

# The Use of Values to Understand Visitors to Natural Areas: A study of campers on the Murray River

**Caroline Winter**

## **Abstract**

*In Australia, protected areas such as national parks have extensive strategies in place to ensure the natural environment is conserved, and visitors are provided with a range of opportunities for satisfying experiences. Many areas, such as those in privately owned or unprotected areas have not yet developed such measures. A growing but relatively unknown type of recreation and tourism is the vehicle-based market which includes caravanning, camping and four wheel driving. This market is attracted to these remote areas and is beginning to create a number of negative impacts. It is a significant management problem that relatively little is known about. This paper describes an exploratory study conducted at a site on the Murray River in South Australia. Campers were grouped into two clusters, Nature lovers and Recreationists, based upon their values. The clusters differed in their intrinsic, use and non-use values but were similar with respect to their recreation values. The clusters indicated some differences in their attitudes to management and their support for the introduction of facilities. The campers' perceptions of the site's naturalness were also measured.*

*Dr. Caroline Winter is a Lecturer in the Department of Marketing and Tourism, University of Southern Queensland, Australia.*

## **Introduction**

In Australia, protected areas such as national parks have extensive strategies in place to ensure the natural environment is conserved and visitors are provided with a range of opportunities for satisfying experiences. However, as Butler and Waldbrook (2003) comment

*Much of the opportunity for outdoor experiences and adventure travel is located in remote, frontier areas which have not been planned or developed for tourism (p. 25).*

Increasing numbers of tourists are requiring access to these natural areas, and in order to supply this need, opportunities exist in privately owned areas, and in those which have been modified in some way. These places are often used for other purposes such as pastoralism, mining, and agriculture, but they also have an alternative, high value use for tourism (Buckley, 1999; Schmiechen, 2004; Weaver, 2001).

A growing but relatively unknown type of recreation and tourism is the vehicle-based market which includes caravanning, camping and four wheel driving. In many areas, these visitors are creating a number of negative impacts to the natural environment through a lack of knowledge and poor camping and environmental

practices (Schmiechen, 2004). Many such areas have not developed strategies to help manage visitors and control the resulting impacts. The two most important methods for managing visitors in natural places are site hardening, such as the installation of campsites, fireplaces and toilets, and managing visitor numbers and behaviour by means such as regulations, education, entry fees and permits (Buckley, 1998).

The successful management of visitors by controlling their behaviour and anticipating their responses requires that managers have adequate information about the visitors' potential reactions to a number of strategies. This paper reports the results from an exploratory study which aimed to provide some information about campers at a site on the Murray River in South Australia. The paper describes campers' natural area values, their attitudes towards management intervention and their perceptions of the site's 'naturalness'. The section to follow provides some information about how values are defined and their relevance to natural resource management.

### **Using values to understand visitors**

Values form the basis of specific attitudes, influence behavioural intention and behaviour, and so form a useful concept in understanding and managing visitors (Stern & Dietz, 1994; Stern, Dietz & Guagnano, 1995; Vaske & Donnelly, 1999). A value is a stable and deeply held concept, which Rokeach (1973) defined as

*...an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence* (p. 5).

In relation to natural areas, both personal and social values are relevant.

Personal values relate to a person's own life and they have been used in a tourism context to analyse travel behaviour and visitation to attractions and destinations, to guide product development and communication strategies (Blamey & Braithwaite, 1997; Madrigal & Kahle, 1994; Muller, 1991; Pitts & Woodside, 1986). Social values relate to broader community and worldly issues and are particularly relevant where an element of social good such as the natural environment is involved (Blamey & Braithwaite, 1997). A cluster of values is termed an orientation (Stern, Dietz, Kalof & Guagnano, 1995) perhaps the best known of which is the New Environmental Paradigm (NEP) (Dunlap & Van Liere, 1978, Dunlap, Van Liere, Mertig & Jones, 2000) which has been extensively used as a measure of environmental concern.

