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**Importance-satisfaction analysis for marine park hinterlands: A Western Australian case study**

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Running title:

Importance-satisfaction analysis

## **Importance-satisfaction analysis for marine park hinterlands: A Western Australian case study**

### **ABSTRACT**

Tourist use of national and marine parks continues to increase worldwide. Effective management depends on being able to evaluate the quality of visitors' experiences, as well as protecting the natural environment. In tourism management, importance-performance analysis (IPA) has been used as part of quality management. It has recently been applied to national park management. This paper re-conceptualises this analysis to one of importance-satisfaction, enabling a focus on the quality of experience. Two methods, importance-performance analysis and service quality gap, were modified and applied in the hinterland of Swan Estuary Marine Park in Western Australia. Both provided data useful for evaluating satisfaction, with the choice of method depending on the end user's resources and requirements as well as cognisance of each method's limitations. For most of the Marine Park attributes, satisfaction exceeded importance and hence no management attention is needed. Exceptions were the condition of the Swan River and associated footpaths, and the presence of litter and wildlife. For these, satisfaction was lower than importance suggesting management attention is needed.

*Key words:* Importance-performance analysis; protected area management; satisfaction; service quality gap; Swan Estuary Marine Park

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### **1. INTRODUCTION**

Protected areas such as national and marine parks have long held a special attraction for people. With increasing mobility, education levels and leisure time, their use has increased dramatically over the last two decades (Scherl & Valentine, 1992; Newsome, Moore, & Dowling, 2002). Most protected areas have the dual mandate of conserving natural resources as well as providing opportunities for recreation and tourism. To meet the second part of this mandate, managers require knowledge about visitors and the type of experiences they are seeking. Also, for today's managers, maintaining high quality experiences is essential if protected areas are to remain competitive with other forms of tourism and retain budgetary allocations from government treasuries (McCool, 2002).

Concerns regarding the effects of increasing levels of use on the quality of visitors' experiences stimulated the first studies in the 1970s (Manning & Lime, 2000). Over time, satisfaction has become the principal measure of the quality of a visitor's experience, with numerous measures and methods now in use. Understanding visitor satisfaction allows managers to provide facilities and services that match visitor expectations, while also validating that visitors are satisfied with their experiences (Hornback & Eagles, 1999). The search continues, however, for the most effective framework for representing these experiences and measuring their quality (Borrie & Birzell, 2001; McCool, 2002). Also of great interest to researchers and managers alike, is how the opportunities provided by

agencies, especially their facilities and services, affect the quality of visitors' experiences (Hamilton & Crompton, 1991; Hollenhorst & Gardner, 1994).

Several approaches to performance analysis in tourism and hospitality research have direct relevance to the experiential component of protected area management (Ryan & Cessford, 2003). One such approach is importance-performance analysis (IPA) (Oh, 2001). This approach combines measures of performance and associated importance in a two-dimensional grid to provide a graphic representation of the performance of managers, suppliers or operators in providing a range of services (Borrie & Birzell, 2001; Oh, 2001). Another related approach is the service quality gap which measures service performance as the difference between expected and perceived evaluations of services (Tribe & Snaith, 1998). Both are relatively easy to use but have had limited application in protected areas (Wade & Eagles, 2003).

This article further develops current work on the quality of tourism experiences in protected areas by focusing on satisfaction and its relationship with importance, as perceived by visitors to protected areas. The widely used importance-performance analysis and the service quality gap are re-conceptualised as importance-satisfaction analyses and applied to visitor use of the hinterland of Swan Estuary Marine Park in Western Australia. The results are compared and the relative efficacy of the methods analysed. The article concludes with management implications.

## 2. METHODS

### 2.1 Study Site

Many of the issues and concerns of terrestrial protected area management, including increasing visitor use and the associated provision of recreation and tourism opportunities, are also relevant to managing marine protected areas. Marine-based visitor research is lagging behind its terrestrial counterparts, with a lack of information on the types and numbers of marine visitors and their satisfaction with the recreation opportunities provided (Vrana, 1999). Recent increases in the number of marine protected areas, as well as in the numbers visiting these areas, also emphasises the need for visitor-related studies (Shafer & Inglis, 2000).

Conducting this study, with a focus on a marine park, meets the dual objectives of testing the re-conceptualised importance-satisfaction approaches as well as collecting visitor data to inform management. The Swan Estuary Marine Park and associated hinterlands provided the study site (Fig. 1). A narrow band of the associated hinterland is nature reserve, while beyond these boundaries is the Perth metropolitan area. Perth is the capital of the state of Western Australia (WA) and home to over one million people. The Marine Park and adjacent nature reserves are managed by the WA Department of Conservation and Land Management (CALM), who have a mandate to protect the natural environment as well as providing opportunities for recreation and tourism experiences.

