Measuring Visitor Satisfaction with Western Australia's Conservation Estate

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Abstract

Protected natural areas such as national parks, marine reserves, forests and other conservation estates are developing into an increasingly important tourism resource. Forecasted growth in visitor numbers suggests that it is imperative that these areas receive the correct balance of conservation and tourism management attention. In addition to their traditional stronghold of conservation, agencies mandated to care for these estates have similarly become involved in the management of visitors as well as the environment. Consequently, the measurement and management of visitor satisfaction has become a prerequisite for these agencies. While many have a history of surveying visitors, little empirical research into the rudiments of 'visitor satisfaction' in a natural environment context has been conducted. This paper reports on a two-year process of survey development and implementation across three survey periods. Structural modeling is used to test confirmatory and path models. Consistent structures and significant indicators of 'value for money' and 'overall satisfaction' are identified

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Introduction

Globally, protected natural areas such as national parks, marine reserves, forests and other conservation estates are developing into an increasingly important tourism resource. Continued growth in visitor numbers suggests that it is imperative that these areas receive the correct balance of conservation and tourism management attention. For example, growth in visitor numbers to the estate managed by the Department of Conservation and Land Management in Western Australia rose by 8.9% (8.9 million visits to 9.7 million visits) between the period 1999/2000 and 2000/2001 (Department of Conservation and Land Management Annual Report, 2000-2001). The Department of Conservation and Land Management has a lead responsibility for conserving the State's rich diversity of native plants, animals and natural ecosystems. The agency also has the integrated responsibilities of managing lands and waters for the conservation of biodiversity and for the renewable resources they provide, as well as the sustainable provision of recreation and visitor services. (Department of Conservation and Land Management Corporate Plan, 2000-2005).

In addition to their traditional stronghold of nature conservation, agencies such as the Department of Conservation and Land Management mandated to sustainably manage these natural areas are also encouraging community involvement and support in the provision of services such as nature-based recreation opportunities that provide enriched visitor experiences. This is reflected in the mission of the agency:

> 'In partnership with the community, we conserve Western Australia's biodiversity, and manage the lands and waters entrusted to us, for the appreciation and benefit of present and future generations' (Department of Conservation and Land Management Corporate Plan, 2000-2005).

Recognizing the importance of visitor experiences to these areas for continued growth in visitation (*within carrying capacity limits*), the measurement and management of visitor satisfaction has become more prevalent amongst conservation agencies in recent years. The results of satisfaction surveys are increasingly being used by public sector agencies as one of the key indicators of performance provided in annual reports to Parliament. (Auditor General of WA, 1998). While many conservation agencies have a history of conducting extensive visitor surveys, and indeed, have used these as performance feedback mechanisms; empirical research into the rudiments of 'visitor satisfaction' has to date been scarce.

As part of a review of the visitor satisfaction survey program conducted by the Department of Conservation and Land Management, a study was undertaken to identify and measure the underlying dimensions of visitor satisfaction. This paper summarizes the design stages of the survey review program and presents the findings generated over two years of implementation. Although perhaps customary, rather than provide a review of the relevant but somewhat scant literature in the area, this paper will be structured in accordance with its primary motivations, which as identified were managerially defined. Thus, first the objectives of the study are defined. Next, an overview of the exploratory research process is presented. In this section, a review of the results and issues associated with the further development of the survey are considered. Following this, the methodology to implement the survey program across areas managed by the Department of Conservation and Land Management for the three reporting periods March 2000, September 2000 and March 2001 is covered. This section is followed by an analysis of the collected data and a discussion of results. A summary of the findings together with a discussion of managerial and academic implications is then presented.

Objectives

Using appropriate methodologies this study sought to:

- Identify the primary experiential dimensions associated with visitation to natural environment settings managed by the Department of Conservation and Land Management in Western Australia (WA).
- Develop and implement a visitor survey program for recreation areas managed by the Department that incorporates valid and reliable measures of the dimensions of visitor satisfaction.
- Refine item measures to ensure that the requirements of empirical rigor were adhered to where possible.
- Standardize the survey program for subsequent periodic visitor satisfaction assessment.

Exploratory Research framework

Information from secondary sources combined with the output from an extensive focus group session involving a number of stakeholders revealed an initial list of 42 experience dimensions. These dimensions essentially represented the sorts of issues that were held to be important to visitors to Department managed lands.