Values and orientations have been used in the context of natural resource management and in the developing field of ecotourism to understand the relationship between visitors and natural sites and to anticipate their attitudes and behaviour (Fennell & Nowaczek, 2003). For example, groups with higher environmental concern have been found to predict intent to engage in proenvironmental behaviour (Cordano, Welcomer & Scherer, 2003) and to engage in appreciative rather than consumptive activities (Jackson, 1986). An orientation such as the NEP is a broad measure of environmental concern but it is not designed to address specific values (Stern, Dietz, Kalof & Guagnano, 1995). Some research has been unable to explain why similar orientations were measured in groups which exhibited highly divergent behaviours (Kempton, Boster & Hartley, 1995). The NEP has been criticised because its use is not straightforward and can produce different results in different situations (Cordano, Welcomer & Scherer, 2003).

Environmental attitudes may be more complex than the NEP acknowledges, such that more sophisticated and updated instruments are required (Lalonde & Jackson, 2002).

Values provide a more specific measure of environmental concern than an orientation but they do not fully explain or predict behaviour. Scott and Willits (1994) argue that high levels of environmental concern have been measured, but they have not been accompanied by high levels of ecologically oriented behaviours. Scott and Willits (1994) also comment that:

*it could be that many people have learned the language of environmentalism without developing a simultaneous behavioural commitment* (p. 255).

Another explanation is that the measuring instruments are not yet fully developed and need to include a number of other influencing factors and ensure a closer link between the variables measuring the values and behavioural components (Tarrant & Green, 1999).

Winter and Lockwood (2004) argue that some of these problems can be overcome by measuring specific values, and they developed the Natural Area Value Scale (the NAVS) to address this need. The NAVS is based upon the measurement of intrinsic and instrumental values and it relates to the multiple uses that natural resource managers face; of providing for both extractive, conservation and recreational uses of a site. The scale was reported to have good validity (Cronbach's alpha) and distinguished between the values and conservation preferences for samples of the general public, farmers and environmentalists. The next section provides some information about the intrinsic and instrumental values used in the NAVS.

Intrinsic value has been defined

and debated in the discipline of environmental philosophy (see for example Callicott, 1989; O'Neill, 1992; Rolston, 1989; Vilkkka, 1997). It is often associated with, but is distinct from other concepts such as ethics (Regan, 1990). Intrinsic value relates to the benefits and well-being of the natural entity or area independent of any relation with humans, and instrumental value relates to the benefits that natural entities provide for humans (O'Neill, 1992; Vilkkka, 1997). Vilkkka (1997, p. 14) states:

*According to the distinction of intrinsic and instrumental valuation, nature has intrinsic value if it has value for its own sake, and instrumental value if it has value for people (p. 14).*

Instrumental values are defined through economics, and the NAVS conceptualises two main types; use value and non-use value. The first type, use value, relates to some form of activity or expenditure and they encompass the values of the resources that humans directly extract from natural areas (timber, water, grazing) (Adamowicz, 1995). The second type, non-use value, also relates to benefits that natural resources hold for humans but which involves their indirect or non-extractive use. Non-use value includes existence value, which is the benefit received by those who derive satisfaction from knowing that a site is preserved in a certain condition irrespective of use or potential use by the individual or others (Brookshire, Eubanks & Randall, 1983; Krutilla, 1967) and the value of a natural area as a 'bequest' to future generations (Cicchetti & Wilde, 1992; Krutilla, 1967).

