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Visitor segmentation for a park system using research and managerial judgement

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Visitors to parks and protected areas are not a homogeneous group. Therefore, it is important for managers of such areas to have an understanding of the diversity of these visitors. One technique applied to understanding the diversity of visitors is segmentation whereby visitors are clustered based on variables of interest. Through a partnership of university-based and protected area agency researchers, this study segmented visitors to 33 parks across the Western Australian protected area estate. Using both psychographic and behavioural variables, four clusters were identified and these were subsequently discussed and validated with agency staff. These discussions identified opportunities for using the segmentation results to inform park and site planning and for marketing and potential re-distribution of supply and demand across the park system to better match visitor needs and the management resources available. Collaborative research efforts such as these, including validation by managers, can contribute to robust findings with a greater chance of being adopted by protected area agencies.

Keywords: behavioural; clusters; protected areas; protected area agency staff; psychographic; segmentation

Introduction

Decades of research have clearly demonstrated enormous diversity in the expectations of visitors regarding tourism and leisure areas (Manning, 2011; Palacio & McCool, 1997). Managers of these areas are under increasing pressure to ensure that these diverse visitors or consumers are able to access and participate in the experiences they anticipate (Zografos & Allcroft, 2007). Awareness of this diversity in visitors can assist planners and managers in becoming cognisant of the development of more appropriate planning and marketing strategies (Beh & Bruyere, 2007; Marques, Reis, & Menezes, 2010). Attempts to define this diversity and develop tourist or visitor types have been called typologies, clustering, classification and segmentation (Hvenegaard, 2002).

Segmentation was developed in the field of marketing as a way of framing management thinking given that it is impossible to satisfy the needs of every individual customer (Choi, Murray, & Kwan, 2011; Tkaczynski, Rundle-Thiele, & Beaumont, 2009). It involves partitioning heterogeneous markets into smaller, more homogeneous segments that can then be distinguished through differing customer needs, characteristics or

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behaviours (Marques et al., 2010; McCool & Reilly, 1993;Tkaczynski et al., 2009). The benefits of segmenting customers include the more efficient use of limited resources, better communication with target customers, increased customer satisfaction and strengthened competitive position (Choi et al., 2011; McCool & Reilly, 1993). For managers of tourism and leisure areas, market segmentation can be used to target the provision of facilities and services, planning, marketing and communication for more cost-effective and efficient management (Galloway, 2002; Hvenegaard, 2002; Konu & Kajala, 2012; Palacio & McCool, 1997).

In the tourism industry, segmentation variables that have been employed include geographic, demographic, psychographic (e.g. interests, attitudes, values, opinions) and behavioural characteristics (e.g. how visitors respond to or use a product/service, loyalty) (Choi et al., 2011; Konu & Kajala, 2012; Tkaczynski et al., 2009; Wade & Eagles, 2003). No single process exists to segment a market, with the majority of studies employing more than one segmentation base or variable for the segmentation process (Tkaczynski et al., 2009). The identification of the segments typically employs the use of factor or cluster analysis techniques, which can generally be derived *a priori* or *a posteriori*. *A priori* segmentation methods involve researcher or managerial judgement as to the expected heterogeneity of consumers, predominantly to create a typology of consumer to target (Konu & Kajala, 2012; Wind, 1978). *A posteriori* segmentation methods generally occur after the data have been collected and are based on inter-related variables and their correlation to the chosen dependent variable (Konu & Konjala, 2012; Wind, 1978). Determining which type of method to use will depend on the purpose of the segmentation of consumers (Frochot & Morrison, 2001).

For managers of protected areas, segmentation is useful since visitors to these areas contain a number of differing types rather than a single homogeneous group (McCool & Reilly, 1993; Wade & Eagles, 2003). However, only a small number of market segmentation studies exist that deal specifically with protected area visitors. Variables used to differentiate visitors in these studies include activities, values, benefits and motivations. For example, hikers in North American protected areas were segmented into clusters based on benefits obtained from hiking and reasons for visiting (Bichus-Lupas & Moisey, 2001; Torbidoni, 2011).

The Katy Trail State Park, which follows the Missouri River, is used by bikers, runners, joggers, walkers and hikers. These visitors were segmented based on the benefit domains of escapism, exploration, company, nature and fitness and health (Bichus-Lupas & Moisey, 2001). The four resultant segments were termed fitness seekers, typical trail users, group naturalists and enthusiasts based on the scoring level on each of the benefit domains. In Catalonia, hikers using three small protected areas were segmented based on their reasons for visiting (Torbidoni, 2011). Nature-minded hikers were those visiting for nature-related reasons; sporting hikers were focused on physical activities and the associated enhancement to their health or physical condition; while general purpose hikers had no clear profile or reason for choosing that particular park or trail.

