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Visitor satisfaction analysis as a tool for park managers: a review and case study

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Abstract

Visitor satisfaction has long been an important area for leisure research and increasingly so for park management. In order to achieve this a number of approaches have been adapted from consumer research including importance-performance analyses, gap analyses, threshold performance targets and overall satisfaction. This paper reviews these approaches with respect to park management. It then draws on focus group research with protected area agency staff to obtain their views on the usefulness and robustness of the analyses associated with these approaches. Yanchep National Park (Western Australia) was used as a case study, with the results from a recent visitor survey providing the data for satisfaction analyses. To provide a more accurate summary of the range in results, confidence intervals were included in the analyses output to illustrate the variation in responses. The analyses results emphasise the importance for leisure managers of accessible, usable data on visitor satisfaction.

Keywords: gap analysis; importance-performance analysis; importance-satisfaction analysis; park management; satisfaction

Introduction

Visitor use of national parks and other protected areas is continuing to increase worldwide (Arabatzis & Grigoroudis, 2010). When visitors choose to visit a particular destination, the main determinant is often the type of leisure experience they are seeking (Bushell & Griffin, 2006). In order for managers to provide facilities and services to support these experiences, information on what visitors need, expect and have obtained is crucial (Wardell & Moore, 2005). Visitor surveys are the most common technique used by protected area management agencies worldwide to obtain this information, with the resultant data used for planning, management, resource allocation, public accountability, interpretation and marketing

(Bushell & Griffin, 2006; Fletcher & Fletcher, 2003; Newsome, Moore & Dowling, 2002; Wardell & Moore, 2005).

Such surveys are particularly useful for obtaining detailed information on visitors, their characteristics, preferences and expectations (Bushell & Griffin, 2006; Griffin et al., 2010; Newsome et al., 2002). In Australia and elsewhere in the world, surveys have been used to collect information on the main reasons or motivations for visiting; patterns and levels of use; importance of various services and facilities to the visitor experience; visitor expectations in regards to services and facilities; and visitor satisfaction (Bushell & Griffin, 2006; Griffin et al., 2010).

Visitor satisfaction

Visitors' satisfaction with outdoor recreation experiences has been an important area of inquiry for many years, with research literature dating back to the 1960s (Baker & Crompton, 2000; Manning, 1986; Tarrant & Smith, 2002). This sustained interest in satisfaction derives from the widely held view that improvement in performance quality and resultant satisfaction will result in the retention or expansion in the numbers and support of visitors, as well as political support (Baker & Crompton, 2000). In addition, understanding what constitutes satisfaction enables managers to provide facilities and services that match visitors' expectations while also validating that they are indeed satisfied (Borrie & Birzell, 2001; Hornback & Eagles, 1999; Tonge & Moore, 2007).

Many different techniques, definitions and theories have been employed to measure satisfaction with leisure experiences (Borrie & Birzell, 2001; Graefe & Fedler, 1986). Most have used service quality and/or satisfaction as the principle constructs, however, a lack of consensus persists regarding the definitions of these constructs, resulting in them being used interchangeably (Baker & Crompton, 2000). This may be due to both constructs being based

on disconfirmation theory, that is, whether perceived performance matches, exceeds or falls below expectations (Baker & Crompton, 2000; Howat & Crilley, 2007; Ryan & Cessford, 2003).

Tian-Cole et al. (2002) and Crompton and Love (1995) have usefully differentiated the two. Service quality or quality of performance is based on the perceptions of the attributes of a particular facility or service, those that can be controlled by managers. Satisfaction or quality of experience is a psychological outcome that is derived from visiting a setting. It is an emotional state of mind after exposure to an opportunity (Baker & Crompton, 2000; Howat & Crilley, 2007; Zabkar, Brencic & Dmitrovic, 2010) making satisfaction more difficult than service quality to operationalise and measure (Zabkar et al., 2010).

Given that visitors to parks can be viewed as “consumers” that are paying for the “product” of leisure experiences (i.e. through taxes or entry fees), it is not surprising that researchers have turned to the field of marketing and consumer research to look for meaningful ways of measuring satisfaction (Borrie & Birzell, 2001). Many of the popular approaches adopted combine a measure of performance with an indication of how important the service, facility or attribute was to the consumer’s experience.

Measuring visitor satisfaction

One of the more popular approaches to measuring visitor satisfaction is *importance-performance analysis* (IPA) developed in the field of marketing to measure customer evaluations of service attributes in a way that was easy to convey results to managers (Borrie & Birzell, 2001; Martilla & James 1977). IPA has been widely adopted in a variety of research fields including travel, tourism, education, leisure and recreation, marketing, management, healthcare and banking (Huang, 2010; Kao, Patterson, Scott & Li, 2008; Oh, 2001; Wade & Eagles, 2003). In a tourism context, IPA has been used for hotels, restaurants,

food service and tour guide performance (Huang, 2010) as well as being applied to special events and ski resorts (Wade & Eagles, 2003). It has had limited application in parks and other protected areas, mainly to facility evaluation, such as visitor centres or cabins, and recently wilderness conditions and outdoor recreation settings (Arabatzis & Grigoroudis, 2010; Tarrant & Smith 2002; Tonge & Moore, 2007; Wade & Eagles, 2003).

