

**Interpretation, activity participation and environmental attitudes of visitors to Penguin Island, Western Australia.**

**\*Michael Hughes**

Curtin Sustainable Tourism Centre

Curtin University of Technology

GPO Box U1987

Perth WA 6485

phone: +61 8 9266 2123

email: Michael.Hughes@cbs.curtin.edu.au

**Angus Morrison Saunders**

School of Environmental Science

Murdoch University

South Street

Murdoch, WA 6150

Australia

phone: +618 9360 6125      fax: +618 9360 6787

e-mail: A.Morrison-Saunders@murdoch.edu.au

\*Author to whom correspondence should be addressed

**Short Title:** Visitor activities and attitudes at Penguin Island

## **Interpretation, activity participation and environmental attitudes of visitors to Penguin Island, Western Australia.**

### **Abstract**

Natural area management agencies use on-site interpretation, in part, to communicate messages based on themes of conservation. These themes stem from the legislative mandate to protect ecologically significant areas. Many of these areas are also popular destinations for a range of visitor activities. This provides the context onto which management overlays their emphasis on protection of often fragile and unique ecosystems. Penguin Island, Western Australia, is an example of one such site. Visitors were surveyed immediately before and after the island experience to ascertain any influence on knowledge and environmental attitude. Analysis focussed on a sub-sample of respondents undertaking different categories of activities while being exposed to the same on-site interpretation. All activity groups seemed to recall factual information equally but environmental attitudes toward the island were influenced significantly differently.

### **Key Words**

Interpretation, natural area, environmental attitude, knowledge, visitor survey.

### **Introduction**

Interpretation, in part, is a process of communicating the significance of a natural area site to encourage a positive concern for that environment. Concern for a natural area requires at least some recognition of the ecological importance of that place. This is a perspective that includes an understanding for the need to conserve such areas and minimize negative impacts. In this context, interpretation aims to positively influence knowledge about the

natural environment and encourage attitudes favouring conservation of nature. Such motives are evident in the strong conservation themes communicated on-site by natural area management agencies (Ashbaugh 1970; Mahaffey 1970; Field and Wagar 1982; Kuo 2002).

Natural area managers may install on-site interpretation with a particular intent in terms of influencing visitor attitudes and knowledge. This intent is usually in relation to site management objectives. However, the extent to which visitors respond to on-site interpretation appears to relate to their motivation for visiting and the subsequent activities they undertake while on-site. Authors such as Shafer and Mietz (1969), Hendee et al (1971) and Hunt (1973) identified various ways in which visitors may interact with a natural area and the emphasis of meaning they may derive. Along these lines, Ballantyne et al (1998) presented evidence that natural area visitors focussing on activities related to exploration of a site were more receptive to interpretative communication than visitors focussing on non-exploration type activities (what was referred to as recreational activities). They surveyed visitors to Fraser Island, a national park and World Heritage Area offering a range of activities such as hiking, camping, four wheel driving, fishing, boating and scuba-diving. They found that visitors who were interested in exploring a natural area were more likely to absorb interpretative messages than their counter parts and perhaps be influenced to a greater extent. The outcome was that exploration focussed visitors were more readily open to conservation themes communicated by site management than were the recreation focussed groups.

Similarly, Hendee et al (1971) grouped natural area visitor activities into five primary categories of natural area experience. This was based on the idea that visitors may undertake different types of activity that may be clustered according to the manner of interaction with

natural areas. Table 1 integrates the categories of activities identified Hendee et al (1971) with the focus as described by Ballantyne et al (1998). In the interests of avoiding confusion, the non-exploration based activities will be referred to according to the 'recreation' category used by Ballantyne et al (1998). While recreation may be seen to apply to all activities, this paper uses it in the context of Ballantyne et al (1998) as defined in Table 1.

#### TABLE 1

When overlaid with the findings of Ballantyne et al (1998), these categories could be equated with receptiveness to on-site interpretation. The appreciative-symbolic and sociable learning categories of activity involve a strong element of exploration. Visitors partaking in activities that fall into these categories, such as hiking or walking and scenic appreciation may thus be receptive to on-site interpretation. Visitors undertaking activities that fall into the extractive-symbolic, passive free-play and active-expressive categories, such as fishing, swimming, picnicking and relaxation, would be relatively less receptive to on-site interpretation owing to the lesser emphasis on exploration.