Given that these dimensions would later form the basis of a visitor survey, it was seen as necessary to reduce the number of dimensions down to a more manageable few. To reduce the number of dimensions and also to ensure that the survey was as meaningful as possible to both visitor and the Department, first a qualitative content (item) reduction process was carried out. At this stage, experts from a number of discipline areas reduced the original list of 42 to 22 'visitor experience' items based on their semantic and context relevance.

A survey questionnaire incorporating this revised list of items was subsequently subjected to a field test at a representative National Park in Western Australia (Yanchep National Park[1]). To ensure that the questionnaire was understandable to visitors, 21 on site personal interviews were conducted. This second development stage allowed for further qualitative refinement of the questionnaire.

The third stage in the development of the survey was conducted over the Easter period (April 1999) and included a pilot test of the survey across seven selected national parks and other recreation areas. The areas selected were biophysically differentiated and thus the type of visitor and the potential activities that could be carried out within each area diverse. To ensure that survey respondents were representative of a number of demographic conditions, a quota-sampling approach was adopted. The resulting data (n = 184) was next exposed to various statistical analysis procedures to 1) refine the survey instrument further, 2) identify the key drivers of visitor satisfaction and 3) provide meaningful insight into conservation and visitor management issues. Based on exploratory factor and reliability analysis using the Cronbach alpha 0.70 cut-off criteria (Nunnally 1967), a further reduction in the number of items down to fourteen was considered acceptable. This item reduction procedure was also consistent with a primary developmental goal of the study namely, to design a survey that would be representative of visitor experiences whilst at the same time considering the length of the survey so as not to compromise the response rate. Exploratory factor analysis revealed that the above fourteen items were best represented by four main factors. A review of items within each factor indicated that the factors had to do with the management of facilities (MngtOp), a sense of isolation and adventure in a wilderness setting (Wilder), the state (degradation) of the environment (Degrad) and the provision of information (InfoFa). The reliability coefficients for the three factors with multiple item measures were very respectable

[1] Yanchep national park is located 80km north of the Perth metropolitan area

being above 0.85, whereas for the fourth 'degradation of the environment', which was only represented by a single item, a reliability coefficient was not attainable.

Implementation of Survey - March 2000, September 2000 and March 2001

Research Design

Based on the above extensive 12 month development process, the final survey questionnaire incorporated: two open-ended questions to ascertain visitation purpose and potential improvement suggestions, 14 visitation items, a measure of value for money, two items to measure visitor satisfaction (one affective and one disconfirmation) and a number of visitor demographic items (see Appendix 1 for main visitation, value and satisfaction items). In order to determine the overall level of visitor satisfaction to recreation areas managed by the Department and to generate trends in visitor information over time, a broad range of survey sites were selected using a recreation opportunity spectrum (ROS) framework. First, the number of survey sites within each of Western Australia's regions was determined according to the number of visits and recreation sites managed within each region (Table C, Appendix 2). Each survey site was then categorised into one of three ROS classes; 'primitive', 'intermediate' or 'developed' according to four ROS classification factors: 'access', 'visitation', 'on-site modification' and 'management' (Table B, Appendix 2) to give a total of 19 survey sites (Table A, Appendix 2). Taking into consideration potential 'peak' and 'non peak' visitation period differences, the aim of the agency was to conduct the survey twice each year at all selected sites thereby allowing for seasonal comparison where relevant.

The adoption of a strict random sampling approach from transient visitors whose identity, origins and travel patterns are unknown is somewhat problematic. Often, the National Parks and other recreation areas where the survey is to be distributed are managed by a small number of staff, and hence; equal opportunity of access to all visitors for random

selection is not feasible. A convenience sampling methodology was therefore selected with staff administering the survey requested as far as possible to adopt a randomised allocation procedure in an attempt to ensure adequate coverage of most visitors. Generally, respondents were approached onsite by a member of staff and asked to complete the survey questionnaire and then either return the completed survey to staff or deposit it in a ballot box provided on-site, or mail it back to the agency using the reply paid address provided on the form. In some cases, survey forms were handed to visitors with other local interpretive material by staff at National Park information/entry points. An incentive in the form of an opportunity to win a subscription to Western Australia's Conservation, Forests and Wildlife magazine 'Landscope' was offered for completion and return. Preliminary tests comparing data based upon method of completion and seasonal variation revealed no significant differences in response patterns. Data from three survey periods coinciding with the March 2000 (n = 525), September 2000 (n = 370), and March 2001 (n = 484) agency reporting periods are discussed below (Total sample size, n = 1379).

Results

Validity and Reliability Assessment

Analysis commenced with an assessment of the survey instrument for psychometric soundness. Confirmatory factor analysis was used to test the earlier derived four-factor structure for each of the three periods, March 2000, September 2000 and March 2001. These periods will be referred to hereinafter as periods 1 - 3 respectively (P1, P2, P3).