The popularity of the IPA method is based on the presentation of data, which is easy to interpret and understand (Borrie & Birzell, 2001; Kao et al., 2008; Martilla & James, 1977; Wade & Eagles, 2003). It provides a visual snapshot of how well a company or agency is meeting their consumer's important concerns in addition to providing guidance on future resource allocation (Kao et al., 2008; Martilla & James 1977; Oh, 2001). It does this by representing a measure of importance along the vertical axis and a performance measure across the horizontal axis of a two dimensional matrix. Each attribute is scored on importance and performance and then plotted into the matrix or grid according to their importance and performance values, generally the means (Lin, Chan & Tsai, 2009; Oh, 2001) (Fig. 1).

INSERT FIGURE 1 ABOUT HERE

Cross-hairs are added to the grid to create four quadrants, with their placement determined by the researcher. One option is their placement at the scale mid-point (i.e. 3 on a 5 point scale) (Oh, 2001). Alternatively, they can be placed at the grand (overall) means for importance and performance, or if an agency is focused on achieving high standards, they can be placed at a point on the higher end of the scale (Ryan & Cessford, 2003; Wade & Eagles, 2003).

The four quadrants of the matrix are labelled to provide guidance for managers. For example, an attribute lying in the top right hand quadrant – it has high importance and high performance – suggests managers need to “keep up the good work”. One with high importance but low performance suggests managers need to “concentrate here”. The

remaining quadrants indicate to managers “possible overkill” in the allocation of resources (low importance and high performance) or “low priority” (low importance and low performance) (Fig. 1).

This technique has had limited application in parks and protected areas research. Wade and Eagles (2003) used it to measure the satisfaction of visitors to Tanzania’s national parks. They choose this technique for its simplicity of analysis given it does not require complex software or specific expertise to conduct, analyse or interpret the information when compared to a program like SERVQUAL¹. Tarrant and Smith (2002) applied the technique across a range of leisure settings typically found in United States’ publically managed lands. They modified the IPA approach to include a measure of the statistical variance in the results. Confidence intervals, with the mean value in the centre and two standard error bars (one each for importance and performance), were included to illustrate whether the attributes measured truly fell within a single quadrant.

Tonge and Moore (2007) reconceptualised IPA as importance-satisfaction analysis (ISA) through application to a marine park and its hinterland in Western Australia. They noted the interchangeable use of “performance” and “satisfaction” and chose to concentrate on the latter because of its attention to desired recreation and leisure experiential outcomes. This focus was also influenced by the prospect of satisfaction leading to repeat visitation and greater support for protected areas (Baker& Crompton, 2000; Tonge & Moore, 2007). Given the purposes of this paper are similar to Tonge and Moore (2007) in terms of focusing on visitor outcomes, importance-satisfaction analyses are used in this paper.

Another common approach to researching visitor satisfaction is *gap analysis*. It is similar to IPA in its reliance on the means of importance and performance/satisfaction scores to determine whether management action is required for a particular attribute. To obtain a gap

score, the importance mean is subtracted from the performance mean, with statistical analysis undertaken (generally a t-test) to determine whether the gap is significant. A negative gap indicates that the importance value is higher than the performance value, therefore action by managers is needed to improve performance. Conversely, a positive gap results when the performance value is higher than the importance value, indicating no management action is warranted (Hornback & Eagles, 1999; Ryan & Cessford, 2003; Tonge & Moore, 2007).

Threshold performance targets have been recently used in parks and protected area management to help understand visitors' satisfaction with their experience. A percentage target for visitor satisfaction with a selected attribute is determined *a priori* (e.g. 85% or more of visitors are satisfied with their visit) and the target is achieved when this percentage is attained or exceeded. If an attribute fails to meet this target it warrants management attention. A level of importance – low, medium or high – is used to identify the priority level for potential management action (Archer & Griffin, 2005). The percentage target can be set by the protected area management agency to reflect their corporate goals, with targets generally ranging from 70-95% of visitors satisfied with a particular attribute.

Finally, the most common and oldest method for assessing satisfaction is asking visitors “how satisfied are you with your visit?” (Bushell & Griffin, 2006). Over time, other questions have been used, including:

- Would you recommend this park to like-minded friends?
- Would you be willing to return to this park?
- On a scale of 1-10, with 10 being the perfect trip, how would you rate the quality of your trip?

(Burns et al., 2003; Ryan & Cessford, 2003).

While these questions may seem superfluous if a protected area management agency simply wants to determine the overall level of satisfaction, they may also serve a specific function. For example, the first listed question can provide managers with an indication whether their marketing techniques have been successful in attracting a specific visitor type or segment and the second question may provide an indication of future usage rates (Howat & Crilley, 2007; Ryan & Cessford, 2003).

These techniques may not, however, be sophisticated enough to precisely represent the range of responses in the data collected (Oh, 2001; Tonge & Moore, 2007). A number of articles (including those cited above) have used modified or extended approaches of the IPA technique specifically to improve its reliability and validity (Huang, 2010; Lin et al.; 2009). Some have included additional statistical analysis including regression analysis, partial correlation and composite ranking (Lin et al., 2009). Trade-offs often exist, however, between analyses that produce robust, reliable results and at the same time are easy for time- and resource-poor managers to use.

Having reviewed satisfaction analyses research to-date in parks and protected areas with respect to visitors' leisure activities, this paper now moves on to a description of the visitor surveys undertaken at Yanchep National Park, Western Australia. The resultant data were used by a focus group of park managers to obtain their views on the usefulness and robustness of the various satisfaction analyses described above. The paper concludes with suggestions for overcoming some current challenges in translating the wealth of research in this area into park management.

