paper are a product of the setting, individual, and social worlds, the descriptions of meanings that comprised this theme illustrated that the physical attributes of the environment are stimuli which serve as social objects with which the informants interacted while creating the meanings they ascribed to the places they identified as special or important. In order to maintain these meanings, the informants reported that they continued to visit the GBRMP and seek out new experiences involving the wildlife.

### *Unique Natural Resource*

Another theme that emerged from the informant statements, which is closely tied to the physical attributes of the environment, was that settings in the GBRMP represent a *unique natural resource*. Many of the informants made it clear that they thought the Marine Park contained a unique natural resource by contrasting it with other marine environments around the world. However, Ms. Night, a tourist to the Townsville area, summed this sentiment up best when she said:

All the wildlife, you don't get that anywhere else. It's a whole other world; the uniqueness of the reef itself. The role that it plays in the ecosystem and the interconnections between what we do on the land. The fact that it is there, we should be grateful.

Ms. Night's quote highlights two reasons many of the informants saw their favorite setting as a unique natural resource. First, the absolute language she uses to describe the amount of wildlife. "You don't get that anywhere else" indicated that she believes that there is no other place on land or in the water that contains the abundance of wildlife. Therefore she values the place she described on the reef for its wildlife. Secondly, Ms. Night used wording that separates the marine environment from the terrestrial. She calls it a "whole other world" and uses "interconnectedness" which implies that although related, marine environments are distinct from terrestrial ones. Both of these sentiments were given by several informants when describing the uniqueness of the reef as important to why they valued places in the GBRMP.

Ms. Night's statement also exemplifies an individual's use of the 'generalized other' when considering the setting and salient social worlds when ascribing place meaning. She used the 'generalized other' when considering the interconnectedness between the sea and land and when she states that "we (i.e., Australian people) should be grateful." The use of the 'generalized other' illustrated that creating and maintaining meaning is a complex process that involves both concrete and abstract thought processes.

Finally, Ms. Night's use of the phrase "we should be grateful" exemplifies how the meanings an individual ascribes to the resource affect their thoughts and behavior. Not only is it evident that the *unique natural resource* meaning caused her to consider her thoughts and feelings, but it also caused her to interact with others. Specifically, during the time of the interview Ms. Night was on vacation with her daughter and from the interactions I observed between the two women it was apparent that Ms. Night was attempting to pass her thoughts and feelings about the reef on to her daughter. Clearly, Ms. Night responded to the meanings she ascribed to GBRMP and, in turn, so did her daughter.

#### *Facilitation of Desired Recreation Activity*

In addition to the landscapes/seascapes and wildlife, the informants also discussed how the attributes of their favorite setting in the GBMRP facilitated the type of recreational activities in which they participated. Several people spoke about how the abundance and diversity of fish was good for angling. Similarly, the "yachties" (people who sail or motor on a live-aboard boat that they operate themselves) noted that the reef

provided relatively smooth waters along the coast which made sailing enjoyable. The recreational divers who participated in this study expressed that their favorite places within the GBRMP had several attributes that made SCUBA diving fun and exciting. For example, Ms. Elv described her experiences at Wheeler Reef, a popular dive spot, saying:

You motor there overnight and wake up and you just see water. You can see the waves crashing on the reef and small sandbars. You just want to jump in the water. You look over the side and you see that the visibility is 25 plus meters. You see schools of fish and you can't wait to get your dive kit and go down to see it. Also, as a diver, the reef is very well set out. A lot of the rare and pretty diverse corals and the fish life are all very shallow, which means you can get quite long dives.... So, there are a lot of cool swim-throughs and it's a real pretty reef. It seemed to be quite sheltered; you couldn't get into any trouble. We just had a ball there. And a really nice place to do a night dive because it is shallow and all the good stuff is in the shallows.

Ms. Elv's description of Wheeler Reef, like many of the informant interviews, highlighted the fact that places become imbued with meaning as individuals interact with the setting and accumulate experiences within it. Her phrase "You just want to jump in the water" suggests that Ms. Elv is interacting with the setting from the moment enters it. She is responding with positive anticipation to the stimuli that the setting provides. Furthermore, most of Ms. Elv's narrative describes how the physical attributes of the setting facilitate her desired recreation, but her use of the word "we" indicates that the



interaction with the setting occurred along with interaction with other people who were also enjoying recreating in the setting. Although not explicitly stated in this quote, I learned from the interview with Ms. Elv that the meanings she ascribed to this place involved both her interactions with the setting and the others on the dive trip. In sum, Wheeler Reef's attributes facilitated SCUBA diving which allowed Ms. Elv and her dive buddies to enjoy their diving. In turn, Ms. Elv now includes descriptions of her recreational experiences at Wheeler Reef in the meanings she ascribes to the place. These meanings then become part of the experience (by creating anticipation) the next time she visits the reef.

#### *Safety and Accessibility*

The first several themes that emerged from the informants' narratives about the places in the GBRMP notably focused on the physical attributes of the setting. The next set of themes that emerged from the interviews included less discussion of physical attributes and greater description of the thoughts and feelings the informants associated with their favorite places.

Many of the key informants indicated that the reef was safe and accessible. Although the *safety and accessibility* theme was manifested in different ways for each informant, it was largely characterized by the fact that most of the places visited by the informants lie between the coast and the outer reef. As Mr. Tweet told me, this is because, "the reef is a natural barrier to open ocean swells and that is very important to people. A lot of people don't like the deep water...Psychologically to a lot of people they like the shallower water." Besides the natural protection the reef provides, several

informants also relayed that the proximity of infrastructure (e.g., marinas and the Australian Volunteer Coast Guard) contributed to their sense of safety. For example, Ms. Uno said:

It is a quite contained and safe environment, the Whitsundays, there is not a lot of weather that goes on. A bit blowy from time to time, but even then it is much more protected than, say, a little bit north. It just feels like it is free, you can sail anywhere, the weather is beautiful, you won't get into trouble. If you do, there are people and infrastructure and things there and it seems like there is enough space between yachts that it is not impacting on my sense of enjoyment.

Ms. Uno made it clear that the safety the setting provides for yachting is important to her. This passage indicated that the safety that Ms. Uno associates with the Whitsundays also increased her enjoyment of yachting there because feeling safe gave her a sense of freedom. The above illustrates that an important aspect of ascribing meaning to a place is the individual's thought processes (in Ms. Uno's case, moving from perceptions of the setting, to evaluating her personal safety in the setting, to understanding the freedom the sense of safety provides, to identifying that the feeling of freedom improves her yachting experience, and finally to ascribing meaning to the setting). The passage also indicates that meanings influence where and when Ms. Uno recreates. That is, in choosing a place to sail she chose places to which she has already ascribed meanings related to safety.

Inseparable from safety, in many of the informants' statements, was the ease of access to their favorite places in the GBRMP. Resembling the thought processes illustrated in the previous passage, informants underwent a similar process when

considering the accessibility of their important or special place in the GBRMP. The informants considered safety and accessibility as linked because both ideas are strongly based on the proximity of the Great Barrier Reef to shore and the well-developed infrastructure that provides a sense of safety and also helps make places in the GBRMP accessible. A snorkeler and ecosystem management agency employee, Mr. Ohh, described the accessibility of the reef:

I think that the beauty of the Great Barrier Reef is its access from the coast to a wide diversity of both reef and island ecosystems and other unique habitat.... [Along] the Queensland coast you've got 2000 [kilometers] worth of Great Barrier Reef that is highly accessible from the coastline. You are not going to find that in too many places.

From these statements, it is apparent that *safety and accessibility* are important to these recreational visitors to the GBRMP because they provide a peace of mind that allows them to enjoy their recreational experiences. These individuals recalled their experiences in a setting, considered their thoughts and feelings about that setting, and ascribed meaning to the setting based, in part, on these experiences and thoughts. They then considered the previously ascribed meanings while preparing for future experiences. Finally, the individuals will continue to refine the meanings they ascribe to the setting by repeating this process.

#### *Curiosity and Exploration*

Besides a sense of safety and accessibility, most of the key informants discussed the enjoyment they attained from observing and learning while visiting the places they

identified as memorable or special. Other informants spoke about exploring underwater reef structures and islands or identifying new routes to use while sailing. In general, the informants' narratives emphasized the importance of interacting with the environment through observation and discovery. I labeled the theme that emerged from these ideas *curiosity and exploration*. An example of this theme can be found in Ms. Sven's description of her solo kayaking and snorkeling excursions near Magnetic Island:

I feel really excited when I get there. The water is beautiful and clear and you can quite easily see the coral... When you have clear water you get really excited.

And then I feel like I want to explore. I just jump in and paddle along until I find something interesting. It fascinates me. I feel fascinated, explorative, and excited.

This quote has an important implication for the place meanings Ms. Sven ascribed to the setting. Her first sentence, "I feel really excited when I get there" indicated that her excitement was focused on the place rather than the activity—she kayaks or snorkels around the island, it is not until she reaches the place she described that she gets excited. Similarly, Ms. Sven referred to the place when she uses the words "fascinates" and "explorative." It is apparent that Ms. Sven's recreation experiences allow her to interact with the setting in a way that engages her, but, in this instance, it is the place—not the activity—that is meaningful to her. Furthermore, the *curiosity and exploration* that she associates with this place compel her to repeatedly visit Magnetic Island to have new experiences. In doing so, she maintains the meanings she ascribes to this setting.

### *Connection to the Natural World*

Another meaning that came to light in the discussion with the recreational visitors was that they felt a *connection to the natural world*. This theme was characterized by a sense of immersion in the natural world, an understanding of the interconnectedness of ecosystems, and an appreciation for how people impact the reef system while being a part of it. Several participants expressed that being in the GBRMP environment made them realize that they were part of a larger world. For instance, Ms. Elv exemplified this when she described it as “a feeling of peace down there because you become part of the ecosystem.” I observed that divers seem to ascribe this type of meaning more easily than other recreational visitors. I suspect this is because, while under water, divers are more completely surrounded by the features of the setting than other recreational visitors and are cut off from many of the distractions (e.g., human made noise, presence of built structures in the view-scape, verbal interaction with other people while in the setting) that exist in other environments. This may focus the thoughts of the diver on the setting and their interaction with the setting to a greater degree than, for example, an angler who can talk to others, hear airplanes overhead, or see built structures in the distance.

Some of the informants described their feeling of being part of the natural world by explaining the importance they placed on the interconnectedness between the natural and built environments. For example, Ms. Sven said:

I like seeing the wildlife. It makes me happy that it's there. When it's there we know its habitat is still there. In terms of connection, as a conservationist, my

primary concern is with the protection of nature, for two reasons: for its intrinsic right to exist and because of its ecosystem function. The connectivity of everything, all components are critical to the function which connects to ecosystem services useful to humans.

In this quote, Ms. Sven's words make two interesting points. First, her words indicate that she has a positive emotional response to the setting because the healthy wildlife habitat affirms the value she places on the nature's intrinsic right to exist. Secondly, she identifies herself as part of a specific social world—conservationists. She then explains two thoughts that she shares with other conservationists that inform the meanings she ascribes to the setting she described. Hence, this provides evidence that the meanings she ascribes to the GBRMP shape her interaction with herself and other conservationists. From the interview, it was apparent that Ms. Sven's felt that the shared meanings among conservationist bind them together toward a common goal—to protect nature for its own sake and for its usefulness to humans in an unaltered state.

Almost all of the informants described a sense of connection with the natural environment while they recreated in the GBRMP. Their descriptions of how this meaning manifested itself varied, but many described that they gained knowledge through interaction with the setting, and by moving in and out of various social worlds. In turn, this may have contributed to the formation of the meanings they ascribed to places in the GBRMP.

*Escape from the Everyday*

One of the most prevalent meanings ascribed to the places in the GBRMP by the key informants was that visiting the marine park allowed them to escape from their everyday lives. Evidence of this meaning was given by every informant and it was usually mentioned more than once by each informant throughout the interview. In addition to 'escape,' they used the following words and phrases to express that visiting the GBRMP provided an escape from the everyday: "freedom," "isolation," "not having to answer the phone," "going to another space," "re-create," "relaxed" *et cetera*. An example of the various ideas that emerged from informants concerning the *escape from the everyday* theme were exemplified in Ms. Cease's narrative, an active SCUBA diver, describing what her favorite island in the GBRMP meant to her. She explained:

The feelings that you get from being out in the isolated area, which is really quite tranquil and an open space, it's quite calming. It does not have those day to day troubles. Things to worry about and think about are all gone because it is a totally different space and a place. It's really calming, no stress, even if you are in a bit of a stressful situation. It's not stressful; it is actually a pleasure and enjoyment ... Yeah, calming and less stress and peace. I need to go out to an island at least every three months in my life. And the water, I need to get out in the water and swim. It adds to the calm, less stress, and peacefulness.

For many of the informants, solitude was essential to the feeling that recreating in the GBRMP allowed him/her to escape from his/her everyday life. This meaning seems to

be so universal that Mr. Stein said that he tells potential sailboat charter customers the following:

It's the rule, not the exception, that you will get a bay to yourself. That is almost unheard of in the Whitsundays or the Caribbean or any of the more popular cruising places in the world. It's about a feeling of getting back to nature, getting back to the basics. The group of people on the boat with you is obviously a group of close friends otherwise you wouldn't choose to be on a boat with them. It is an opportunity to interact with them in solitude at the exclusion of all other outside distractions.

*Escape from the everyday* is a theme that demonstrates that place meanings are formed through an individual's interaction with the setting, their social worlds, and themselves. In the above quotations, it is evident that the physical attributes (e.g., large open spaces that lack built structures) suggest a setting that is different from the informants' daily lives. Likewise, choosing to visit the GBRMP alone or with a small group of close family or friends represents a potentially different set of social worlds for the informants as opposed to the worlds they move in and out of during a day at home, work, and places in between. That is, an individual's friends or family present at a GBRMP setting represent the more salient social worlds at the time of interacting with the setting, whereas the social worlds represented by people more proximally and emotionally distant (e.g., co-workers; parents of children's friends, and unknown individuals) are less salient to the situation. These differences, between the setting and social worlds present in the marine park and in the informants' daily lives, influenced the



place meanings each informant ascribes to places in the GBRMP by focusing the informants' thoughts on the contrast between the two places. Lastly, the informants' narrative also conveyed that once meanings of escape were ascribed to the setting, the individuals sought out their places in the GBRMP to achieve peace, relaxation, and recreation.

### *Family and Friends*

The final theme that emerged from the key informant interviews concerned the participants' social interaction with *family and friends*. The informants' narratives used important places in the GBRMP as backdrops for memories of enjoyable experiences with friends and family, coming of age stories, and passing family stories and knowledge to younger generations. In the following passage, Mr. Too told me how Lady Musgrave Island served as a setting for these types of social interactions:

I have been back with camping trips with our friends and all of our children. We've taken our children back to that place. That was an important thing for me to do, to have my children to partly understand why I do the job I do and why I was passionate about it. And also to try to give them that sense, that great feeling you have when you are in wild wilderness places that are stunningly beautiful, and that freedom.

Mr. Too has had a lifelong relationship with the place he described. Similarly, Mr. Dee, a recreational angler, spoke to me about the importance of places across generations. Mr. Dee, a member of an indigenous group, told me about his traditional ancestral home. He said:

I am attracted to it because I have a connection there through the Torres Strait Islanders. I guess my ancestors have utilized that place for many hundreds of years to access the guano on the island, but also the turtle.... There is a lighthouse or beacon that was erected over a hundred years ago. It was used as a stopover for people during the pearling days. There are a number of names inscribed on the beacon there. All of the names I have from my grandfathers whose names are inscribed on the beacon. I like to go there and spend time there and have a look around.

Beyond demonstrating the importance of family, past and present, to the meanings these informants ascribed to their respective settings, these passages also illustrate the relationship between place meanings and individual identity. When Mr. Too told me that he brought his children to his favorite place “to partly understand why I do the job I do and why I was passionate about it” it was clear that he thought the place reflected the values he holds and parts of his personal and professional identity. Likewise, Mr. Dee feels that the island described informs a part of his identity that he takes from his ancestral roots. For each individual, these places are repositories for memories that are tied closely to their individual identities (Altman & Low, 1992). These places are symbols of their heritage—past, present, and future. Thus, they are meaningful to them.

Besides their families, the informants also discussed how they interacted with friends in the places they identified in the GBRMP. The informants spoke about the joy of sharing the place with others and about how the interaction with others improved (or

hindered) their experiences at the place. Two of the informants, who were SCUBA divers, spoke of how the interactions with others while diving were mediated by being underwater. For example, Ms. Elv described the experiences of interacting with companions while diving in the following way:

It is also very social on some of these trips. It very much depends on who you are diving with and how often you dive with them. Sometimes you dive with someone that your communications with them are pretty good. It is a much more personal experience, but equally you are still sharing it. So the discussion happens when you surface and you are on the boat together for two days. You have a bonding moment because you've just been scared ... by a shark. Also, you are very dependent on one another down there for your safety....

From this statement it is clear that social interaction occurs while diving and is only constrained verbally until everyone is back on the boat. Ms. Elv's narrative also draws attention to the importance of shared experiences, especially in emotionally charged situations, (i.e., the shark encounter and dependence on one another for safety) in creating meaning.

Examples of the *family and friends* theme could be identified in transcripts of every interview. All of the narratives illustrated that the importance of family and friends influenced how the informants interacted with others in the setting. For many, this meaning compelled them to bring others with them to their favorite places in the GBRMP. Hence, this meaning along with others shaped the activities and interactions they had while visiting the reef. Also, it is important to note that it was almost

impossible to separate out statements that were related to this theme from those that dealt specifically with the other themes identified. This observation has two implications. First, this confirms the notion that social interaction is important to the formation of a wide range of place meanings. Secondly, interaction with family and friends may have been a precursor to the formation of other meanings for recreational visitors to the GBRMP interviewed.

In sum, ten themes emerged from the informants' narratives about the meanings they ascribed to places in the GBRMP that they identified as important or special to them. Beyond gaining a description of the place meanings ascribed to this marine setting, the analysis of the informants' statements also elicited information on the roles of the setting, the individual, and salient social worlds in the processes that underlie the creation and maintenance of place meanings. Furthermore, the informants considered the meanings they ascribed to the reef when considering future interaction with the setting and/or with other people. The implications of these observations will be discussed in the next section.

## Discussion

The purpose of this investigation was to identify and describe the place meanings that recreational visitors ascribed to a marine setting (i.e., the GBRMP) and to evaluate the usefulness of the symbolic interactionism framework in understanding the recreational visitors' meanings they ascribed to special or important places in the GBRMP. Generally speaking, the ten themes identified in the present data were similar to those described in previous literature. Any disparities appeared to be the result of

nuanced differences in the setting, the individual, and the social worlds in which the individual operated. The results of this analysis also indicated that symbolic interactionism is useful in understanding place meaning. Together these findings illustrated several of the process through which the recreational visitors interviewed developed place meanings.

Although the place meaning themes identified in the marine settings were similar to those ascribed to different setting types in previous studies, this does not mean that the setting attributes were not important to the meanings that the informants' ascribed to the GBRMP. It was apparent that the physical attributes in the marine setting contributed to the informants' place meanings. For example, *aesthetic beauty* appears to be an important meaning associated with most places that people identify as special, within protected areas. As in previous research (Gunderson & Watson, 2007; Bricker & Kerstetter, 2002; Schroeder, 2002), *aesthetic beauty* was used in reference to the sea/landscapes, open vistas, and presence of verdant foliage. One distinction between the participant narratives in the present study and most previous research is the descriptive attributes of water. In the marine environment, the informants described the beauty of the water in terms of color and clarity, whereas in terrestrial settings it is usually the mere presence of a water feature that is important; rarely is the water described in detail (Farnum, Hall, & Kruger, 2005). Another distinction between the meanings that emerged in this analysis and those that have been identified previously was that in the present investigation the *abundance and diversity of coral and other wildlife* emerged as a unique theme. In the literature, the presence of wildlife has been part of a place meaning

theme that describes the physical attributes of the setting; it has not been a standalone theme. Every informant cited the abundance and diversity of the wildlife as part of what makes the GBRMP unique. Some participants indicated that on land you see wildlife intermittently, but in the GBRMP encounter wildlife almost continuously. This repeated interaction with the flora, fauna, and geological structures that make up the physical attributes of the environment may provide the basis for the influence of setting on the creation of place meanings.

In this and previous studies, the *lack of built infrastructure/pristine environment* theme is associated with privacy (Manzo, 2005), naturalness, and wilderness values (Gunderson & Watson, 2007) and is juxtaposed to the urban settings. Similarly, the *escape from the everyday* and the *unique natural resource* themes were similar to meanings identified by Manzo (2005) and Gunderson and Watson (2007). Although the informants' narratives supporting the *unique natural resource* theme were nearly identical to previous descriptions of this type of meaning, the current investigation did allow for one important observation. That is, in this investigation the informants' descriptions of the meanings labeled *unique natural resource* were similar in the fact that almost all of the recreational visitors' discussed the intrinsic value of nature. The high degree of similarity in the key informant narratives suggested that there was a common definition of what made places in the GBRMP unique. As Kyle, Mowen, and Tarrant (2004) noted, this may be the result of culturally defined images that are symbolized by labels such as "Marine Park" and "World Heritage Area." If so, then this

theme exemplifies the interaction between the setting, the individual, and social worlds in place meaning creation.

Just as the attributes of the setting, the individual's thoughts and feelings also contribute to the meanings he/she ascribes to important or special places. This was manifest in the informant narratives related to *curiosity and exploration*, the importance of how (and the degree to which) a place *facilitates desired recreational activities*, and *safety and accessibility*. Analogous to the meanings identified by Manzo (2005) and Gunderson and Watson (2007), one of the aspects that many of the informants cited as important to the meanings they ascribed to places in the GBRMP was the ability to explore the setting. Also, all of the participants in this investigation described the ways in which their place in the GBRMP made enjoying SCUBA diving, snorkeling, angling, cruising, et cetera enjoyable. This is comparable to the joy of running the river experienced by rafters on the American River (Bricker & Kerstetter, 2002). The ability to safely explore a place and to engage in certain recreational activities are both allowed for and constrained by the physical layout of the setting. However, equally important to the setting is the type of individual who engages in these activities. Exploration and many of the recreational activities cited by the informants are considered to be adventurous, which is apparent from the fact that several of these activities are often labeled adventure or risk recreation. Individuals who participate in these activities have a perception of their self-efficacy and personal identity that make these activities and settings enjoyable (Paxton & McAvoy, 2000). It may be that the characteristics of the individual shape the thoughts and feelings they have in response to a place; which then

influence the meanings they ascribe to the place. Furthermore, while ascribing meaning to places in the GBRMP the informants were often influenced by a salient social world (e.g., those who SCUBA dive) through direct interaction with other divers, during the dive and conversation after the dive, and/or mediated interaction (e.g., magazines, brochures, and videos). By interacting with others, the informants gained new information and experiences that could be incorporated into subsequent meanings ascribed to the GBRMP. The similarities, in terms of individual characteristics and salient social worlds, between recreational visitors to marine settings and those to terrestrial settings may explain the similarity in meanings identified in this and previous studies. This implies that the individual and salient social worlds have a dominating effect over the physical attributes of the setting in the formation of meanings that are ascribed to important or special places.