A number of measures are used to test the overall fit of each model (P1 – P3). Given that the chi-square (χ^2) measure is recognisably sensitive to sample size and often discounted by researchers (e.g., Bentler and Bonnet 1980; Hoelter 1983), the comparative fit index (CFI) and the root mean square error of approximation (RMSEA) are provided throughout as tests

of model fit. With respect to the CFI measure, Bentler (1990) argues that CFI values above 0.95 indicate a good overall fit, while values of between 0.90 and 0.95 suggest adequate fit. Last, with respect to RMSEA, measures between 0.05 and 0.08 are deemed acceptable (Hair, Anderson, Tatham and Black 1998). Analysis reveals satisfactory results for all models (P1 – P3) with goodness-of-fit (CFI) values for P1 – P3 all greater than 0.95 suggesting a good overall fit (P1 = 0.95; P2 = 0.97, P3 = 0.96) and likewise, the RMSEA for each period is acceptable with measures of 0.07, 0.06, and 0.08 for periods 1 – 3 respectively. Overall therefore, each of the period 1 – 3 models is deemed acceptable.

Convergent and Discriminant Validity

Convergent and discriminant validity were evaluated by calculating the average variance extracted (AVE) for each factor within each model. Convergent validity is established if the shared variance accounts for 0.50 or more of the total variance. Discriminant validity is evident when the AVE for each construct is greater than the squared correlation between that construct and any other construct in the model (Fornell and Larcker, 1981).

The results presented in Table 1 confirm both the convergent and discriminant validity of each of the models (P1 – P3) with only a few exceptions, notably those associated with the single item measure of degradation of the environment. This issue is discussed again under 'academic implications' in the concluding section.

----Table 1 goes here----

Internal Consistency

Internal consistency was assessed by means of the Cronbach alpha coefficient. Values were calculated for each of the multi-item factors included in each of the three models (P1 – P3).

The results presented in Table 2 attest to the high internal consistency of the instrument in that all values are above the suggested 0.70 level for scale robustness (Nunnally, 1967).

----Table 2 goes here----

The results presented in the above sections offer consistent support for the psychometric soundness of the measures adopted across each of the three survey periods. The following section reports on the findings derived from a series of structural path models conducted to identify the key satisfaction indicators across all periods at both the factor and item levels.

Structural Path Testing

The path models tested incorporate the measure of value for money as a criterion variable alongside the measure of overall satisfaction. No position is taken with respect to the causal relationship between value and satisfaction in this paper. Across the three periods, the structural path models reveal in each case satisfactory model fit statistics (P1: CFI = 0.96, RMSEA 0.06; P2: CFI = 0.98, RMSEA = 0.06; P3: CFI = 0.95, RMSEA = 0.08). The standardised path coefficients for each model (Figures 1 – 3) reveal for all periods significant paths for 'wilderness' and 'management' with respect to satisfaction and, 'information', 'wilderness', and 'management' with respect to value. To ascertain indicator hierarchies across the three periods, further structural path models were conducted incorporating indicators from each of the three factors. Multiple models were tested using the Lagrange multiplier test for adding parameters and, the Wald test for dropping parameters (Bentler 1990). A number of modifications resulted in the final model solution and included only those indicators whose paths in the previous rounds of testing were significant. Figures 4 – 6

reveal satisfactory model fit statistics across all three periods for these models (P1: CFI = 0.964, RMSEA = 0.07, P2: CFI = 0.971, RMSEA = 0.07, P3: CFI = 0.915, RMSEA = 0.06).

Findings and Discussion

With respect to 'overall satisfaction', figures 1 – 3 indicate fairly consistent results with the highest path coefficient being for 'wilderness' in two out of the three periods (P1 = 0.32, P2 = 0.47). The next highest coefficient is for 'management' (P1 = 0.29, P2 = 0.26). For P3 this situation is reversed with the highest coefficient being for 'management' (0.40) followed by 'wilderness' (0.37). In P2 the only other significant indicator of satisfaction albeit weak, is 'information' (0.10).