By using a recent visitor survey at Yanchep National Park, Western Australia as a case study, the remainder of this paper explores managers' preferences for importance-satisfaction analyses and how relatively "simple" statistical measures can be included to accurately reflect

the range in visitors' responses. It will conclude with a discussion of these analyses and their usefulness and also provide some recommendations to protected area managers on how to translate research into park management.

Methodology

The survey was developed and tested in Yanchep National Park. It was distributed on-site to all adult visitors encountered in the Park during the April school holidays in 2008. The survey included questions on visitor demographics and trip specific characteristics. Visitors were also asked to indicate their level of importance and satisfaction with a list of attributes (see Table 1 for list of attributes). As indicated above, satisfaction has been used to reflect the outcome-based nature of protected area management. The attributes were provided by the protected area management agency in Western Australia (Department of Environment and Conservation, WA DEC) who have used these for many years in their corporate visitor satisfaction survey. A 5-point Likert scale was used for both with 1 being the lowest (not at all important, not at all satisfied) and 5 the highest (extremely important, extremely satisfied). Three measures of overall satisfaction were also included: overall satisfaction with their visit to the Park; how they felt about their visit; and how strongly they would recommend the Park to their friends.

After the survey a two-hour focus group of representatives from WA DEC was convened to obtain their views on the general usefulness of the survey questions and the resulting data, including satisfaction analyses presented as an ISA, gap scores and overall satisfaction.

Participants were sent background notes, including the satisfaction analyses. Staff members were identified and selected in collaboration with the manager of the Department's Social Research Unit and included regional, district and specialist branch staff. The meeting was digitally recorded with the resultant material contributing to the results presented below.

Study site

Yanchep National Park is located approximately 48 km north of Perth in Western Australia and is about 2,800 ha. There are a diverse recreational opportunities including picnic areas, underground caves, wildlife enclosures and numerous tracks and trails (DEC, 2008). Visitors can participate in a range of activities such as cave tours, hire rowboats on the lake or visit the tea house or museum. The central area of the Park is highly developed and modified with visitor activities concentrated here. The Park attracts over 240,000 local, interstate and international visitors per year (DEC, 2008).

Analysis of satisfaction with individual attributes

Satisfaction with attributes was examined in three ways: importance-satisfaction grid analysis; gap analysis; and threshold performance targets. For the first, *importance-satisfaction grid analysis*, importance and satisfaction means for each attribute were plotted onto the two-dimensional grid. The cross-hairs were placed at the grand means for importance and satisfaction to make allowance for the positive skew often found in satisfaction surveys (Ryan & Cessford, 2003). Also included in the grid were 95% confidence interval bars to provide an indication of sampling variation. Adding these bars is important because they indicate the accuracy with which the attribute's position within the grid can be determined, and assist the reader (manager) to determine the quadrant(s) in which the attribute may be located. Tarrant and Smith (2002) are the only other researchers identified who have considered including a measure of the sampling variation.

The *gap analysis* relied on subtracting the importance mean from the satisfaction mean to produce a gap value or score and testing for statistical significance via a paired t-test. The standard error was also calculated so the accuracy with which the gap between importance and satisfaction was estimated could be assessed.

The third approach to importance-satisfaction analysis relied on *threshold performance targets*. The threshold target used for this study was 85% of respondents (WA DEC corporate KPI) (DEC, 2010) indicating that they were ‘very’ or ‘extremely satisfied’ with each particular attribute (i.e. 4 or 5 on 5-point scale). For each attribute that did not meet the target, P-values were calculated to determine whether the percentage satisfaction score was significantly lower than 85%. Importance was provided as a rating – low, moderate or high – depending on whether the importance mean was above the grand importance mean, between the grand mean and the scale midpoint, or below the scale midpoint as per Archer and Griffin (2005).

Analysis of overall satisfaction

Three different questions were included to measure visitors’ overall satisfaction with their park experience –

- Question 11: “overall, how satisfied were you with your visit?”
- Question 12: “how did you feel about your visit?”
- Question 13: “would you recommend the Park to others?”

All three questions used a 5-point Likert scale with 1 being the lower (negative) end of the scale and 5 being the higher (positive) end. To examine the correlation between the three questions relating to overall satisfaction, Pearson correlation tests were undertaken. Paired t-tests were also used to establish whether there were any significant differences between the responses provided for these questions.

Results

A total of 480 surveys were completed with 9 visitors who were approached declining to participate. This resulted in an unusually high response rate of 98% with on-site interviews

generally considered a success with a response rate of 80% or better (Hornback & Eagles, 1999).

Just under half (47%) of respondents indicated that this was their first visit to the Park. The main activities participated in included sightseeing; bird/wildlife viewing; and relaxing/fun/enjoyment. Of the 480 respondents, approximately 60% were female and 66% were from Australia. Of this 66%, 8% were from interstate with the remainder from Western Australia. Overseas visitors (34%) were mainly from European countries such as the United Kingdom and Germany. The largest age group of respondents was 35-44 years old, which corresponds with the most common travel group being friends and/or relatives (39%) and young or mid-life families (32%).

Analysis of satisfaction with individual attributes

Table 1 contains the mean importance and satisfaction for each attribute. The most important attribute to respondents in relation to the Yanchep National Park was “being able to enjoy nature” which had a mean of 4.34 (Table 1). Surprisingly, “feeling safe in the Park” was the next most important attribute, followed by “clean, well presented toilets”. All attributes had an importance mean over 3.0, which was also shown in the means for satisfaction.