*INSERT FIGURE 1 ABOUT HERE*

This Marine Park is recognised internationally as important habitat for migratory birds as well as providing a diversity of visitor experiences (Keeling, 1987; CALM, 1999). The shallow

waters of the Marine Park cater for fishing, boating, and wind- and kite-surfing. The hinterland, with dual use paths (for walking and cycling), information signs and waterbird viewing platforms, provides ready access to the shoreline of the Swan River and opportunities for extensive walking and cycling. The hinterland is also regularly used by dog-owners as a place to take their pet for a walk. Further information on patterns of visitor use, the visitors themselves and demand, was not available, emphasising the importance of surveys such as this.

## 2.2 Re-conceptualising Performance-based Approaches

Hospitality and tourism research has drawn extensively on importance-performance analysis (IPA) to monitor services such as hotels, restaurants and tours (Oh, 2001). Its use in protected area research has focused on evaluating facilities, such as visitor centres, campsites, and cabins. For example, Wade and Eagles (2003) used IPA to examine the importance and performance of visitor services (tours and accommodation) in two Tanzanian national parks, to provide the managers with measures of client satisfaction.

Ryan and Cessford (2003) also used IPA, as well as the service quality gap, in their analysis of facilities and associated conditions in New Zealand national parks. These authors moved beyond a focus on facilities to also consider conditions, such as the muddiness of walk trails and crowding. Hollenhorst and Gardner (1994), in their work in wilderness areas, also broadened their study beyond services to consider conditions, an essential precursor to understanding and providing for desired experiences. Their indicator performance estimate (IPE) measured performance based on the difference between visitor standards and actual conditions.

Importance-performance-satisfaction research has been plagued by definitional and conceptual confusion and ambiguities (Baker & Crompton, 2000; Oh, 2002; Ryan & Cessford, 2003). Baker and Crompton (2000) noted that there has been relatively little discussion concerning the differentiation of performance and satisfaction and subsequently they have been used interchangeably. Importance-performance analysis has been used to measure and report on satisfaction, however, it is performance rather than satisfaction that has been measured (Oliver, 1997). Conversely, importance and satisfaction have been measured and then analysed and reported as importance and performance (e.g., Griffin & Archer, 2001). In an effort to reduce confusion, Baker and Crompton (2000) defined performance as a measure of provider output while satisfaction is a measure of visitor outcome.

Research drawing on the service quality gap has, similarly to IPA work, focused on services and their provision, rather than conditions and experiences. Approaches such as SERQUAL and HOLSTAT examine the difference between expected and perceived evaluations of performance (Tribe & Snaith, 1998; Ryan & Cessford, 2003). In tourism research, the focus has been the performance of services such as resorts, accommodation and restaurants. The gap method has had limited application in protected area management, the exceptions being Ryan and Cessford's (2003) and Wade and Eagles' (2003) work. The same confusion around performance and satisfaction has troubled service quality gap applications as it has IPA.

Re-conceptualisation of the importance-performance basis of both methods to an importance-*satisfaction* approach was essential, in the context of this study and for protected area management more generally, for two reasons. First, protected area agencies are ultimately concerned with providing desired outcomes for visitors. Given that these outcomes are strongly experientially based (and assuming the previously-discussed relationship between experience and satisfaction holds), satisfaction then provides essential information for judging an agency's outcome-based performance. Comparing importance and satisfaction then provides much-needed information on where limited resources can be directed, or conversely saved.

Second, most importance-performance and importance-satisfaction work has concentrated on the performance of services. For protected areas, services are only one element contributing to the opportunities provided and resultant experiences. Central to experiences of natural areas is the condition of natural features, such as wildlife and water bodies. Basing the analysis on satisfaction rather than performance enables visitors' responses to elements such as these, additional to service provision, to be accessed and analysed.

### 2.3 Survey Methods

Visitors to the Marine Park hinterland were surveyed over a three-month period during autumn and early winter and including weekdays and weekends, as well as school holidays and terms. Managers of the Marine Park (CALM) recommended this survey period, as it would potentially encompass warm (i.e. summer, autumn and spring) and cool (i.e. winter) season users. Surveying was spread across the early hours of the morning, the day itself and evenings. The questionnaire was distributed and collected by hand. The higher use parts of the Park were sampled more intensively (i.e. Pelican Point and Alfred Cove). As most of the visitors were on the dual use paths in the hinterland surveying concentrated here, while making sure that those in the water (mostly at Pelican Point where they were wind-surfing or kite-surfing) were also surveyed. All visitors who passed the researchers were asked to take part in the survey.

Questions covered visitor characteristics (age, gender, place of residence), visit characteristics (type of activity, number of times visited), importance of and satisfaction with environmental conditions, and management preferences. For both importance and satisfaction, respondents were given the same list of attributes, covering environmental, social and managerial conditions, and asked to assign a value to each using a five-point uni-directional scale. For importance the scale ranged from 'not at all important' to 'extremely important' and for satisfaction from 'low' to 'high'. For satisfaction, respondents also had the option of 'not sure'. For importance, a uni-directional scale has been suggested as being more useful and making more sense than a bi-directional measure (Oh, 2001). A pilot study was used to refine the questions before the survey proper was conducted.