Authors discussing the relationship between natural area activity and responsiveness to on-site communication media often advocate targeted interpretation. This method involves the use of a variety of on-site communication approaches tailored to suit the variety of audiences categorised by activity type. This is based on the concept that visitors undertaking particular activities will respond to communication media that is consistent with their mode of interaction with an environment. Embedding desirable themes based on site management objectives within tailored interpretation media styles and content is supposedly more likely

to 'reach' the non-exploration focussed audience for which it is designed. The targeted on-site communication approach thus would require a range of on-site interpretation media using styles and messages tailored for specifically identified activity groups (Magill 1995; Ballantyne et al 1998; Hvenegaard and Dearden 1998).

Assuming visitors display varying levels of receptiveness to on-site interpretation based on the activities they are participating in, it seems logical that a generic (or non-targeted) approach to interpretation will affect some visitor types more than others. For example, non-exploration (recreation) focussed visitors participating in passive free-play, extractive-symbolic or active-expressive type activities might be only marginally influenced by a generic approach to on-site interpretation. Visitors involved in exploration based activity categories (appreciative-symbolic and sociable-learning) are more likely to be receptive to on-site interpretation and will thus be more influenced. This is supposedly because recreation type visitors are not interested in gathering information and thus do not pay much attention (Ballantyne et al, 1998).

This paper presents the results of a survey of visitors to a natural area, Penguin Island in Western Australia. Virtually no detailed research on visitor use and response to Penguin Island has been conducted, aside from very general information regarding visitation numbers and types of activities undertaken. Penguin Island has a strong presence of interpretive media while also accommodating a wide range of visitor activities that fall into a variety of categories defined by Hendee et al (1971) and Ballantyne et al (1998). Previous work by Hughes and Morrison-Saunders (2003) examined the influence of conservation focussed interpretation on visitors to a site with a highly restricted range of activities. This paper

builds on the previous work by analysing the response of visitors to a site offering a variety of activities coupled with interpretation founded on a strong conservation ethic.

### **Site Description**

Penguin Island is situated within the Shoalwater Marine Park, approximately 40km south of Perth, the capital of Western Australia (Figure 1). It is managed by the Department of Conservation and Land Management, a state government organization with a legal mandate to conserve protected natural areas within the state. Penguin Island is a class 'A' reserve, a category of protected area where conservation is the highest priority owing to the presence of a unique or fragile ecosystem. The island provides important breeding sites for the northern most population of Little Penguin and various other coastal marine birds as well as a resting ground for the rare Australian Sea-Lion (CALM 1996). For these reasons, Penguin Island is of particular ecological and conservation significance. It is also the most frequently visited of the several islands in the park due to its relatively large size and its close proximity to the mainland and has a long history of recreational use (Dans 1997).

Penguin island was redeveloped in the mid 1990's with the aim of reducing or reversing ecological degradation that had resulted from almost a century of unregulated recreational use (Orr and Pobar 1992). While Penguin Island was rehabilitated and established as a significant conservation reserve, the redevelopment of the island took into account its historical status as an important recreational area for local residents. Visitor access was excluded from a large portion of the island to preserve the fragile habitat. However, facilities were also installed to encourage use of designated recreational areas. For example, a grassed area with wooden tables between the visitor centre and eastern beach provides for picnicking amongst the shade of native trees (Dans 1997). There are also two beaches, a

protected, shallow “family beach” on the lee side of the island and a beach on the westward side exposed to ocean swells (used for surfing, fishing, snorkelling and swimming).

A sand bar connecting the island with the mainland provides a means for visitors to access the island on foot. The sand bar is submerged, with the depth of water ranging from several centimetres (1 or 2 inches) at low tide to over a metre (3-5 feet) at high tide. Strong tidal currents, difficult to see ‘potholes’ and daily variation in the sandbar morphology pose a significant threat to safety. During the peak season, management staff rescue visitors who encounter difficulties crossing the sandbar on a daily basis. Subsequently, use of the sandbar is actively discouraged (large signs warning of dangers at the access points) by the island management. Many visitors access the island using private water craft, including small motorised craft, canoes, kayaks and sailboards. Another alternative is to pay for a ferry crossing. The cost of the ferry ticket includes the return trip and entry to the visitor centre on the island. Visitors accessing the island by other means must pay to use the visitor centre.

#### FIGURE 1

A visitor centre (the Penguin Experience) displays a range of interpretive materials. The centre piece of the visitor centre is an enclosure housing orphaned and injured Little Penguins unable to be released from captivity. These captive penguins provide visitors with the rare opportunity of viewing Little Penguins that otherwise are rarely seen. The penguins are fed at advertised times as part of a interpretive demonstration that visitors are encouraged to attend. Each feeding session is accompanied by commentary by the CALM ranger describing the ecology and biology of the penguins (Figure 2).