Arnberger et al. (2011) identified three segments of visitors to Gesaeuse National Park in Austria based on their national park affinity – explicit national park visitor, interested national park visitor and area visitor. Zografos and Allcroft (2007) used statements measuring the New Environmental Paradigm to segment visitors to 20 sites of 'natural beauty' in Scotland into four clusters termed disapprovers, scepticals, approvers and concerners. Weaver and Lawton (2002) identified softer, harder and structured ecotourists based on responses of visitors staying at ecolodges in Lamington National Park, Australia to items pertaining to ecotourism behaviour.

An early study by McCool and Reilly (1993) segmented visitors to three state parks in Montana based on the visitors' perceived importance of benefits obtained. For the escapists segment, solitude, nature appreciation and escape were the most important benefits; group naturalists scored higher on the nature appreciation and affiliation (social) benefits; passive players were more moderate on the nature appreciation and lower on the other four benefit factors; while enthusiasts produced higher scores for all five benefit factors. Galloway (2002) focused on the single motivation of sensational seeking to segment visitors to three protected areas in Ontario, Canada. The three segments were related to those who actively enjoyed nature, visited to escape stress and the sensation seekers.

On a larger scale, Marques et al. (2010) segmented domestic visitors to Portuguese protected areas based on their motivations for visiting. However, they condensed their sample to specific regions in Portugal that had a population density, resident population and socio-economic status relevant to visiting protected areas. Following principal component analysis on the motivation statements, cluster analysis identified five distinct segments of visitors that were named according to their motivations and profiles in relation to activity preferences. These were termed self-centred, occasional, urban visitors, excursionists and social naturalists. Konu and Kojala (2012) identified four clusters of visitors to Finnish national parks based on motivations for visiting. These were social self-developers who were more willing to meet new people and improving their skills; exercising nature explorers who were predominantly motivated by keeping fit as well as learning about nature; nostalgia appreciative seekers of mental well-being who were motivated by maintaining mental well-being and pleasant old memories; and nature-orientated relaxation seekers who enjoyed nature experiences, relaxation and getting away from noise and pollution.

Based on this research, it is apparent that visitors have different reasons for visiting parks and protected areas depending on the context of the study. It also highlights the lack of studies focusing on protected area networks rather than a single or small number of parks. Therefore, this study aims to segment nature-based tourists to a suite of parks within the Western Australian protected area network through a partnership between university and protected area management agency-based researchers. The park managers involved in the study were interested in segments that would provide management decision support for a variety of purposes, including recreation site infrastructure planning and visitor communication needs. Given the emphases in the previous protected area visitor research (on motivations and activities) and the interest by the park agency in managing for experiences, segmentation in this study was based on the purpose of the visit and the activities in which participants were engaged. This was instead of segmentation based on the socio-demographic characteristics of visitors, which would not necessarily provide this important information.

Nature-based tourism is a rapidly growing component of international tourism (Marques et al., 2010) and a large proportion of Western Australia's nature-based tourism product is focused on experiences in protected areas, with dramatic growth in this sector over the past two decades (Tourism Western Australia & Department of Environment and Conservation [TWA & DEC], 2010). Therefore, it is essential for the effective management of these increasing visitor numbers that market segments be identified and validated. This study aims to address both of these aspects by first identifying visitor segments using the psychographic variable 'purpose of visit' along with the behavioural variable 'activities undertaken while visiting' and then working with park managers to validate these segments and discuss how they could inform management practices.

Methods

The Western Australian Department of Parks and Wildlife manages approximately 28.5 million hectares or 10.2% of total land area of the state of Western Australia for nature conservation, recreation and associated purposes. These protected areas include national parks, state forests, marine parks and reserves, which receive more than 15 million visits per annum (Department of Environment and Conservation [DEC], 2013). Thirty-three of these protected areas from across the state of Western Australia were included in this study, with data accessed from a Department-based state-wide visitor monitoring programme. These protected areas range from very remote to peri-urban locations with a range of visitation levels. They also offer a range of opportunities and include both iconic tourism sites and lesser known parks.