### **Perceptions of naturalness**

Given that values do not fully explain behaviour, the influence of other factors needs to be explored. Rapport *et al.* (1998) argue that values determine the overall type of landscape management, its use and subsequently,

its health. The 'naturalness' of a site, that is the degree to which it has been modified by humans, can be perceived in many ways depending upon the experience, knowledge and cultural orientation of the audience (Lamb & Purcell, 1990; Williams & Cary, 2002). As Lamb and Purcell (1990) state:

*Ecological naturalness and perceived naturalness are related but not equivalent (p. 350).*

Chirgwin and Hughes (1997) showed that tourists visiting an artificial wetland perceived it as natural, and experienced a number of benefits as a result. Other studies showed that respondents with high environmental concern were less accepting of impacts than those with lower concern (Floyd, Jang & Noe, 1997). Hillery, Nancarrow, Griffin and Syme (2001) used a survey design which focused on specific localised issues, and found that a range of perceptions relating to environmental impacts of tourists could be measured.

### **Background to the study site**

The Murray Darling Basin, which covers parts of four states, is one of Australia's major river systems. It is facing a number of serious threats including the loss of agricultural productivity, salinity, loss of biodiversity and reduced water flows (River Murray Catchment Water Management Board (RMCWMB), 2003). In South Australia, the RMCWMB was established to prepare a water management plan to ensure sustainable use of the river system. As a part of this planning and management, the Sustainable Recreation Steering Committee (SRSC) was set up in 1998 to examine the impact of recreation at ninety four river sites and to recommend a course of action that would ensure sustainable use. Recreation and tourism are acknowledged as important uses of the river, which

result in a significant contribution to regional economies. These activities however contribute to the degradation of the river system (RMCWMB, 2003; Sustainable Recreation Steering Committee (SRSC), 2002).

### **Research objectives**

There are a number of sites along the river for which no management plan is in place and where little information about visitors is available. In conjunction with the RMCWMB, a site was selected for study in anticipation that the results would assist in the development of management plans and guide further research. The research aims were to identify the characteristics of campers and their visitation habits, determine why they visited specific sites, measure their natural area values and assess their likely responses to the introduction of management strategies.

### **The study site at Hogwash Bend**

Hogwash Bend was selected for study because it is a relatively large site which is experiencing increasing visitation and a large degree of environmental impacts (Waanders *pers. comm.*, 2004). The site comprises approximately 200 hectares, located on the Murray River 177 kilometres north of Adelaide in South Australia, in the centre of a popular tourist area (Riverland Tourism Association, 2003). The main natural attractions at Hogwash Bend include a large sandbar of white sand approximately two hundred metres in length, shallow water for children to swim and mature river red gums providing shade along the bank. A small section is owned by a Local Council, and a narrow area along the bank is Crown Land. The largest proportion of the site is owned privately by two landholders. At the time of this study there was no management plan for the site, and no facilities existed other than some rubbish bins.

A number of stakeholders, including the private land-holders, river management groups and local people are concerned at the impact of uncontrolled visitation on the ecology of the area. The biological aspects of Hogwash Bend were recently assessed along with forty-four other sites in the Riverland West Local Action Planning Area by Wetland Care Australia (1998). The study reported the site as being in poor condition, and rated it much lower than other sites. A large number of stressed mature river red gums, and the presence of weeds were noted (Wetland Care Australia, 1998). The report also stated that eighty seven percent of the site was affected by heavy recreational impacts, particularly tracks, and that action is urgently required.

### Research method

Data for this study were collected at Hogwash Bend over the Easter weekend in April 2004 using observation, face to face interviews and a self-completed questionnaire. A camp was defined as a group of people camped around one fire-place. The camps were approached by the researcher and asked if they would like to participate in an interview. Each interview took about 20 minutes and involved a semi-structured format in which participants were asked about their visitation habits, perceptions of the site, attitudes towards management and their main reason for visiting the site. Two camps refused and an estimated nine camps were missed because campers left before they could be interviewed. Of the estimated 38 camps, at least one person from 27 camps (71%) was interviewed. Interviews were used to identify any major issues that had not been included in the questionnaire, to assess the personal values for this site and the types of indicators that campers used to assess its naturalness. It was anticipated that the presence of the researcher may cause some

uncertainty about the future access to the site, and the interview provided an opportunity for campers to contribute their views.