Although I have already discussed the influence of social worlds on place meaning creation and maintenance, the influence of salient social worlds was exemplified most clearly in the *family and friends* theme. This is not surprising given that previous literature has described the importance of social worlds in the formation of place meanings (Kyle & Chick, 2007). Similar to Gunderson and Watson (2007) some of the meanings identified from this analysis dealt with the historic and traditional importance of the place to the informants' families. Likewise, just as Bricker and Kerstetter (2002) found, many of the recreational visitors to the GBRMP discussed enjoying certain places because they had had shared experiences with friends there.



Beyond understanding the roles that the setting, the individual, and the salient social world play in the formation and maintenance of place meanings, the results of this analysis also illustrated that symbolic interactionism can be used to understand the social construction of place meanings. Specifically, informant statements emphasized the importance of social interaction with others in the creation and maintenance of place meanings. The narratives also provided examples of how the salient social world affected the meanings they ascribed to the GBRMP. Secondly, the symbolic interactionism framework specifies that an individual responds to their own thoughts and feelings when ascribing meanings. Informant statements indicated that meanings ascribed to places in the GBRMP were conceived from a combination of cognitive and emotional responses to interacting with the physical attributes of the setting. Furthermore, it was clear that an understanding of the symbols (i.e., the term “wilderness”) others have used to describe places in the GBRMP influenced the meanings the informants ascribed to important places. Also, the symbolic interactionist framework suggests that the individual identifies what is important to them about the setting through responses to internal (e.g. individual thoughts and feelings) and external stimuli (e.g. influence of salient social worlds). This was clear in informant narratives incorporated into several of the themes, including: the *unique natural resource*, the *connection to the natural world*, and the *safety and accessibility* themes. Additionally, a few of the informants’ narratives highlighted the role of memories of past shared experiences in creating place meanings. Likewise, future expectations of similar experiences were evident in the meanings an individual ascribed to a setting and vice-

versa. Also, several of the narratives focused on the informants' interaction with the physical attributes of the setting. These statements described examples how the physical attributes of the setting are stimuli, which serve as social objects, with which the informants interacted while creating the meanings they ascribed to the places they identified as important. According to the symbolic interactionism (Charon, 2007), the individuals accomplished this by applying the 'role of the generalized other' to the setting. Finally, it was apparent that the meanings the informants ascribed to places in the GBRMP shaped their subsequent behaviors when interacting with the setting or with others with regard to the setting.

### Conclusion

This investigation was one of the first to describe place meanings ascribed to a marine environment and to assess the usefulness of the symbolic interactionism, as a whole, to understand place meaning. Identifying the place meanings that are ascribed to marine settings by recreational visitors is an important step in understanding how other constructs interact with an individual's notion of place. For example, using the meanings identified, in this investigation, in future research conducted in the GBRMP may allow for the identification of the relationships between place meanings and recreational visitors' attitudes toward the reef and management actions that affect the reef. Furthermore, the fact that the general aspects of the symbolic interactionism were present in the informants' narratives, suggests that the framework can be used to inform future research about the social construction of place meanings. Conducting research to better understand place meaning through the use of the symbolic interactionism

framework will lead to knowledge that the recreation place literature is currently lacking. Particularly, a better comprehension of how place meanings are ascribed to a setting and maintained through shared symbols (e.g., language) and experiences (e.g., recreational activities) may be developed.

Gaining a better understanding of place meanings will allow researchers and recreation resource managers to more easily identify and comprehend the thoughts and feelings that visitors ascribe to a place. This information can be useful when making decisions that affect the resource and the visitors who use that resource.

CHAPTER III  
RECREATIONAL VISITORS' PLACE MEANING AND PLACE ATTACHMENT  
IN A MARINE SETTING

Eight hundred registered recreation and tourism organizations operate 1,700 snorkeling, SCUBA diving, fishing, and sightseeing vessels within Australia's Great Barrier Reef Marine Park (a World Heritage Area, managed by the Great Barrier Reef Marine Park Authority). These organizations bring nearly seven million people to the reef each year (GBRMPA, 2007). Recreational visitors (i.e., local residents and tourists who use the reef for a recreational activity) contribute over one billion dollars annually to the Australian economy (Harriot, 2002). Given the sheer magnitude of recreational visitors and their contribution to the local and national economy, the Great Barrier Reef Marine Park Authority (GBRMPA) has identified these individuals as an important stakeholder group. Over the past three decades, as democratization of the natural resource management process has occurred, it has become imperative that managers understand the attitudes that various stakeholder groups hold toward natural resource recreation settings (Cortner & Moote, 1999; Williams & Stewart, 1998). This allows managers to ensure that competing values are considered before making decisions and to understand how their actions affect the stakeholder groups.

One way to gain an understanding of the attitudes recreational visitors hold toward the natural environment is to examine the meanings from which these attitudes are gleaned. Place meanings tell us how individuals feel about the landscape. Work

examining the meanings people associate with place fall under the rubric of place attachment and other related concepts (e.g., “place attachment,” “place bonding,” and “genres of place” ) (Altman & Low, 1992; Hammitt & Cole, 1998). In the recreation literature, two terms have been used to discuss an individual’s conception of place; place meaning and place attachment. Place meanings are the cognitions and/or evaluative beliefs concerning a setting that reflect the value and significance of the setting to the individual (Stedman, 2002). Kyle, Graefe, Manning, and Bacon (2003) defined place attachment as “the extent to which an individual values or identifies with a particular environmental setting” (p. 250)—the intensity of the human-place bond. Although place meaning and place attachment have been used independently in many studies, it is important to note the singularity of the terms. That is, the words an individual uses to describe the place meanings he/she ascribes to a setting reflect why a place is valued and the intensity of that value. Similarly, place attachment indicates the intensity of the human-place bond, but also abstractly addresses the value of the setting through an understanding of the dimensions that comprise measures of place attachment (e.g., the place identity dimensions reflect meanings related to the expression/confirmation of self-identity and the social bonding dimension provides insight into the importance of meanings related to relationship with friends and family in the context of the setting).

Although place meaning and place attachment represent a single set of ideas; authors are, correctly, selective in the term they use for several reasons. A main reason is the difference in methodological approaches used by the researcher (Lalli, 1992). Specifically, two different modes of knowing have predominately been used to

investigate the meanings an individual ascribes to a setting and their intensity of attachment. Place meaning has been used in conjunction with interpretive designs (Tuan, 1977; Kyle & Chick, 2007). These studies provide tremendous insight on the character of meanings, but may only reflect the meanings of a select few people due to small sample sizes. On the other hand, the term place attachment has most often been used with quantitative designs (Williams, Paterson, Roggenbuck, & Watson, 1992; Kyle, Mowen, & Tarrant, 2004). The place attachment scales used in these studies often divide an individual's place attachment into dimensions that provide only abstract insight into the subjective meanings we associate with places. This methodological dichotomy has inadvertently created a gap in the recreation literature's understanding of place (Farnum, et al., 2005): the connection between the context (i.e., the unique set of attributes that are contained in a place) and an individual's lived experiences in the context with indicators that illustrate the intensity of attachment (but only abstractly capture the basis of the attachment).

Hence, the purpose of this investigation was to explore how recreational visitors' attachment to a marine resource is reflected in their depictions of why the resource is meaningful. To achieve this goal, I report the findings of a mixed-method approach that was designed to overcome the limitations of single method approaches. I first identified the meanings ascribed to places in the Great Barrier Reef Marine Park (GBRMP) by recreational visitors through a set of 20 key informant interviews. I then used the meanings identified, to create a questionnaire that was administered to a large sample ( $n=324$ ) of individuals who have interacted with various settings in the GBRMP.

## Literature Review

As I indicated in the introduction, the concept of place has been examined by a number of authors from a wide range of academic disciplines. Hence, there is a wide range of definitions (often conflicting) of terms used to address place (Farnum, et al., 2005). The place-related recreation literature can be generally divided into two groups: 1) investigations of what is important about places that people develop a bond with—place meaning (e.g., Schroeder, 1996; and Stokowski, 2002 ); and 2) quantitative investigations of the relationships involving the intensity of that bond—place attachment (e.g., Moore & Graefe, 1994; and Stedman, 2003b). Beyond defining the terms used in relation to place, researchers have also sought to identify the processes that contribute to the formation of attachment to a place. Based on a social constructivist framework, several authors have suggested that meanings are ascribed to a place through a series of ongoing interactions between the individual, the environment, and others (Lee, 1972; Greider & Garkovich, 1994) In the following sections, past research concerning place meaning and place attachment is presented.

### *Place Meaning*

Tuan (1977) suggested that an unknown setting is a “blank space” that only becomes a “place” when it is endowed with meaning through lived experience. Based on a social constructivist framework, several authors (e.g., Greider & Garkovich, 1994; and Milligan, 1998) have suggested that the subjective definitions of the attributes that comprise a place are the basis for place meanings. That is, individuals use symbols (e.g., language) to express the value of a place to themselves and others. In turn, meanings

form through the use of these symbols during interactions between the setting, the individual, and the individual's social worlds. Hence, meanings can be held by both the individual and the collective (Saleeby, 2004). Through social interaction, meanings held by the group influence the meanings an individual ascribes to a place. That is, the symbolic meanings shared among group members lend themselves to the formation of a person—place bond in individuals (Blake, 2002).

The meanings an individual ascribes to a setting are often associated with the setting's context; the attributes that characterize the place. Nassauer (1995) posited that this is because landscape attributes and the meanings shared within a group of people about those attributes are related in a continuous feedback loop. People ascribe meaning to the attributes and then interact with the setting with those meanings in mind, thus creating new experiences which, in turn, redefine the meanings ascribed to the setting. Important attributes include both the physical characteristics of the setting and the social interaction that is experienced in a place (Eisenhauer, Krannich, & Blahna, 2000; Kyle & Chick, 2007).

Humans are especially attracted to natural environments. More specifically, people of western cultures ascribe the meanings of solitude and aesthetic beauty to natural and pristine environments (Williams, et al., 1992). Moreover, Manzo (2005) observed that people generally ascribe the meanings of privacy, introspection, and self-reflection to natural settings. She also found that the meaningful places identified by individuals were often near their homes, thus convenient to visit, and were different from the persons' work or home (e.g., open spaces with scenic views rather than confined



spaces and views often found in offices). Furthermore, visiting favorite places allowed an individual to express their identity. Finally, Manzo found that meaningful places often provided people with a new setting to explore.

Beyond the meanings that people ascribe to natural environments generally, there are meanings that are specific to protected areas that have been set aside for conservation, natural resource recreation, etc. These meanings may be partially the result of the culturally defined symbols that are embodied in labels such as “National Park,” “National Forest,” and “wilderness” (Kyle, et al., 2004). For example, in a study about place meanings on the Bitterroot National Forest, Gunderson and Watson (2007) identified seven different meanings associated with frequently visited areas. The first was “ease of access to wild places” which was centered on the respondents’ ability to access trailheads and places that facilitated desired recreational activities. The meaning labeled by the authors as “natural-roadless,” concerned the physical attributes of the setting; namely, that the landscape was void of human built structures. In a related theme, respondents indicated that ideals related to scenery and natural beauty comprised the “scenically attractive” meaning theme. Gunderson and Watson identified the “physical features of significance” meaning theme as describing the flora, fauna, streams, and other physical attributes of the setting. Their respondents also indicated that the setting was meaningful because it represented a “unique contrast to everyday settings.” That is the forest provided opportunity for solitude and the ability to see a landscape in a perfect natural state. Gunderson and Watson defined the theme labeled “familiar, historically important, or tradition” as meanings that have to do with family or

cultural traditions. Finally, the authors noted that a “work oriented” theme emerged from their data that indicated some respondents were attached to the forest because of the practical benefits they received from the setting (i.e., irrigation water from a reservoir located within the forest). In a recreation-specific context, Bricker and Kerstetter (2002) reported on the meanings river rafters associated with the South Fork of the American River in California. Their respondents indicated that the river’s beauty (e.g., natural landscape and power of the flowing water), their shared experiences with friends (e.g., the bonding that occurs while sharing common experiences), and the joy of running the river (e.g., the excitement of participating in their desired recreational activity) were important meanings.

#### *Place Attachment*

Although descriptions of place meanings paint a detailed picture of the affective and cognitive aspects of the relationship between the individual and a setting, they do not capture the emotional intensity of the human-place bond in a way that easily quantifiable. Hence, place attachment scales have been developed. Place attachment is “the extent to which an individual values or identifies with a particular environmental setting” (Kyle, Graefe, Manning, & Bacon, 2003). Just as place meanings are attributed to symbols in the landscape, the attachment an individual feels is with the meanings that are expressed through symbolic representations of the setting’s attributes, not the landscape itself (Stedman, 2002). Research pertaining to place attachment has been prominent in literature concerning the relationship between humans and the natural environment for the past two decades. Much of this work has focused on developing

scales that provide insight on the intensity of attachment rather than on identifying the factors that produce attachment (Stedman, 2002). In this vein, Williams et al. (1992) suggested a two-dimensional scale composed of place identity and place dependence. Place identity refers to the cognitive connection with the setting which is a substructure of the global concept of self-identification (Proshansky, 1978). Place dependence has been conceived of as the functional utility of a setting in providing for achievement of a certain goal (Stokols & Shumaker, 1981). Other researchers have suggested additional dimensions, including familiarity, belongingness, and rootedness (Hammit, Backlund, & Bixler, 2006; Hummon, 1992; Mesch & Manor, 1998; Nasar, 2000).

For this investigation, I used a place attachment scale developed by Kyle et al. (2004) that captures how intensely an individual identifies with, or values, a setting. This scale expanded the operationalization of place attachment (i.e., place attachment as composed of place identity and place dependence, as described above) by also including an affective dimension and a social dimension. From this, they developed a four-dimensional model of place attachment consisting of place identity, place dependence, affective attachment, and social bonding. The conceptualizations of place identity and place dependence were carried over from Proshansky (1978) and Stokols and Shumaker (1981), respectively. Affective attachment is defined as the emotional bond to a place that is formed by interaction with the setting and others (Milligan, 1998; Jorgenson & Stedman, 2001). Empirical support for affective attachment has been extensive. For example, Bricker and Kerstetter (2000) observed that affective attachment among whitewater rafters was high in relation to other dimensions of attachment. Others have

obtained similar findings (Jorgensen & Stedman, 2001; Moore & Graefe, 1994). The construct of social bonding asserts that social ties to a setting are developed through shared experiences in the place (Mesch & Manor, 1998). Mesch and Manor observed that the more close friends and neighbors their respondents had nearby, the higher their level of attachment was.

#### *The Formation of Place Meanings and Attachment*

As I reported earlier, meanings and attachment form through interactions between the setting, the individual, and the individual's social worlds. Several studies have examined one or more of these interactions. For example, Manzo (2005) suggested that place meanings form, in part, through repeated use of the same places over time. Likewise, repeated positive experiences have been shown to increase an individual's level of attachment to a place (Hammit, Backlund, & Bixler, 2004; Moore & Graefe, 1994). Similarly, empirical studies have suggested that past experience with a setting and memories of those experiences increase intensity of attachment (Vorkinn & Riese, 2001) and the formation of place meanings (Kyle & Chick, 2007). Additionally, Mesch and Manor (1998) and Manzo (2005) indicated that ease of access to a place (e.g., proximity of the place is to one's home) facilitates the development of place meanings.

In addition to repeated experience and ease of access, place attachment and place meaning have been linked to self-identity. Early on, Proshansky (1978) conceptualized place identity as a sub-component of self-identity. Knez (2005) suggested that this was operationalized in the following way: repeated experiences intensify the intensity of the individual's attachment to a place and the place, in turn, becomes part of one's

conceptual and extended selves. This is akin to Manzo's (2005) finding that the distinctions people choose to emphasize through expressions of place meaning allow "significant places [to] reflect people's evolving identity; provide opportunities for privacy, introspection and reflection; serve as transitional markers as well as bridges to the past; and reflect the salience of safety, threat and belonging which are fundamentally connected to socially constructed identities" (p.74).

Beyond individual interaction with the environment, other studies have indicated the importance of social interaction in creating the meanings an individual ascribes to a setting and fostering the attachment they have to the setting via their place meanings. For example, Manzo (2005) found that a place becomes more meaningful due to the social opportunities one finds there or because it represents a turning point in an important relationship. Likewise, the more positive social interaction that takes place in a setting, the higher an individual's intensity of attachment is to that place (Mesch & Manor, 1998).

Although several decades of research have sought to identify and refine the recreation literature's understanding of place, there remains a paucity of research that has explored how individuals' attachment to a setting is reflected in their depictions of why the place is meaningful. Only a few studies have tangentially addressed this issue. For example, Milligan (1998) hypothesized, but did not test, that

Every interaction [with a setting and/or within a setting] bestows some form of meaning on its stage, transforming that site into a known place, but when the

interaction involves a higher degree of meaning, whether or not that meaning is perceived at the time, the place becomes the site of place attachment. (p. 28)

Furthermore, Stedman (2003a) indicated that the meanings people ascribe to a setting shape their attachment to that setting. He found that place meanings mediated the relationship between the characteristics of the setting and the respondent's intensity of place attachment. Understanding how attachment is reflected in meaning is important for furthering the literature on place because, as it stands now, studies utilizing quantitative scales often ignore the context in which attachment is fostered. Hence, these investigations provide little insight on why settings of interest are important to people. I attempted to mitigate this problem by connecting the context (and peoples' lived experiences of the context) with the indicators of the intensity of attachment (that more abstractly capture their bond with the setting).

#### Methods

To explore how recreational visitors' attachment to the GBRMP was reflected in their depictions of why the resource is meaningful, I collected data using a mixed-method design. This approach has several advantages over singular modes of data collection (Greene, Caracelli, & Graham, 1989; Hanson, Creswell, Plano Clark, Petska, & Creswell, 2005). First, the use of both qualitative and quantitative techniques allows a more comprehensive understanding of a phenomenon. Moreover, the use of this type of sequential exploratory design (i.e. qualitative data collection followed by quantitative) is useful for exploring unknown relationships because the qualitative phase can be used to identify potential relationships that can be tested in the quantitative phase (Hanson et al.,

2005). Lastly, the use of both qualitative and quantitative methods allows for triangulation of the data (Greene et al., 1989).

### *Phase I*

*Sampling.* I began this investigation with 20 key informant interviews that I conducted between July and August of 2008. From these interviews, I attempted to inventory the breadth of meanings recreational visitors ascribe to the GBRMP. I sought out a pool of key informants, knowledgeable about recreational visitors to the GBRMP, that included at least one individual from each of the following groups: tourist industry representatives; managers from local, state, and federal agencies who worked in the GBRMP; and recreational visitors, both local resident users and tourists (in fact, all informants were also recreational visitors to the GBRMP). To identify subsequent informants, I used a snowball technique where I asked the initial informants to suggest others that met the criteria above. As suggested by Creswell and Plano Clark (2006), interviews were conducted until the data obtained reached the saturation point.

*Interview prompts.* Although my interviews were purposefully designed to be as conversational as possible, two prompts were adapted from Schroeder (1996) to ensure that discussion stayed relevant to the place meanings each informant ascribed to the GBRMP. The first prompt asked informants to give a physical description of a place that stood out in their “mind as being important, memorable, meaningful or special” to them personally. The second prompt asked them to “describe the thoughts, feelings, memories, and associations that come to mind when you think about this place....”

*Data analysis.* Analysis of the data obtained through the key informant interviews began immediately after the first interview. All of the individuals contacted agreed to participate in an interview. Participants ranged in age from 24 to 70 ( $M=46$ ) and 13 were male. The informants' length of interaction with the reef ranged from three years to a lifetime, while most respondents had been recreating near the Great Barrier Reef for 20 to 25 years. Using transcriptions of the interviews and field notes, a colleague and I coded the key informants' statements and sorted them into 34 discrete elements that represented different ideas. Following the open coding of respondents' transcripts, we evaluated the list of the 34 ideas using constant comparison to identify similarities and distinctions (Merriam, 1998). To perform this analysis, we each, individually, grouped the ideas identified in the open coding to form categories and assigned each category a title consistent with the theme of the ideas reflected therein. This process elicited 10 themes. Once the data were coded, Holsti's inter-rater reliability test was conducted. The inter-rater reliability between the two researchers for the themes identified from these data was 90.9%, indicating an acceptable level of reliability (Miles & Huberman, 1994).

### *Phase II*

*Survey design.* In the second phase, I designed a survey instrument in light of the findings emerging from phase one and a review of the relevant literature. Relevant to the analysis conducted for this investigation, the survey included the 34 statements representing the 10 place meaning themes that emerged from the key informant interviews. For each statement, respondents were asked to indicate the importance of



each of the meaning statements to them in regards to the GBRMP (respondents were prompted to think of a important or meaningful place in the GBRMP when responding to these items, however if they did not have a specific setting they were asked to consider the GBRMP as a whole). They indicated their response on a five-point scale, where: 1=*Only slightly important* ; 2=*Somewhat important*; 3=*Moderately important*; 4=*Fairly important*; and 5=*Extremely important*. To assess the level of the respondents' place attachment to GBRMP, they were asked to respond to 16 items adapted from Kyle, et al. (2004). This scale is a four-dimensional model of place attachment consisting of place identity, place dependence, affective attachment, and social bonding. Respondents indicated their level of agreement with each statement on a five-point scale, where: 1=*Strongly disagree*; 2=*Disagree*; 3=*Neither agree nor disagree*; 4=*Agree*; and 5=*Strongly agree*.