Attributes used in this study were derived from Morin, Moore, and Schmidt's (1997) research into the conditions regarded as acceptable by protected area visitors in southwest Australia

and from discussions with CALM staff. This selection approach ensured that the survey attributes collectively captured the conditions most likely to contribute to a satisfying experience for visitors as well as being meaningful to managers (Oh, 2003; Ryan & Cessford, 2003). Management preferences were similarly derived, with CALM staff asked for proposed management activities, these were listed and respondents asked to indicate on a five-point scale the extent of their support, from 'strongly support' through to 'strongly oppose', plus a 'not sure' category.

#### 2.4 Data Analysis

The importance-satisfaction analysis was based on importance-performance analysis (Martilla & James, 1977), except satisfaction replaced performance. The means of importance and satisfaction for each attribute provided the coordinates for placement in a two-dimensional matrix (Fig. 2). The crosshairs were located at the mean of the scale range, after Oh (2001). He recommended using the mean of the scale range rather than the mean of the results as the crosshairs, arguing that using the scale means allows for a simpler comparison of importance and performance. Other researchers have used the mean of the results (e.g. Ryan & Cessford, 2003) or target-driven approaches, such as setting the crosshairs at 4 out of 5, to reflect standards of 'extremely important' and 'excellent' performance (Wade & Eagles, 2003).

*INSERT FIGURE 2 ABOUT HERE*

Calculation of the re-conceptualised service quality gap also relied on the means of importance and satisfaction. To obtain the gap value for an attribute the mean for importance was subtracted from the mean for satisfaction (Table 1). A two-sample t-test tested the gap's statistical significance (Roggenbuck, Williams & Watson, 1993; Ryan & Sterling, 2001). A negative, statistically significant gap (e.g. Table 1, the presence of litter) where the importance mean is larger than the satisfaction mean, suggests management action is required. Conversely, a positive, significant gap (e.g. Table 1, the presence of wildlife), because the importance mean is lower than the satisfaction mean, suggests no extra management is required.

*INSERT TABLE 1 ABOUT HERE*

### 3. RESULTS

#### 3.1 Visitor Profile

A total of 213 visitors were approached with 132 questionnaires completed, a response rate of 62%. This lower than expected response rate was due in large part to the high number of cyclists using the dual use paths and their unwillingness to stop and be surveyed. Only 9% of visitors were 24 and younger, with 24% in the 25-39 age group, 41% aged 40-59 and 26% aged 60 and over. In total, 21% of questionnaires were completed by couples. For the remainder (79%), 67% were completed by females and 27% by males. Group size was one to two people for 88% of respondents. For a further 10%, the group size was 3-5 people and it was 8 or more for 2% of respondents.

The majority of respondents lived in the Perth metropolitan area (94%), with 2% from other places in Western Australia, 2% from interstate and 2% from overseas. The main activities were walking (61%) and walking dog(s) (29%). The remaining 10% of visitors were cycling, windsurfing or kite-surfing. Repeat visitation was very high (92%), with the majority (80%) visiting the area at least once a week.

### 3.2 Importance, Satisfaction and Management Preferences

Visitors to the Marine Park and hinterland indicated the presence of litter and wildlife, and the condition of the Swan River and the path as having the highest levels of importance (Table 2). Those given the lowest levels were the presence of kitesurfers, windsurfers, anglers, and cyclists. For satisfaction, those with the highest levels included access to, smell and condition of the Swan River, the presence of dogs, and places to park (Table 3). Lower levels of satisfaction were associated with the presence of cyclists, information signs and litter. No attribute had a mean satisfaction level below 3.0.

*INSERT TABLES 2 & 3 ABOUT HERE*

For management actions, when the responses for ‘support’ and ‘strongly support’ were combined, the highest levels of support were for replanting native vegetation, providing more information about waterbirds, providing shelters, and constructing a bird-hide (Table 4). The actions that received the lowest levels of support were zoning for kite-surfing and windsurfing, providing more information signs, and constructing a lookout.

*INSERT TABLE 4 ABOUT HERE*

### 3.3 Importance-satisfaction Analysis and the Gap Method

Plotting the means of satisfaction and importance for the 14 attributes, from Tables 2 and 3, into two-dimensional space as per the proposed importance-satisfaction approach, placed all the attributes in quadrats B and D (Fig. 3). These quadrat descriptors are high satisfaction and importance (B, keep up the good work) and high satisfaction and low importance (D, possible overkill).

*INSERT FIGURE 3 ABOUT HERE*

Using the gap method, all calculated gaps were statistically significant, except for two – access to River and presence of signs (Table 5). Four of the statistically significant attributes – condition of the Swan River and path, and presence of wildlife and litter – had negative gap values. A negative value results from a lower mean level of satisfaction than importance and suggests that the associated attribute requires management attention. Of the remaining attributes, all had positive gap values, with three having particularly large gaps (Table 5) – the presence of anglers, kite-surfers and windsurfers. Positive gaps result from a higher mean level of satisfaction than importance, suggesting ‘overkill’ – less management attention is needed.