Respondents indicated that they were most satisfied with “being able to enjoy nature” (mean 4.35) with high mean satisfaction scores also being produced for “feeling safe in the Park” and “sightings of native wildlife/birds”. Low satisfaction means were attributed to “clean, well presented toilets”, “clear information about visitor safety” and “pre-visit information about the Park was easy to obtain” (Table 1).

INSERT TABLE 1 ABOUT HERE

Importance-satisfaction grid analysis (Fig. 2) showed that three attributes fell within the “concentrate here” quadrant – “useful directional road signs in the Park” (2 on grid), “clean,

well presented toilets” (5), and “healthy water condition” (12). An important inclusion in Figure 2 is the illustrative confidence intervals in the lower right part of the grid. The longest (dashed) and shortest (solid) lines show the range of satisfaction and importance confidence intervals for the means in this figure. Visually, these lines can be moved to be centred on any attribute in the grid.

INSERT FIGURE 2 ABOUT HERE

Overlaying these confidence intervals on a number of attributes in Figure 2 suggests uncertainty regarding which quadrant they are actually located in, especially those on or next to the cross hairs. A *complementary analysis* is provided in Table 1 (column 3) where the information in each cell summarises whether the 95% confidence interval for an attribute is entirely above (+), entirely below (-), or both above and below (?) the grand mean for importance and satisfaction. To illustrate, a “- -” in a cell in column 3 (of Table 1) would indicate that the attribute is below the grand means for both importance and satisfaction even after taking in to account sampling variation, as shown for “pre-visit information about the park was easy to obtain”. The attribute “sightings of native wildlife/birds” is “++” indicating confidence that importance and satisfaction for the attribute were both above the grand means. The table also illustrates that for a number of attributes, such as “clean, well presented picnic/BBQ facilities”, it is too ambiguous to determine where the attribute is located relative to the grand means.

Gap analysis provides another way of interrogating satisfaction (Table 1, columns 8-10). Of the 11 attributes with a statistically significant gap score, only one was negative – “clean, well presented toilets”. Although attributes 2 and 12 also have negative gaps, these are not statistically significant and hence the evidence for management attention for these attributes is weak. In terms of *threshold performance targets*, 14 of the 21 attributes fell below the 85%

target (Table 2). Importance ratings were applied to add a further layer of interpretation. Only one attribute – “clean, well presented toilet facilities” – was below 85%, statistically different to the threshold target at $p < 0.001$, and of high importance.

INSERT TABLE 2 ABOUT HERE

In the *focus group*, managers were asked for their preferences regarding importance-satisfaction grid and gap analyses (they were not asked to comment on threshold performance targets or capability in performing analyses to keep the number of tasks undertaken by the focus group manageable). Half of the participants found the presentation of the importance-satisfaction data in both the grid and gap table format very useful. A third preferred the grid on its own and a smaller number again the gap table on its own. Participants considered the grid more visually appealing and easy to interpret allowing for immediate identification of problem areas. They also indicated that having the gap table located under the grid provided a quick understanding of results through provision of the numerical values for the importance and satisfaction means.

Analysis of overall satisfaction

The results from the three questions on visitors’ overall satisfaction were analysed using paired t-tests (Table 3). There were no significant differences in the average responses for the three questions. Nearly three quarters of respondents (or more) provided the same answers to at least two of these questions. Correlations between these three questions were moderately high (Table 3). In addition, focus group members commented that Question 11 (overall how satisfied) and Question 12 (how did you feel about your visit) were very similar and that one could be omitted.

INSERT TABLE 3 ABOUT HERE

Discussion

Visitor Satisfaction – Yanchep National Park

Attributes relating to the natural environment, such as an unspoiled natural environment, unique scenery and natural features (Archer & Griffin, 2005) and wildlife and the presence of water (Tonge & Moore, 2007) have been widely identified as very important to visitors to parks and protected areas. This pattern was repeated in this study, with attributes relating to the natural environment also receiving the higher levels of satisfaction. Again, comparable results can be found in other protected area studies (Archer & Griffin, 2005; Ryan & Cessford, 2003; Tonge & Moore, 2007).

From the grid analysis, attributes in the “concentrate here” quadrant were healthy water condition, useful directional road signs and clean, well presented toilets. Toilets were also an area requiring management attention in the study by Ryan and Cessford (2003) as well as the availability and cleanliness of campsites. Those attributes found in the “keep up the good work” quadrant found similarities in the Archer and Griffin (2005) study where visitors were satisfied with the natural environment, scenery features and visitor behaviour. Little similarity is found with the study by Tonge and Moore (2007) which had 10 out of their list of 14 attributes in the “keep up the good work” quadrant, with no attributes in “concentrate here”. However, it should be noted that their study had the cross-hairs placed at the scale mid-point rather than the grand means as per this study.

The only attribute with a statistically significant negative gap value in this study was clean, well presented toilets, a finding mirrored by Ryan and Cessford (2003) in their study of publically managed natural settings in the Coromandel, on the north island of New Zealand. These authors also obtained statistically significant negative gap values for signposting, first aid kits, and a litter free trail. In terms of threshold targets, Archer and Griffin (2005) in their

visitor research in New South Wales national parks found that 44% (11 of 25 attributes) were below a threshold target of 80%. When the target in this study is similarly set, then a roughly equivalent 33% of attributes (9 out of 21) were below target. In this study five of the attributes were below the target (of 85%) and of high importance, whereas only one attribute in Archer and Griffin's (2005) study – pre-visit information – was below target (of 80%) and of high importance.