*Sampling.* The sample for this survey was obtained through a telephone survey that was part of a larger study on the values associated with the Great Barrier Reef. The final question of the telephone survey asked respondents living in areas adjacent to the GBRMP if they were willing to participate in a follow-up written survey. If so, they were asked if they preferred to receive the written survey via email or postal mail. Seven hundred and twenty-seven (71%) of the phone survey respondents agreed to participate (none of the demographic or visitation variables were found to be significantly different between those who chose to participate and those who did not). Using a modified Dillman (2000) method the surveys were distributed from November, 2008 to February, 2009. Those who chose the email option received an email and survey four times over an

eight week period, whereas those who chose the postal mail option were contacted three times, receiving: (1) a cover letter and survey; (2) a postcard reminder; and (3) a second survey and cover letter. This procedure elicited a 49% response rate with 106 of 235 responding to the email survey and 218 of 431 completing the postal survey, for a total  $n=324$ . The age range of these respondents was 18 to 82 years ( $M = 50$ ;  $SD = 13.8$ ). Just over half were male (57%). Only a few had not completed their secondary education (6%), most had attended a technical college (58%) or university (29%), and seven percent had graduate education. Respondents' incomes were well dispersed with about half (52%) earning less than \$60,000 (AUD) a year, almost one-third earning between \$60,000 and \$99,999, and the remaining 18 percent earning over \$100,000 a year. All respondents indicated they had visited the GBRMP to participate in a recreational activity; 76 % ( $n=229$ ) had done so in the past year. On their last visit to the GBRMP the primary activity many participated in was recreational fishing ( $n=85$ , 28.3%). Others went: to walk along a beach ( $n=77$ , 26%); to SCUBA/snorkel ( $n=31$ , 10%); or to swim ( $n=28$ , 9%).

*Data analysis.* The survey data were analyzed by first performing a set of confirmatory factor analyses (CFA) using LISREL 8.80 to assess the hypothesized 10 theme place meaning model and the four-dimensional place attachment model. Since the chi-square Likelihood Ratio test is sensitive to sample size, the assessment of the model was provided through several other goodness-of-fit indices: root mean square error of approximation (RMSEA), comparative fit index (CFI), normed fit index (NFI), and non-normed fit index (NNFI) (Byrne, 1998). For the  $\chi^2$  values  $\leq .08$  indicate acceptable fit

(Steiger & Lind, 1980). For the CFI and NNFI (Bentler and Bonnett, 1980) values  $\geq .95$  indicate acceptable fit. Also, Cronbach's alpha was calculated for each of the factors as an indicator of the scales' internal consistency. New variables were then created, based on the mean of the items loading onto each factor, reflecting each of the ten types of place meanings and the four place dimensions.

To facilitate the analysis of the link between the context (as indicated in the place meaning scale) and the intensity of attachment (as indicated by the place attachment scale), I grouped the respondents by their responses to the place attachment scale. Since the conceptualization of place attachment used in this investigation was based on previous research that indicated the multi-dimensional nature of the construct, I used cluster analysis (K-means procedure) to account for each of the place attachment dimensions simultaneously. Cluster analysis allowed for the identification of homogenous segments (Milligan & Cooper, 1987) of respondents based on their scores for the four place attachment dimensions. The advantage of this method is that the categories are based on the respondents' responses rather than being assigned *a priori* by the researcher. An accompanying ANOVA (with accompanying Tukey and Tamhane's T2 post hoc tests) was used to determine whether there were differences between the clusters on their mean place attachment dimension scores.

To determine how the recreational visitors' attachment to GBRMP was reflected in their depictions of why the setting was meaningful, I first conducted a set of ANOVAs that compared the mean score of importance of each of the 10 place identity themes between the four levels of attachment intensity identified in the cluster analysis.

Although the ANOVAs provided insight as to how the importance of the context described in the place meaning themes varied across the four levels of attachment intensity, it did not provide insight into how certain sets of the meanings may be associated with the varying levels of attachment intensity. Hence, I conducted a multinomial logistic regression to identify how certain aspects of the context depicted in the respondents' place meanings were combined to reflect in their attachment to the GBRMP. Based on the literature suggesting that people ascribe meanings to a place and then become attached to those meanings (Milligan, 1998), the independent variables used were the ten constructed variables representing each of the ten place meaning themes. The dependent variable used was the respondent's place attachment intensity group that resulted from the cluster analysis of the four dimensions of place attachment. To assess the adequacy of the regression model, I calculated its classification accuracy, *chi-square statistic*, and Nagelkerke pseudo *R-square*.

## Results

I used a sequential exploratory mixed-method design (Hanson et al., 2005) to explore how recreational visitors' attachment to the GBRMP is reflected in their depictions of why the resource is meaningful. The meanings that emerged from *Phase I* of the investigation were used to create several survey items. The importance that respondents indicated on each of these items was analyzed along with their responses to a place attachment scale to connect the context of the setting with the indicators of attachment intensity. The results of each phase follow.

### *Phase I—Key Informant Interviews*

During my interviews, the informants identified a favorite or special place within the GBRMP, described the physical characteristics of the setting, and explained the meanings they ascribed to these places. Coding of the transcripts of the informants' narratives revealed over 30 unique ideas. Using constant comparison to identify similarities and distinctions, ten themes emerged from these data. The themes were: *aesthetic beauty*; *lack of built infrastructure/pristine environment*; *the abundance and diversity of coral and other wildlife*; *a unique natural resource*; *facilitation of desired recreation activity*; *safety and accessibility*; *curiosity and exploration*; *a sense of connection to the natural world*; *escape from the everyday*; and *experiences with family and friends*.

*Aesthetic beauty.* The first several place meaning themes that I identified were defined, in part, by the informants' interaction with the physical attributes of the setting. One theme that arose in all the interviews was the *aesthetic beauty* of the land and seascapes within the GBRMP. Many cited the clarity and color of the water, the sandy beaches, the beauty of the coral reef structures, the openness of the views, and/or the sounds of the waves and wildlife. The participants used several common descriptors to illustrate the visual appeal of the places they discussed, such as “amazing,” “fabulous,” and “spectacular.”

*Lack of built infrastructure/pristine environment.* In addition to the *aesthetic beauty* of places in the GBRMP, many participants highlighted the lack of a built environment suggesting that the setting was pristine. Since the key informants often

linked the lack of built structures with descriptors such as undeveloped, pristine, wilderness, et cetera, the theme that emerged from these ideas was labeled *lack of built infrastructure/pristine environment*. For the informants, meanings that were included in this theme were constructed from a combination of cognitive (e.g., the categorization of similarities and differences between a specific setting in the marine park and other settings in the informants' lives) and emotional (e.g., the enjoyment of solitude) responses to interacting with the physical attributes of the setting. There was also evidence that socially constructed symbols, such as the term "wilderness," had a shared definition among the various informants which shaped the meanings the individuals ascribed to places in the GBRMP.

*Abundance and diversity of coral and other wildlife.* Besides the inanimate objects that comprised the setting, the informants also indicated that their interaction with wildlife contributed to the creation of meanings that they ascribed to the setting they identified. Several people expressed their excitement toward the wildlife by quickly listing all the species with which they had come into contact. Although the informants each mentioned a range of wildlife, all of them specifically identified the quantity and diversity of coral as important features.

*Unique natural resource.* Another theme that emerged from the informant statements was that settings in the GBRMP represent a *unique natural resource*. Many of the informants made it clear that they thought the Marine Park contained a unique natural resource by contrasting it with other marine environments around the world. In reference to the abundance of wildlife one respondent declared, "You don't get that

anywhere else.” She was implying that there is no other place on land or in the water that contains the abundance of wildlife that one encounters in the GBRMP. Others described places in the GBRMP in terms of the distinction between marine and terrestrial environments. Both of these sentiments were shared by several informants when describing the uniqueness of the reef as important to why they valued places in the GBRMP.

*Facilitation of desired recreation activity.* In addition to the landscapes/seascapes and wildlife, the informants also discussed how the attributes of their favorite setting in the GBRMP facilitated the type of recreational activities in which they participated. Several people spoke about how the abundance and diversity of fish was good for angling. Similarly, the “yachties” noted that the reef provided relatively smooth waters along the coast which made sailing enjoyable. The recreational divers who participated in this study expressed that their favorite places within the GBRMP had several attributes that made SCUBA diving fun and exciting.

*Safety and accessibility.* The first several place meaning themes that emerged from the informants’ narratives involved the physical attributes of the setting. The next set of themes included less discussion of physical attributes and more description of the thoughts and feelings the informants associated with their favorite places.

Many of the key informants indicated that the reef was safe and accessible. Although the *safety and accessibility* theme was manifested in different ways for each informant, it was largely characterized by the fact that most of the places visited by the informants lie between the coast and the outer reef. Thus, recreational visitors are

protected from the open ocean. In addition to the natural protection provided by the reef, several informants also relayed that the proximity of infrastructure (e.g., marinas and the Australian Volunteer Coast Guard) contributed to their sense of safety. Inseparable from safety, in many of the informants' statements, was the ease of access to their favorite places in the GBRMP. The informants considered safety and accessibility as linked because both ideas are strongly based on the proximity of the Great Barrier Reef to shore and the well-developed infrastructure that provides a sense of safety and also helps make places in the GBRMP accessible.

*Curiosity and exploration.* Besides a sense of safety and accessibility, most of the key informants discussed the enjoyment they attained from observing and learning while visiting the places they identified. Other informants spoke about exploring underwater reef structures and islands or identifying new routes to use while sailing. In general, the informants' narratives emphasized the importance of interacting with the environment through observation and discovery. I labeled the theme that emerged from these ideas *curiosity and exploration*.

*Connection to the natural world.* Almost all of the informants described a sense of connection with the natural environment while they recreated in the GBRMP. Their descriptions of how this meaning manifested itself varied, but generally were characterized in one of the following ways. Many said that being in the place they described gave them a sense of immersion in the natural world. Several indicated that recreating in certain places in the GBRMP gave them an understanding of the interconnectedness of ecosystems. Similarly, others expressed gaining an appreciation



for how people impact the reef system while being a part of it. Regardless of the reasoning, experiencing a connection to the natural world was an important meaning that many of the informants ascribed to places in the GBRMP.

*Escape from the everyday.* One of the most prevalent meanings ascribed to the places in the GBRMP by the key informants was that visiting the marine park allowed them to escape from their everyday lives. Evidence of this meaning was given by every informant and it was usually mentioned more than once by each informant throughout the interview. For many of the informants, solitude was essential to the feeling that recreating in the GBRMP allowed him/her to escape from his/her everyday life. In addition to ‘escape,’ they used such words and phrases as “freedom,” “isolation,” “not having to answer the phone,” “going to another space,” “re-create,” and “relaxed” to express that visiting the GBRMP provided an escape from the everyday.

*Family and friends.* The final theme that emerged from the key informant interviews concerned the participants’ social interaction with *family and friends*. The informants’ narratives used important places in the GBRMP as backdrops for memories of enjoyable experiences with family, coming of age stories, and passing family stories and knowledge to younger generations. Besides their families, the informants also discussed how they interacted with friends in the places they identified in the GBRMP. The informants spoke about the joy of sharing the place with others and about how the interaction with others improved (or hindered) their experiences. Beyond demonstrating the importance of family and friends to the meanings these informants ascribed to their respective settings, the informants’ narratives also illustrated the relationship between

place meanings and individual identity. When one informant told me that he brought his children to his favorite place “to partly understand why I do the job I do and why I was passionate about it” it was clear that he thought the place reflected the values he holds and parts of his personal and professional identity.

In sum, ten themes emerged from the informants’ narratives about the meanings they ascribed to places in the GBRMP that they identified as important or special to them. Thirty-four statements that represented the ten themes that emerged from the *Phase I* data were included in the survey instrument utilized during the second phase of this study.

#### *Phase II—Survey of Recreational Visitors*

The results of the CFAs of the 34 place meaning items into the ten place meaning themes that emerged from the key informant interviews and the place attachment scale indicated that both models were a good fit for these data (Tables 1 & 2). The fit indices for the place meaning model were all within acceptable range (RMSEA = .08, NFI = .94, NNFI = .97, & CFI = .97), as were the fit indices of the place attachment model (RMSEA = .08, NFI = .98, NNFI = .98, & CFI = .99). Most of the place meaning themes (factors) had an acceptable internal consistency statistic ( $\alpha \geq .70$ ), however four themes had lower values ( $\alpha = .58-.67$ ). As suggested by Cortina (1993) and Gay (1991), who indicated that it was acceptable retain factors with alpha values greater than .6 when working with new scales or factors with a low number of items, I decided to retain all the themes. The internal consistency for each place attachment dimension was also acceptable ( $\alpha = .70-.94$ ). After completing the CFAs, I used the results to compute

composite variables for each of the ten place meaning themes and each place attachment dimension.

The place meaning descriptives presented in Table 2 indicate that the respondents rated the importance of each of the place meanings as at least moderately important to them. Respondents indicated that the *aesthetic beauty* ( $M = 4.20$ ;  $SD = .88$ ) and the *unique natural resource* ( $M = 4.20$ ;  $SD = .81$ ) themes had the greatest importance, followed by *escape from the everyday* ( $M = 4.11$ ;  $SD = .83$ ). The mean of the *lack of built infrastructure/pristine environment* theme was 4.01 ( $SD = .81$ ). Slightly lower levels of importance were reported for the *abundance and diversity of coral and other wildlife* ( $M = 3.97$ ;  $SD = .99$ ), the *facilitation of desired recreation activity* ( $M = 3.87$ ;  $SD = .98$ ), and the *family and friends* ( $M = 3.64$ ;  $SD = .86$ ) themes. The respondents indicated that the place meanings with the lowest importance were *safety and accessibility* ( $M = 3.59$ ;  $SD = 1.07$ ), *curiosity and exploration* ( $M = 3.59$ ;  $SD = .97$ ), and *connection to the natural world* ( $M = 3.49$ ;  $SD = 1.16$ ).

Table 3 contains the descriptive statistics of the place attachment dimensions. The means for each place attachment dimensions indicated that the respondents, as a whole, were moderately attached to places in the GBRMP. Respondents scored highest on the social bonding dimension ( $M = 3.79$ ;  $SD = .89$ ), followed by affective attachment ( $M = 3.73$ ;  $SD = .89$ ), place dependence ( $M = 3.58$ ;  $SD = .97$ ), and finally place identity ( $M = 3.11$ ;  $SD = 1.04$ ).

**Table 2***Place meaning importance - item means, factor loadings, and reliabilities*

Factored theme (Item)	Item mean	Factor loading	Std. error	Factor mean ( <i>SD</i> )	Cronbach's alpha
<b>Aesthetic beauty*</b>				4.20 (.88)	.81
The seascapes and landscapes are beautiful	4.42	.72	.07		
I enjoy the sounds of the waves and wildlife	4.09	.84	.09		
The tropical beaches are special	4.08	.74	.09		
<b>Lack of built infrastructure/pristine environment</b>				4.01 (.81)	.82
The reef appears healthy	4.31	.58	.08		
It is a pristine environment	4.34	.69	.08		
The vastness of the GBR around my place puts things into perspective	3.79	.79	.09		
The place provides a wilderness experience	3.98	.85	.08		
There is little evidence of human built structures	3.61	.52	.11		
<b>Abundance and diversity of coral and other wildlife</b>				3.97 (.99)	.67
The amount, diversity, and structure of the coral is unique	4.03	.67	.09		
The numbers and diversity in types of wildlife	3.91	.75	.09		
<b>Unique natural resource</b>				4.20 (.81)	.80
It is important because it is part of a World Heritage Area	3.85	.49	.12		
The GBR is a natural wonder	4.57	.78	.07		
The place has a unique set of corals, other wildlife, and water quality	4.13	.77	.08		
It has inherent value because it is part of the natural environment	4.26	.81	.08		
<b>Facilitation of desired recreation activity</b>				3.87 (.98)	.63
There are a lot of different things to do	3.56	.65	.10		
It is a good place for the kind(s) of recreation I enjoy	4.18	.72	.09		
<b>Safety and accessibility</b>				3.59 (1.07)	.65
It is easily accessible	3.60	.66	.11		
It is a safe place to be	3.59	.74	.11		

**Table 2 continued**

Factored theme (Item)	Item mean	Factor loading	Std. error	Factor mean ( <i>SD</i> )	Cronbach's alpha
<b>Curiosity and exploration*</b>				3.59 (.97)	.58
The area provides a sense of exploration and curiosity	4.09	.70	.09		
It challenges me to be self-reliant	3.11	.58	.11		
<b>Connection to the natural world</b>				3.49	.71
I feel like I am a part of the place	3.43	.78	.11		
I feel connected to the natural world	3.56	.72	.11		
<b>Escape from the everyday*</b>				4.11 (.83)	.82
The place makes me feel calm, tranquil, and/or peaceful	4.22	.67	.09		
Being there provides escape from everyday life	4.24	.84	.08		
I feel happy or good or a sense of pleasure	4.31	.90	.08		
I can be alone or I feel a sense of solitude	3.65	.60	.10		
<b>Family and friends</b>				3.64 (.86)	.71
I enjoy being there with family and friends	4.38	.61	.09		
I feel a sense of connection to my ancestors	2.40	.46	.12		
I want to pass my family's knowledge about the place to younger Generations	3.83	.59	.11		
Being there makes me feel like I am part of a lifestyle that is unique to the area	3.94	.76	.09		

Means based on a 5-point scale: 1=only slightly important; 2=somewhat important, 3=moderately important; 4=fairly important; 5=extremely important

\*One item each from the *aesthetic beauty*, *escape from the everyday* and *curiosity and exploration* themes were removed due to low factor loadings and cross-loading.

Model:  $X^2=608.30$ ,  $df=360$ ;  $RMSEA=.08$ ;  $NFI=.94$ ;  $NNFI=.97$ ;  $CFI=.97$

I then used the factor solution that emerged from the CFA of the place attachment scale to classify the respondents into homogenous groups based on their mean score for each. This analysis revealed four groups (Table 4). The first cluster ( $n = 35$ ), labeled “high attachment,” consisted of respondents who scored high on all four place attachment dimensions (place dependence,  $M = 4.64$ ,  $SD = .47$ ; place identity,  $M = 4.43$ ,  $SD = .56$ ; affective attachment,  $M = 4.81$ ,  $SD = .31$ ; social bonding,  $M = 4.69$ ,  $SD = .51$ ). The “moderate attachment” ( $n=121$ ) cluster had slightly lower means on each dimension (place dependence,  $M = 3.83$ ,  $SD = .52$ ; place identity,  $M = 3.08$ ,  $SD = .60$ ; affective attachment,  $M = 3.86$ ,  $SD = .44$ ; social bonding,  $M = 3.90$ ,  $SD = .55$ ). The third cluster, “low attachment” ( $n = 88$ ), scored below neutral on the place identity ( $M = 2.83$ ,  $SD = .57$ ) and place dependence ( $M = 2.57$ ,  $SD = .65$ ) dimensions, but above neutral on the affective attachment ( $M = 3.20$ ,  $SD = .38$ ) and social bonding dimensions ( $M = 3.34$ ,  $SD = .56$ ). The “not attached” ( $n=23$ ) cluster had markedly lower means across all dimensions (place dependence,  $M = 2.02$ ,  $SD = .79$ ; place identity,  $M = 1.31$ ,  $SD = .41$ ; affective attachment,  $M = 1.88$ ,  $SD = .71$ ; social bonding,  $M = 2.14$ ,  $SD = .92$ ) indicating that that these respondents were not bonded to the setting. The ANOVA results confirmed that the cluster analysis produced groups with unique sets of the profiles, regarding the intensity of the respondents’ attachment to the GBRMP. The means of all of the place attachment dimensions differed between clusters (place dependence,  $F_{df=3,297} = 212.25$ ,  $p < .01$ ; place identity,  $F_{df=3,297} = 208.63$ ,  $p < .01$ ; affective attachment,  $F_{df=3,297} = 345.95$ ,  $p < .01$ ; social bonding,  $F_{df=3,297} = 134.75$ ,  $p < .01$ ).

**Table 3***Place attachment scale - item means, factor loadings, and reliabilities*

Factored dimension (Item)	Item mean	Factor loading	Std. error	Factor mean (SD)	Cronbach's alpha
<b>Place dependence*</b>				3.58 (.97)	.70
My favorite place in the GBRMP is the best place for the recreation activities that I enjoy	3.72	.70	.06		
I can't imagine a better place for what I like to do	3.44	.77	.06		
<b>Place identity</b>				3.11 (1.04)	.94
I feel that my favorite place in the GBRMP is a part of me	3.07	.91	.05		
I identify with my favorite place in the GBRMP	3.22	.94	.05		
I feel that my identity is reflected in my favorite place in the GBRMP	2.99	.90	.05		
Visiting my favorite place in the GBRMP says a lot about who I am	3.13	.85	.05		
<b>Affective attachment*</b>				3.73 (.89)	.85
I have a strong emotional bond to my favorite place in the GBRMP	3.29	.83	.06		
I really enjoy my favorite place in the GBRMP	4.04	.73	.05		
My favorite place in the GBRMP means a lot to me	3.86	.77	.05		
<b>Social bonding*</b>				3.79 (.89)	.84
The time spent in the GBRMP allows me to bond with my family and friends	4.03	.75	.05		
I have a lot of fond memories of past experiences with family and friends in my favorite place in the GBRMP	3.61	.72	.06		
Visiting my favorite place in the GBRMP allows me to spend time with my family and friends	3.72	.73	.06		

Means based on a 5-point scale: 1=strongly disagree; 2=disagree; 3=neither agree nor disagree; 4=agree; 5=strongly agree

\*Two items from the place dependence and one item each from the affective attachment and social bonding dimensions were removed due to low factor loadings and cross-loading.