*INSERT TABLE 5 ABOUT HERE*



## 4. DISCUSSION

### 4.1 The Visitor Profile and its Influence on the Results

This Marine Park and its hinterland have a very high level of local usage (94% of respondents from the Perth metropolitan area) and repeat visitation. The negative gap value for satisfaction with the condition of the path, significant at the 0.1% level, reflects the path's centrality to the experiential concerns of the majority of visitors who are regular walkers (90% of respondents). The lower levels of importance attributed to activities such as kite-surfing and angling reflects the smaller numbers of visitors engaged in these activities (10% of respondents). The intolerance of litter complements findings elsewhere in Australia and overseas (Morin et al., 1997).

### 4.2 Quality of Experience

Interpreting the importance-satisfaction matrix, no attribute requires management attention (Fig. 2). In all respects the experience, and the management contributing to it, is satisfactory. In other studies, in contrast, a number of attributes have been plotted into the quadrat of high importance–low satisfaction (Quadrat A), meaning concentrated management attention is needed (Griffin and Archer, 2001; Ryan and Cessford, 2003; Wade & Eagles, 2003).

Although these studies were conducted with visitors to terrestrial protected areas many of the attributes of interest are the same. Griffin and Archer (2001), in their research with visitors to seven national parks on north-eastern NSW, Australia, located directional signs and maps, crowding, seeing wildlife, and toilets in Quadrat A. Ryan and Cessford (2003), in their research with campsite users in New Zealand national parks, placed car parks, toilets, and the availability and cleanliness of tent sites in Quadrat A. Wade and Eagles (2003), in their Tanzanian research, put security and crowding in Quadrat A.

All of these studies have, however, used different approaches to locate the matrix crosshairs (Table 6), with these differences potentially contributing in part to similar attributes being allocated to very different quadrats. Differences between visitors (Wade & Eagles, 2003) and between the quality of experience provided by the sites have also contributed to these differences. If the crosshairs in this study are shifted to 4, as per Wade and Eagles' (2003) work and in line with continually improving practice (Oh, 2001), then the condition of the Swan River and path, and the presence of wildlife and litter move into Quadrat A (Fig. 3). This amended result aligns with the significance afforded these attributes through the gap analysis (Table 5). The issues associated with crosshair placement and other methodological issues are discussed below.

*INSERT TABLE 6 ABOUT HERE*

The results from the gap analysis suggest that the quality of experience for visitors is being adversely affected by the condition of the River and path, and the presence of litter and wildlife (lack of presence). For all other attributes, satisfaction exceeds importance, giving a positive gap value and no need for management. In their satisfaction surveys of day-walkers in New Zealand national parks, Ryan and Cessford (2003) found a similarly high level of concern regarding track (path) condition, although in their case, satisfaction well exceeded importance, (5.52 and 4.60 respectively) giving a significantly positive gap value.

#### 4.3 Judging the Efficacy of the Importance-satisfaction Analysis and Gap Method

Importance-satisfaction analysis, based on the two-dimensional matrix, provides a quick, simple visual representation of visitors' satisfaction with the conditions of an area relative to the importance they assign to these conditions. This representation allows for easy interpretation of results and provides managers with an indication of what needs to be done: continue as they are, give more attention, or reduce the resources being allocated. Also, through plotting attributes against both importance and satisfaction a quick comparison of all attributes across a given site is possible. This is its optimal use – comparing attributes across a given site at one point in space and time. It is best suited to managers and agencies with limited computer and statistical support.

The gap method, in contrast, provides tabulated data, including analysis of the statistical significance of the gap between the satisfaction and importance means for each attribute. Such data are easy to store in a computer spreadsheet program and can be readily tabulated for corporate decision making and reporting. Interpretation of these data is relatively easy, with a statistically significant negative gap suggesting management action is needed. Using this technique, the end user (manager) is unable, however, to readily compare the different levels of satisfaction with attributes across a given site, as is possible with the visual matrix. It does, however, enable managers to quickly determine, for a number of sites, which attributes require attention. This method is best for dealing with a large number of sites across space and time.

The choice regarding use must also be based on a clear understanding of the limitations (and the implications of these) in how the results may be interpreted and used. For the matrix, the main issue is crosshair placement (Oh, 2001). Where the crosshairs are placed determines which attributes need management attention. For both methods, ongoing concerns also centre on the selection and definition of variables (Baker & Crompton, 2000; Ryan & Cessford, 2003).

In this study, the crosshairs were located at the scale means, after Oh (2001). Various other approaches have been used, as summarised in Table 6. Oh (2001) recommended using scale means as it allows a simpler description of the comparison between importance and performance than using actual means. Also, study-specific adjustments to scales and crosshair location are not required. It does seem, however, that given current emphases on best practice and moving beyond satisfactory to excellent performance (Oh, 2001), that Wade and Eagles (2003) approach may prove useful and pertinent to managers. In this study, when the crosshairs were moved to 4, the results from this analysis aligned exactly with the gap analysis findings and made more practical sense.