These three analytical approaches – ISA, gap analysis and performance targets – produced similar results. ISA identified three attributes needing attention, and the other two analyses identified the same one attribute: clean, well presented toilets (also one of the three ISA attributes). As such, the choice of analysis then rests in issues such as usefulness and robustness.

Usefulness and robustness of satisfaction analyses for managers

The ease of application and interpretation of results has led to the wide-scale acceptance of the IPA (and ISA) grid technique (Oh, 2001; Ryan & Cessford, 2003; Tarrant & Smith, 2002). Managers in the focus group were also very supportive of this approach, especially when combined with the tabulated gap analysis. However, given that visitors to protected areas generally rate the quality of the associated attributes highly, the results can be skewed and the range of variation within the collected data inadequately represented (Borrie & Birzell, 2001). Using the grand means for the cross hairs addresses the skew issue while including confidence intervals allows the range of variation to be represented (Tarrant & Smith, 2002). Having the confidence intervals, plus the associated information provided in Table 1 (column 3) regarding the certainty with which an attribute lies fully within a quadrant, are both important features from this study for managers. For example, placing the confidence intervals on top of the means for the three attributes in the “concentrate here” quadrant

(Figure 2) suggests that this prescription can only be confidently applied to attribute 5 “clean, well presented toilet facilities”. A similar level of confidence cannot be extended to the other two attributes that have confidence intervals overlapping into at least one other quadrant. Similar interpretations are possible for the attributes falling into other quadrants, with potentially erroneous conclusions if the confidence intervals are ignored. For example, attributes 6 and 13 have confidence intervals overlapping all four quadrants even though their estimated position is within the “keep up the good work” quadrant. They also have a “?” in Table 1 suggesting their exact quadrant location is uncertain.

These indications of certainty have not been previously calculated or explored. Such information is essential for managers in determining the reliability of these analyses for individual attributes and allowing them to proceed with confidence. Such knowledge is fundamental in times of limited resources and increasing accountability (Worboys et al., 2005). These additional satisfaction analyses can also help managers identify attributes that require ongoing scrutiny. For those attributes just outside the “concentrate here” quadrant, for example attributes 13 and 16, the confidence intervals have the potential to locate the attribute within this quadrant. This finding suggests monitoring these marginal attributes so that if their status changes slightly and the gap between importance and satisfaction widens, action can be initiated.

Gap analysis is related to grid analysis but concentrates on the directions from upper left to lower right in Figure 2 while ignoring the orthogonal direction from lower left to upper right. Thus gap analysis concentrates on the direction of most interest to managers (concentrate here to possible overkill) and is an important supplement to the grid analysis. Managers in the focus group drew a similar conclusion about this supplementary value. There are, however, two important reasons why conclusions from the grid and gap analyses can differ, and this needs to be carefully explained, especially to managers, to avoid confusion.

First, by ignoring one direction on the grid analysis, the gap analysis provides a more precise analysis of the direction of most interest – whether satisfaction is higher or lower relative to importance. Second, gap analysis compares the mean satisfaction to the mean importance directly. Grid analysis, however, compares these relative to the scale means. For example, although attribute 6 (clean, well presented picnic/BBQ facilities) is close to the cross hairs on Figure 2 and has a confidence interval overlapping all four quadrants, the gap of 0.2 is significantly greater than zero ($p = 0.026$) because the mean overall satisfaction (4.06) is greater than the mean overall importance (3.89). Grid analysis provides an assessment of attributes relative to each other while gap analysis compares absolute satisfaction and importance for each attribute separately.

The high correlation in responses between the overall satisfaction questions suggests that only one is needed. Question 11 (overall satisfaction) is the most widely used in surveys across Australia and elsewhere and is often used in corporate reporting as a measure of accountability and value for budget monies spent (Bushell & Griffin, 2006). For comparability of results, this seems to be a good reason to use this question over the other two. However, the purpose of the survey must determine the final choice of questions. If the purpose is to monitor overall satisfaction, then Question 11 has value (Ryan & Cessford, 2003), but if the interest is attracting new or repeat visitation, then Question 13 is better suited (Howat & Crilley, 2007).

Conclusion

This paper provides a timely review of satisfaction surveys and analyses given that the recently completed report *Protected Area Management: Collection and Use of Visitor Data* (Griffin et al., 2010) recommends park agencies collect information on visitor satisfaction as part of their core data (i.e. data collected on an annual or other regular basis). This review

combined with the focus group results highlights the value to managers of a grid-based approach combined with tabulated gap analyses. Critical additions to these analyses in today's resource-limited environment explored in detail in this paper are confidence intervals and standard error information, plus P-values, all of which increase the confidence with which managers can make decisions. Although overall satisfaction is often measured as a multi-item latent construct, such an approach is not essential for park agencies. Having a single question, as supported by the focus group participants, seems a practical compromise.

Several challenges remain, most relate to broader issues associated with visitor data collection, storage and use by park and leisure agencies. Included are measurement issues, lack of use of data by managers and limited staff training and capability (Griffin et al., 2010). Measurement issues continue to challenge satisfaction research at a fundamental level with the constructs of satisfaction versus service quality still being used interchangeably (Baker & Crompton, 2000). Lack of use of satisfaction data can potentially be addressed by using the grid-based approach described here however the statistical analyses required, although simple, may be too daunting for time-poor managers. A related concern is lack of staff expertise in statistical analysis and survey design: the need to engage statisticians as collaborators (Keller, 2010) to address this shortfall in leisure research and management is being increasingly recognised.

Endnotes

¹SERVQUAL is a multi-item scale developed by Parasuraman et al. (1988) to determine customer perceptions of service quality in service businesses.