At the completion of the interview a package containing a questionnaire booklet, a letter of introduction from the researcher and a return addressed envelope was offered for all adult members of the camp. A total of 116 questionnaires were distributed

and campers were offered the option of returning the questionnaire directly to the researcher the following day or mailing it. Two questionnaires were mailed, 79 were collected the following day and provided 68 usable surveys (30% of the estimated adult population).

### Variables

The design of the questionnaire was based on the SRSC (2002)

*Table 1: Value Statements*

<b>Item</b>	<b>Mean</b>
<b>NON-USE VALUE</b>	
Natural areas are valuable to keep for future generations of humans.	6.63
I'm seeing natural areas the next generation of children may not see, and that concerns me.	6.01
I need to know that untouched, natural places exist.	5.62
There are plenty of natural places that are not very nice to visit but I'm glad they exist.	5.40
We have to protect the environment for humans in the future, even if it means reducing our standard of living today.	5.26
Even if I don't go to natural areas, I can enjoy them by looking at books or seeing films.	4.66
<b>RECREATION VALUE</b>	
* I value natural places like forests and rivers for my spare time activities.	6.31
* The natural environment is valuable to me for my leisure.	5.54
Natural areas are important to me because I use them for recreation.	5.15
Natural areas must be protected because I might want to use them for recreation in the future.	4.93
*I value natural areas mainly for their use to me for my sport and hobbies.	4.01
<b>INTRINSIC VALUE</b>	
The only value that a natural place has, is what humans can make from it.	5.38
Ugliness in nature indicates that an area has no value.	5.35
The value of an ecosystem only depends on what it does for humans.	5.24
The value of nature exists only in the human mind.	
Without people nature has no value.	4.75
Places like swamps have no value and should be cleaned up.	4.69
Only humans have intrinsic value - that is, value for their own sake.	4.43
<b>USE VALUE</b>	
I don't like industries such as mining destroying parts of nature, but it is necessary for human survival.	4.75
Native forests are valuable because they produce wood products, jobs & income for people.	4.00
To say that natural areas have value just for themselves is a nice idea but we just cannot afford to think that way: the welfare of people has to come first.	3.58
All plants' and animals' lives are precious and worth preserving but human needs are more important than all other beings.	3.16
It is better to test new drugs on animals than on humans.	2.90
Our children will be better off if we spend money on industry rather than on the natural environment.	2.18

\*= item additional to Natural Area Value scale (Winter and Lockwood 2004), All Intrinsic items were reverse coded.

Items were measured using a Likert scale from 1 (strongly disagree), 2 (disagree), 3 (slightly disagree), 4 (undecided), 5 (slightly agree), 6 (agree), 7 (strongly agree).



• Adults	225	• Dogs	14
• Children	105	• Trail bikes	15
• Tents	71	• Vehicles	103
• Caravans	22	• Jet skis	3
• Portable toilets	37	• Camps	38

Figure 1: Profile of camping at Hogwash Bend

report, the literature review and discussions with senior staff from the RMCWMB. The questionnaire comprised the following sections:

- the Natural Area Value Scale (Winter & Lockwood, 2004), comprising 20 items (statements) designed to measure intrinsic, non-use, use and recreation values using a seven point Likert type scale (Table 1). Three items were added to provide a more comprehensive measure for recreation value;
- a list of facilities for which respondents were asked to indicate whether or not they supported their introduction. The list was obtained from the SRSC (2002) (Table 5);
- 6 items (on a scale of 1 to 7) to determine attitudes towards management intervention (Table 6);
- a question relating to respondents' perceptions of the site's 'naturalness' (Table 7).
- questions relating to frequency and duration of visits; and
- socio-demographic information (age, sex, income, education and occupation).