In terms of 'value for money', the highest significant indicator for P1 is 'management' (P1 = 0.32) followed by 'information' (0.19) and 'wilderness' (0.15). For P2 the highest coefficient is for 'information' (0.26), followed by 'wilderness' (0.24) and then 'management' (0.19). Last, for P3 the highest path coefficient relates to that found for both 'information' and 'management' (0.26) followed by 'wilderness' (0.22). Thus to an extent the results are equally consistent, only in this case for the 'information' indicator. These results indicate the importance of providing useful and sufficient information with respect to visitor perceptions of 'value for money'. This is perhaps not unusual given that 'information' represents what could be considered the more tangible aspects of the experience, often resulting from direct interaction between the visitor and member of staff within the National Park or recreation area. Many of the National Parks and other areas conducting this survey program provide Park brochures and other information material to visitors. In addition, National Park guides such as rangers, and tour operators act as information providers and environment interpreters. Interpretive signage provides another form of information for visitors about aspects of the area.

The within factor indicators incorporated in the final path models (Figures 4 – 6) include 'the facilities provided were ideal' (nofac); 'I thought this was an attractive natural area' (natural); 'this area provided a sense of adventure' (adventur); and 'the information provided was useful' (useinfo). To reiterate, these items pertain to those whose path coefficients were significant across all three periods when introduced into a series of competing models incorporating the original 14 survey indicators. With respect to overall satisfaction, for P1 – P2, the strongest significant indicator was for 'the facilities provided were ideal' (0.29, 0.31 respectively) whereas for P3 the two items, 'this area provided a sense of adventure' and 'I thought this was an attractive natural area' revealed the same significant coefficient for both (0.27, 0.27). The next strongest indicator for P1 was, 'I thought this was an attractive natural area' (0.18), followed by 'this area provided a sense of adventure' (0.15). For P2 this position was reversed with 'this area provided a sense of adventure' revealing a significant coefficient of 0.29 and 'I thought this was an attractive natural area' a significant coefficient of 0.19. For P3, the least strong of the significant indicators related to 'the facilities provided were ideal' (0.24), thereby reversing the condition found in P1 and P2.

With respect to 'value for money', a consistent picture is presented with the strongest indicator across all three periods being 'the information provided was useful' (0.31, 0.33, 0.33 respectively). The next strongest for P1 and P3 was 'the facilities provided were ideal' (0.27, 0.19 respectively) whereas for P2 the next strongest was 'I thought this was an attractive natural area' (0.28) which for P1 and P3 was the least strong of the indicators (0.19, 0.16 respectively). The least strong indicator for P2 was 'the facilities provided were ideal' (0.19). These results again identify the importance of information in terms of 'value for money'. Based on these findings, it would be logical to suggest that it is the 'usefulness' of the information (i.e., quality) that is important rather than the sufficiency (quantity) of information. In terms of overall satisfaction, no clear picture is evident although adopting a

crude weighting schema based on relative position in each period, 'the facilities provided were ideal' would appear to be marginally more important. It should be noted that this is a crude tool and it would be erroneous to attempt to prioritize resources accordingly. Clearly all three are important. Noticeably, no significant path coefficient was evident for 'usefulness of information' with respect to overall satisfaction. This is not to say that this issue does not contribute in some way to visitors' satisfaction but it might suggest that when present, the 'usefulness of information' does not add significantly to satisfaction. Further, the findings could suggest that visitors expect information to be provided and what is provided is consistent with their expectations. Linked to this, failing to provide an acceptable (consistent with expectations) level of information could lead to dissatisfaction. This issue is presented in the following section as an area for further research.

Summary

The main dimensions contributing toward visitor 'satisfaction' and 'value for money' relate to those that could be described as 'managerially provided' and 'experiential'. Managerially, the 'type, location and number of facilities' together with the 'usefulness of information', proved consistently throughout the analysis to be the strongest indicators of satisfaction. The strongest indicator of 'value for money' was as discussed above, the 'usefulness of information'. Experientially, visitor perceptions of the environment as being 'natural and attractive' and likewise, providing a 'sense of adventure' were the strongest experiential themes for both 'satisfaction' and 'value for money'. It is interesting to note the identification of the 'natural attractiveness of the environment' visited as a strong indicator of 'satisfaction' and 'value for money'. This notion is likewise consistent with the requirements for sustainable tourism, i.e., that an environment be conserved in its natural state (Middleton and Hawkins 1998). This would seem to provide further testimony of the need for a balanced