References

- Arabatzis, G., & Grigoroudis, E. (2010) Visitors' satisfaction, perceptions and gap analysis: The case of Dadia-Lefkimi-Soufli National Park. *Forest Policy and Economics*, 12(3), 163-172.
- Archer, D., & Griffin, T. (2005) *Study of Visitor Use and Satisfaction in Mungo National Park*. The Gold Coast, Queensland, Australia, Sustainable Tourism Cooperative Research Centre.
- Baker, D. A., & Crompton, J. L. (2000) Quality, satisfaction and behavioral intentions. *Annals of Tourism Research*, 27(3), 785-804.
- Borrie, W. T., & Birzell, R. M. (2001) *Approaches to Measuring Quality of the Wilderness Experience*. Missoula, MT, US Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Burns, R. C., Graefe, A. R., & Absher, J. D. (2003) Alternate measurement approaches to recreational customer satisfaction: Satisfaction-only versus gap scores. *Leisure Sciences*, 25(4), 363-380.
- Bushell, R., & Griffin, T. (2006) Monitoring visitor experiences in protected areas. *Parks*, 16(2), 25-33.
- Crompton, J. L., & Love, L. L. (1995) The predictive validity of alternate approaches to evaluating quality of a festival. *Journal of Travel Research*, Summer, 11-24.
- DEC (Department of Environment and Conservation) (2010) *2009-10 Annual Report*. Perth, Western Australia Department of Environment and Conservation.
- DEC (Department of Environment and Conservation) (2008) *Yanchep National Park: Information and Visitor's Guide*. WA Department of Environment and Conservation, Perth, Western Australia.
- Fletcher, D., & Fletcher, H. (2003) Manageable predictors of park visitor satisfaction: Maintenance and personnel. *Journal of Park and Recreation Administration*, 21(1), 21-37.
- Graefe, A. R., & Fedler, A. J. (1986) Situational and subjective determinants of satisfaction in marine recreational fishing. *Leisure Sciences*, 8(3), 275-295.
- Griffin, T., Moore, S. A., Crilley, G., Darcy, S., & Schweinsberg, S. (2010) *Protected Area Management: Collection and Use of Visitor Data Volume 1: Summary and Recommendations* Gold Coast, Queensland, Australia, Sustainable Tourism Cooperative Research Centre.

- Hornback, K. E., & Eagles, P. F. J. (1999) *Guidelines for Public Use Measurement and Reporting at Parks and Protected Areas*. Gland, Switzerland and Cambridge, UK, IUCN.
- Howat, G., & Crilley, G. (2007) Customer service quality, satisfaction and operational performance: A proposed model for Australian public aquatic centres. *Annals of Leisure Research*, 10(2), 168-195.
- Huang, S. S. (2010) A revised importance-performance analysis of tour guide performance in China. *Tourism Analysis*, 15(2), 227-241.
- Kao, M. C., Patterson, I., Scott, N., & Li, C. K. (2008) Motivations and satisfactions of Taiwanese tourists who visit Australia. *Journal of Travel & Tourism Marketing*, 24(1), 17-33.
- Keller, S.A. (2010) Vital statistics. *Nature*, 467, 914.
- Lin, S.-P., Chan, Y.-H., & Tasai, M.-C. (2009) A transformation function corresponding to IPA and gap analysis. *Total Quality Management*, 20(8), 829-846.
- Manning, R. E. (1986). *Studies in Outdoor Recreation: A Review and Synthesis of the Social Science Literature in Outdoor Recreation*. Corvallis, OR, Oregon State University Press.
- Martilla, J. A., & James, J. C. (1977) Importance-performance analysis. *Journal of Marketing*, 41(1), 77-79.
- Newsome, D., Moore, S. A., & Dowling, R. K. (2002) *Natural Area Tourism: Ecology, Impacts and Management*. Clevedon, England, Channel View Publications.
- Oh, H. (2001) Revisiting importance-performance analysis. *Tourism Management*, 22(6), 617-627.
- Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1988) SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12-40.
- Ryan, C., & Cessford, G. (2003) Developing a visitor satisfaction monitoring methodology: Quality gaps, crowding and some results. *Current Issues in Tourism*, 6(6), 457-507.
- Tarrant, M. A., & Smith, E. K. (2002) The use of a modified importance-performance framework to examine visitor satisfaction with attributes of outdoor recreation settings. *Managing Leisure*, 7(2), 69-82.
- Tian-Cole, S., Crompton, J. L., & Willson, V. L. (2002) An empirical investigation of the relationships between service quality, satisfaction and behavioral intentions among visitors to a wildlife refuge. *Journal of Leisure Research*, 34(1), 1-24.

- Tonge, J., & Moore, S. A. (2007) Importance-satisfaction analysis for marine-park hinterlands: A Western Australian case study. *Tourism Management*, 28(3), 768-776.
- Wade, D. J., & Eagles, P. F. J. (2003) The use of importance-performance analysis and market segmentation for tourism management in parks and protected Areas: An application to Tanzania's National Parks. *Journal of Ecotourism*, 2(3), 196-212.
- Wardell, M., & Moore, S. A. (2005) *Collection, Storage and Application of Visitor Use Data in Protected Areas: Guiding Principles and Case Studies*. The Gold Coast, Queensland, Australia, Sustainable Tourism Cooperative Research Centre.
- Worboys, G. L., Lockwood, M., & De Lacy, T. (2005) *Protected Area Management: Principles and Practice*. Melbourne, Australia, Oxford University Press.
- Zabkar, V., Brencic, M. M., & Dmitrovic, T. (2010) Modelling perceived quality, visitor satisfaction and behavioural intentions at the destination level. *Tourism Management*, 31(4), 537-546.