Model:  $X^2=138.02$ ,  $df=56$ ; RMSEA=.08; NFI=.98; NNFI=.98; CFI=.99

**Table 4***Results of cluster analysis and comparison of place attachment means by cluster (n=301)*

Dimension	Cluster place attachment dimension means ( <i>SD</i> )				ANOVA	
	High Attachment ( <i>n</i> =69)	Moderate Attachment ( <i>n</i> =121)	Low Attachment ( <i>n</i> =88)	Not Attached ( <i>n</i> =23)	<i>F</i> <sub>df=3,297</sub>	<i>p</i>
Place dependence	4.64 (.47)	3.83 (.52)	2.83 (.57)	2.02 (.79)	212.25	< .01
Place identity	4.43 <sup>a</sup> (.56)	3.08 (.60)	2.57 (.65)	1.31 (.41)	208.63	< .01
Affective attachment	4.81 <sup>a</sup> (.31)	3.86 (.44)	3.20 (.38)	1.88 (.71)	345.95	< .01
Social bonding	4.69 <sup>a</sup> (.51)	3.90 (.55)	3.34 (.56)	2.14 (.92)	134.75	< .01

Means based on a 5-point scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree

Post-hoc tests indicated that all means of each cluster within each place attachment dimension were significantly different from one another at  $p < .01$



After identifying groups of respondents based on their place attachment dimension scores, I used the cluster membership to investigate how the importance of the place meaning themes differed across varying levels of place attachment intensity. Table 5 contains the results of this analysis. In general, the order of level of importance for each of the attachment intensity groups was similar to that identified for the pooled sample of all respondents (Table 2). Also, the importance of all the themes was greater and significantly different across all meanings for the “high attachment” group as opposed to the other groups. The “moderate attachment” group ( $M$ s range between 3.33 and 4.17;  $SD$ s range between .83 and 1.05) had slightly lower means than “high attachment” group ( $M$ s range between 4.02 and 4.82;  $SD$ s range between .31 and .99) and shared some commonality with the “low” ( $M$ s range between 2.78 and 3.84;  $SD$ s range between .88 and 1.16) and “no attachment” ( $M$ s range between 2.02 and 3.49;  $SD$ s range between 1.07 and 1.32) groups. The only theme that varied across all for levels of attachment was *escape from the everyday* (“high attachment:”  $M=4.02$ ,  $SD=.64$ ; “moderate attachment:”  $M=3.49$ ,  $SD=.98$ ; “low attachment:”  $M=2.89$ ,  $SD=1.00$ ; “no attachment:”  $M=2.02$ ,  $SD=1.30$ ;  $F=33.97$ ,  $p\leq.001$ ). While, the *abundance and diversity of wildlife*, *unique natural resource*, and *curiosity and exploration* varied the least between the attachment intensity groups; these themes were only rated as significantly more important by respondents in the “high attachment” cluster (*abundance and diversity of wildlife*:  $M=4.39$ ,  $SD=.84$ ,  $F=10.35$ ,  $p\leq.001$ ; *unique natural resource*:  $M=4.59$ ,  $SD=.50$ ,  $F=13.73$ ,  $p\leq.001$ ; *curiosity and exploration*:  $M=4.41$ ,  $SD=.60$ ;  $F=31.39$ ,  $p\leq.001$ ).

**Table 5***Comparison of place meaning importance scores between place attachment clusters*

Place meaning theme	Place attachment cluster means ( <i>sd</i> )				$F_{df=3, 271-294}$	<i>p</i>
	High Attachment	Moderate Attachment	Low Attachment	No Attachment		
Aesthetic beauty	4.82 (.31) <sup>a</sup>	4.17 (.85) <sup>b</sup>	3.61 (.91) <sup>c</sup>	3.48 (1.32) <sup>b, c</sup>	31.96	≤.001
Lack of built infrastructure/ pristine environment	4.51 (.46) <sup>a</sup>	3.93 (.91) <sup>b</sup>	3.49 (.88) <sup>c</sup>	2.99 (1.20) <sup>c</sup>	30.52	≤.001
Abundance and diversity of coral and other wildlife	4.39 (.84) <sup>a</sup>	3.93 (.91) <sup>b</sup>	3.58 (1.05) <sup>b</sup>	3.45 (1.34) <sup>b</sup>	10.35	≤.001
Unique natural resource	4.59 (.50) <sup>a</sup>	4.01 (.84) <sup>b</sup>	3.84 (.99) <sup>b</sup>	3.49 (1.32) <sup>b</sup>	13.73	≤.001
Facilitation of desired recreation activity	4.59 (.62) <sup>a</sup>	4.00 (.84) <sup>b</sup>	3.16 (1.04) <sup>c</sup>	2.88 (1.33) <sup>c</sup>	39.89	≤.001
Safety and accessibility	4.21 (.99) <sup>a</sup>	3.57 (1.05) <sup>b</sup>	3.22 (.99) <sup>b</sup>	2.62 (1.22) <sup>c</sup>	17.72	≤.001
Curiosity and exploration	4.41 (.60) <sup>a</sup>	3.50 (.97) <sup>b</sup>	3.16 (.89) <sup>b</sup>	2.76 (1.16) <sup>b</sup>	31.39	≤.001
Connection to the natural world	4.49 (.74) <sup>a</sup>	3.33 (1.05) <sup>b</sup>	2.78 (1.16) <sup>c</sup>	2.63 (1.07) <sup>b, c</sup>	38.83	≤.001
Escape from the everyday	4.02 (.64) <sup>a</sup>	3.49 (.98) <sup>b</sup>	2.89 (1.00) <sup>c</sup>	2.02 (1.30) <sup>d</sup>	33.97	≤.001
Family and friends	4.35 (.63) <sup>a</sup>	3.66 (.83) <sup>b</sup>	3.08 (.91) <sup>c</sup>	2.52 (1.18) <sup>c</sup>	40.72	≤.001

Means based on a 5-point scale: 1=Only slightly important; 2=Somewhat important; 3 Moderately important; 4=Fairly important; and 5=Extremely important

\* Means without different superscripts are significantly different at  $p \leq .05$

To assess whether two or more meanings depicted a setting context that was reflected in the differing attachment intensity groups, I conducted a multinomial logistic regression where the respondent's place attachment intensity cluster membership was regressed on the ten place meaning variables. Hence, each place meaning variable was entered into a regression equation for each place attachment intensity group, where the reference category was the "not attached" group. The significance of the Wald statistic indicates whether the independent variable is useful in differentiating between the categories of the dependent variable. Odds ratios ( $Exp(B)$ ) indicate the direction and relative power of the association between each of the independent variables and the dependent variable (Ott & Longnecker, 2001). Values above 1.0 indicate a positive association and values below 1.0 indicate a negative association.

The results of the logistic regression (Table 6) indicated that there was an association between certain sets of the respondents' place meanings and their membership in one of the place attachment intensity clusters ( $\chi^2_{df=30}=188.70, p\leq.001$ ; Nagelkerke pseudo  $R^2=.57$ ). The classification accuracy of the model was 63.20%, which exceeded the proportional by chance accuracy rate (32.35%) by more than the recommended 25 percent, indicating that the model fit the data well. Four place meaning themes significantly contributed to the model's ability to correctly predict each respondent's place attachment intensity cluster membership. When compared to the respondents who were members of the "not attached" cluster, place meaning themes best able to assess the likelihood that a respondent would be in the "high attachment" cluster included the *lack of built infrastructure/pristine environment* ( $Exp(B)=7.07, p\leq.02$ ) and

the *facilitation of desired recreation activity* ( $Exp(B)=2.90, p \leq .05$ ) themes. That is, the odds of being in the “high attachment” group versus the “not attached” group increased by 7 times for each unit increase in importance placed on the *lack of built infrastructure*. Likewise, for each one-unit increase in the importance of the *facilitation of desired recreation activity* theme, the odds that these respondents were members of the “high attachment” cluster versus the “not attached” cluster increased 290%. For those respondents who reported “moderate attachment” with places in the GBRMP, the meanings *lack of built infrastructure/pristine environment* ( $Exp(B)=6.36, p \leq .01$ ) and *escape from the everyday* ( $Exp(B)=4.00, p \leq .01$ ) increased the odds they would be members of this cluster versus the “not attached” respondents. However, for the moderate attachment group, as their rating of the importance of *aesthetic beauty* ( $Exp(B)=.21, p \leq .03$ ) increased by one unit there was a 79% decrease in the odds that a respondent would be a member of this group versus the “not attached” cluster. Similarly, when comparing the “low attachment” cluster to the “not attached” cluster, there was a positive association between the respondent’s importance of the *lack of built infrastructure/pristine environment* ( $Exp(B)=3.74, p \leq .04$ ) meaning and their place attachment intensity cluster membership. A negative association was identified between the *aesthetic beauty* meaning ( $Exp(B)=.16, p \leq .01$ ) and place attachment.

It is important to note that as opposed to the other significant meanings, the *aesthetic beauty* meaning increased the odds that respondents were members of the “not attached” cluster. This result appears to be counterintuitive; however the logistic regression procedure was not designed to indicate how a particular meaning is associated

**Table 6***Multinomial logistic regression analysis of place meaning themes that are associated with levels of place attachment intensity*

Place meaning theme	Place attachment intensity group versus the “not attached” group (ref.)											
	High Attachment				Moderate Attachment				Low Attachment			
	<i>Exp(B)</i>	<i>B</i>	Wald	<i>p</i>	<i>Exp(B)</i>	<i>B</i>	Wald	<i>p</i>	<i>Exp(B)</i>	<i>B</i>	Wald	<i>p</i>
Aesthetic beauty	.50	-.69	.61	.43	<b>.21</b>	<b>-1.59</b>	<b>4.74</b>	<b>.03</b>	<b>.16</b>	<b>-1.84</b>	<b>6.88</b>	<b>.01</b>
Lack of built infrastructure/ pristine environment	<b>7.07</b>	<b>1.96</b>	<b>5.89</b>	<b>.02</b>	<b>6.36</b>	<b>1.85</b>	<b>6.96</b>	<b>.01</b>	<b>3.74</b>	<b>1.32</b>	<b>4.07</b>	<b>.04</b>
Abundance and diversity of coral and other wildlife	.80	-.22	.14	.71	1.38	.32	.34	.56	1.38	.32	.35	.55
Unique natural resource	.68	-.38	.26	.68	.55	-.59	.84	.36	1.00	-.01	.01	.99
Facilitation of desired recreation activity	<b>2.90</b>	<b>1.07</b>	<b>3.76</b>	<b>.05</b>	2.37	.86	3.49	.06	.94	-.07	.02	.88
Safety and accessibility	1.30	.26	.34	.56	1.06	.06	.02	.90	1.41	.34	.65	.42
Curiosity and exploration	1.15	.14	.05	.83	.58	-.54	.91	.34	.89	-.12	.05	.82
Connection to the natural world	1.92	.65	1.86	.17	.74	-.30	.51	.47	.72	-.33	.66	.42
Escape from the everyday	2.59	.95	2.69	.10	<b>4.00</b>	<b>1.39</b>	<b>7.02</b>	<b>.01</b>	2.55	.94	3.36	.07
Family and friends	2.79	1.03	2.70	.10	1.86	.62	1.24	.27	1.42	.35	.40	.53

 $\chi^2_{df=30}=188.70, p \leq .001; Nagelkerke \text{ pseudo } R^2=.57$

with place attachment in general (in fact, as indicated in Table 5, as the importance of aesthetic beauty increases so does intensity of attachment), but rather indicates which set of variables is significant in the classification of the groups within the dependent variable. Hence, this analysis indicated that increases in the *escape from the everyday* and *lack of built infrastructure/pristine environment* themes along with a decrease in the importance of aesthetic beauty increased the odds of the respondent being a member of the “moderate attachment” group or the “low attachment” group versus the “not attached” group. Furthermore, previous research (Schroeder, 2002; Bricker & Kerstetter, 2002) has indicated that *aesthetic beauty* is a meaning that many people ascribe to setting even if they have lower bonding to the environment. This is confirmed by the results described in Table 5 which indicated that the “no attachment group” places more importance on the aesthetic beauty meaning than most of the other meanings and there was no significant difference between the importance of this meaning between the “moderate”, “low” and “no attachment” groups). Hence, because this meaning is common across attachment groups (i.e., does not differentiate between the groups) the results of the logistic regression indicated that it is the intermix of a decrease in the importance of *aesthetic beauty* and increases in the other significant meaning variables that differentiate higher levels of attachment groups from the “not attached” group.

In sum, the results of the logistic regression analysis indicated that recreational visitors’ attachment to the GBRMP is reflected in, to some degree, in the place meanings they ascribe to the setting. Four of the place meanings identified from *phase I* of this investigation were found to be influential in distinguishing between the respondents’

levels of place attachment. It is the amalgamation of sets of these four variables working in concert that differentiated between the levels of attachment to the GBRMP. Hence, although all meanings provide context for a recreational visitor's attachment to the GBRMP, there are certain sets of meanings that, as they become more or less important, change the basis of an individual's attachment to a setting.

### Discussion

The purpose of my analysis was to continue the discourse on place by exploring how recreational visitors' attachment to a marine resource is reflected in their depictions of why the resource is meaningful. My observations supported Milligan's (1998) hypothesis and provide greater understanding of Stedman's (2003a) conclusions. I extended this work by attempting to identify an exhaustive list of the place meanings recreational visitors ascribed to the GBRMP and then used survey respondents' importance levels for each meaning theme to provide context to varying levels of place attachment intensity.

Not surprisingly, the results of the ANOVA between place meanings and levels of attachment intensity suggest that all the meanings recreational visitors ascribe to the GBRMP provide context to attachment they hold for the setting. I observed that this was especially true for individuals that are highly or moderately attached. This finding suggests that all of the aspects depicted in the ten themes provide the context for their attachment. That is, the characteristics of the setting (e.g., beautiful untrammelled sea/land-scapes, wildlife, the recreation opportunities afforded, interaction with others, etc.) provide a basis for the attachment these respondents have toward places in the

GBRMP. These observations extend similar finding by Stedman's (2003a), who noted the importance of meanings related to social interaction and escape, by also suggesting that several other meanings (e.g., meanings related to wildlife, sense of safety, and uniqueness of the resource) provide context to the intensity of an individual's attachment to a place. However, my conclusions based on these observations diverge slightly from Stedman's. He concluded that place meanings mediated the relationship between the physical attributes of the setting and the intensity of attachment to that setting. I agree with Stedman that landscape attributes do matter; although these attributes are not separate from meanings, they are included in meaning. My observations (i.e., identification of the importance of themes related to wildlife, aesthetic beauty, lack of the built environment, etc.) indicate that, through social construction, place meanings not only involve the individual and their social interactions, but also interactions with the elements contained in the setting. That is, place meaning includes the individual's interpretation (formed during the individual's lived experiences) of the physical attributes of the setting; it is to the amalgamation of several meanings an individual ascribes to the setting that he/she becomes attached.

The results of the ANOVA also indicated that the context reflected in meanings associated with lower levels of intensity of attachment was limited to the amount of wildlife that makes the GBRMP unique and the personal feelings (i.e. safety and accessibility provided by the Australian infrastructure and fulfillment of their curiosity of the unique setting) the respondents had while interacting with the setting. My observation that, the variety and depth of meanings reflecting lower levels of intensity of



attachment was minimal (as opposed to higher levels of attachment) provides empirical support of Milligan's (1998) hypothesis. It seems that, "when the interaction involves a higher degree of meaning . . . the place becomes the site of place attachment" (p. 28).

The results of the logistic regression indicated that particular sets of meaning themes are important in differentiating between levels of attachment. This provides insight into how particular contexts are reflected in varying levels of attachment. For example, respondents who reported a "high attachment" to a GBRMP setting versus those who were "not attached," the *lack of built infrastructure/pristine environment* and the *facilitation of a desired recreation activity* distinguished them. The *lack of built infrastructure/pristine environment* meaning was significant in distinguishing all three attached groups from the "not attached" cluster (it was also the most influential type of meaning in the model identified by the logistic regression analysis). That is, for marine areas, this meaning is associated with whether the respondent is attached, regardless of the level of that attachment. There may be several reasons for the commonality of this meaning. As suggested by reading Tuan (1977) and Low and Altman (1992), a likely explanation is that the importance of an untrammelled setting may be shared among most recreational visitors through the use of common symbols (i.e., the labeling of the GBRMP as "wilderness" or a "marine park") and through similar experiences in the GBRMP.

Providing context and empirical support for several authors (e.g., Moore & Graefe, 1994; Bricker & Kerstetter, 2000; Hammitt, Backlund, & Bixler, 2004), who have indicated a relationship between recreational activity (type and amount of

participation) and an increase in the recreational users intensity of attachment, I also observed this relationship. For example, among “high attachment” respondents, the appropriateness of the setting for the types of recreational activities the respondents enjoyed was a meaning that distinguished them from respondents who were “not attached” to the GBRMP. It is possible that the settings’ facilitation of a desired recreational activity may have encouraged these respondents to recreate in the GBRMP more often, thus increasing the respondents’ interaction with the setting. In turn, the increased interaction with the pristine environment of the GBRMP fostered the development of higher levels of attachment to the place. Furthermore, these meanings may be significant for the “high attachment” group because they are logically related. That is, the undeveloped landscapes and seascapes may enhance or allow for several types of recreation that are less possible in built environments (e.g., kite boarding, sailing, etc.). Hence, those who enjoy these types of activities may have an increased level of interacting with the setting that may lead to an increased level of attachment to the setting.

The respondents in the “moderate attachment” group were also differentiated from the “not attached” cluster by the *lack of built infrastructure/pristine environment* meaning. Additionally, the *escape from the every day* and the *aesthetic beauty* meanings were significant in the model. From the key informant interviews I learned that solitude was an important aspect of the *escape from the everyday* meaning for most informants. This is similar to meanings of privacy identified by Manzo (2005) and the ability to get away from the stress of everyday life (Stedman, 2003a). From the interviews and survey

responses, I observed that the participants in the present study may be attached to places in the GBRMP because they value the ability to avoid the stressors present in their daily lives. The stark difference between the built environment and the undeveloped settings of most of the GBRMP reinforced the respondents' perception that the marine park offers a place to relax and re-create themselves.

As described, three meanings were positively associated with the varying levels of place attachment: *lack of built infrastructure/pristine environment*; *facilitation of a desired recreation activity*, and *escape from the everyday*. These three themes may differentiate between the levels of place attachment intensity because there is a common thread tying them together in the lived experiences of recreational visitors. All three meanings can express and/or confirm the recreational visitor's self-identity in a similar way. As Manzo (2005) suggested, meanings allow individuals to express their identity, and people in turn become attached to places that express and/or confirm this identity (Knez, 2005). It may be that the combination of: a) the shared definition of wilderness (i.e., a pristine natural environment that provides the individual with challenges to overcome) in the *lack of built infrastructure/pristine environment* theme; b) the type of recreation activity a visitor participates in, and c) the contrast between the settings in which the individual lives and works with the marine setting as expressed in the *escape from the everyday* meaning allows them to express/confirm a desired identity. This identity may be partially characterized as someone who enjoys outdoor recreation in undeveloped settings that provide challenges and are a contrast to the settings in which the individual usually finds themselves.

Finally, the results of the logistic regression, that sets of meanings differentiated each place attachment intensity group indicates that the type of meaning(s), the strength of importance of the meaning to the recreational visitor, and the combination of different meaning types contributes to different intensities of place attachment among recreational visitors. In other words, aspects of the context and the recreational visitor's lived experiences are reflected in their attachment to the marine setting. To confirm this conclusion, future research should examine the way in which place meanings provide information on how attachment to a resource is reflected in the setting context (both the physical attributes of the setting and the visitor's lived experiences) in various settings and among a wide range of user groups.

### Conclusion

Identifying the place meanings a recreational visitor ascribes to a resource provides insight into the context surrounding their place attachment to the resource. Investigating place in this way will allow researchers and managers to better understand how the values, thoughts, and beliefs recreational visitors ascribe to a setting affect their feelings (attachment) toward the setting. This information may shed light on the attitudes different types of user groups hold toward management practices, impacts on the health of the resource, and willingness to engage in activities that improve the resource. Knowledge of meaning context and attachment intensity may be used to prime environmental education and conservation messages. However, before this can be done, further research is needed to expand on the findings of this investigation in different

settings and among different types of stakeholders, as well as to establish the relationships between place meanings and the management constructs mentioned.

CHAPTER IV  
ENVIRONMENTAL WORLD VIEW, PLACE ATTACHMENT, AND ATTITUDES  
TOWARD ENVIRONMENTAL IMPACTS IN A MARINE ENVIRONMENT:  
THE CASE OF THE GREAT BARRIER REEF MARINE PARK

Recently, the World Conservation Union (WCU) added several types of coral to its threatened species list (IUCN, 2007). Moreover, Wilkinson (2004) reported “that 24% of the world’s reefs are under imminent risk of collapse through human pressure; and a further 26% are under a longer term threat of collapse” (p.7). While the WCU cited climate change and coral bleaching as the most prominent threats to coral reefs, many other anthropogenic activities impact reefs. Human activities, both on shore (e.g., development for agriculture and urban purposes increases harmful runoff) and in the water (e.g., over-fishing, shipping, and recreational uses) can negatively impact the health of a marine ecosystem.

The largest reef ecosystem, which is also the Earth’s largest natural feature, is the Great Barrier Reef (GBR). The reef stretches more than 2,300 km along the northeast coast of Australia. The GBR provides habitat for thousands of species of fish, birds, mammals, reptiles, and plant life (CRC, 2004). Beyond the reef’s inherent value, the biodiversity is important for several of the ecosystem services it provides. For example, the GBR plays an integral role in moving nutrients from coastal areas to open-ocean fisheries, which are a source of food and several pharmaceuticals. Furthermore, the rich diversity of the GBR attracts millions of visitors each year to go SCUBA diving or

snorkeling, participate in recreational fishing, or learn about this natural wonder (Hinrichsen, 1997).

The task of protecting this resource falls to the managers of the Great Barrier Reef Marine Park (a World Heritage Area, managed by the Great Barrier Reef Marine Park Authority (GBRMPA) that includes most of the GBR). However, due to the many complex decisions that have to be made, protected area managers cannot manage the reef without the support of the public (i.e., concerned stakeholder groups). As Agardy (2004) suggested, managers must resist oversimplifying the issues of impacts on reefs. Instead managers need to develop a better understanding of the human dimensions of managing marine environments (Rouphael & Inglis, 2002). Through an understanding of stakeholders' attitudes toward the resource and toward theirs and others' actions that affect the health of reef ecosystems, managers can work with stakeholders to design strategies that protect the GBR.

The GBRMPA has identified several stakeholder groups that it engages in the decision making process. These include commercial fishing interests, shipping industry representatives, tourism industry managers, and recreational visitors, to name a few. All stakeholder groups should be engaged; however recreational visitors (i.e., local residents and tourists who use the reef for a recreational activity) are a particularly important group because of their numbers (7 million per year) and their contribution to the local and national economy (over a billion dollars annually). Hence, information about the recreational visitors' views concerning the GBR is needed. Through an increased knowledge of this group's thoughts and feelings toward the negative impacts on the

GBR, managers will gain an understanding of the recreational visitors' attitudes toward the GBR.