#### FIGURE 2

Other interpretive media available at the visitor centre and include signs, pamphlets and touch tables. A series of back lit signs containing text and illustrations explain the lifecycle and biology of Little Penguins. Posters are also displayed inside the visitor centre describing the fauna and flora found on the island. Large signs located on the exterior walls of the visitor centre describe the social history and indigenous history of the island. Pamphlets containing the same information may be obtained from an information desk outside the visitor centre. Two touch tables present preserved and dried marine biological specimens from the island and surrounding waters.

All visitors using the ferry are given a brief overview of the island's history, ecology and available activities by the ferry operator. The main attractions of the island are pointed out (such as wildlife and lookouts) and feeding times for the penguins in the visitor centre are mentioned along with the location and route of the island walk trail loop. Visitors are also advised regarding appropriate behaviour in relation to interaction with fauna and preservation of the delicate flora.

The on-site interpretation is of a general design and does not specifically target any of the various visitor groups on the island. The content and themes communicated by the various types of media are essentially the same. For example, the ranger presentation summarizes the messages and information provided by the more detailed text-based media (signs and pamphlets). The touch table provides physical examples of the marine life described in the signs and pamphlets. The on-site interpretation has a strong conservation theme that stems from the 'A' class reserve status of the island.



## **Method**

We surveyed visitors to Penguin Island immediately before and after their experiences at the site. The questionnaire was designed in consultation with a social scientist with experience in designing visitor surveys and CALM management staff along with the limited publications about visitor use of the island and related public issues. A pilot survey was conducted over four weekend days and five week days in January. The pilot was used to ensure the questionnaire was comprehensible to visitors and able to be completed within the restricted time frame of the ferry crossing. The primary survey was conducted on weekdays and weekend days during February, April, November and December 2001. The ferry service does not operate over the winter months (May – August) and the island is officially closed at night. The survey period included samples from the beginning, middle and end of the peak visitation season.

While visitors to Penguin Island may access the site by various means, we targeted the ferry users alone. The ferry service provided a controlled environment for data collection that enabled greater ease in gathering consistent paired data immediately before and after the site experience. Unlike other means of access, the ferry users were regulated by set departure and arrival times and the single point of access. In addition, the inclusion of the visitor centre admission price in the ferry ticket increased the likelihood of these visitors using the facility and being exposed to the interpretation. However, ferry users may represent a specific subgroup of the total island visitor population. The results thus cannot be extrapolated to include all visitors to Penguin Island.

Questionnaires were distributed to visitors on the ferry crossing to and from the island to obtain a paired before and after sample. To ensure accurate matching of before and after

experience data, visitors were asked to write their ferry ticket number on the forms. A group of questionnaires were also distributed to visitors after the experience who had not completed a before experience form. This allowed testing for reactivity bias resulting from the completion of a questionnaire prior to experiencing the site.

We were very conscious of the need to minimise disruption of both the visitor's experience and the ferry operator's schedule. For these reasons, the questionnaire was designed to be completed before visitors arrived at the destination end of the crossing. The ferry crossing takes approximately 7 minutes although visitors may board up to ten minutes prior to departure. This meant that forms had to be distributed before the ferry left the dock to allow enough time for visitors to complete them during the crossing. Thus, a mostly multiple choice survey design was selected as the most rapid means of collecting data. We were aware that multiple choice responses do not provide the same richness of data as other more narrative forms of questioning. Extended interviews were not feasible in the short time available and may decrease the response rate owing to the length of time commitment (Zinn et al. 1998). Multiple choice questions provide a reliable indication of visitor response to the issues raised (Neuman 2000).

The questionnaire included two key elements, a knowledge quiz and environmental attitude measure, completed by visitors before and after their experience. The questionnaire completed before the experience also requested information about the reason for visitation and whether or not the respondent was a repeat visitor to the island. The questionnaire completed after the experience requested information regarding interpretive media used, activities undertaken and demographic data such as sex, age, place of residence and who the respondent was visiting the island with.

Knowledge was measured using a quiz style format. We devised a series of ten ‘factual statements’ based on information available on-site as determined by site management objectives. Visitors responded to the statements by selecting “true”, “false” or “don’t know”. The don’t know option was intended to reduce the chance of random guessing. Statements covered concepts such as the ecology and conservation status of the island, Little Penguins and Sea Lions; types of visitor activities that are permitted and social history of the island. For example, “Little Penguins only live in the area around Penguin Island” and, “Fishing is allowed on Penguin Island”. The knowledge quiz represented a measurement of the ability for short term factual recall. This might relate to the extent of information absorption by visitors as well as the effectiveness of the on-site media design in communicating facts.