approach to sustainable destination management. Environmental impact studies would prove invaluable toward this end and conservation agencies are urged to collect such data. While perhaps somewhat obvious, it is nonetheless worth noting that the role of managing the environment does not rest with conservation agencies alone. Tourism operators and visitors alike need to be aware how to behave and subsequently, behave in a manner consistent with the conservation needs of each area. Environmental education, interpretive and promotional programs alike would assist in this regard. In terms of the environment providing 'a sense of adventure', and also being 'natural' and 'attractive', it is perhaps not surprising to find these two dimensions proving to be key indicators of both 'satisfaction' and 'value for money'. Not only are they consistent with the 'action-excitement' and 'nature' (recreation experience preference) motivation items (Driver 1977) but also, one of the six benefits of non-facilitated use of wilderness identified by Roggenbuck and Driver (2000). This would suggest the presence of a relationship between visitor motivations, benefits, perceived value and satisfaction for these dimensions. The nature of this relationship was not addressed in this study though clearly further research in the area is warranted. In this regard, exploring the effect of consistency between motivations and perceived benefits with respect to satisfaction and perceived value may prove a useful starting point.

Of particular interest in this study is the finding that the identified indicators include both 'expressive' and 'instrumental' satisfaction factors (Swan and Combs 1976). Expressive factors are feeling, affect-based, whereas instrumental factors consist of those dimensions that when absent, can create "dissatisfaction" (Czepiel and Rosenberg 1974, c.f. Neal, Sirgy and Uysal 1999). Distinction between the instrumental and expressive attributes was also evident in a study conducted by Lieber and Fesenmaier (1985) in which they examined visitor satisfaction with a walking trail experience in a Chicago reserve. The authors revealed that instrumental attributes such as surface, length, terrain and proximity to residence

contributed less to satisfaction than did expressive attributes relating to visual perspective and preference. The emotionally positive experience of sightseeing was found to be more important than the access or trail-way that afforded the experience. The findings of this study are generally consistent with those of the above authors, in that for two of the three periods, 'wilderness' incorporating affect-based experiential attributes proved to be the strongest indicator of visitor satisfaction. While the findings were not altogether consistent across all three periods, perhaps of greater importance is the finding that both expressive and instrumental indicators are important satisfaction and value for money indicators. Not only does it appear necessary to include items pertaining to both dimensions in such visitor surveys, it also indicates the need for managers to manage both dimensions. Similarly, if indeed there is some foundation to the notion that 'instrumental' attributes are 'dissatisfiers' and expressive attributes 'satisfiers' (Herzberg 1966), the need for a balanced management approach is clearly warranted. Further research to identify not only those factors that contribute towards satisfaction, but also those that could lead to visitor dissatisfaction would prove invaluable. Oliver's (1999) introduction of mono and bivalent satisfiers/dissatisfiers would prove a useful framework for future studies.

Conclusion

This paper has provided some insight into the key indicators of 'satisfaction' and 'value for money' as reported over three time periods by over 1300 visitors to the natural environment of Western Australia. Further visitor studies of the type described in the above sections would serve to build upon the findings of this study thereby assisting agencies operating in a natural environment context with their management initiatives. The success of agencies responsible for both the maintenance of the natural environment and the provision of nature-based visitor experiences is clearly dependent upon many criteria. Positioning the human-made and natural

environment dimensions as the 'product' and the visitor as the 'consumer', this paper has provided an overview of a structured program of research to measure visitors' satisfaction whilst in a natural setting. The main purpose of the review of the Department of Conservation and Land Management's visitor survey program was to obtain a reliable and valid measure of visitor satisfaction whilst also enabling valuable visitor feedback to assist with decision-making regarding the management of the recreation areas surveyed. With this as a primary goal, this study has been successful with the survey program now fully integrated across all regions managed by the Department.

As with most surveys, this one is likewise open to further refinement. For example, the inclusion of an extra item to measure 'state of the environment' is suggested. This would enable this factor's reliability to be assessed over time. Also, consideration will be given to the addition of other items into the survey dependent on the needs of the Department. Similarly, methodological refinement concerning the interpretation and presentation of the survey results will be assessed in accordance with the needs of the Department at a local, regional and corporate level.

This article has outlined the development of a project the aims of which were ultimately to serve as a useful source of information for natural environment managers. The appropriate measurement and management of visitor satisfaction with respect to these areas is one critical step in this process.