### Analysis

A mean for each of the four values (intrinsic, non-use, use and recreation) was calculated using the responses for each group of relevant items (Table 1). Nonparametric tests to compare the means between the value types was conducted using Wilcoxon signed ranks tests.

To help understand the sample

further, a cluster analysis was conducted using the means for each of the value types as inputs. Two different clustering procedures were tested (K-Means and Hierarchical) with the Squared Euclidean distance measure being used. An agglomeration schedule, which was produced using the hierarchical procedure and the Ward's method indicated the sample could be grouped into two clusters (n=39, 25). The K-means method was also tested using two clusters and it produced groups of a similar size (n=37, 27). Given the small sample size and the risk of over analysing the data, two clusters were considered appropriate and the initial hierarchical clusters (Ward's method) were used. Non-parametric analysis to compare the magnitude of the means was conducted. Mann-Whitney U test statistics for independent samples were used for comparisons between the clusters, and Wilcoxon signed ranks test for two related samples were used to compare responses within the clusters.

### Profile of campers and their visitation habits

Twelve camps, most of which were quite large and included the tents, vehicles, toilets and camp fires for up to five families, were situated on the sandbar. The remainder of the camps were set

up along the river bank for approximately two kilometres in one direction and about half a kilometre in the other direction. A range of age groups were represented at the site and many camps consisted of family groups. Approximately eighty percent of respondents had previously visited Hogwash. Over fifty percent (54%) had been visiting the site for ten years or more and almost thirty percent had been visiting from three to six years. Almost everyone lived in or near the city of Adelaide. Figure 1 shows the composition of the camp sites and their equipment.

### Values for Hogwash Bend

The results of the interviews relating to the campers' personal values for the site are reported in Winter (2005) and show that campers value the site for enjoying time with family and friends, for its safety, for relaxation and its easy and cheap access. A common theme was the campers' need for individual freedom which they expressed by providing all of their own facilities.

Table 1 shows the means for the individual value items and the four value types. Wilcoxon signed ranks test to compare pairs of the value means for the four value types showed that they were significantly different with the exception of recreation and intrinsic values ( $z = -0.47$ ,  $p = 0.64$ ,  $n = 66$ ). The strongest value for campers overall is non-use value, followed by recreation and intrinsic values, with use value being less strongly valued. The correlation between the value types, shown in Table 2 reflects theoretical expectations in that

Table 2: Correlation of Value Types.

	Intrinsic	Non-use	Use
Non-use	0.32*		
Use	-0.65*	-0.34*	
Recreation	-0.18	0.35*	0.16

\* indicates significant relationship

intrinsic value is negatively correlated with use and recreation values, and positively correlated with non-use value. Recreation value is significantly related to non-use value only.

### Comparisons of values for clusters

The value type means for each cluster are shown in Table 3. For cluster 1, the stronger value means were intrinsic (5.8) and for non-use (5.5) followed by recreation (4.95), with use (2.95) values being the weakest. The relative magnitude of the value means within each cluster were compared using non-parametric tests for two related samples (Wilcoxon signed ranks test). The pairs of value means were significantly different with the exception of intrinsic and non-use. The strongest value means for cluster 2 were recreation (5.3) and non-use (5.17) and the weaker were use (4.12) and intrinsic (3.6). Of these, two value pairs were not significantly different; intrinsic and use values, and non-use and recreation values. To compare the value means between the clusters Mann-Whitney U statistics for two independent samples were used. The intrinsic, non-use and use values were significantly different, but no difference was detected for recreation value (Table 4).

A series of tests to compare the two clusters with respect to the number of years and frequency of visitation, age, sex, education, occupation type and income did not detect any significant differences.

### Attitudes towards management intervention

Some of the site hardening strategies suggested by the SRSC (2002) to help minimise visitor impacts include building facilities such as showers, toilets and permanent campfire places, rubbish collection, signage and car parking. The introduction of

Table 3: Value Means for Clusters.