#### 4.4 Contribution to Methodological Development

The validity and reliability of the analyses and results from importance-satisfaction analyses, and specifically as applied to visitor use of protected areas, could be enhanced in a number of ways. As mentioned earlier, clear definitions are essential. These definitional efforts need to

continue focusing on variables such as satisfaction, which have been identified as contributing to behavioural intent and ideally result in action. Satisfaction is of particular interest because of the expectation that it leads to repeat visits and political and broader societal support for the product of interest and associated tourists (Baker & Crompton, 2000).

The selection of attributes for reporting on satisfaction is another area of current interest to researchers and practitioners alike (Oh, 2003; Ryan & Cessford, 2003). Other studies have sought to categorise satisfaction indicators as 'satisfiers' or 'dissatisfiers' (Baker & Crompton, 2000) or as physical attributes and locational experiences (Ryan & Cessford, 2003). Satisfiers are attributes that satisfy, excite and motivate. In this study they included wildlife and the River. Dissatisfiers are part of the site's infrastructure, such as information and comfort amenities and access provision, which cause dissatisfaction through their absence or 'dysfunction'. They have no satisfying consequences when fulfilled, only negative consequences if they do not meet visitor needs and expectations. In this study, the path and its condition were a dissatisfier.

Most other related studies (e.g. Griffin & Archer, 2001; Ryan and Cessford, 2003; Wade & Eagles, 2003) focus on dissatisfiers, such as toilets, walk tracks and signage, rather than satisfiers. This focus can be explained, in large part, by Ryan and Cessford's (2003) grouping of attributes into physical attributes (dissatisfiers) and locational experiences (satisfiers), the former being easier to manage and therefore dominating satisfaction surveys. For protected areas, given that many satisfiers are integral to the visitor experience, more concerted research attention to them is warranted.

In terms of attributes, there also seems value in pursuing the development of a core set of attributes, based on progressing the preliminary work of Ryan and Cessford (2003). They used factor analysis to group 13 protected area service attributes into 4 clusters – infrastructure, ancillary infrastructure, aesthetic/experience components, and car parking – and indicating the contribution of each cluster to the percentage variance in responses.

Several critical future research directions are apparent from this study. First, the crosshairs issue associated with importance-satisfaction analysis requires further attention, which may be sensibly achieved by marrying this research with current interests in the development of indicators, targets and standards (Moore, Smith & Newsome, 2003). If, for example, an agency chose to set a target/standard at 4 on a 5-point scale for both importance and satisfaction, this would clearly delineate the boundaries of the 'concentrate here' quadrat. Judgments by managers regarding an acceptable gap might be similarly employed in gap analyses. For example, a manager may determine that attributes with gap values above -1.0 require immediate management attention (due to the large difference in mean values) and that attributes with gap values over +1.0 can potentially have resources directed away from them to improve other areas. Research is needed to determine the acceptable standards and gap sizes.

A final future focus is exploring further how satisfaction varies between different visitor segments (Wade & Eagles, 2003). In this study, attributes such as presence of cyclists, windsurfers, and anglers seemed to have a very different importance-satisfaction profile to others, probably in response to the influences and interests of these small user groups. It seems likely that these groups have different requirements and be seeking different experiences, an importance not picked up in this study, but potentially needed to manage and provide for a diversity of visitors and associated experiential requirements.

## 5. CONCLUSION AND MANAGEMENT IMPLICATIONS

This study re-conceptualised importance-performance analysis and service quality gap methods to encompass satisfaction and then applied these methods in the hinterland of Swan Estuary Marine Park. Both methods provided a valuable description of the importance ascribed to and visitor satisfaction with conditions. Satisfaction with conditions is an essential contributor to positive visitor experiences, with this being an outcome central to protected area management (Ryan & Cessford, 2003). Both also provided an analysis of the management needs for a range of condition-related attributes, based on the relationships between importance and satisfaction.

The findings from these importance-satisfaction analyses have important implications for management. For most of the Marine Park attributes, for example, places to park, presence of signs, presence of dogs and so on (Table 5), satisfaction exceeded importance and hence no management attention is needed. This means that resources do not need to be dedicated to providing more parking spaces or policing the activities of dog owners. Rather, they can be directed to those attributes where importance exceeds satisfaction. In this category is the condition of the Swan River and associated dual use paths, and the presence of litter and wildlife. For managers, this flags a need for management attention. Ideally, resources can then be allocated to improving the condition of the River and the dual use paths, dealing with littering and perhaps providing signs to explain where, when and why wildlife, and particularly migratory birds, might be present or absent.

The management preferences findings also have important implications for managers. There was strong support for providing more information about waterbirds (Table 4), an action supporting the dual mandate of this marine protected area and as such should be afforded high funding priority. On the other hand, zoning for kite-surfing and windsurfing, and constructing a lookout, were not widely supported. The managing agency can take these results as a clear signal that they do not need to pursue these proposals, where the former is politically volatile and the latter expensive. In conclusion, these relatively simple methods can provide invaluable information to protected area managers to assist in identifying their management needs and then prioritising the associated actions.