Table 1 - Convergent and Discriminant Validity

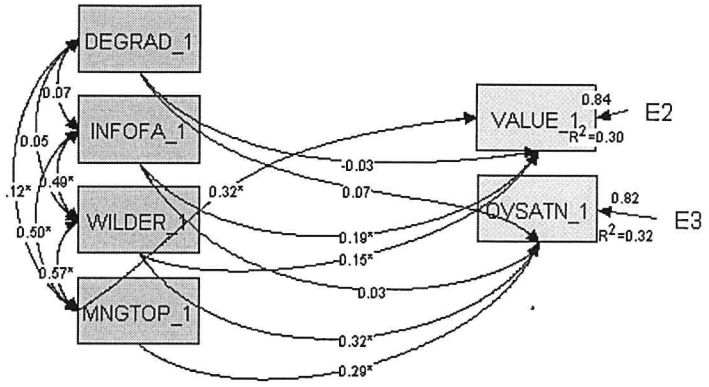
	March 2000 (P1)				Sept. 2000 (P2)				March 2001 (P3)			
	M	W	I	D	M	W	I	D	M	W	I	D
Convergent validity	.62	.69	.54	.21	.51	.55	.66	.28	.50	.60	.64	.20
$(\text{Correlation})^2$	.61	.49	.61	.05	.44	.44	.44	.35	.31	.48	.48	.09
Discriminant validity	1.02	1.41	.90	4.1	1.16	1.25	1.5	.80	1.61	1.25	1.33	2.22

M = Management; W = Wilderness, I = Information, D = Degradation of environment
AVE = Average Variance Extracted = _ of std. loading^2/__ of std. loading^2 + _ of _j
Conv. = Convergent Validity (AVE >0.50)
Disc. = Discriminant Validity = $\text{AVE}/(\text{Corr})^2 > 1$
$(\text{Corr})^2$ = Highest $(\text{Corr})^2$ between factors of interest and remaining factors

Table 2 - Reliability assessment (Coefficient = Cronbach Alpha)

Period/ Construct	March 2000 (P1)	September 2000 (P2)	March 2001 (P3)
Management & Operations	0.9075	0.8244	0.8445
Wilderness	0.7846	0.7586	0.7447
Information	0.7356	0.7896	0.7808
Degradation of Environment	NA (Single item)		

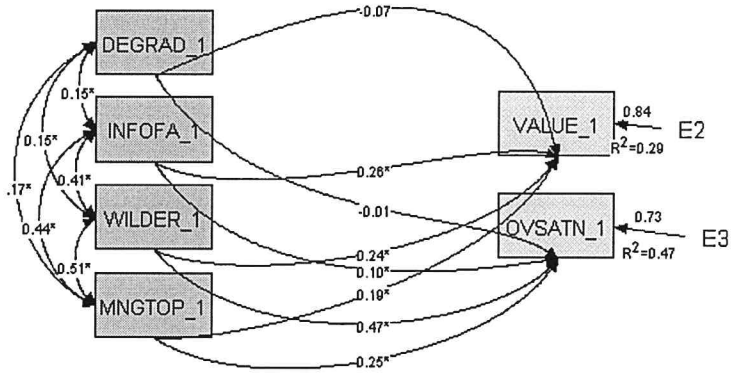
Figure 1 – Structural path model period 1 (March 2000)



Model fit: CFI = 0.96, RMSEA = 0.06

DEGRAD = Degradation of environment, INFOFA = Information, WILDER = Wilderness, MNGTOP = Management and operations

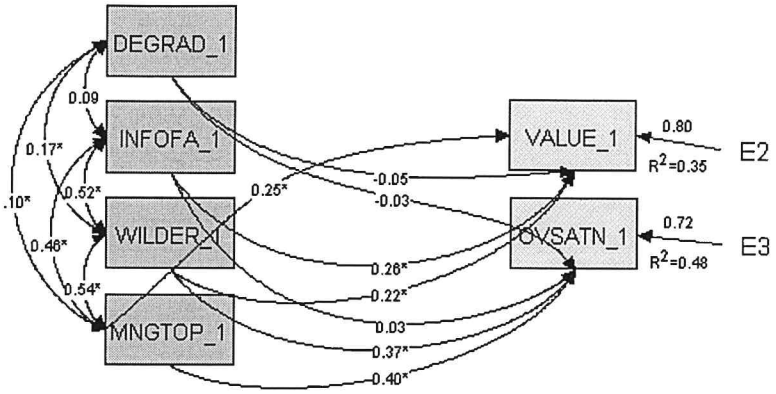
Figure 2 – Structural path model period 2 (September 2000)



Model fit: CFI = 0.98, RMSEA = 0.06

DEGRAD = Degradation of environment, INFOFA = Information, WILDER = Wilderness, MNGTOP = Management and operations