Environmental attitudes were measured using a modified version of the New Environmental Paradigm scale devised by Dunlap and Van Liere (1978) and subsequently used by Jurowski et al (1995) and Manning et al (1999) among other authors. The modified version we used in this study used ten statements that collectively contained the anthropocentric and ecocentric themes expressed in the original scale. However, the statements were worded in specific reference to Penguin Island. Five statements expressed attitudes supporting human use of the island as the dominant management priority; for example, “Humans have a right to modify Penguin Island to suit their needs”. Five statements expressed attitudes supporting management for the intrinsic ecological value over human use; for example, “Ideally, humans should not be allowed to visit Penguin Island to ensure it is not damaged or degraded”. The statements were selected in consultation with a social scientist and based on issues identified by management staff and Western Australian tourism organizations. A five

point Likert Scale was used to ascertain the extent to which respondents agreed or disagreed with these statements.

Measurement of environmental attitude immediately before and after the site experience afforded the opportunity to measure changes that may be directly attributable to that experience. However, the immediate influence of on-site interpretation as part of a natural area experience may not necessarily remain consistent in the long term for either knowledge or attitudes. Work by Hovland et al (1949), Watts and McGuire (1964), Gruder et al (1978) and Mazursky and Schul (1988) among others discussed the distinct differences between immediate and long term influences of attitudes as a result of exposure to persuasive communication. An important point to note regarding this issue is the possibility that long term changes in attitude may be a result of intervening factors between exposure to the persuasive message or experience and measurement of attitude. These factors may be artifacts of the experimental procedure itself (e.g. participants stimulated to discuss and compare attitudes between exposure to the message and measurement of attitude) or a result of subsequent experiences that themselves influence how the original persuasive message is interpreted by the audience. The measurement of short term influences presents a clearer link between the attitude response and the provision of the message or experience but does not provide any indication of how the attitude may alter in the long term.

All data were analysed at  $\alpha = 0.05$  using the SPSS statistical package.

## **Results**

One hundred and seven visitors, using the ferry as access, completed paired questionnaires before and after their visit to the island. Approximately 35% of those approached refused to

participate. To test for reactivity bias, 50 visitors completed questionnaires after visitation only, with a 21% refusal rate. Comparative analysis of the paired and after-only data revealed no significant difference in responses, suggesting no significant reactivity bias in the data..

### **Respondent Characteristics**

Demographic data indicated that most respondents were local residents of Western Australia (76%) while the remaining proportion were international visitors. The majority of respondents were accompanied by family members (64%). All of the repeat visitors to Penguin Island were Western Australian residents. The dominance of local resident visitors correlates with the observation of Dans (1997) that the island was a major local recreational venue. This may be related to the recreational focus of the Penguin Island site in combination with its close proximity to urbanised areas. Alternatively, this result may indicate that families are more likely to use the ferry than other visitor group types.

### **Main Reason for Visitation**

Respondents were asked to indicate their main reason(s) for visiting the island in an open ended question. The responses were categorised according to activity types defined by Hendee et al (1971) and Ballantyne et al (1998). Respondents most commonly indicated they were visiting Penguin Island for exploration reasons (46%). This encompassed either seeing the captive penguins, walking the island trail loop or showing others the penguins and island trail. About 35% indicated they were visiting solely for recreational purposes such as swimming, snorkelling, fishing or general relaxation. A small proportion (15%) indicated they were visiting for a combination of exploration and recreation-based activities.

First time visitors were more likely to indicate a range of reasons for visiting while repeat visitors tended to indicate a more singular reason ( $\chi^2 = 12.73$ ,  $df = 2$ ,  $p < 0.01$ ). That is, repeat visitors tended to either explicitly indicate exploration-based reasons or recreation-based reasons for visiting. First time visitors were more likely to indicate a combination of exploration and recreation reasons. In their seminal work on visitor behaviour, Falk and Dierking (1992) found that repeat visitors returned to a site either to re-experience a particular aspect that appealed to them or to experience something they didn't experience in a previous visit. First time visitors were likely to be unfamiliar with the site and aimed to experience everything in one visit rather than pre-emptively targeting activities over several visits. Thus repeat visitors were likely to state a singular reason for visitation while first time visitors were likely to state a range of reasons. In this context, the Penguin Island repeat and first time visitor data reflect the findings of Falk and Dierking (1992).

### **Activities**

After their experience, respondents were requested to select the activities they participated in from a list provided by the questionnaire. When listing the activities they participated in while on the island, respondents often indicated several different types. This meant the total number of activities listed in Table 2 was more than the number of respondents. A majority indicated that they visited the Penguin Experience visitor centre. This was followed by 71% indicating they walked the island trail loop and about 34% indicating they went swimming, snorkelling or some other aquatic recreational activity while on the island.