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## FIGURES

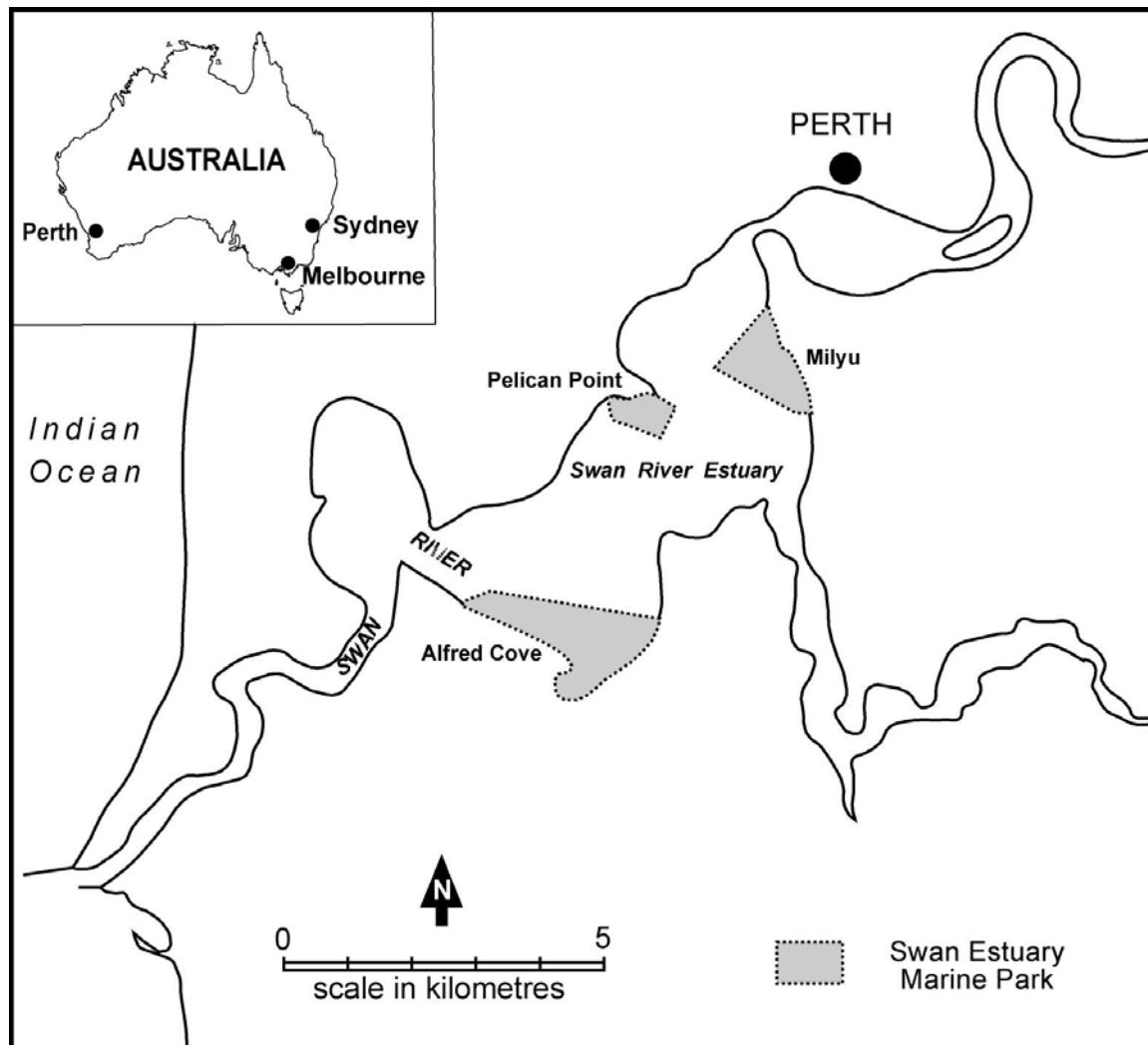


Figure 1. Location of Swan Estuary Marine Park, Western Australia

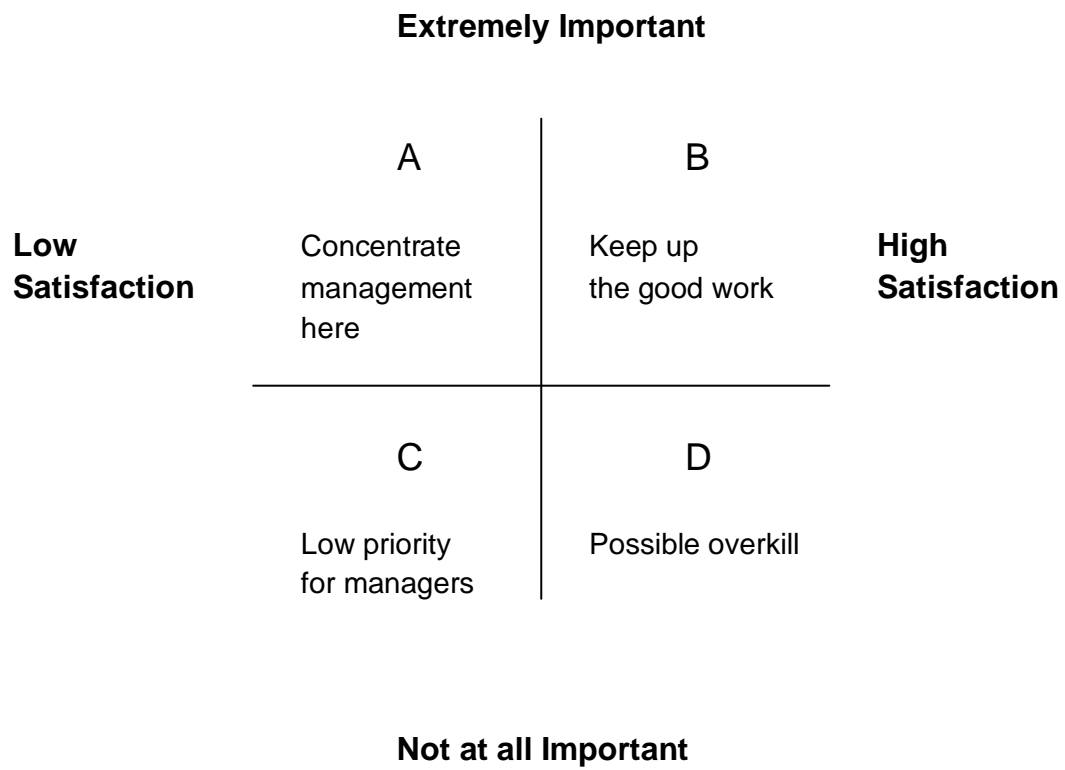


Figure 2. Importance-satisfaction matrix



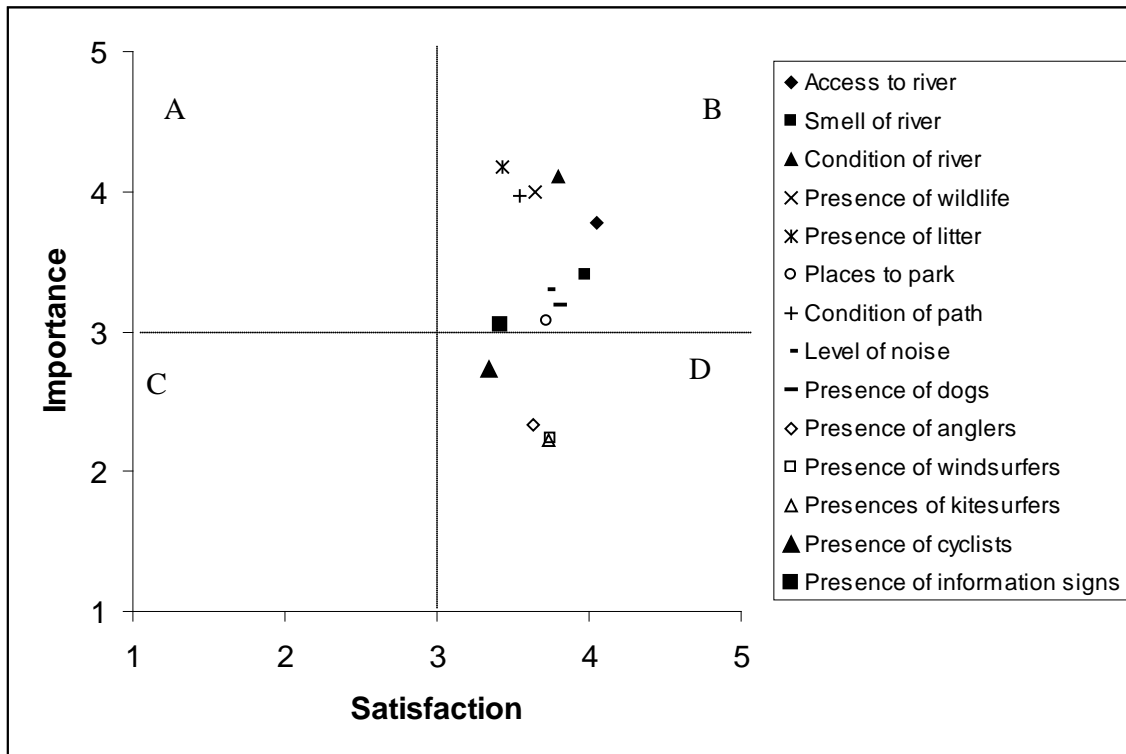


Figure 3 Importance-satisfaction analysis for Swan Estuary Marine Park

**TABLES**

Table 1. Example of importance-satisfaction gap calculation

<b>Attribute</b>	<b>Satisfaction mean</b>	<b>Importance mean</b>	<b>Gap value</b>	<b>P-value</b>	<b>Sig.</b>
Presence of litter	4.2	4.5	-0.3	0.005	**
Presence of wildlife	4.5	4.0	0.5	0.005	**