One way to understand the attitudes recreational visitors have toward a particular environment is to examine the meanings they ascribe to places in the GBR. Place meanings are an individual's cognitions and evaluative beliefs concerning a setting that reflect the value and significance of the setting (Stedman, 2002). Because place meanings are an amalgamation of social, psychological, and cultural interpretations, they have a dynamic nature that is difficult to study. One way resource management researchers have sought to quantitatively explore the array and salience of the meanings people ascribe to the physical world is through the concept of place attachment (Altman & Low, 1992).

Place attachment is "the extent to which an individual values or identifies with a particular environmental setting" (Kyle, Graefe, Manning, & Bacon, 2003, p. 250). Past research has indicated that those who have strong bonds to natural settings are more inclined to act as resource stewards (Stedman, 2002; Vaske & Kobrin, 2001). However, there has been little work that provides insight about attachment to marine environments and individuals' attitudes toward human impacts and protection activities in marine settings. Research conducted in North American terrestrial settings has illustrated that there is an association between the attachment an individual has with a setting, the effects of human activity on the ecosystem, and the individual's attitudes towards protecting the resource (Payton, Fulton, & Anderson, 2005; Stedman, 2003a, 2003b). However, the exact relationships between these constructs remain unclear. This area



needs attention because insight of the meanings stakeholders ascribe to setting (via a measure of their intensity of attachment) can aid managers in the decision making process. Managers can use the stakeholder groups' varying levels of intensity of attachment to inform their understanding of the group members' perception of resource conditions (Kyle, Graefe, Manning, & Bacon, 2004) and management actions that affect the resource. This knowledge may suggest to managers new ways to encourage recreational visitors to protect or improve the health of the reef ecosystem. For example, managers may highlight sources (i.e., place meanings) of attachment in their messages to recreational users about what may be done to reduce the impact of their own and others actions.

#### Literature Review

Perceptions of impacts on the environment and place attachment have received considerable attention in the resource management literature for over two decades. However, there have been only a handful of studies that have addressed the potential of a relationship between these constructs; none of which have been conducted in marine environments. Moreover, most of these studies have not attempted to determine where place attachment fits into a framework explaining attitudes toward human impacts on the environment.

#### *Attitudes toward Environmental Impacts*

Several authors have used Fishbein and Ajzen's Theory of Reasoned Action (1975) and Ajzen's Theory of Planned Behavior (1985) to explain an individual's attitude toward impacts and intention to reduce those impacts on the environment

(Monroe, 2003). Other frameworks, such as Hungerford and Volk's Environmental Citizenship Behavior model (1990), are based on educational research. These models suggest that perceptions of impacts are based on environmental knowledge. Most of these frameworks fail to account for the individual's attitudes toward the environment prior to perceiving the impact. A notable exception was suggested by Stern, Kalof, Dietz, and Guggano (1995) in their Value-Belief-Norm Theory of Environmentalism. Their model suggests that an individual's values, social interaction, and knowledge about the environment inform the creation of an individual's environmental world view (EWV).

EWV have been conceived as general values and attitudes toward the environment. EWV has been operationalized as two dimensions: anthropocentric and biocentric (Absher, Vaske, & Bright, In press; Vaske & Donnelly, 1999). These dimensions form the two ends of the spectrum on which an individual's EWV can be identified. An anthropocentric view represents a human-centered view of the nonhuman world where human values and experience are paramount and nature's only value lies in what it can produce for human society. In contrast, a biocentric view is a nature-centered approach that espouses that all forms of life are equally valuable and that people are not the center of existence. According to this view, nature has inherent and utilitarian values (Eckersley, 1992).

Stern et al. (1995) hypothesized that an individual's EWV influences his/her attitudes toward place specific environmental impacts. The authors suggested measuring EWV through Dunlap, Van Liere, Mertig, Cation, and Howell's (1992) revised New

Ecological Paradigm (NEP). The NEP is based on the understanding that human survival is dependent on the health of the environment.

Several studies have found empirical support for a relationship between EWV and attitudes toward impacts on the environment (Nilsson, von Borgstede, & Biel, 2004; Steg, Dreijerink, & Abrahamse, 2005). However, Stern et al.'s conceptualization of this relationship has its critics. Schultz, Shriver, Tabanico, and Khazian (2004) suggested that one of the limitations is that it measures general attitudes toward the environment, but does not include a construct that represents the relationship between the individual and a specific setting within the environment. Schultz et al. contended that a worldview is too general of a concept to use alone and suggested that a measure that connects the individual to a specific environment is also needed. This criticism is supported by Steg et al.'s finding that the more specific the attitude object (e.g., a specific setting versus the environment in general), the better the model predicted an individual's attitude toward the health of the ecosystem. This criticism of VBN is important because it suggests that the VBN model may be improved by including an additional construct in the model that indicates an individual's thoughts concerning the specific setting of interest, prior their attitude concerning impacts on the environment. Schultz et al. suggested that this construct should be a measure of the relationship between an individual and the specific setting of concern within the larger ecosystem. Hence, I propose that the concept of place attachment may be useful in bridging the gap between EWV and attitudes toward impacts on the environment.

### *Place Attachment*

Tuan (1977) suggested that an unknown physical setting is a “blank space” that only becomes a “place” as it is endowed with meanings through lived experiences. Hence, to understand the relationship between recreational visitors’ thoughts and feelings about the reef and their attitudes toward human impacts, it is worthwhile to examine the varying place meanings people ascribe to different settings. These meanings represent an individual’s cognitions and evaluative beliefs concerning a setting that reflect the value and significance of the setting (Stedman, 2002). Meanings are often assigned to important attributes in a setting that include both the physical characteristics of the setting and the social interaction that is experienced there (Eisenhauer, Krannich, & Blahna, 2000; Kyle & Chick, 2007). Because place meanings are an amalgamation of social, psychological, and cultural interpretations, they have a dynamic nature that is difficult to study. One way resource management researchers have sought to quantitatively explore the array and salience of the meanings people ascribe to the physical world is through the concept of place attachment (Altman & Low, 1992).

Place attachment is “the extent to which an individual values or identifies with a particular environmental setting” (Kyle et al., 2003, p. 250). The object of this attachment are the meanings (as expressed through the use of shared symbols, such as language) the individual ascribes to the setting, not the physical attributes of the setting (Stedman, 2002). Research pertaining to place attachment has focused on developing scales that indicate levels of intensity of attachment (Stedman, 2002). In this regard, Williams, Patterson, Roggenbuck, and Watson (1992) suggested a two-dimensional

scale composed of place identity and place dependence. Place identity refers to the cognitive connection with the setting which is a substructure of the concept of self-identification (Proshansky, 1978). Place dependence has been conceived of as the functional utility of a setting in providing for achievement of a certain goal (Stokols & Shumaker, 1981). Other researchers have suggested additional dimensions, including familiarity, belongingness, social bonding, and rootedness (Bricker & Kerstetter, 2000; Hammitt, Backlund, & Bixler, 2004; Kyle, Graefe, & Manning, 2005).

The place attachment model that I used in this investigation was developed by Kyle, Mowen, and Tarrant (2004). This scale expanded the conceptualization of place attachment (i.e., place attachment as composed of place identity and place dependence) by also including an affective dimension and a social dimension. From this, they developed a four-dimensional model of place attachment consisting of place identity, place dependence, affective attachment, and social bonding. The conceptualizations of place identity and place dependence were carried over from Proshansky (1978) and Stokols and Shumaker (1981), respectively. Affective attachment consists of the emotional bonds to a place that are formed by interaction with the setting and others (Milligan, 1998; Jorgenson & Stedman, 2001). Empirical support for affective attachment has been prolific. For example, Bricker and Kerstetter (2000) observed that affective attachment among river rafters was high in relation to other dimensions of attachment. Others have obtained similar findings (Jorgensen & Stedman, 2001; Kyle, Mowen, & Tarrant, 2004; Moore & Graefe, 1994). Social bonding has been operationalized as the social ties to a setting that are developed through shared

experiences in the place (Mesch & Manor, 1998). Mesch and Manor observed that the more close friends and neighbors their respondents had nearby, the higher their level of attachment was. Similarly, Hidalgo and Hernández (2001) suggested that in built environments social attachments were stronger than attachments based on meanings concerning the physical attributes of the setting.

*The Logic of a EWV—Place Attachment—Attitude toward Negative Impacts Relationship*

In order to understand the potential relationship between a recreational visitor's EWV, place attachment, and attitudes toward impacts on the resource; it is necessary to look at the individual relationships between the three variables. The literature contains evidence of empirical support for the EWV—attitudes toward impact on the resource relationship for impacts related to climate change (Nilsson, von Borgstede, & Biel, 2004) and energy development (Steg, Dreijerink, & Abrahamse, 2005). However, there has been almost no work investigating the EWV—place attachment relationship. Tangentially, Stern et al. (1995) suggested that attitudes toward specific settings flow from values toward the environment in general. Hence, if one accepts Jorgensen and Stedman's (2001) argument that place attachment is an attitudinal construct, then it follows that an individual's EWV influences their place attachment. Two studies have addressed this issue. In the first, Bonaiuto, Carrus, Matorella, and Bonnes (2002) identified a positive correlation between general environmental attitudes and place attachment using data collected from residents who lived in or near two Italian national parks. In the second investigation, Wynveen et al. (2008) concluded that EWV, as measured using a variation of the NEP scale, also influences place attachment using data

collected from residents living near a national forest in southern California. The authors found that the more a resident indicated a biocentric worldview, the greater their attachment to the national forest.

The relationship between an individual's place attachment and his/her attitudes toward negative impacts on the resource has received only slightly more attention in the recreation literature (Kaltenborn, 1997; Vorkinn & Riese, 2001). However, results of related studies have illustrated that those who are attached to a place are more likely to be concerned with the environmental health of the setting that they are attached to (Farnum, Hall, & Kruger, 2005; Patterson & Williams, 1991; Smaldone, Harris, Sanyal, & Lind, 2005). For example, in their paper concerning place attachment and the environmental conditions of the Appalachian Trail, Kyle, Graefe, Manning, and Bacon (2004) observed that respondents with higher place identity scores were more critical of environmental impacts encountered along the trail. However, those with a greater level of place dependence did not appear to be as sensitive to use impacts and depreciative behavior.

Beyond influencing attitudes towards human impacts on the environment, there is empirical evidence that has indicated a relationship between place attachment and attitudes toward actions that improve the health of an ecosystem. In their study of place attachment among visitors to the Sherburn National Wildlife Refuge in Minnesota, Payton et al. (2005) found that as an individual felt more attached to the refuge, they held more positive attitudes towards engaging in behaviors they felt improved the health of the ecosystem. These intentions translated into participation with others in organized

efforts to maintain and improve the environmental characteristics of the Sherburn NWR. Furthermore, a combination of a positive place attachment and low satisfaction with the current conditions, due to human impacts on a setting, best predicted behaviors that protected the environment among residents owning property adjacent to several lakes in northern Wisconsin (Stedman, 2002, 2003a, 2003b).

Attachment to coral reefs has not received attention from place researchers. However, a couple of studies have tangentially addressed the topics. For example, Barker and Callum (2004) reported that their respondents, who enjoyed diving on a particular reef, wanted to learn how to avoid damaging the reef. Many were willing to limit the freedom of their dives by following the intervention of dive guides if this would prevent accidentally damaging the reef.

In summary, there have been several frameworks applied to understanding the attitudes individuals have toward human impacts on the environment. A criticism of this line of research is that it has not incorporated an individual's connection to the specific resource that he/she perceives as being negatively impacted. Given that the relationships between EWV and place attachment and place attachment and attitudes toward environmental impacts has received some empirical support in previous studies, it is reasonable to propose its inclusion in a framework used to understand visitors' attitudes towards human impacts on a specific environmental setting. The basis of this assertion lies in the individual's cognitive and emotional considerations of the environment in general and particular settings, in specific. More explicitly, in their article about EWV, Vaske and Donnelly (1999) posited that individuals become cognitively and emotionally



vested in their world view. Similarly, the recreation literature has indicated that the meanings an individual ascribes to a setting and the intensity of their attachment to those meanings represent the “entire group of cognitions and affective sentiments held regarding a particular geographic locale” (Farnum et al., 2005, p. 2). Hence, it is logical to suggest that an individual’s EWV is related to their attachment to a natural setting because as an individual becomes vested in their EWV, the places they choose to visit (and the elements contained within) are often reflected in their EWV (e.g., a highly biocentric person may visit more pristine settings). They then ascribe meaning to the setting and develop an attachment to the symbolic representations of those meanings. It is also logical that both an individual’s general thoughts about the environment (i.e., EWV) and the local focus of their place attachment influence the individual’s attitudes toward impacts on the setting that he/she is cognitively and emotionally connected.

Hence, the purpose of this investigation was to determine how place attachment influences the relationship, as conceived by Stern et al. (1995), between EWV and recreational visitors’ attitudes toward negative impacts on the environment. Since, the literature has empirically supported independent relationships between EWV and attitudes toward impacts, EWV and place attachment, and place attachment and attitudes toward impacts; I hypothesized that place attachment would act as a partial mediator between a recreational visitor’s EWV and their attitudes towards impacts that negatively affect the health of the GBR ecosystem (Figure 1, model a).

## Methods

I collected data via a survey instrument distributed between December, 2008 and February, 2009 to investigate the inclusion of place attachment in a model of a visitor's attitude toward impacts on the environment. I obtained the sample for this study through a telephone survey that was part of a larger investigation into the values associated with the Great Barrier Reef. The final question of the telephone survey asked respondents living in areas adjacent to the GBRMP if they were willing to participate in a follow-up written survey. If so, they were asked if they preferred to receive the written survey via email or postal mail. Seven hundred and twenty-seven (71%) of the phone survey respondents agreed to participate (none of the demographic or visitation variables were found to be significantly different between those who chose to participate and those who did not). Using a modified Dillman (2000) method the surveys were distributed from November, 2008 to February, 2009. Those who chose the email option received an email and survey four times over an eight week period, whereas those who chose the postal mail option were contacted three times, receiving: (1) a cover letter and survey; (2) a postcard reminder; and (3) a second survey and cover letter. This procedure elicited a 49% response rate with 106 of 235 responding to the email survey and 218 of 431 completing the postal survey, for a total  $n=324$ . The age range of these respondents was 18 to 82 years ( $M = 50$ ;  $SD = 13.8$ ). Just over half were male (57%). Only a few had not completed their secondary education (6%), many had attended a technical college (58%) or university (29%), and seven percent had graduate education.

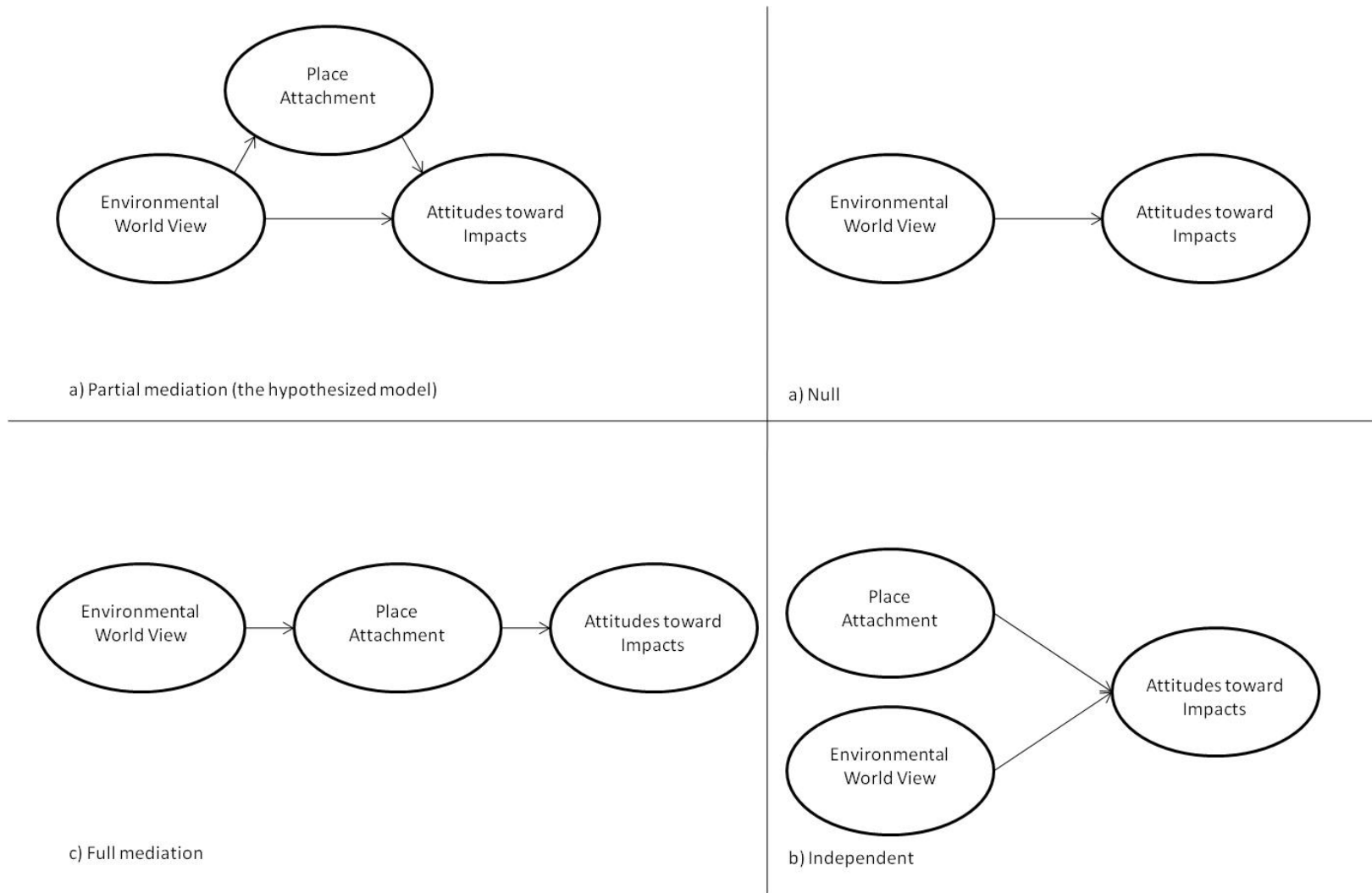


Figure 1. Potential models of the relationship between EWV, place attachment, and visitors' attitudes towards impacts

Respondents' incomes were well dispersed with about half (52%) earning less than \$60,000 (AUD) a year, almost one-third earning between \$60,000 and \$99,999, and the remaining 18 percent earning over \$100,000 a year. All respondents indicated they had visited the GBRMP to participate in a recreational activity; 76.2 % (n=229) had done so in the past year. On their last visit to the GBRMP many participated in recreational fishing (n=85, 28.3%). Others went: to walk along a beach (n=77, 25.7%); to SCUBA/snorkel (n=31, 10.3%); or to swim (n=28, 9.3%).

Relevant to the analysis conducted for this investigation, I included the 15 item NEP scale (Dunlap et al., 1992) in the survey. This scale was designed to elicit the respondent's EWV (i.e., their level of environmental concern). For each item, I asked respondents to indicate their agreement with a statement concerning the relationship between humans and the natural environment in general. They indicated their response on a five-point scale, where: 1=*Strongly disagree*; 2=*Mildly disagree*; 3=*Unsure*; 4=*Mildly agree*; and 5= *Strongly agree*.

To assess the level of the respondents' attachment to the GBRMP, I asked them to respond to 16 items I adapted from Kyle, Mowen, and Tarrant (2004). This scale is a four-dimensional model of place attachment consisting of place identity, place dependence, affective attachment, and social bonding. Respondents indicated their level of agreement with each statement on a five-point scale, where: 1=*Strongly disagree*; 2=*Disagree*; 3=*Neither agree nor disagree*; 4=*Agree*; and 5= *Strongly agree*.

Lastly, to gauge attitudes toward impacts on the GBR, I asked the respondents to reply to three items developed by Stern et al. (1995) for each of five types of

environmental impacts. The five impacts (which I identified through interviews of recreational visitors to the GBR and GBRMPA managers) I included in the survey were: water quality; over-fishing; climate change; coastal development; and tourism activities. The items asked the respondents to indicate the level of seriousness of an impact on a five-point scale, where: 1=*Very serious problem*; 3=*Somewhat of a problem*; and 5=*Won't really be a problem*. The first item asked, "Do you think the consequences of this impact will be: a very serious problem for you and your family; somewhat of a problem; or won't really be a problem for you and your family?" The second asked about the consequences of the impact on the "country as a whole" and the third item asked about the impact on "plants and animals."

I analyzed the survey data by first performing a confirmatory factor analysis (CFA) using LISREL 8.80 to assess the hypothesized two dimensional EWV model and the four-dimensional place attachment model. Furthermore, I conducted a CFA involving the attitude toward environmental impact items to verify that each set of three items loaded onto a single factor representing each of the impact types. Since the chi-square Likelihood Ratio test is sensitive to sample size, the assessment of the model was provided through several goodness-of-fit indices: root mean square error of approximation (RMSEA), comparative fit index (CFI), normed fit index (NFI), and non-normed fit index (NNFI) (Byrne, 1998). For the RMSEA, values  $\leq .80$  indicate acceptable fit (Steiger & Lind, 1980). For the CFI and NNFI values  $\geq .95$  indicate acceptable fit (Bentler and Bonnett, 1980). Also, I calculated a Cronbach's alpha for each of the factors as an indicator of the scales' internal consistency.

After completing the CFA, I tested the hypothesis that place attachment partially mediated the relationship between EWV and attitudes toward impacts. Because this investigation was the first to examine all three constructs in a single model, I also tested a null model and two other models in order to rule them out as possible competition for the hypothesized model. Hence, this analysis compared four models, where place attachment: a) was a partial mediator between EWV and attitudes toward impacts; b) was not included (null model); c) was a full mediator between the other constructs; and d) was treated as a variable independently, aside from an individual's EWV, influencing a recreational visitor's attitude toward impacts on the GBR (Figure 1).