### TABLE 2

The incidence of respondents visiting the Penguin Experience contrasted with the proportion specifically indicating this as the main reason for visitation (46%). This suggested that many respondents accessed this facility opportunistically or saw it as secondary to their main reason for visitation. The inclusion of the cost of entry in the ferry ticket is likely to have encouraged a high rate of visitation by ferry users.

Responses indicating participation in activities categorised as 'exploration focussed' or 'dual focussed' (exploration and recreation) correlated strongly with the reasons given for visiting the island. However, reasons for visitation categorised as 'recreation focussed' did not necessarily predict the actual activity (recreation and/or exploration) respondents participated in. This may be a function of the 25% of respondents indicating "relaxation" as a reason for visiting (categorised as non-exploration focussed passive free-play by Hendee et al (1971). What a respondent found to be relaxing may have encompassed activities classed by Ballantyne (1998) as exploration focussed, such as the island walks or viewing the penguins. This notion was supported by the data where 63% of respondents stating 'relaxation' as a reason took part in the island walks and Penguin Experience. This highlights a divergence between how visitors perceive their experience and how they may be categorised by the literature.

Approximately 75% of respondents visited the Penguin Experience in combination with some other activity (Table 3). Interestingly, while approximately 35% of respondents indicated they were visiting the island expressly for recreationally focussed reasons, all recreationally focussed activities were carried out in combination with exploration or the Penguin Experience.

TABLE 3

Approximately equal proportions of repeat and first time visitor respondents visited the Penguin Experience. It seems that repeat visitors were more likely to visit the Penguin Experience in combination with the island walk trail loop. First time visitors appeared to be more prone to accessing the Penguin Experience in combination with a range of other exploratory and recreational activities ( $\chi^2 = 35.10$ ,  $df = 5$ ,  $p < 0.001$ ). This again suggests that repeat visitors tended to specifically target particular activities while first time visitors tended to sample a bit of everything.

For the purposes of this study, further analysis focused on the respondents undertaking a variety of activities (exploration and/or recreation focussed) in combination with the Penguin Experience. As the Penguin Experience represents a common factor, the three groups will be referred to by the focus of their activities on the island to differentiate between them. Thus, based on the data in Table 3, the three categories of respondents are “exploration”, “recreation” and “exploration and recreation”. The last group will be labelled “hybrid” in the interests of succinctness. Comparative analysis of the response of these three activity groups was carried out in relation to environmental attitude and knowledge responses.

### **Knowledge**

Analysis of the knowledge of respondents who visited the Penguin Experience indicated no significant difference between the activity groups before or after visiting the island. All groups had a mean score of approximately 55% correct responses before experiencing the island. All activity groups had a mean correct score ranging between 69% and 74% after experiencing the island. This suggests that all three activity groups who were exposed to the



Penguin Experience were able to recall facts from the on-site interpretative material to an equal extent. This in turn might suggest that all activity groups 'paid attention' to the on-site media enough to be able to recall additional facts when leaving the island.

### **Environmental Attitude**

All groups demonstrated ecocentric attitude responses to the NEP derived attitude scale statements. Analysis of environmental attitude before experiencing the Penguin Island indicated a significant difference between the exploration focussed group and the two remaining groups (Figure 3). The two groups taking part in recreation (recreation and hybrid) seemed to be more ecocentric in their attitude before experiencing the site than the exploration group ( $\chi^2 = 10.79$ ,  $df = 2$ ,  $p < 0.01$ ).

The difference between the exploration group and the two remaining groups was apparently due to a significant difference in response to the aspects of human use of the environment. Those who took part in recreation focussed activities were significantly more ecocentric in response than those who did not ( $\chi^2 = 18.89$ ,  $df = 2$ ,  $p < 0.01$ ). The difference in response to the "Human use" statements suggested that respondents who were more strongly ecocentric in terms of the view of the environment as a resource for human exploitation tended to undertake recreational activities whereas less ecocentric individuals were less likely to do so. There was no significant difference in response, between the groups to the statements of "Intrinsic ecological value"

The relationship between the groups of the post experience response to environmental attitude was statistically similar to the pre experience response (Figure 4). However, when

the mean individual magnitude of change in environmental attitude was analysed, some interesting differences became apparent.

FIGURE 3

FIGURE 4

Comparative analysis of the mean magnitude of change by each activity group showed no significant difference (Figure 5). However, while the recreation group demonstrated the same mean magnitude of change as the exploration group, the change in response to the intrinsic value statements was in opposite directions. That is, the exploration group shifted towards ecocentrism while the recreation group moved towards anthropocentrism when responding to statements promoting the value of the island independent of human use. What is intriguing about this result is that both groups were able to recall factual information equally, but the exploration group appears to have been more influenced by the underlying theme of ecological conservation.