**Sig.** – Statistically significant. \*\*  $p < 0.01$ .

Table 2. Importance assigned to attributes of Swan Estuary Marine Park (% of respondents)

<b>Attribute/Importance*</b>	<b>(5)</b>	<b>(4)</b>	<b>(3)</b>	<b>(2)</b>	<b>(1)</b>	<b>N</b>	<b>Mean</b>
Access to river	30	38	18	9	4	123	3.78
Smell of river	24	26	24	20	6	123	3.41
Condition of river	43	33	17	6	1	124	4.10
Presence of wildlife	33	47	11	7	2	123	4.00
Presence of litter	48	32	11	5	4	124	4.18
Presence of dogs	30	12	25	14	19	124	3.19
Presence of anglers	9	5	26	29	31	108	2.34
Presence of wind-surfers	8	7	22	29	34	116	2.24
Presences of kite-surfers	9	6	20	31	34	117	2.23
Presence of cyclists	15	11	28	27	19	124	2.73
Presence of information signs	19	22	20	25	14	119	3.05
Places to park	16	21	34	13	16	114	3.08
Condition of path	33	42	18	5	2	125	3.97
Level of noise	18	29	26	19	8	121	3.29

\***5** - Extremely important; **4** - Very important; **3** - Somewhat important; **2** - Not very important; **1** - Not at all important.

Table 3. Satisfaction expressed with attributes of Swan Estuary Marine Park (% of respondents)

<b>Attribute/Satisfaction*</b>	<b>(5)</b>	<b>(4)</b>	<b>(3)</b>	<b>(2)</b>	<b>(1)</b>	<b>N</b>	<b>Mean</b>
Access to river	51	24	13	2	10	123	4.05
Smell of river	38	33	20	5	4	123	3.97
Condition of river	29	37	24	8	2	124	3.80
Presence of wildlife	24	37	25	7	7	123	3.64
Presence of litter	22	32	23	13	10	124	3.43
Presence of dogs	38	27	22	4	9	124	3.81
Presence of anglers	33	27	23	4	13	108	3.63
Presence of wind-surfers	32	29	28	2	9	116	3.75
Presences of kite-surfers	32	30	26	3	9	117	3.73
Presence of cyclists	19	29	32	10	11	124	3.34
Presence of information signs	20	32	30	8	10	119	3.42
Places to park	34	25	29	5	7	114	3.72
Condition of path	25	34	22	8	11	125	3.55
Level of noise	28	32	26	12	2	121	3.73

\* **5** - High level of satisfaction, ranging to **1** - Low level of satisfaction

Table 4. Level of support for management actions (% of respondents)

<b>Management Action/Level of Support*</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>N</b>
Replant native vegetation	40	49	6	2	3	129
More waterbird information	29	53	8	1	9	129
Guided tours of waterbirds	19	46	12	6	17	129
More information signs	15	45	17	9	14	129
Provide shelters	19	55	10	8	8	129
Construct a bird-hide	28	38	12	10	12	129
Construct a lookout	32	29	22	12	5	129
More cycle/walk paths	24	41	20	9	6	128
Provide toilets	23	42	19	10	6	129
More Ranger visits	19	42	17	6	16	129
Zoning for kite- and windsurfing	24	27	15	11	23	128

\* **1** - Strongly support; **2** - Support; **3** - Oppose; **4** - Strongly oppose; **5** - Not sure.

Table 5. Results from the gap method

Attribute	Satisfaction mean	Importance mean	Gap value	P-value	Sig.
Access to river	4.05	3.78	0.27	0.067	NS
Smell of river	3.97	3.41	0.56	9.2xE-6	***
Condition of river	3.80	4.10	-0.30	0.01	**
Presence of wildlife	3.64	4.00	-0.36	0.0051	***
Presence of litter	3.43	4.18	-0.75	1.3xE-6	***
Presence of dogs	3.81	3.19	0.62	0.00030	***
Presence of anglers	3.63	2.34	1.29	1.2xE-13	***
Presence of windsurfers	3.75	2.24	1.51	6.3xE-19	***
Presences of kite-surfers	3.73	2.23	1.5	3.1xE-18	***
Presence of cyclists	3.34	2.73	0.61	0.0014	***
Presence of information signs	3.42	3.05	0.37	0.037	NS
Places to park	3.72	3.08	0.64	0.0025	***
Condition of path	3.55	3.97	-0.42	0.00074	***
Level of noise	3.73	3.29	0.44	0.0055	***

**Sig.** – Statistically significant. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , NS – not significant.

Table 6. Method used to locate crosshairs in importance-satisfaction/performance analyses

Study	Location method	Numeric value
This study	Scale mean	3
Oh (2001)	Scale mean	3
Griffin and Archer (2001)	Results mean	Variable
Cessford and Ryan (2003)	Results mean	Variable
Wade and Eagles (2003)	Standard set at 'extremely important'/'excellent performance' (4 on 5 point scale)	4