Tables and Figures

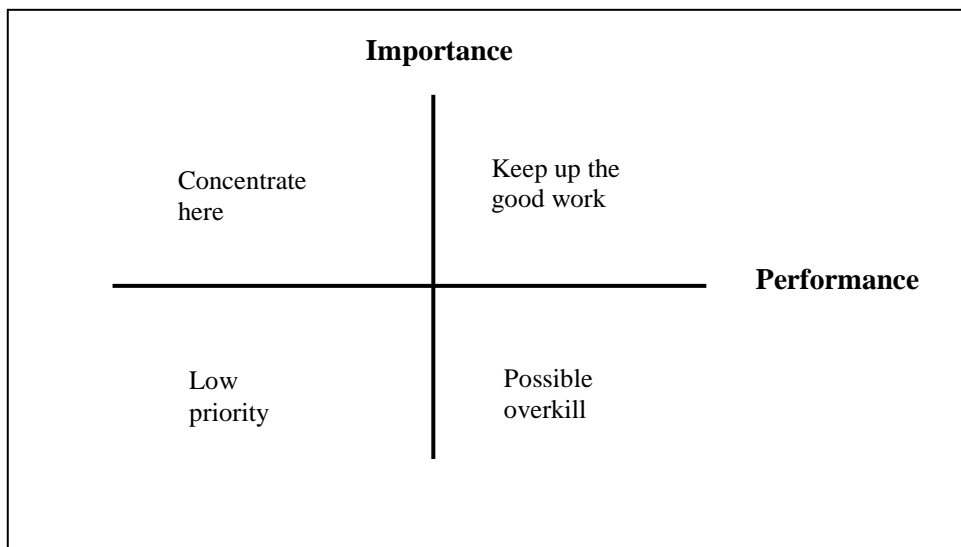


Figure 1: Importance-performance grid (source: Oh, 2001, p.618)

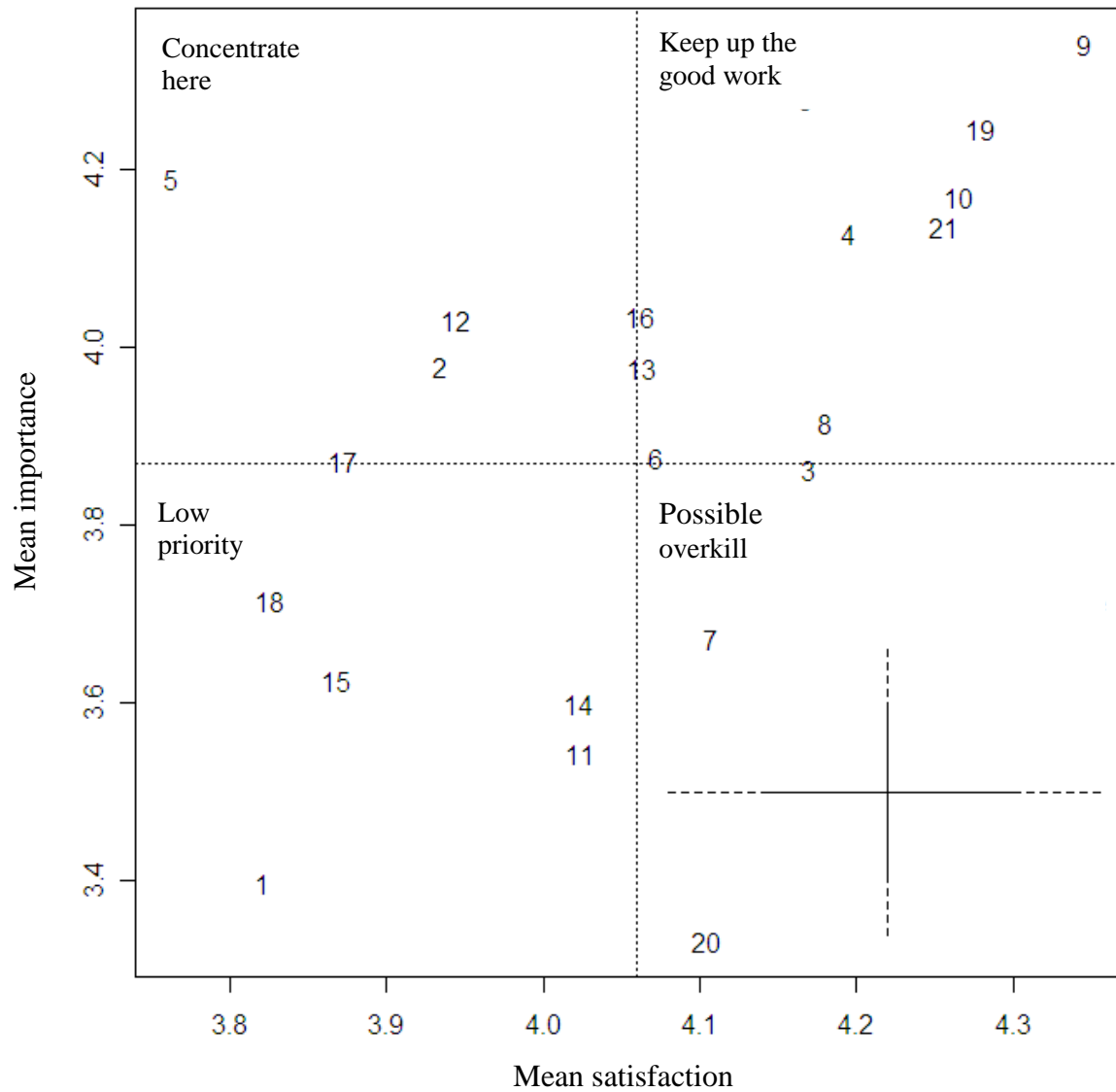


Figure 2: Importance-satisfaction grid – Yanchep National Park
 (see Table 1 for corresponding attributes)