To facilitate the determination of which model best fit these data, I first computed composite variables for the EWV dimensions. The composite variables were computed using the mean of the items that comprised each dimension. This parceling technique has several advantages. First, it allows for an easier interpretation of results because there are fewer observed variables to consider when modeling the relationships of interest (Matsunaga, 2008). Matsunaga also suggested that aggregated scores represent the distribution of the dimension better than individual items. Parceling also stabilizes parameter estimates and improves model fit (Little, Cunningham, Shahar, & Widaman, 2002). Because parceling minimizes the ability to observe the characteristics of some relationships in a model (Matsunaga, 2008), I chose only to parcel the EWV dimensions because behavior of each dimension was not the focus of my analysis of the EWV—place attachment—environmental impact relationship.

I then tested each of the models using covariance structure analysis, using Lisrel 8.80, and determined model superiority based on several of the same goodness-of-fit indices as mentioned above (Byrne, 1998) and evaluation of the model solutions (e.g. squared multiple correlations) (Perez, 1996). Additionally, I used the Akaike Information Criterion (AIC) to compare models because it accounts for parsimony and overparameterization of the model; the lowest AIC reflects the best-fitting model (Akaike, 1987). After determining which model best fit the data, I calculated the direct and indirect effects of the recreational visitors' EWV and place attachment on their attitudes toward impacts on the GBRMP environment.

## Results

### *Scale Validation*

Each of the scales used in my investigation were subjected to a CFA to demonstrate that their constituent items loaded on the factors as hypothesized. The CFA of the NEP scale illustrated that the two-dimensional model of EWV was a good fit for these data (Table 7). After I removed two items from the biocentric dimension and one item from the anthropocentric dimension, due to low factor loadings and possible cross-loading, the fit indices were all within acceptable ranges:  $RMSEA = .06$ ,  $NFI = .94$ ,  $NNFI = .96$ , and  $CFI = .97$ . The internal consistency for each dimension was also acceptable (biocentric:  $\alpha = .76$ ; anthropocentric:  $\alpha = .75$ ). The EWV item descriptives also presented in Table 7 indicated that the respondents held a slightly biocentric EWV (biocentric factor mean = 3.92,  $sd = .79$ ; anthropocentric factor mean = 2.45,  $SD = .84$ —higher scores indicated agreement with the items that comprise each dimension).

I obtained similar results from the CFA of the four-dimensional place attachment model (Table 8). I removed two items from the place dependence and one item each from the affective attachment and social bonding dimensions due to low factor loadings and cross-loading between the dimensions. The fit indices of the final model are contained in ( $RMSEA = .08$ ,  $NFI = .98$ ,  $NNFI = .98$ , and  $CFI = .99$ ). The internal consistency for each place attachment dimension was also acceptable ( $\alpha = .70 - .94$ ). The descriptive statistics indicated that the respondents had a moderate level of attachment to the GBRMP (place dependence:  $M = 3.58$ ,  $SD = .97$ ; place identity:  $M = 3.11$ ,  $SD = 1.04$ ; affective attachment:  $M = 3.73$ ,  $SD = .89$ ; social bonding:  $M = 3.79$ ,  $SD = .89$ ).

Finally, the goodness-of-fit indices for each of the environmental impacts (Table 9) indicated that the data fit the attitude toward impact scale well ( $RMSEA = .085$ ,  $NFI = .98$ ,  $NNFI = .97$ , and  $CFI = .98$ ). The Cronbach's alphas, measuring internal consistency, ranged from .86 to .94. The mean score for each impact indicated that respondents perceived impacts of coastal development ( $M = 2.12$ ,  $SD = 1.03$ ) as the most serious problem for the GBRMP. A close second and third were impacts related to climate change ( $M = 2.14$ ,  $SD = 1.21$ ) and water quality ( $M = 2.19$ ,  $SD = 1.06$ ), respectively. The respondents indicated that tourism impacts ( $M = 2.71$ ,  $SD = 1.09$ ) and over-fishing ( $M = 3.02$ ,  $SD = .99$ ) were slightly less problematic.

#### *Model Comparison*

Following the CFAs, I tested the competing models using covariance structure analysis. Initially, I assumed that covariance among exogenous concepts was freely



**Table 7***Environmental World View (NEP) scale - item means, factor loadings, and reliabilities*

Factored dimension (Item)	Item Mean	Factor loading	Std. error	Factor mean ( <i>SD</i> )	Cronbach's alpha
<b>Biocentric*</b>				3.92 (.79)	.76
B <sub>1</sub> We are approaching the limit of the number of people the earth can Support	3.78	.49	.07		
B <sub>2</sub> When humans interfere with nature it often produces disastrous results	4.13	.48	.07		
B <sub>3</sub> Humans are severely abusing the environment	3.97	.53	.07		
B <sub>4</sub> The earth is like a spaceship with very limited room and resources	3.68	.52	.06		
B <sub>5</sub> The balance of nature is very delicate and easily upset	4.23	.64	.08		
B <sub>6</sub> If things continue on their present course, we will soon experience a major ecological catastrophe	3.70	.74	.07		
<b>Anthropocentric*</b>				2.45 (.84)	.75
A <sub>1</sub> Humans have the right to modify the natural environment to suit their Needs	2.43	.55	.08		
A <sub>2</sub> Human ingenuity will ensure that we do NOT make the earth Unliveable	2.94	.46	.08		
A <sub>3</sub> The balance of nature is strong enough to cope with the impacts of modern industrial nations	2.02	.69	.06		
A <sub>4</sub> The so-called “ecological crisis” facing humankind has been greatly Exaggerated	2.76	.60	.08		
A <sub>5</sub> The earth is like a spaceship with very limited room and resources	2.08	.62	.07		
A <sub>6</sub> Humans will eventually learn enough about how nature works to be able to control it	2.49	.40	.08		

Means based on a 5-point scale: 1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree

\*Two items from the biocentric and one item from the anthropocentric dimensions were removed due to low factor loadings and cross-loading.

Model:  $\chi^2=107.31$ ,  $df=50$ ; RMSEA=.061; NFI=.94; NNFI=.96; CFI=.97

**Table 8***Place attachment scale - item means, factor loadings, and reliabilities*

Factored dimension (Item)	Item mean	Factor loading	Std. error	Factor mean (SD)	Cronbach's Alpha
<b>Place dependence*</b>				3.58 (.97)	.70
PD <sub>1</sub> My favorite place in the GBRMP is the best place for the recreation activities that I enjoy	3.72	.70	.06		
PD <sub>2</sub> I can't imagine a better place for what I like to do	3.44	.77	.06		
<b>Place identity</b>				3.11	.94
PI <sub>1</sub> I feel that my favorite place in the GBRMP is a part of me	3.07	.91	.05		
PI <sub>2</sub> I identify with my favorite place in the GBRMP	3.22	.94	.05		
PI <sub>3</sub> I feel that my identity is reflected in my favorite place in the GBRMP	2.99	.90	.05		
PI <sub>4</sub> Visiting my favorite place in the GBRMP says a lot about who I am	3.13	.85	.05		
<b>Affective attachment*</b>				3.73 (.89)	.85
AA <sub>1</sub> I have a strong emotional bond to my favorite place in the GBRMP	3.29	.83	.06		
AA <sub>2</sub> I really enjoy my favorite place in the GBRMP	4.04	.73	.05		
AA <sub>3</sub> My favorite place in the GBRMP means a lot to me	3.86	.77	.05		
<b>Social bonding*</b>				3.79 (.89)	.84
SB <sub>1</sub> The time spent on the Cleveland NF allows me to bond with my family and friends	4.03	.75	.05		
SB <sub>2</sub> I have a lot of fond memories of past experiences with family and friends	3.61	.72	.06		
SB <sub>3</sub> Visiting my favorite place in the GBRMP allows me to spend time with my family and friends	3.72	.73	.06		

Means based on a 5-point scale: 1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree

\*Two items from the place dependence and one item each from the affective attachment and social bonding dimensions were removed due to low factor loadings and cross-loading.

Model:  $\chi^2=138.02$ ,  $df=56$ ; RMSEA=.080; NFI=.98; NNFI=.98; CFI=.99

**Table 9***Attitudes toward impacts - item means, factor loadings, and reliabilities*

Impact (Item)*	Item mean	Factor loading	Standard error	Factor mean (SD)	Cronbach's Alpha
<b>Water quality</b>				2.19	.87
WQ <sub>1</sub> A problem for <u>you and your family</u> ?	2.44	.73	.06		
WQ <sub>2</sub> A problem for <u>the country as a whole</u> ?	2.22	.93	.05		
WQ <sub>3</sub> A problem for <u>other species of plants and animals</u> ?	1.90	.81	.06		
<b>Over-fishing</b>				3.02 (.99)	.86
OF <sub>1</sub> A problem for <u>you and your family</u> ?	2.23	.74	.06		
OF <sub>2</sub> A problem for <u>the country as a whole</u> ?	2.01	.92	.05		
OF <sub>3</sub> A problem for <u>other species of plants and animals</u> ?	1.82	.84	.05		
<b>Climate Change</b>				2.14	.94
CC <sub>1</sub> A problem for <u>you and your family</u> ?	2.35	.88	.06		
CC <sub>2</sub> A problem for <u>the country as a whole</u> ?	2.14	.97	.05		
CC <sub>3</sub> A problem for <u>other species of plants and animals</u> ?	1.93	.89	.05		
<b>Coastal Development</b>				2.12	.88
CD <sub>1</sub> A problem for <u>you and your family</u> ?	2.38	.80	.06		
CD <sub>2</sub> A problem for <u>the country as a whole</u> ?	2.17	.97	.05		
CD <sub>3</sub> A problem for <u>other species of plants and animals</u> ?	1.80	.79	.05		
<b>Tourism Activities</b>				2.71	.88
TA <sub>1</sub> A problem for <u>you and your family</u> ?	2.95	.80	.06		
TA <sub>2</sub> A problem for <u>the country as a whole</u> ?	2.78	.93	.05		
TA <sub>3</sub> A problem for <u>other species of plants and animals</u> ?	2.40	.83	.05		

Means based on a 5-point scale: 1 = Very serious problem; 3 = Somewhat of a problem; 5 = Won't really be a problem

\*The actual wording of each item is described in the methods section

Model:  $\chi^2=138.02$ ,  $df=56$ ; RMSEA=.085; NFI=.98; NNFI=.97; CFI=.98

estimated and the uniqueness associated with each measured variable was uncorrelated. However, the preliminary analysis indicated that model fit would be improved for the *null* model by allowing covariance among several sets of error terms. Hence, the model was re-specified allowing for a covariance in error between the following attitude toward impact variables:  $OF_3$  &  $WQ_3$ ;  $CC_1$  &  $WQ_1$ ;  $CC_3$  &  $WQ_3$ ;  $CC_3$  &  $OF_3$ ;  $CD_1$  &  $WQ_1$ ;  $CD_1$  &  $CC_1$ ;  $TA_3$  &  $CD_3$ ; and  $TA_1$  &  $OF_1$  (see Table 9). My decision to allow for covariance between these variables was based on the likelihood that the common source of error stemmed from identical item wording, and level of measurement (Byrne, Shavelson, & Muthen, 1989). Specifically, each set of three impact items were identical, except for the impact term (e.g., water quality, climate change, and coastal development) used. Hence, it is logical that some covariance in the error occurs within this set of items and not the other scales. These modifications were held across all four models in order to accurately compare each model's fit. Furthermore, I allowed for covariance between the four place attachment dimension latent variables.

**Table 10**

*Goodness-of-fit indices of competing models*

Model	$X^2$	<i>Df</i>	<i>RMSEA</i>	<i>NFI</i>	<i>NNFI</i>	<i>CFI</i>	<i>AIC</i>
Model comparison							
Null	392.55	106	.093	.96	.97	.98	448.08
Independent	892.99	351	.077	.95	.97	.97	1001.64
Full mediation	1063.38	348	.084	.94	.95	.96	1193.45
Partial mediation	887.61	350	.071	.95	.97	.97	1001.26

The goodness-of-fit indices of each model are reported in Table 10. The fit indices do not vary greatly between the models, however based on the *RMSEA* statistic all three models that included place attachment were a better fit to these data than the *null* model. In fact, the *null* model exceeded the maximum *RMSEA* value of .08 as suggested by Steiger and Lind (1980). Considering that the *partial mediation* model has the lowest chi-square value (887.61), lowest *RMSEA* (.071), and lowest *AIC* statistic (1001.26) of the remaining models, I conducted significant difference tests between the *partial mediation* model and the next best model, the independent model ( $\chi^2=892.99$ , *RMSEA* = .084, *NFI* = .95, *NNFI* = .97, *CFI* = .97). The chi-square difference test ( $\Delta\chi^2_{df=1}=5.38$ ,  $p\leq.05$ ) indicated that the *partial mediation* model fit these data better. Furthermore, a test for difference between the models' *RMSEA* values ( $\Delta RMSEA = .06$ ,  $\Delta df=1$ ,  $p\leq.01$ ) indicated that the *partial mediation* model had a significantly lower *RMSEA* value than the *independent* model (this test had a statistical power greater than .95) (Preacher & Coffman, 2006). Furthermore, a previous study has identified a relationship between EWV and place attachment (Wynveen, Kyle, Absher, & Theodori, 2008), indicating that these constructs are not independent of one another. Hence, I decided to retain the *partial mediation* model for the remainder of the analysis.

#### *EWV—Place Attachment—Attitude toward Impact Relationship*

The results of the relationships I tested in the *partial mediation* model are depicted in Figure 2. As indicated, EWV was a positive and significant predictor of each of the place attachment dimensions (place identity:  $\beta=.26$ ;  $t=4.00$ ;  $p\leq.001$ ; place dependence:  $\beta=.26$ ;  $t=3.40$ ;  $p\leq.001$ ; social bonding:  $\beta=.24$ ;  $t=3.55$ ;  $p\leq.001$ ; affective

attachment:  $\beta=.30$ ;  $t=4.29$ ;  $p\leq.001$ ) and each of the attitude toward environmental impact variables (coastal development:  $\beta=-.70$ ;  $t=-9.39$ ;  $p\leq.001$ ; tourism activities:  $\beta=-.58$ ;  $t=-7.59$ ;  $p\leq.001$ ; water quality:  $\beta=-.94$ ;  $t=-6.61$ ;  $p\leq.001$ ; over-fishing:  $\beta=-.86$ ;  $t=-9.81$ ;  $p\leq.001$ ; climate change:  $\beta=-.85$ ;  $t=-11.01$ ;  $p\leq.001$ ). Specifically, as a respondent indicated that she/he held a more biocentric EWV, their intensity of attachment as reflected in each of the place attachment dimensions increased. Also, given the scale wording, the more biocentric a respondent's EWV, the more seriously they perceived each of the impacts on the GBRMP. Only the respondents' place identity and affective attachment were significantly related to their attitudes toward any of the impacts. Place identity was negatively related to attitudes toward coastal development ( $\beta=-.48$ ;  $t=-3.49$ ;  $p\leq.001$ ) and tourism activities ( $\beta=-.70$ ;  $t=-4.13$ ;  $p\leq.001$ ). This indicates that as the respondents' place identity scores increased, they expressed greater concern over coastal development and tourism activity. However, I observed that the opposite was true for the relationships between affective attachment and both coastal development ( $\beta=.44$ ;  $t=3.18$ ;  $p\leq.001$ ) and tourism activities ( $\beta=.78$ ;  $t=4.48$ ;  $p\leq.001$ ). That is, as the respondents' emotional attachment to the GBRMP increased, their concern over coastal development and tourism activity impacts declined. The variance explained in the place attachment dimensions ranged from .07 to .09. The variance explained by EWV and the place attachment dimensions in each of the impact variables ranged between .40 and .89. Furthermore, I calculated the indirect and total effects in the model (Table 11). By way of place identity and affective attachment, EWV had a significant total effect on the respondents' attitudes toward tourism activity impacts ( $-.53$ ;  $t=-7.58$ ;  $p<.001$ ) and

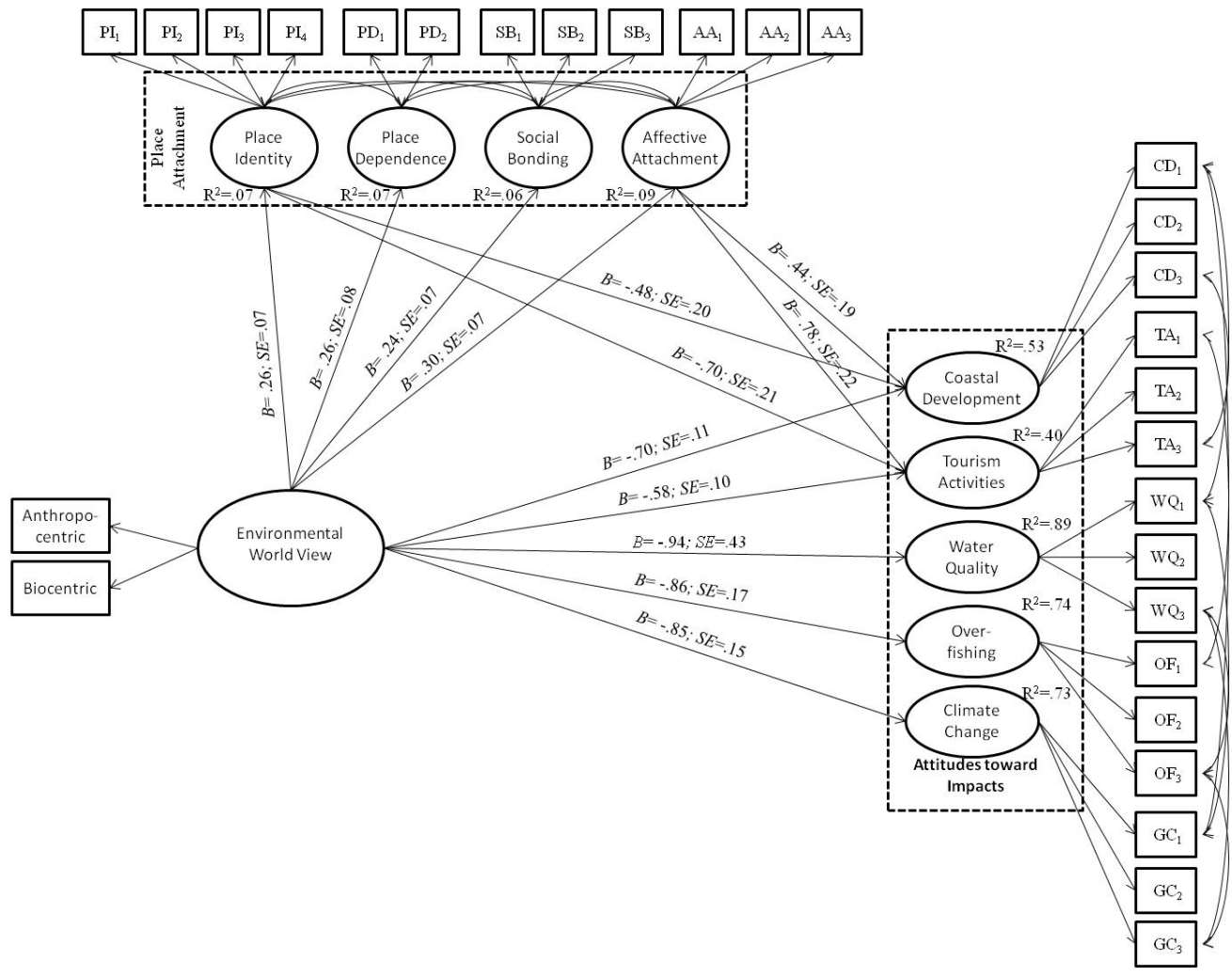


Figure 2. Final EWW—place attachment—attitude toward impact model ( $\chi^2=887.61$ ,  $RMSEA=.071$ ,  $NFI=.95$ ,  $NNFI=.97$ ,  $CFI=.97$ ;  $p \leq .001$  for all  $\beta$ s).

coastal development ( $-.70$ ;  $t=-9.72$ ;  $p<.001$ ). That is, overall, the more biocentric the respondents' EWV, the greater the severity they considered for each of the impacts. However, the indirect effects that I calculated illustrate a more complex relationship. The indirect effect of the EWV—place identity—attitudes toward tourism impacts was  $-.18$  and the EWV—affective attachment—attitudes toward tourism impacts was  $.23$ . My results indicated that the combined indirect effect of the respondents' EWV on their attitudes toward tourism impacts, via place attachment, was negative. In other words, restricted to the indirect relationship, the more biocentric an individual's EWV the greater their attachment, the less serious they perceived tourism impacts. Finally, it should be noted that the indirect effect of EWV on attitudes toward coastal development is essentially zero because of the identical magnitude, but opposite valence, of the effects through affective attachment ( $.13$ ) and place identity ( $-.13$ ).

**Table 11**

*Summary of effects*

Path	Indirect effect	Total effect	Std. error	$t^*$
EWV→Attitude toward Tourism Activity Impacts		-.53	.11	-7.58
EWV→Affective Attachment→Attitude toward Tourism Activity Impacts	.23			
EWV→Place Identity→Attitude toward Tourism Activity Impacts	-.18			
EWV→Attitude toward Coastal Development Impacts		-.70	.09	-9.72
EWV→Affective Attachment→Attitude toward Coastal Development Impacts	.13			
EWV→Place Identity→Attitude toward Coastal Development Impacts	-.13			

\*All  $t$  values are significant at the  $p<.001$  level



## Discussion

The purpose of my investigation was to determine the nature of place attachment's relationship with EWV and recreational visitors' attitudes toward negative impacts on the environment. The results supported the hypothesis that, for recreational visitors to the GBRMP, place attachment partially mediates the relationship between EWV and attitudes toward impacts on the marine environment. In the context of this study, individuals who valued nature and perceived all life as equally valuable (i.e., a biocentric EWV) were not only more sensitive to the negative effects of impacts on the ecosystem, but also valued and identified with a setting in the GBRMP (i.e., place attachment) to a greater extent than those with a more anthropocentric EWV. In regards to the effect of EWV via place attachment, individuals who held a more biocentric world view had an increased cognitive connection (i.e., place identity) to the setting, which resulted in a greater sensitivity toward impacts. However, this sensitivity was minimized by the individual's emotional bond to the setting. That is the individual's emotional connection to the setting minimized their perceptions of the negative effects of the impacts. That said, the overall relationship between EWV and attitudes toward impacts remains: the more biocentric an individual's general values and attitudes are toward the environment the greater they value and identify with natural settings and the more sensitive they are to the impacts that degrade the aspects of those settings that reflect their thoughts and feelings about the specific setting and the environment in general.