In speculation, given that there was no significant difference in response to the ecocentric statements prior to the experience, the shift may possibly be a symptom of the exploration focussed respondents being more receptive, than the recreation focussed respondents, to the conservation themes communicated on-site. Ballantyne et al (1998) observed that visitors undertaking exploration based activities tended to be more receptive to on-site communication than visitors involved in recreation based activities.

FIGURE 5

## **Conclusions**

In the absence of other obvious mitigating variables in the sample, it would appear that there is a relationship between the activity undertaken by visitors and their change in environmental attitude. Both exploration and recreation focussed groups were able to recall factual information to an equal extent. All groups retained their ecocentric environmental attitudes immediately after the site experience. However, examination of the magnitude and direction of change in attitude after the site experience suggested a significant difference in how the experience influenced respondents.

The recreation activity focussed group moved away from attitudes sympathetic to the intrinsic value of the island while moving toward the attitudes valuing nature according to its utility to humans. The exploration group also moved toward the attitudes valuing nature according to its human utility but they also moved toward the attitudes favouring the valuation of the island independent of its usefulness to humans. This intimates that the type of activity undertaken on the island was related to the type of influence the interpretation had. Exploration focussed respondents appeared to shift toward a kind of responsible conservation stance with human use balanced by a view of the intrinsic value of the natural area site. The recreation focussed group appeared to have a mean shift toward a human centred view of the natural area despite the exposure to conservation themed interpretative messages. This would suggest that visitors exposed to the same on-site interpretation will be influenced in relation to the activities they are participating in at the site. While knowledge may be effectively conveyed, the attitudinal context in which that knowledge is placed will vary according to what activities the site has to offer.

Given that Penguin Island is an 'A' class conservation reserve, the primary mandate of CALM is to conserve and protect the island's ecology. The on-site media focuses on the delicate and unique nature of the island and its importance as a marine island habitat and breeding ground. The long history of recreational use by European settlers has arguably watered down the conservation message. CALM effectively inherited the social traditions of the island. In the public interest, it was necessary to combine the recreational traditions with a legal requirement to conserve an 'A' class reserve and educate the public of its ecological significance. It would seem that even when respondents were exposed to on-site interpretation, the type of activity they took part in coloured their interpretation of conservation messages. This seemed to be to the extent whereby respondents taking part in recreational activities responded contrary to the intended message.

Our research has shown that visitor activity type affects attitudes to the environment but not knowledge, with respect to exposure to generic interpretive material in natural areas. This has clear implications for natural area managers with respect to both site and interpretive design elements. We suggest, on-site interpretive media design should be incorporated into the total site design at the planning stage rather than as a post hoc add-on as is commonly practiced. This will ensure that the activities accommodated at a site and the messages conveyed by on-site interpretation will compliment each other and promote a consistent message to visitors.

It would be useful for future research to verify these findings at other natural area sites. Additionally, we have grouped visitor activity into simple categories which potentially could be further subdivided to determine, for example, whether particular recreational activities influence visitor attitudes to a greater or lesser extent than others.

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**Table 1: Categorisation of visitor activities in natural area settings**

<b>Category</b>	<b>Activity</b>	<b>Focus</b>
appreciative-symbolic	Hiking, walking, photography, bird watching, viewing scenery	Exploration
sociable-learning	Same as above but with priority on socialisation as part of a group.	Exploration
passive-free play	Relaxation, reading, domestic activities in a natural setting	Recreation
active-expressive	Swimming, ball games – physical exercise in a natural setting	Recreation
extractive-symbolic	Fishing, hunting - taking ‘trophy’ from a natural setting	Recreation

Adapted from Hendee et al (1971) with “focus” categories from Ballantyne et al (1998)



**Table 2: Categorisation of activity participation at Penguin Island**

Activity	Focus	No.	%
Penguin experience	Exploration	93	86.9
Island walks/lookouts	Exploration	76	71.0
Swimming/snorkelling	Recreation	36	33.6
Fishing	Recreation	5	4.7
Other	Recreation	3	2.8
<b>Total</b>		<b>213</b>	<b>199.1</b>

**Table 3: Combinations of categorised activities undertaken by survey participants**

Activity Focus	No.	%
PE* & exploration	45	42.1
PE & recreation	18	16.8
PE, exploration and recreation	17	15.9
PE only	13	12.1
Exploration only	11	10.3
Recreate and exploration only	3	2.8
<b>Total</b>	<b>107</b>	<b>100</b>