Table 1: Importance and satisfaction analysis for individual attributes

Attribute	N	Quadrant Certainty	Importance		Satisfaction		Gap Analysis		
			Mean	SE	Mean	SE	Gap value	SE	P
1. Pre-visit information about the Park was easy to obtain	168	--	3.40	0.08	3.82	0.06	0.42	0.095	0.000***
2. Useful directional road signs in the Park	183	?-	3.98	0.06	3.93	0.06	-0.05	0.079	0.579
3. Access to friendly, responsive Park staff	176	?+	3.86	0.06	4.17	0.05	0.31	0.068	0.000***
4. Access to toilet facilities	179	++	4.13	0.06	4.20	0.05	0.07	0.065	0.305
5. Clean, well presented toilet facilities	169	+-	4.19	0.05	3.76	0.07	-0.43	0.076	0.000***
6. Clean, well presented picnic/BBQ facilities	138	??	3.88	0.08	4.07	0.06	0.20	0.087	0.026*
7. Well designed & maintained roads	186	-?	3.67	0.06	4.11	0.05	0.44	0.059	0.000***
8. Well designed & maintained walking tracks/trails	166	?+	3.92	0.06	4.18	0.05	0.27	0.062	0.000***
9. Able to enjoy nature in this Park	191	++	4.34	0.05	4.35	0.05	0.01	0.047	0.911
10. Sightings of native wildlife/birds	181	++	4.14	0.06	4.27	0.05	0.13	0.055	0.023*
11. Access to water (e.g. lake, river, ocean)	171	-?	3.54	0.07	4.02	0.06	0.48	0.072	0.000***
12. Healthy water condition (e.g. lake, river, ocean)	161	+?	4.03	0.06	3.94	0.06	-0.09	0.063	0.171
13. A broad range of activities available (e.g. walking, picnicking, bird watching)	174	??	3.98	0.06	4.06	0.05	0.09	0.068	0.204
14. Interesting guided walks/talks by rangers/others	130	-?	3.60	0.08	4.02	0.06	0.42	0.083	0.000***
15. Interesting information on culture (e.g. Aboriginal, non-Aboriginal, heritage)	136	--	3.63	0.07	3.87	0.07	0.24	0.076	0.002**
16. Useful visitor guides/maps in the Park	177	+?	4.03	0.05	4.06	0.05	0.03	0.054	0.602
17. Useful information on plants & animals in the Park	164	?-	3.87	0.06	3.87	0.06	0.00	0.072	1.000
18. Clear information about visitor safety	155	--	3.72	0.07	3.83	0.06	0.11	0.076	0.153
19. Feeling safe in the Park	183	++	4.25	0.06	4.28	0.04	0.03	0.061	0.594
20. Not too many other visitors present	183	-?	3.33	0.08	4.10	0.05	0.77	0.085	0.000***
21. Other visitors generally well behaved	184	++	4.14	0.06	4.26	0.05	0.12	0.064	0.063
Grand means			3.89		4.06				

*, ** & *** denote gaps significantly different to 0 at the 0.05, 0.01 and 0.001 level.

“+” = above grand mean; “-“ = below grand mean; “?” unable to determine whether above or below grand mean

Table 2: Park attributes not meeting 85% threshold target

Attributes	Satisfaction score (%)	P-value	Importance Rating
Pre-visit information about the Park was easy to obtain	72	0.007**	Moderate
Useful directional road signs in the Park	77	0.175	High
Access to friendly, responsive Park staff	84	0.357	Moderate
Clean, well presented toilet facilities	69	0.001***	High
Clean, well presented picnic/BBQ facilities	83	0.296	Moderate
Access to water (e.g. lake, river, ocean)	78	0.007**	Moderate
Healthy water condition (e.g. lake, river, ocean)	75	0.057	High
A broad range of activities available	80	0.048*	High
Interesting guided walks/talks by rangers/others	79	0.415	Moderate
Interesting information on culture (e.g. Aboriginal, non-Aboriginal, heritage)	72	0.012*	Moderate
Useful visitor guides/maps in the Park	83	0.229	High
Useful information on plants & animals in the Park	73	0.014*	Moderate
Clear information about visitor safety	70	0.001***	Moderate
Not too many other visitors present	83	0.291	Moderate

*, ** & *** denote satisfaction scores significantly lower than 85% at the 0.05, 0.01 and 0.001 level
Importance ratings: High = mean > 3.89; Moderate = mean between 3.89 and 3.0; Low = mean < 3.0

Table 3 Relationships between overall satisfaction questions

Questions	Significance in difference in mean responses	Correlation (r)	Percentage of respondents providing same answer
Question 11-Question 12 (satisfied & feeling)	0.174 (NS)	0.684	85
Question 11-Question 13 (satisfied & recommend)	0.575 (NS)	0.568	73
Question 12-Question 13 (feeling & recommend)	0.509 (NS)	0.664	75