In order to better comprehend the implications of the partial mediation model as a whole, it is necessary to examine how the individual relationships within the model fit

into the existing literature. The present findings supported earlier work that indicated a positive correlation between general environmental attitudes and place attachment (Bonaiuto et al., 2002; Wynveen et al., 2008). Furthermore, my results expand upon this earlier work by indicating that EWV influences all four dimensions of place attachment, explaining between six and nine percent of the variance. Although this is a small portion of the variance, it warrants further consideration. Continued testing in varied context in conjunction with other previously identified behavioral, psychological, and cultural constructs will help refine models aimed at refining understanding of the development of place attachment.

As reported earlier, the literature does contain evidence of a relationship between an individual's place attachment and his/her attitudes toward negative impacts on the resource (Kaltenborn, 1997; Vorkinn & Riese, 2001). However, these studies have utilized only a bi-dimensional model of place attachment: place dependence and place identity (Kyle, Graefe, Manning, & Bacon, 2004; Smaldone, Harris, Sanyal, & Lind, 2005). Using a bi-dimensional model provides limited evidence as to why people are attached to place and may limit our understanding of the nuanced relationship between place attachment and attitudes towards impacts because place is a multidimensional concept (Stedman, 2003b). For example, my findings were similar to those reported by Kyle, Graefe, Manning, Bacon (2004) in their study of Appalachian Trail users. However, they used a two-dimensional place attachment model comprised of place identity and place dependence. Their results indicated that place identity was positively related to trail users' sensitivity to use impacts and place dependence was negatively

related. Both Kyle et al. and I found that as place identity increased, individuals became more concerned with impacts; however place dependence was not determined to be significant in the final model used in my analysis. In fact, I found as a recreational visitor's affective attachment increased, they rated impacts as less serious. It is possible that by including a multi-dimensional model of place attachment, the place dependence-impact relationship "fell out" and its effect on a visitor's perceptions of negative impacts were accounted for by the influence of the combination of EWV, place identity, and affective attachment. However, further testing is warranted.

The advantage I gained by using a multidimensional place attachment model allowed me to observe that as the respondent's affective attachment increased, the level of seriousness they assigned to the impacts decreased. This relationship would not have been identified in studies utilizing a bi-dimensional place attachment model because in Williams and Roggenbuck's (1989) place identity/place dependence conceptualization, place identity included aspects of affective attachment and did not distinguish between the two. By distinguishing between the place identity and affective attachment dimensions, I was able to describe the *place attachment—attitude toward impacts* relationship with greater detail. Specifically, aspects of attachment that concern the individual's expression/confirmation of their identity increase their sensitivity to impacts, but emotional attachment to a setting decreases their sensitivity to impacts. One possible explanation for the difference in the relationships identified lies in the distinction between place identity and affective attachment. That is, affective attachment is a shallower (i.e., not as central to the individual) form of attachment as compared with

place identity (Bricker & Kerstetter, 2000). Place identity is a subset of self-identity (Proshansky, 1978), thus those who identify with a setting incorporate the setting into their self-definition. In turn, they express stronger bonds with place. Furthermore, if the place is part of oneself, then the negative impacts to the setting are substantially more concerning to the individual.

Beyond the difference between place identity and affective attachment, future research needs to be conducted to determine why affective attachment was negatively related to attitudes toward impacts due to tourism activities and coastal development. A possible direction for this research could be to test whether, as a recreational visitor becomes more emotionally attached to a place in the GBRMP, they are less likely to be consciously aware of changes in the health of the resource. As often cited in the crowding and resource condition literature, this may be a result of a change in standards used as a coping mechanism to avoid being displaced from a setting to which an individual is increasingly emotionally attached (Manning, 1999). Furthermore, this relationship needs to be investigated among various types of stakeholders (both sub-groups of recreation visitors and other types of users).

Lastly, my results indicated that only two of the five impacts considered by the respondents were affected by their intensity of attachment. This raises the question: why does the type of impact matter in the relationship between place attachment and attitudes towards impacts? Two ideas come to mind. On the place attachment side, as suggested by reading Tuan (1979) and Altman and Low (1992), place attachment provides insight on why individuals value a setting. Hence, different groups of people may value

different aspects of a setting. For example, sight seers may primarily value a setting for the types of activities that are afforded for or for the setting's aesthetic beauty; whereas, a fisher may place greater value on the quantity of certain species of fish. Each aspect of the setting is affected in differently by each type of impact (Hinrichsen, 1997). Hence, one group may perceive the seriousness of an impact differently from another because aspects of the setting they value are negatively impacted to varying degrees. In this study, it appears that recreational visitor's value aspects of the GBRMP that reflect/confirm their identity (as suggested by the significance of the place identity dimension) which they perceived as negatively affected by coastal development and impacts. Future research should include items that indicate what specific aspects of the setting the respondent's perceive as being affected by particular impacts, thus allowing for a test of the relationships I suggested.

On the other hand, perceptions of impacts are affected by other phenomenon. In their study on national park visitors' perceptions of impacts, Floyd, Jang, and Noe (1997) suggested two factors that may play a role. First, he hypothesized that the primary type of activity in which the respondent participated may influence their perception of an impact (e.g., does the visitor's participation in a certain activity causes the visitor to focus on the resource?). Second, Floyd, et al. also suggested (supported by the concept of the "recency effect" (Worchel, Cooper, & Goethals, 1991)) that perception of impacts are affected by information recently gained about the resource or impact (e.g., observation of the cause of an impact or reading literature about an impact's effect on the resource). Based on Floyd, et al.'s ideas about perceptions of

impacts, future research concerning EWV, place attachment, and attitudes toward impacts should also consider the individual's activities and exposure to information about the resource and the impact.

### Conclusion

My investigation added to the recreation literature's understanding of the relationship between EWV, place attachment, and attitudes toward impacts that negatively affect the health of the resource. Specifically, my analysis indicated that the attachment a recreational visitor feels toward a specific setting, along with their EWV, contributes to understanding their attitudes toward certain impacts. Future research should continue to explore these relationships in alternative contexts and with different stakeholders. Such research will better inform managers as to how knowledge of stakeholders' attachment to the resource can be incorporated in their understanding of the concerns and attitudes of various stakeholder groups. For example, managers may be able to increase the salience of a conservation message by highlighting the meanings to which a certain visitor group is attached. This, in turn, may increase the visitor's ability to avoid behaviors that impact the environment. Potentially, managers will also be able to use this information to understand how stakeholders will perceive management actions designed to minimize the negative effects of impacts on the health of the resource.

## CHAPTER V

### SUMMARY AND CONCLUSION

Through learning more about the place meanings recreational visitors ascribe to the environments in which they spend their free time, I gained insight into: the factors that influence the creation and maintenance of meaning; the ways that attachment is reflected in an individual's descriptions of why a setting is meaningful; and the relationship between the individual's attachment and their attitudes toward impacts that negatively affect the resource. This knowledge contributed to the bodies of literature concerning each of these constructs and phenomena and provided information that can be used by managers of marine parks and other protected areas. Specifically, this dissertation identified and described meanings ascribed to the marine environment which has not been investigated, in great detail, previously. I also contributed to the recreation literature's understanding of how meanings are reflected in the attachment individuals have for a place and identified the role of place attachment in regards to an individual's attitudes toward impacts that negatively affect the health of the environment.

#### Summary

I started this investigation by identifying themes of place meanings that recreational visitors ascribed to settings in the GBRMP. The ten themes identified were: *aesthetic beauty; lack of built infrastructure/pristine environment; the abundance and diversity of coral and other wildlife; a unique natural resource; facilitation of desired recreation activity; safety and accessibility; curiosity and exploration; a sense of*

*connection to the natural world; escape from the everyday; and experiences with family and friends.* As described in Chapter II, these themes represent meanings that emerged as the informant considered the setting, themselves, and their social worlds. Although the place meaning themes identified in the marine settings were similar to those ascribed to different setting types in previous studies, it was apparent that the physical attributes in the marine setting still contributed to the meanings the informants ascribed to the GBRMP in nuanced ways. For example, the *abundance and diversity of coral and other wildlife* emerged as a separate theme indicating that the magnitude and diversity of wildlife was much greater in this setting than the settings of previous studies conducted in terrestrial settings.

Beyond being one of one of the only efforts to describe place meanings ascribed to a marine environment, this was also one of the few investigations to assess the usefulness of the symbolic interactionist framework, as a whole, in understanding place meaning. In the future, conducting research to better understand the place meaning through the use of the symbolic interactionism framework will lead to knowledge that the recreation place literature is currently lacking. Particularly, a better comprehension of how place meanings are ascribed to a setting and maintained through shared symbols (e.g., language) and experiences (e.g., recreational activities) will be realized.

The meanings identified in Chapter II allowed for the exploration of how recreational visitors' attachment to a marine resource is reflected in their depictions of why the resource is meaningful. My observations supported Milligan's (1998) hypothesis that subjective definitions of the setting's attributes are the basis for place



meanings. Also, the results provided greater understanding of Stedman's (2003a) conclusion that the meanings people ascribe to a setting shape their attachment to that setting. Specifically, the results suggested that all of the aspects depicted in the ten themes provide the context for the recreational visitor's attachment to the GBRMP. That is, the characteristics of the setting (e.g., beautiful untrammelled sea/landscapes, wildlife, the recreation opportunities afforded, interaction with others, etc.) provide a basis for the attachment these respondents have toward places in the GBRMP. However, my conclusions diverge slightly from Stedman's. He concluded that place meanings mediated the relationship between the physical attributes of the setting and the intensity of attachment to that setting. I agree with Stedman that landscape attributes do matter; however these attributes are not separate from meanings, they are included in meaning. My observations (i.e., identification of the importance of themes related to wildlife, aesthetic beauty, lack of the built environment, etc.) indicate that, through social construction, place meanings not only involve the individual and their social interactions, but also interactions with the elements contained in the setting.

Although all ten themes provided context for the attachment the respondents had to the GBRMP, the analysis described in Chapter III also indicated that particular sets of meaning themes are important in differentiating between levels of attachment. This information sheds light on the possible reasons why attitudes differ among user groups. For example, groups with varying levels of attachment intensity may hold differing attitudes toward management practices, impacts on the health of the resource, and willingness to engage in activities that improve the resource.

Identifying the meanings ascribed to the GBRMP provided a better appreciation for the context of the recreational visitor's attachment to settings within the Marine Park and allowed me to gain a better understanding of the relationship between an individual's EWV, their attachment to the setting, and their attitudes toward impacts that negatively affect the health of the resource. Specifically, the analysis described in Chapter IV indicated that the attachment a recreational visitor feels toward a specific setting partially mediated the relationship between their EWV and their attitudes toward the impacts of coastal development and tourism activities. Place identity was positively related to the respondents' impact attitudes and affective attachment was negatively related. As discussed, these findings suggest that individuals who highly identify with a setting (i.e., use the setting to confirm/express their self-identity) perceive the effects of impacts more seriously. On the other hand, those who have a strong emotional bond with the setting are less sensitive to the negative effects of coastal development and tourism activities.

### General Conclusions

Since each of the investigations described in this dissertation built upon the findings of the previous analyses and results, a fair question to ask is: what is the big picture? As I collected data, interpreted the interviews, and conducted the statistical calculations it became evident that to fully understand an individual's thoughts and feelings about a place and to understand how their emotions and cognitions influence the attitudes they develop in regard to the setting, it is necessary to have knowledge of the setting, the place meanings they ascribe to the setting, and the attachment they develop

toward the setting via the meanings. In the context of this dissertation, the GBRMP is a large marine protected area that in many places has physical characteristics that are vastly different from most other settings. However, these differences did not seem to correspond to large differences from the types of meanings people ascribe to any setting. Nevertheless, the symbols (i.e., language) used by the informants to describe the meanings they associated with places in the GBRMP reflected that they were speaking about a marine environment that was important, in part, because it was different from the terrestrial environments of their everyday lives.

These meanings became the basis for their attachment to the GBRMP and provided context for the attachment scale used. Hence, to understand both the context and intensity of the human-place bond, it was important to have a description of why the place was meaningful and a quantitative indicator of the intensity of the respondent's attachment. Although attachment developed to each of the meanings to one degree or another, I found that varying levels in intensity of attachment are distinguished by the importance of certain sets of meanings. For example, highly attached respondents were differentiated from not attached respondents by the fact that they placed greater importance on the meanings related to the pristine condition of the environment and the recreation activity(ies) they participated in while visiting the GBRMP.

The recreational visitors' place meanings and intensity of attachment provided insight into the relationship described in Chapter IV, which was that place attachment partially mediated the relationship between EWV and attitudes toward impacts that negatively affect the health of the resource. The findings suggested that meanings,

abstractly measured by the place attachment scale, related to the respondents' identity and emotional bond to the setting influenced how EWV and attitudes toward impacts were related. Looking back at the findings of Chapters II and III, the meanings that reflect identity may include the types of activities the respondents participated in and meanings related to the recreational visitors' perceptions of the physical characteristics of the setting (e.g., *aesthetic beauty*, *lack of built infrastructure/pristine environment*, and a *unique natural resource*) because these meanings express/confirm the visitors' identity (Proshansky, 1978). For example, a person who SCUBA dives and visits remote parts of the GBRMP may feel that this activity and characteristics of the setting express their identity as someone who is adventurous. Hence, these meanings and others that reflect identity may represent the aspects of the settings in the GBRMP that are affected by tourism and coastal development impacts. If the symbols of these meanings are negatively affected by these impacts to a greater degree than by the other impacts, then it is logical to suggest that recreational visitors that highly identify with the setting will be more sensitive to the impacts on the setting that affect the aspects of the setting that represent important meanings.

Furthermore, an example of a meaning that provides context for emotional bonds to a place is illustrated in the *family and friends* theme. While conducting the key informant interviews it was evident that a visitor's bond with the setting was positively correlated with the social world(s) they interacted with in the GBRMP; that is, emotional ties with others contributed to an emotional connection to the place because it became a repository for memories of shared experiences (Altman & Low, 1992). If a place

becomes highly emotionally important for a recreational visitor because of social ties then it is possible that the visitor is willing to overlook some of the negative effects of impacts in order to continue to enjoy the interaction with the setting and their friends and/or family.

### Limitations

As with all investigations, the conclusions based on the results described in this dissertation were limited by the reality of implementing the research design. Two limitations warrant discussion. The paramount limitation was that most of the 20 key informants were from the areas adjacent to the southern half of the GBRMP. Although the informants had visited many locations within the GBRMP and interacted with others who were from different regions, this may have limited the breadth of meanings identified. To mitigate this effect, I included an open-ended question on the survey instrument (which was sent to the entire GBR region) attempting to elicit meanings that were not identified through the interviews and included on the questionnaire. I was unable to identify any more meanings from the responses to the open-ended item; even so, I think that in geographic scales as large as the GBRMP, more research is needed to identify all the meanings ascribed to settings within the larger area. This would allow for an understanding of the extent to which certain meanings are influenced by interactions within the specific setting and the extent to which an individual's thoughts and feelings about the larger setting influenced their place meanings.

Another limitation of my research was that I was unable to obtain a large subsample of tourists to respond to the survey. I attempted to do this with an onsite intercept

of visitors. I intercepted every third party I encountered at several different locations (e.g., boat ramps, SCUBA operators, and sailing charter operations) and asked those who agreed to return the survey to me via a postage paid envelope. However, the response rate to this attempt was less than 20 percent (of which many were local residents and several respondents did not complete the questionnaire), hence I did not include these surveys in the analysis included in this dissertation. However, this procedure did serve as a pilot test of the instrument that was mailed to the final sample. Based on the 100 surveys that I obtained from the on-site sampling I was able to make minor adjustments to the wording of several items to improve clarity and number of responses. In the future, an exploration of the similarities and differences between sub-groups of recreational visitors should be completed. For instance, it is possible, even likely, that there is some difference in the meanings tourists ascribe to recreation places versus local residents.

#### Significance of Research

After considering the limitations of this study and reviewing the findings, my observations have allowed for a better understanding of the meanings, attachment, and attitudes regarding the Great Barrier Reef and other protected areas. This dissertation made a small contribution to literature on place by identifying the meanings that are ascribed to a marine setting and by comparing and contrasting these meanings with those associated with other settings. Furthermore, the literature now has a more comprehensive understanding of how meanings provide context for attachment and which meanings may provide context for varying levels of attachment intensity. Finally, new information

was gleaned about the relationship between place attachment and attitudes toward impacts that negatively affect the health of the environment by confirming that place attachment partially mediated the relationship between EWV and attitudes toward impacts.

Besides contributing to the literature, my results can be useful for the managers of the GBRMP and other protected areas. The information contained in this dissertation can aid managers and service providers in their future decision-making efforts by: helping them to understand why a setting is a special or favorite place; and providing information about recreational visitors' place meanings which can then be used to make decisions which may affect these visitors. Also, improved knowledge of meaning context and attachment intensity can aid managers in identifying meanings that can be used to prime the public to be more receptive to environmental education and conservation messages. Lastly, this dissertation broadened the information available to managers through: providing insight into the types of place meanings that are salient to visitors' attitudes toward negative impacts on the health of the reef system; and, in doing so, increasing their understanding of how stakeholders will perceive management actions designed to minimize the negative effects of impacts on the health of the resource.

In conclusion, the conservation of protected areas, such as the GBRMP, is possible only through an understanding of the human dimensions of resource management. My dissertation addresses just one small aspect of the complex issues that surround the management of protected areas. However, it contributes to the research literature and practical knowledge of stakeholders' place meanings and their attitudes

toward environmental impacts. Future research should continue to explore the constructs and relationships used in this study in alternative contexts and with different stakeholders.



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APPENDIX A  
INFORMATION SHEET

## **INFORMATION SHEET FOR KEY INFORMANT INTERVIEWS**

### **Place Meaning and Human Impacts on the Great Barrier Reef**

#### **Introduction**

You have been asked to participate in a research study about designed to learn about people's thoughts and feelings toward the Great Barrier Reef and their attitudes towards behaviour that improves the health of the reef. You were selected to be a possible participant because you live near the reef or participate in recreational activities on the reef.

#### **What will I be asked to do?**

You will be asked to participate in an interview where you will be asked to discuss your thoughts and feelings about the Great Barrier Reef. This interview will take 30 to 60 minutes of your time. With your verbal consent, your participation in the interview will be audio recorded.

#### **What are the risks involved in this study?**

Your identity will be kept confidential and data will be reported with no reference to your name or other identifying information. The risk of participation is not greater than that posed by ordinary daily life.

#### **What are the possible benefits of this study?**

Your participation will help by providing managers with knowledge of how recreation visitors think and feel about the reef and the human impacts that harm it. They can use this information to develop educational materials to encourage pro-environmental behavior. This study will also contribute to the geography, recreation, and environmental psychology scientific knowledge by providing a description of place meanings in marine environments and a deeper understanding of how meanings shape attachment.

#### **Do I have to participate?**

No. Your participation is voluntary. You may decide not to participate or to withdraw at any time without your current or future relations with Texas A&M University, James Cook University, or the Great Barrier Reef Marine Park Authority being affected.

#### **Who will know about my participation in this research study?**

This study is confidential and the records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely. If you choose to participate in this study, you may be audio recorded. Any audio recordings will be stored securely. Any recordings will be kept for no more than two years and then erased.

#### **Whom do I contact with questions about the research?**

If you have questions regarding this study, you may contact Christopher J. Wynveen (wynveen@tamu.edu) 07 4781 5226, Dr. Gerard T. Kyle (gtkyle@tamu.edu) or Dr. Stephen Sutton (stephen.sutton@jcu.edu.au).

#### **Whom do I contact about my rights as a research participant?**

This research study has been reviewed by the Human Subjects' Protection Program and/or the Institutional Review Board at Texas A&M University. For research-related problems or

questions regarding your rights as a research participant, you can contact these offices at 001 979 458 4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

**Participation**

Please be sure you have read the above information, asked questions and received answers to your satisfaction.

APPENDIX B  
INTERVIEW GUIDE

*Interview Guide:  
Place Meaning and Human Impacts on the Great Barrier Reef*

The following is a set of questions that will be used to facilitate the semi-structured interviews for phase one of the study on *Place meaning and human impacts on the Great Barrier Reef*. This guide was designed to learn about people's thoughts and feelings toward the Great Barrier Reef and their attitudes towards behavior that improves the health of the reef.

Instructions:

1. Have the participant read the information sheet regarding participation in the study.
2. Describe the interview process to the participant and ask for their permission to record the audio of the interview.

Question prompts: (*Although the interview will take on a conversational tone and be driven by the participant, the following topics will be used to ensure that we obtain the information pertinent to this study*)

1. Is your permanent residence along the Queensland Coast?
2. If you do not live in this area, do you visit here regularly?
3. How old were you when you came to the Great Barrier Reef for the first time?
4. How would you describe your activities on the reef?
  - a. *Recreational*
  - b. *Employment related*
  - c. *Managerial*
  - d. *Other*
  - e. *A combination*

5. Select from memory a place within the Great Barrier Reef Marine Park an area that stands out in your mind as being important, memorable, meaningful or special to you personally. It might be a place you have been to many times, or a place you have only seen in pictures.

In your own words, please describe the place on the Great Barrier Reef? What the place is like - for example, what the place looks, sounds, smells, or feels like; important features that are present, and so on.

6. Please describe the thoughts, feelings, memories, and associations that come to mind when you think about this place. What makes this place important for you? What kind of experiences have you had there? Tell me as much or as little as you like. There are no right or wrong answers. I am interested in anything at all you want to tell me about why this place is important or special to you.
7. What types of recreational activities do you participate in on the reef?
- What does the Great Barrier Reef experience offer that you can't get anywhere else?
  - Please tell me how you feel when you \_\_\_\_\_ (activity)?
  - How important is \_\_\_\_\_ (activity) to you?
  - Is there anything you would change about the reef or your experiences here? Why?
8. Please describe what role humans have in the environment?
9. Are humans affecting the Great Barrier Reef? If, yes:
- How?
  - What are the most serious impacts?
10. Do we need to take measures to protect the environment?
11. What can people do to improve the health of the Great Barrier Reef?
- Development
  - Agriculture
  - Pollution
  - Recreational activities
  - Commercial activities
  - Other
12. Please discuss how you feel about how the Great Barrier Reef Management Authority manages the reef.