\*Penguin Experience visitor centre

Figure 1

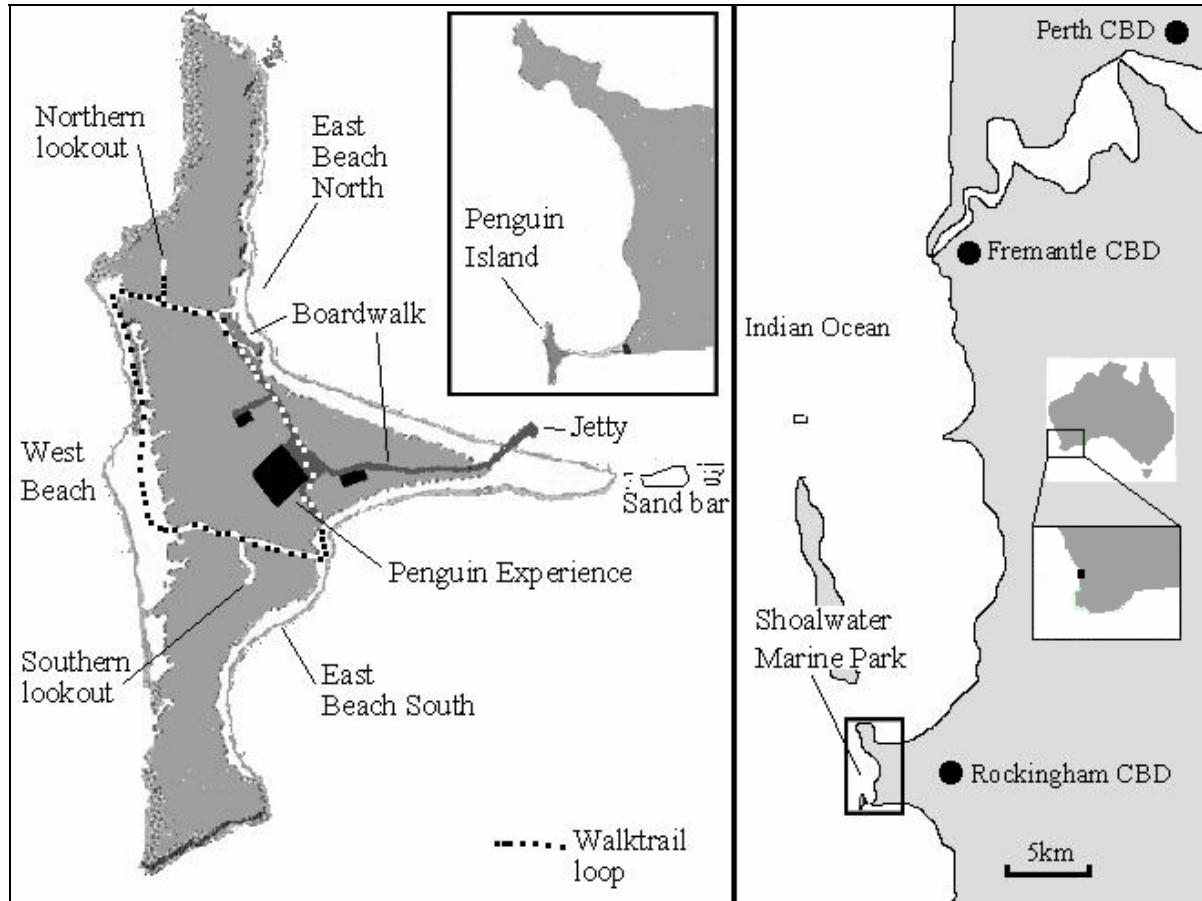


Figure 2



figure 3

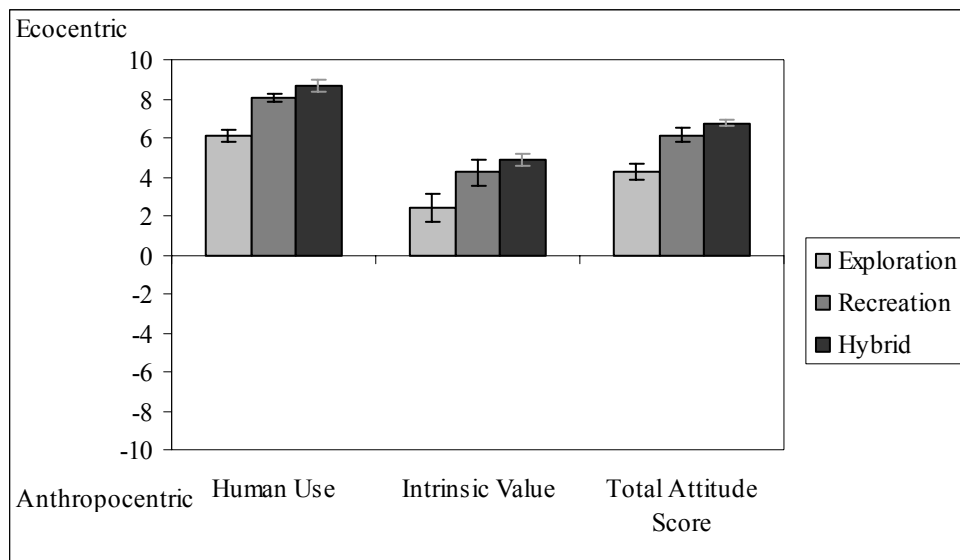


figure 4

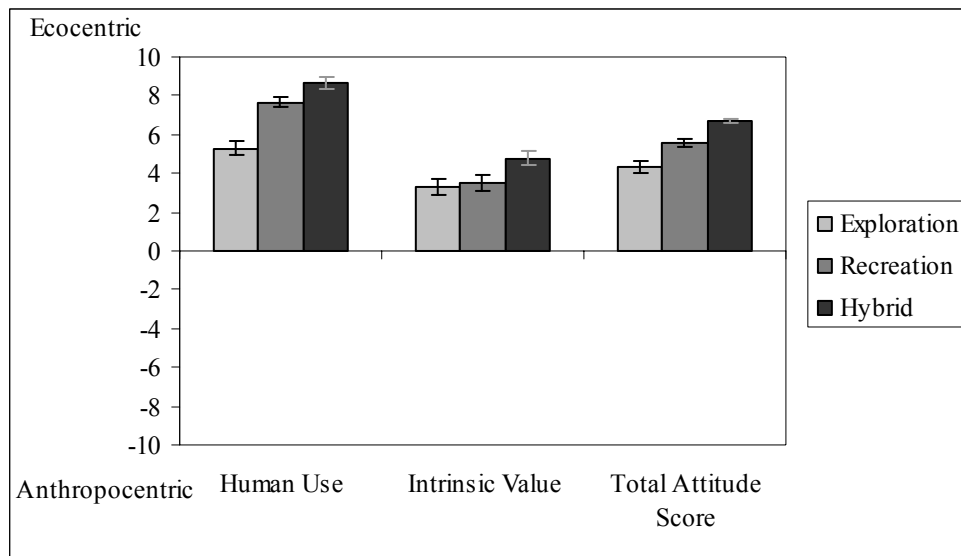
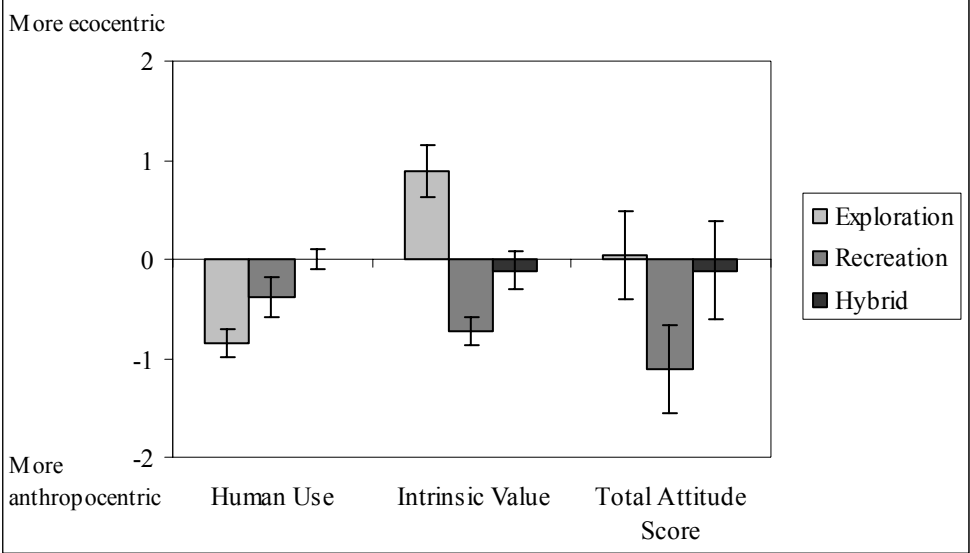


figure 5



**Figure 1: Location map and layout of Penguin Island, Western Australia.**

**Figure 2: Penguin Experience visitor centre showing ranger presentation with onlookers and interpretive sign.**

**Figure 3: Mean environmental attitude score immediately before experiencing Penguin Island.**

**Figure 4: Mean environmental attitude score immediately after experiencing Penguin Island.**

**Figure 5: Mean individual magnitude of change in environmental attitude after experiencing Penguin Island .**