Value type	Cluster 1: Nature lovers	Cluster 2: Recreationists	Combined Sample
<b>n</b>	<b>39</b>	<b>25</b>	<b>64</b>
Intrinsic	5.77a	3.86d	5.00
Non-use	5.85a	5.17e	5.60
Recreation	4.95b	5.38e	5.16
Use	2.93c	4.12d	3.42

Significant differences between clusters for pairs of value means shown (p<.05)

No significant differences indicated by: a (p=0.42); d (p=0.52); e (p=0.46)

Table 4: Results for Comparison of Values Between Clusters.

	Intrinsic	Non-use	Use	Recreation
Mean rank cluster 1	44.86	37.60	23.46	29.83
Mean rank cluster 2	13.22	24.54	46.60	36.66
Significance (p)	0.00	0.01	0.00	0.15

Results for Mann-Whitney U test statistic for two independent samples

Table 5: Campers' Attitude Towards Facility Provision.

(% who agree with introduction of the facility)

Facility type	Cluster 1	Cluster 2
	Nature lovers %	Recreationists %
Car parking	5.1	-
Barbeques	2.6	-
Toilets	17.9*	44.0*
Showers	12.8**	32.0**
Firewood provided	20.5	16.0
No facilities are needed. I like the place as it is	46.2	36.0

Significant difference between clusters: \*p<.01, \*\*p<.05

these facilities may also involve a change in campers' behaviour, especially at places like Hogwash Bend, where the same campers have been visiting for many years. For example the provision of permanent camp sites may limit campers' own selection. Campers were asked whether or not they would like various facilities provided (Table 5). Forty three percent of respondents thought no facilities are needed. Car parking and barbeques were supported by less than 4%, while there is some support for toilets (30.8%) and showers (21.5%). A Mann-Whitney U test showed that Recreationists were significantly more in favour than the Nature lovers of toilets and showers being provided.

The sample overall was asked to indicate their agreement or disagreement (where 1 = strongly disagree, to 7 = strongly agree) to a series of six statements that represented attitudes towards management directions given to campers. The mean of 5.8 for Statement 1 in Table 6 indicates that respondents agreed that they were "happy to do whatever helps the natural parts of the area". Sixty nine percent of respondents agreed or strongly agreed with this statement and only 4.5% disagreed. Respondents also agreed with Statement 2 which indicated they prefer to have no rules, and with Statement 3 indicating they should be free to camp where they like. They disagreed that there should be a limit to the number of campers allowed to camp at

Table 6: Attitudes Towards Management Intervention (n =68).

Attitude Statements	Mean
1. I am happy to do whatever helps the natural parts of the area	5.8
2. I like camping at Hogwash Bend because there are no rules about what I do	5.5
3. I should be free to camp wherever I like along the River Murray	5.4
4. No management changes are needed here - everything should stay as it is	5.2
5. There should be a limit to the number of people allowed to camp at places like Hogwash	2.7
6. Managers should tell campers what they can and cannot do at Hogwash	2.7

1 = strongly disagree, 2 = disagree, 3 = disagree somewhat, 4 = undecided, 5 = agree somewhat, 6 = agree, 7 = strongly agree

places like Hogwash (Statement 5) and disagreed with being told what they can and cannot do (Statement 6). A comparison of responses for the management statements was also made between the two clusters using Mann-Whitney U tests. For statement 1, the Nature lovers indicated a significantly higher response (mean rank=34.24) than the Recreationists (mean rank = 25.25) (p<.05). An analysis of the frequencies shows that ninety percent of Nature lovers agreed or strongly agreed with the statement compared with forty four per cent of Recreationists. No other significant differences between the clusters were detected for these statements.