*Thank the participant for his/her time.*

*Ask the participant if we can contact them again to clarify anything we have discussed.*

*Provide our contact information to the participant.*

*Thank him/her again.*

Interviewer Observations: *(These are the interviewer's observations. I will not ask these questions).*

1. Approximate age of participant \_\_\_\_\_
2. Gender of participant \_\_\_\_\_
3. Location of interview (participant will have determined location) \_\_\_\_\_
4. Field notes about how the interview went.



APPENDIX C  
SURVEY INSTRUMENT

# PERCEPTIONS OF THE GREAT BARRIER REEF MARINE PARK



Dear Coastal Resident:

Thank you for your assistance with our recent telephone call and agreeing to complete this follow-up survey.

We need your help in understanding the thoughts and feelings people like yourself have about the Great Barrier Reef Marine Park. The information you provide will inform management and conservation of the reef.

As you are aware, the Great Barrier Reef is an important natural resource that receives millions of visitors a year and contributes significantly to the economy of Queensland. The human activity that takes place on or around the reef has an impact on it. For these reasons, we are interested in understanding how people feel about the Great Barrier Reef in general and the impact of human activity. The information that we collect will be used to expand our understanding of the relationship between humans and the Great Barrier Reef. Also, it will provide managers of the Great Barrier Reef Marine Park with knowledge of how recreational visitors think and feel about the reef.

Your participation in this survey is voluntary, but very important. Your answers are confidential and will be reported anonymously. We WILL NOT sell or distribute any identifying information to any party.

If you have any questions or comments about this survey, please contact Chris Wynveen at [wynveen@tamm.edu](mailto:wynveen@tamm.edu) (or [chris.wynveen@jcu.edu.au](mailto:chris.wynveen@jcu.edu.au)) or Dr. Steve Sutton at 07 4781 5510.

Thank you in advance for your valuable feedback.

Sincerely,

Christopher J. Wynveen  
Project Manager

## SECTION A: RECREATION PARTICIPATION

*While responding to the questions in this survey, please consider the term Great Barrier Reef Marine Park to include coastal beaches areas adjacent to the marine park boundaries and all islands located within the marine park. The first set of questions asks about your recreation in the Great Barrier Reef Marine Park. Please write or circle the appropriate response in the areas provided.*

1. Since this time last month, how many times have you participated in any recreational activity on the Great Barrier Reef or surrounding waters? \_\_\_\_\_

a. Since this time last year? \_\_\_\_\_

2. Several types of recreation take place on or near the Great Barrier Reef, *please circle* the number corresponding to how important participating in each of these activities on/in the waters over the Great Barrier Reef is to you.

	I do not participate in this activity	Only slightly important	Somewhat important	Moderately important	Fairly important	Extremely important
a. Picnicking	0	1	2	3	4	5
b. Recreational fishing	0	1	2	3	4	5
c. Small craft motor boating	0	1	2	3	4	5
d. Small craft sailing	0	1	2	3	4	5
e. Scuba diving	0	1	2	3	4	5
f. Snorkelling	0	1	2	3	4	5
g. Sunbathing at the beach	0	1	2	3	4	5
h. Swimming	0	1	2	3	4	5
i. Yachting (Sail)	0	1	2	3	4	5
j. Yachting (Motor)	0	1	2	3	4	5
k. Jet skiing or other PWC	0	1	2	3	4	5
l. Wind surfing/kite boarding	0	1	2	3	4	5
m. Walking along the beach	0	1	2	3	4	5
n. Organised tour boat ride	0	1	2	3	4	5
o. Wildlife watching	0	1	2	3	4	5
p. Other ( <i>please specify</i> ): _____	0	1	2	3	4	5

3. Of the recreational activities listed in question 1, please *circle one* letter that corresponds to the activity that was your primary reason for visiting the Great Barrier Reef Marine Park most recently (for example, if picnicking was the reason for your visit you would circle "a")?

a    b    c    d    e    f    g    h    i    j    k    l    m    n    o    p

4. Since this time last month, how many times have you participated in the recreational activity you indicated in question 3 in the Great Barrier Reef Marine Park? \_\_\_\_\_

4b. Since this time last year? \_\_\_\_\_

<b>SECTION B: THE GREAT BARRIER REEF</b>
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Questions in this section ask about your feelings and attitudes toward the Great Barrier Reef.

- 1 Do you have a favourite or special place within the Great Barrier Reef?

NO → Skip to question 2 below; YES → Please continue with question 1b

1b. What do you call this place? \_\_\_\_\_

1c. Why is this place meaningful to you? \_\_\_\_\_

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- 2 Below is a list of descriptors people have used to describe why the Great Barrier Reef Marine Park is meaningful. If you indicated a favourite place in 1b of this section then consider that place when responding to the following statements. If you did not indicate a favourite place above, then respond to these phrases in regards to the entire Great Barrier Reef Marine Park. Please circle the number corresponding to how important the meaning described is to you.

	Not important to me	Only slightly important	Somewhat important	Moderately important	Fairly important	Extremely important
a. The place makes me feel calm, tranquil, and/or peaceful	0	1	2	3	4	5
b. I enjoy being there with family and friends	0	1	2	3	4	5
c. The reef appears healthy	0	1	2	3	4	5
d. The seascapes and landscapes are beautiful	0	1	2	3	4	5
e. The weather is constantly changing	0	1	2	3	4	5
f. I feel a sense of connection to my ancestors	0	1	2	3	4	5
g. It is important because it is part of a World Heritage Area	0	1	2	3	4	5
h. The place is isolated from the rest of the world	0	1	2	3	4	5
i. The amount, diversity, and structure of the coral is unique	0	1	2	3	4	5
j. Being there provides escape from everyday life	0	1	2	3	4	5
k. I feel happy or good or a sense of pleasure	0	1	2	3	4	5
l. The GBR is a Natural Wonder	0	1	2	3	4	5
m. The water is very clear	0	1	2	3	4	5
n. It is a pristine environment	0	1	2	3	4	5
o. I feel like I am a part of the place	0	1	2	3	4	5
p. There are a lot of different things to do	0	1	2	3	4	5

Please continue on to next page

	Not important to me	Only slightly important	Somewhat important	Moderately important	Fairly important	Extremely important
q. I feel connected to the natural world	0	1	2	3	4	5
r. I can be alone or I feel a sense of solitude	0	1	2	3	4	5
s. It is easily accessible	0	1	2	3	4	5
t. The place has a unique set of corals, other wildlife, and water quality	0	1	2	3	4	5
u. I want to pass my family's knowledge about the place to younger generations	0	1	2	3	4	5
v. It is a safe place to be	0	1	2	3	4	5
w. It has inherent value because it is part of the natural environment	0	1	2	3	4	5
x. The area provides a sense of exploration and curiosity	0	1	2	3	4	5
y. It is a good place for the kind(s) of recreation I enjoy	0	1	2	3	4	5
z. I enjoy the sounds of the waves and wildlife	0	1	2	3	4	5
aa. The vastness of the GBR around my place puts things into perspective	0	1	2	3	4	5
bb. The place provides a wilderness experience	0	1	2	3	4	5
cc. Being there makes me feel like I am part of a lifestyle that is unique to the area	0	1	2	3	4	5
dd. The numbers and diversity in types of wildlife	0	1	2	3	4	5
ee. The tropical beaches are special	0	1	2	3	4	5
ff. It challenges me to be self-reliant	0	1	2	3	4	5
gg. There is little evidence of human built structures	0	1	2	3	4	5
hh. I am able to catch fish there	0	1	2	3	4	5

3. Please indicate how you feel about your favourite or special place in the Great Barrier Reef Marine Park by responding to each of the statements below. Again, if you did not indicate a favourite place in question 1b of this section then think of the entire Great Barrier Reef Marine Park as one place when responding to the statements below. (circle one number for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. My favourite place in the Great Barrier Reef Marine Park is the best place for the recreation activities that I enjoy	1	2	3	4	5
b. I feel that a lot of other areas that I could visit can substitute for my favourite place in the Great Barrier Reef Marine Park	1	2	3	4	5
c. Compared to my favourite place in the Great Barrier Reef, there are few other places that are satisfactory alternatives	1	2	3	4	5
d. I have a lot of fond memories of past experiences with family and friends in my favourite place in the Great Barrier Reef Marine Park	1	2	3	4	5
e. I have a strong emotional bond to my favourite place in the Great Barrier Reef Marine Park	1	2	3	4	5
f. I can't imagine a better place for what I like to do	1	2	3	4	5
g. I feel that my favourite place in the Great Barrier Reef Marine Park is a part of me	1	2	3	4	5
h. I feel a strong sense of belonging to my favourite place in the Great Barrier Reef Marine Park	1	2	3	4	5
i. I identify with my favourite place in the Great Barrier Reef Marine Park	1	2	3	4	5
j. I feel that my identity is reflected in my favourite place in the Great Barrier Reef Marine Park	1	2	3	4	5
k. I really enjoy my favourite place in the Great Barrier Reef Marine Park	1	2	3	4	5
l. My favourite place in the Great Barrier Reef Marine Park means a lot to me	1	2	3	4	5
m. Visiting my favourite place in the Great Barrier Reef Marine Park says a lot about who I am	1	2	3	4	5
n. The time spent at my favourite place in the Great Barrier Reef Marine Park allows me to bond with my family and friends	1	2	3	4	5
o. I associate special people in my life with my favourite place in the Great Barrier Reef Marine Park	1	2	3	4	5
p. Visiting my favourite place in the Great Barrier Reef Marine Park allows me to spend time with my family and friends	1	2	3	4	5

<b>SECTION C: THOUGHTS ABOUT THE NATURAL ENVIRONMENT</b>
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*Questions in this section ask about your thoughts about the natural environment in general.*

1. Listed below are statements concerning the relationship between humans and the environment. For each item, please indicate whether you **STRONGLY DISAGREE**, **MILDLY DISAGREE**, are **UNSURE**, **MILDLY AGREE**, or **STRONGLY AGREE** by circling one number for each statement.

Do you agree or disagree that:	Strongly disagree	Mildly disagree	Unsure	Mildly agree	Strongly agree
a. We are approaching the limit of the number of people the earth can support	1	2	3	4	5
b. Humans have the right to modify the natural environment to suit their needs	1	2	3	4	5
c. When humans interfere with nature it often produces disastrous results	1	2	3	4	5
d. Human ingenuity will ensure that we do NOT make the earth unliveable	1	2	3	4	5
e. Humans are severely abusing the environment	1	2	3	4	5
f. The earth has plenty of natural resources if we just learn how to develop them	1	2	3	4	5
g. Plants and animals have as much right as humans to exist	1	2	3	4	5
h. The balance of nature is strong enough to cope with the impacts of modern industrial nations	1	2	3	4	5
i. Despite our special abilities, humans are still subject to the laws of nature	1	2	3	4	5
j. The so-called "ecological crisis" facing humankind has been greatly exaggerated	1	2	3	4	5
k. The earth is like a spaceship with very limited room and resources	1	2	3	4	5
l. Humans were meant to rule over the rest of nature	1	2	3	4	5
m. The balance of nature is very delicate and easily upset	1	2	3	4	5
n. Humans will eventually learn enough about how nature works to be able to control it	1	2	3	4	5
o. If things continue on their present course, we will soon experience a major ecological catastrophe	1	2	3	4	5



SECTION D. ATTITUDES TOWARD IMPACTS ON THE GREAT BARRIER REEF
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*There are a variety of impacts that humans have on the health of the Great Barrier Reef. These impacts are often related to, or work in concert with, one another. Please read the descriptions of some of these impacts and then respond to the questions that follow by circling the number on the scale below each statement.*

**Water quality** may be affected by a number of impacts. For example, increased sedimentation may lower water quality due to soils and dirt eroding off the land into waterways and the Great Barrier Reef ecosystem. Water quality on the reef may also be affected by nutrients (fertilisers and chemicals) leaching from the land into the water.

1. First, I'd like you to consider the effects related to **water quality** near the Great Barrier Reef. Do you think the consequences of this impact will be: a very serious problem for you and your family; somewhat of a problem; or won't really be a problem for you and your family?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

2. Do you think that the consequences of impacts on the Great Barrier Reef's **water quality** will be: a very serious problem for the country as a whole; somewhat of a problem; or won't really be a problem for the country as a whole?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

3. Do you think that the consequences of impacts affecting the **water quality** near the Great Barrier Reef will be: a very serious problem for other species of plants and animals; somewhat of a problem; or won't really be a problem for other species of plants and animals?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

**Over-fishing** may impact the health of the Great Barrier Reef by reducing the population of fish to below the number needed for reproduction. Over-fishing may also negatively affect other plant and wildlife species. Over-fishing may be the result of any extractive fishing activity; recreational or commercial fishing.

4. Next, I'd like you to consider the effects of **over-fishing** on the Great Barrier Reef ecosystem. Do you think that the consequences of this impact will be: a very serious problem for you and your family; somewhat of a problem; or won't really be a problem for you and your family?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

5. Do you think that the consequences of **over-fishing** on the Great Barrier Reef ecosystem will be: a very serious problem for the country as a whole; somewhat of a problem; or won't really be a problem for the country as a whole?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

Please continue on to next page



6. Do you think that the consequences of **over-fishing** on the Great Barrier Reef ecosystem will be: a very serious problem for other species of plants and animals; somewhat of a problem; or won't really be a problem for other species of plants and animals?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

**Global Climate Change** may impact the Great Barrier Reef ecosystem by causing an increase in water temperature, higher sea levels, and ocean acidification. The results of these changes that may adversely affect the reef ecosystem include: coral bleaching, loss of habitat for plants and wildlife, and loss of the number and types of different species living near the reef.

7. In general, do you think that the consequences of **climate change** on the Great Barrier Reef will be: a very serious problem for you and your family; somewhat of a problem; or won't really be a problem for you and your family?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

8. Do you think that the consequences of **climate change** on the Great Barrier Reef will be: a very serious problem for the country as a whole; somewhat of a problem; or won't really be a problem for the country as a whole?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

9. Do you think that the consequences of **climate change** on the Great Barrier Reef will be: a very serious problem for other species of plants and animals; somewhat of a problem; or won't really be a problem for other species of plants and animals?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

**Coastal Development** may impact the health of the Great Barrier Reef ecosystem in several ways. For example: a) coastal development may increase sedimentation into the water; b) it may decrease coastal habitat that serve as breeding areas for marine wildlife; and c) coastal development may increase the amount of waste and rubbish that makes its way to the waters around the Great Barrier Reef.

10. Next, I'd like you to consider the problems associated with **coastal development** along the Great Barrier Reef. Do you think that the consequences of this impact will be: a very serious problem for you and your family; somewhat of a problem; or won't really be a problem for you and your family?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

11. Do you think that the consequences of **coastal development** along the Great Barrier Reef will be: a very serious problem for the country as a whole; somewhat of a problem; or won't really be a problem for the country as a whole?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

*Please continue on to next page*

12. Do you think that consequences of **coastal development** along the Great Barrier Reef will be: a very serious problem for other species of plants and animals; somewhat of a problem; or won't really be a problem for other species of plants and animals?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

Finally, **tourism Activities** may impact the health of the Great Barrier Reef. Suggested possible effects of tourism include leaving rubbish in the waters around the reef, scuba divers and snorkellers damaging coral, and wildlife behaviour being altered by the presence of people.

13. I'd like you to consider the consequences of the impacts of **tourism activities** on the Great Barrier Reef. Do you think these will be: a very serious problem for you and your family; somewhat of a problem; or won't really be a problem for you and your family?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

14. Do you think that the consequences of **tourism activities** on the Great Barrier Reef will be: a very serious problem for the country as a whole; somewhat of a problem; or won't really be a problem for the country as a whole?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

15. Do you think that the consequences of the impacts of **tourism activities** on the Great Barrier Reef will be: a very serious problem for other species of plants and animals; somewhat of a problem; or won't really be a problem for other species of plants and animals?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

16. Do you feel that there is another impact, not indicated above, that is a problem for the health of the Great Barrier Reef?

*If not, please skip to question 20 on the top of page 10 (just before Section E).*

*If YES, what is the impact (please specify): \_\_\_\_\_*

17. I'd like you to consider the consequences of **the impact you wrote in question 16** on the Great Barrier Reef. Do you think this will be: a very serious problem for you and your family; somewhat of a problem; or won't really be a problem for you and your family?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

18. Do you think that the consequences of **the impact you wrote in question 16** on the Great Barrier Reef will be: a very serious problem for the country as a whole; somewhat of a problem; or won't really be a problem for the country as a whole?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

19. Do you think that the consequences of **the impact you wrote in question 16** on the Great Barrier Reef will be: a very serious problem for other species of plants and animals; somewhat of a problem; or won't really be a problem for other species of plants and animals?

1	2	3	4	5
Very serious problem		Somewhat of a problem		Won't really be a problem

20. What do you think is the biggest negative impact that currently threatens the health of the Great Barrier Reef ecosystem? \_\_\_\_\_

#### SECTION E. PERCEPTIONS ON THE REDUCTION OF IMPACTS

*This section will ask a series of questions about your attitudes towards your ability to reduce the negative impacts on the health of the Great Barrier Reef ecosystem and actions you could take that impact the health of the ecosystem.*

1. Please indicate your level of agreement with the following statements concerning minimising the effects of human impacts on the Great Barrier Reef (GBR). (circle one number for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. I am not concerned about the health of the Great Barrier Reef	1	2	3	4	5
b. Every visitor must take responsibility for the health of the Great Barrier Reef	1	2	3	4	5
c. Government authorities, rather than visitors, are responsible for the health of the Great Barrier Reef	1	2	3	4	5
d. I have the ability to improve the environmental conditions of the Great Barrier Reef	1	2	3	4	5
e. I have enough knowledge to understand how to limit my own impacts on the health of the Great Barrier Reef	1	2	3	4	5
f. I am able to influence how others impact the health of the Great Barrier Reef	1	2	3	4	5
g. I can participate in recreational activities on the reef in a manner that limits my impact on the health of the Great Barrier Reef	1	2	3	4	5

2. Please indicate your level of agreement with the following statements concerning your obligation to the Great Barrier Reef (GBR). (please circle one number for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. I feel personally obliged to help improve the health of the Great Barrier Reef	1	2	3	4	5
b. Regardless of what others do, I feel morally obliged to help improve the health of the Great Barrier Reef	1	2	3	4	5
c. I feel guilty about the ways I negatively impact the health of the Great Barrier Reef	1	2	3	4	5
d. I feel morally obliged to use products and services that minimise my impact on the health of the Great Barrier Reef	1	2	3	4	5
e. People like me should do everything they can to reduce their negative impacts on the health of the Great Barrier Reef	1	2	3	4	5
f. I feel obliged to keep the environment and nature in mind in my daily behaviour	1	2	3	4	5
g. I would be a better person if I minimised my negative impacts on the health of the Great Barrier Reef	1	2	3	4	5
h. I do not feel guilty at all when I engage in activities that may negatively impact the health of the Great Barrier Reef.	1	2	3	4	5

3. Please indicate your level of agreement with the following statements concerning your own actions that impact the health of the Great Barrier Reef (GBR). (circle one number for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. I am willing to change the way I participate in my favourite recreation activities in order to limit my impact on the health of the GBR.	1	2	3	4	5
b. I support regulations that protect the health of the GBR, even if they limit my ability to recreate on the reef	1	2	3	4	5
c. I will contribute money to organisations whose mission is to improve the health of the GBR.	1	2	3	4	5
d. I would sign a petition in support of tougher environmental laws designed to further protect the GBR.	1	2	3	4	5
e. I would participate in a demonstration against organisations that are harming the health of the GBR.	1	2	3	4	5
f. I would participate in clean-up efforts or other environmental improvement efforts designed to benefit the health of the GBR.	1	2	3	4	5
g. I would tell other visitors to the GBR how they can limit their impact on the health of the reef.	1	2	3	4	5

Please continue on to next page



<b>SECTION F. INFORMATION ABOUT YOU</b>
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1. Please indicate the city, state (province), and country of your primary residence?

\_\_\_\_\_  
 City                                      State                                      Country

2. What is your gender? (*circle one*) 1. Female 2. Male

3. What year were you born? 19\_\_\_\_\_

4. How many years of education have you completed? (*circle one of the following numbers*)

9	10	11	12	13	14	15	16	17	18	19	20	21	22
Secondary	Secondary	Technical/	Technical/			University	University	Master's	Master's		Doctorate	Doctorate	
School	School	Commercial	Commercial			Degree	Degree						

5. What was your total household income (before taxes) in 2007? (*circle one of the following*)

1. Under \$30,000	4. \$50,000 to \$59,999	7. \$80,000 to \$89,999
2. \$30,000 to \$39,999	5. \$60,000 to \$69,999	8. \$90,000 to \$99,999
3. \$40,000 to \$49,999	6. \$70,000 to \$79,999	9. \$100,000 or more

6. Are you presently: (*circle one*)

1. Employed outside the home → Occupation (*please indicate*): \_\_\_\_\_

2. Unemployed

3. Retired → Previous occupation (*please indicate*): \_\_\_\_\_

4. Full-time homemaker

5. Student

7. Do you identify yourself as one of the following? (*please circle one*)

1. Aboriginal      2. Torres Strait Islander      3. Both      4. Neither

**Thank you for completing this survey.**

Please place your completed survey in the included reply paid envelope (the postage is already paid) and place in the nearest post box.

Alternatively if the reply paid envelope was missing or damaged, place in a standard envelope, and post it (reply paid) to:

GBR Perceptions  
 Fishing and Fisheries Research Centre  
 Reply Paid 109  
 James Cook University, QLD 4811

This research study has been reviewed by the Institutional Review Board - Human Subjects in Research, Texas A&M University, College Station, Texas, USA. For research-related problems or questions regarding subjects' rights, you can contact the Institutional Review Board through Ms. Melissa McIlhenny, IRB Program Coordinator, Office of Research Compliance, 1 937 458-4067, mcilhenny@tamu.edu.

## VITA

Name: Christopher Jan Wynveen

Address: 263 Lehotsky Hall, Clemson University, Clemson, SC 29634

Email Address: [cwynveen@msn.com](mailto:cwynveen@msn.com)

Education: B.S., Leisure Studies, University of Illinois, 2001  
M.S., Parks, Recreation, and Tourism Management, Clemson University, 2005