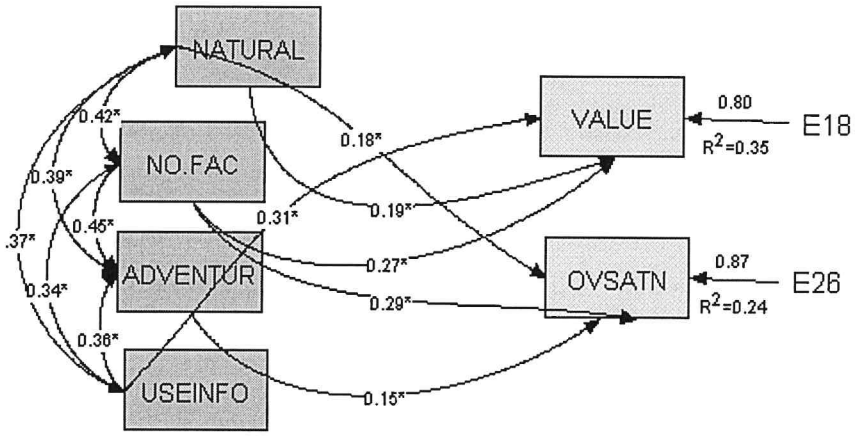
Figure 3 – Structural path model period 3 (March 2001)



Model fit: CFI = 0.95, RMSEA = 0.08

DEGRAD = Degradation of environment, INFOFA = Information, WILDER = Wilderness, MNGTOP = Management and operations

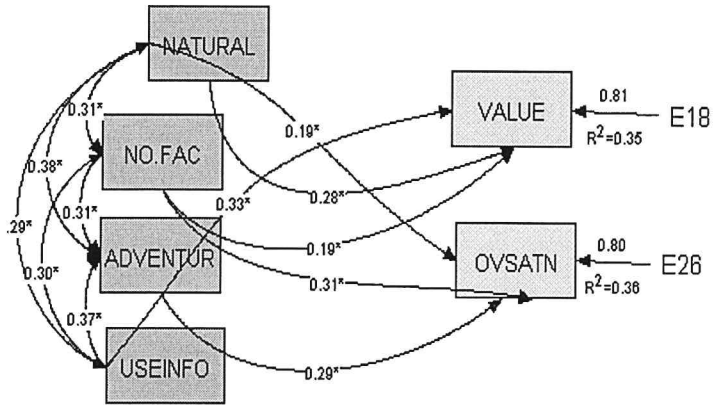
Figure 4 – Period 1 – Structural path model (March 2000)



Model fit: - CFI = 0.964, RMSEA = 0.07

NATURAL = I thought this was an attractive natural area, No.FAC = The facilities provided were ideal (type, location and number), ADVENTUR = This area provided a sense of adventure, USEINFO = The information provided was useful.

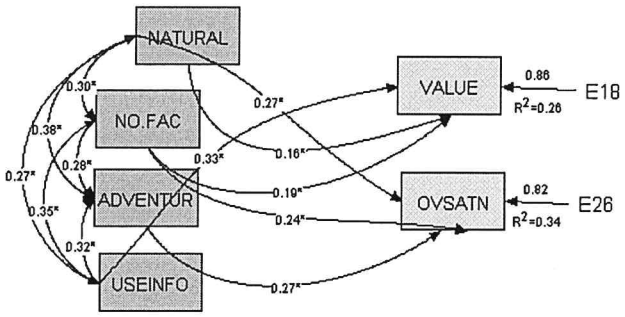
Figure 5 – Period 2 – Structural path model (September 2000)



Model fit: - CFI = 0.971; RMSEA = 0.07

NATURAL = I thought this was an attractive natural area, No.FAC = The facilities provided were ideal (type, location and number), ADVENTUR = This area provided a sense of adventure, USEINFO = The information provided was useful.

Figure 6 – Period 3 – Structural path model (March 2001)



Model fit: - CFI = 0.915; RMSEA = 0.06

NATURAL = I thought this was an attractive natural area, No.FAC = The facilities provided were ideal (type, location and number), ADVENTUR = This area provided a sense of adventure, USEINFO = The information provided was useful.

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Appendix 1 – Visitor Survey (item bank)

1. I enjoyed the leisure activities I participated in (strongly disagree/agree)
2. The condition of the site was excellent
3. The rangers and other CALM staff were helpful
4. The facilities were well managed (quality and cleanliness)
5. Road access and conditions were reasonable
6. The information provided was useful
7. Being here I felt close to nature
8. Sufficient information was provided about the area
9. Areas such as this provide solitude and isolation
10. I thought this was an attractive natural area
11. Features of cultural/historic value were well preserved *(where applicable)*
12. I saw evidence of environmental degradation (erosion, littering, vandalism)
13. This area provided a sense of adventure
14. The facilities provided were ideal (type, location and number)
15. My visit today provided value for money *(applicable only if fee charged)*
16. How did you feel about your visit today (extremely displeased/pleased)
17. How would you rate your visit overall (much worse/better than expected).