### Campers' assessment of the site's naturalness

Respondents were asked: "How natural overall do you think the area at Hogwash Bend is?" and required to indicate their assessment using one of six options (listed in Table 7). Over fifty percent of respondents perceived the area as being in pristine condition or close to its natural condition and a further thirty eight percent thought it was mostly natural and in reasonable condition. Six percent thought the area was poor or totally degraded. No significant differences between the clusters were detected for the responses to this question. The interviews revealed that the indicators used by campers to assess the site

included low water flow, water turbidity, weeds on the sandbar, and to a lesser extent the amount of rubbish lying around and the presence of introduced and native fish. Few respondents mentioned the condition of the bush (trees and undergrowth).

### Discussion and conclusions

The research measured the campers' intrinsic and instrumental values, attitude to management intervention, acceptance of facilities and perceptions of the site's naturalness. The values provided a means to segment the sample into two clusters that differed in the magnitude of their intrinsic, use and non-use values, but held similar recreation values. Both clusters rated non-use value highest, but where the Nature Lovers ranked it equally with intrinsic value, the Recreationists ranked it with recreation value. The Recreationists ranked the two opposing values, intrinsic

and use, with equal magnitude. The literature suggests that the different values of the clusters would result in different behaviours and attitudes and, to some extent, this was the case. The Recreationists were more likely than the Nature lovers to agree with modification to the site through the introduction of toilet and shower facilities. However, no difference was detected for agreement to other facilities such as car parking and barbeques, which may help minimise impacts to the site. The Nature lovers were to be more likely to be willing to do whatever would help the natural area in a broad sense but did not agree with the specific strategies used in this survey.

The value measurements suggest that different communication strategies may be appropriate at the site to appeal to the different cluster members. Communication that relates management strategies to the recreational benefits that the site provides would appeal to all campers. Appeals to the value of the site for its own sake, such as the conservation of the river red gums, may also be appropriate for the Nature lovers. The campers' non-use values, such as leaving the site in good condition for their children and for passive recreation may also be relevant.

This research also shows there is a difference between the scientific assessments which rated the site as being in poor condition, and most campers who

Table 7: Campers' Assessment of Hogwash Bend's Naturalness.

Assessment	Frequency	Percent
Totally degraded and destroyed	1	1.5
Mostly not natural and in poor condition	3	4.5
Mostly natural and in reasonable condition	26	38.8
Some changes have been made, but it is close to its natural condition	28	41.8
Pristine condition - in its original native state	9	13.4
Not sure	-	-
<b>Total</b>	<b>67</b>	<b>100</b>

Source: Winter, 2004.

perceived the site to be mostly natural. For example, few campers perceived problems with the river red gums, whereas the Wetland Care Australia (1998) assessed them as being stressed. This research did not specifically link these perceptions with the values or attitudes to management, however further study is warranted in this area. Other research has shown, for example, that scientific evidence alone, without input from the public detracts from the acceptance and subsequent success of strategies designed to restore natural environments (Davis, Finlayson & Hart, 2001; Harrison & Burgess, 2000). The SRSC (2002) report and the RMCWMB include extensive sections on educational strategies. The results of this research suggests that education can play a critical role in the development of sustainable camping practices.

### Limitations

There were a number of limitations to this study, in particular the small sample which limited the capacity for more extensive testing of the data. The small sample prohibited the use of factor analysis which would have allowed for internal validity testing of the NAVS items, and assess the relevance of the items for this sample. It also means that the results between the two clusters should be treated with caution and cannot be generalised to a broader population. The nature of camping along the river is that most sites are smaller than Hogwash Bend and thus further studies may also be limited by small sample sizes.

Further testing is warranted with respect to campers' perceptions of the site's naturalness and whether or not they correlate with other factors such as values and environmental knowledge. This will also help to direct future educational strategies.

The study shows that natural area values provide a useful tool

for understanding a sample. In many respects, the campers were alike with respect to their socio-demographic profile, perceptions of the site and attitudes to some management strategies. In other respects however, they were significantly different. The differences in their values suggest that different behaviour would be seen in the two clusters and that some would be more willing than others to assist in conservation efforts to sustain camping.

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