Appendix 2 – Recreation Opportunity Spectrum

The distribution of the survey was determined using the following parameters:

- Survey sites were classified into one of the three ROS classes; primitive, intermediate or developed as shown below in Table a, with the number of sites in each class to be approximately 10% (primitive), 30% (intermediate) and 60% (developed) of the total number of sites surveyed (19 sites). The factors used to determine the appropriate ROS class for each survey site is shown in Table b.
- At least one survey site in each CALM Region.
- Number of visits to each Region (taken from 1998/99 VISTAT figures), see Table c below.
- Number of recreation sites in each Region (taken from RecData), see Table c below.

Table A. - Recreation Opportunity Spectrum (ROS) Classification Matrix

	ROS Class			
CALM Region	**Primitive**	**Intermediate**	**Developed**	**TOTAL survey sites**
Goldfields			*Kalgoorlie Aboretum*	1
Wheatbelt			*Dryandra Woodland*	1
Kimberley	*Purnululu National Park*			1
Midwest			*Nambung National Park, Kalbarri National Park*	2
Pilbara		*Karijini National Park*	*Cape Range National Park*	2
South Coast		*Fitzgerald River National Park*	*Cape Le Grand National Park*	2
Southern Forest		*Diamond Tree, Warren National Park*	*Gloucester National Park*	3
Central Forest		*Blackwood recreation sites*	*Leeuwin Naturaliste National Park, Wellington Forest National Park*	3
Swan			*Yanchep National Park, John Forrest National Park, Penguin Island, Lane Poole Reserve*	4
TOTAL survey sites	1	5	13	19

Table b. -ROS Classification Factors

Factor	ROS Class		
	Primitive	**Intermediate**	**Developed**
ACCESS			
Distance from nearest town	Over 80kms.	50-80kms.	Less than 50kms.
Access	Foot/Bicycle/4WD/limited 2WD.	2WD gravel.	2WD bitumen/public transport/bus & caravan access.
Parking Capacity	Up to 3 cars (non designated parking area).	4-10 cars and 2 buses (designated parking area).	Over 10 cars and 2 buses.
VISITATION			
No. of recorded visits per year	Less than 20,000 visits.	Between 20,000-80,000 visits.	Over 80,000 visits.
ON-SITE MODIFICATION			
Visual Impact/Facilities	Minimal, only those for conservation purposes.	Basic facilities e.g. barbecues, pit toilet, picnic tables.	Modified site with large scale developments and/or substantial facilities.
Disabled access	Unsuitable for disabled.	Site accessible with assistance to a degree.	Disabled facilities provided.
Information/ interpretation	Minimal, possibly site orientation.	Site/park brochure or information, panels.	Visitor centre, organised activities, display/information shelters.
Appropriate Use	Activities requiring little or no equipment e.g. bird watching, bushwalking, swimming, fishing.	Activities requiring equipment and/or vehicle access e.g. vehicle based camping.	A range of activities.
MANAGEMENT			
Management presence	Irregular, as required (approx. once a month).	Regular (daily at certain times of the year, and at other times, once a week).	All year round, daily.
Visitor management	Subtle guidance e.g. tracks.	Definition of use areas by provision of facilities e.g. bollards to guide vehicles.	Provision of different access routes e.g. vehicle, foot, bicycle and/or parking areas for different vehicles provided.

Note: The ROS class (primitive, intermediate or developed) for each survey site was determined where the majority of the factors were applicable for the site.

Table C - Number of Visits and Recreation Sites per CALM Region

CALM Region	**No. of visits 98/99** (% of total no. of visits to all Regions)	**No. of recreation sites** (% of total no. of recreation sites)
Goldfields	86000 (1%)	11 (1%)
Wheatbelt	39000 (1%)	26 (3%)
Kimberley	186000 (2%)	53 (5%)
Midwest	689000 (8%)	64 (6%)
Pilbara	321000 (4%)	104 (11%)
South Coast	518000 (6%)	166 (17%)
Southern Forest	988000 (11%)	144 (15%)
Central Forest	2035000 (24%)	168 (17%)
Swan	3806000 (43%)	246 (25%)
TOTAL	8668000 visits (100%)	982 sites (100%)

Note: The figures provided in the above table were used as a general guide to determine the number of sites surveyed in each Region (as shown in the ROS Classification Matrix – Table b.).

Appendix 3 – Western Australia