The Department-based state-wide visitor monitoring programme collects visitor information via surveys distributed onsite. The main purpose of this survey instrument is to collect information about levels of visitor satisfaction in relation to enjoyment of park facilities and services, and other natural attributes. Information on overall visitor satisfaction is used to calculate a Visitor Satisfaction Index for Department of Parks and Wildlife-managed lands and waters state-wide, as well as assisting in the planning and management of the protected areas. The survey also obtains information on characteristics pertaining to visitors and their visit including socio-demographic information, activities undertaken, main purpose of visit, as well as enabling importance-performance analysis of park facilities, activities and services. It also provides an opportunity for visitors to provide recommendations for improvement. The relevant questions from the survey are provided as part of the results detailed below.[1]

Department of Parks and Wildlife's standardised surveys are distributed on-site by Departmental staff and volunteers. The target population is the general public who visit Department of Parks and Wildlife-managed lands and waters. Adult visitors are intercepted, generally at recreation sites such as picnic areas and campgrounds, and asked to self-complete the survey. Surveys are conducted in a range of parks across the state. Sampling is performed on a continuous basis, and thus includes a mix of weekdays and weekends and includes public and school holidays as well as non-school holiday periods.

Data analysis

The survey responses of visitors to the 33 protected areas for the period 2008−2011 were merged into one large data-set. Invalid or incomplete responses were then removed resulting in 3610 useable responses, which provided the basis for subsequent segmentation analysis based on clustering.

The clustering process used a data-driven or *a posteriori* K-means cluster analysis method based on the psychographic variable of 'main purpose of visit' and the behavioural variable of 'activity undertaken at the site' where groups are segmented into homogeneous or similar groupings. The 11 listed items for main purpose of visit (e.g. to rest and relax, to enjoy nature and the outdoors) and the 20 listed activities (e.g. camping, sightseeing, fitness/health) were used in the K-means cluster with each item given equal weighting. The analysis was performed for up to eight cluster groupings and was configured to be performed iteratively until convergence was achieved.

The items used to cluster the variables were examined to assist in the allocation of names to the clusters. Additionally, one-way ANOVAs were performed on other variables (not involved in the cluster analysis) to further profile the clusters and evaluate any

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differences between the resultant groups. The *posthoc* tests on these variables for identification of differences and similarities were performed with Tukey Honestly Significant Difference (HSD) and Bonferroni tests to check for homogeneity between the resultant clusters. As group sizes were unequal for the different Tukey HSD tests, harmonic mean sample sizes were used. A tight alpha of 0.05 was used to reduce the likelihood of type 1 errors.

Some of these variables were Boolean fields as participants were able to choose multiple responses. As such, secondary verification of cluster membership was also performed with filters for at least one response per family of questions applied to ensure meaningful clustering without confusion between a no-response and a non-response. This verification step confirmed that non-response did not have a large impact on the final clustering.

An integral part of this study was the involvement of Department of Parks and Wildlife researchers in conducting the cluster analysis and the subsequent validation of the visitor segments by protected area managers from this Department. In 2012, presentations pertaining to the development and explanation of the resulting segments were made to regional and divisional managers, including members of the senior executive, from the Parks and Visitor Services and Regional Services Divisions of Department of Parks and Wildlife. A presentation was also given to a broader staff base that included rangers and other services staff at the Parks and Visitor Services Division's annual conference. After these presentations, comments were sought from staff in relation to two aspects – did the segments make intuitive sense based on the parks they were most familiar with; and how these segments might be used in managing parks and associated visitor services. Comments from staff were documented by the researchers.

Results

A pattern in the responses to the two variables was identified which produced a rough approximation of a natural binary possibility matrix (Table 1). This produces 2^2 possible outcomes and as such four clusters of respondents were examined as the optimal number of clusters. First, larger numbers of clusters tended to subdivide the four clusters based on criteria that were relatively weaker or less intuitive. Sum of Euclidean distances from cluster centres indicated a four-cluster solution, with a larger gain moving from three to four clusters than from four to five and beyond five clusters (see Appendix, Table A1). This suggests that four clusters were the optimal solution as splitting further would have provided diminishing returns. To illustrate, many clusters with minor differences are difficult to interpret and use, especially for high-level decisions by senior management. Additionally, the resulting four clusters had intuitive interpretations based on the number of activities and number of reasons for visiting (Table 1).

Table 1. Cluster distribution within a binary matrix.

Main purpose of visit	Activity participation	
	Higher frequency of activity responses	Lower frequency of activity responses
Higher frequency of main purpose responses	Nature Experience Seekers (Cluster A)	Relaxing Socialisers (Cluster D)
Lower frequency of main purpose responses	Nature Explorers (Cluster C)	Passive Experiencers (Cluster B)

Table 2.   Final clusters by formative membership response proportions (%).

Cluster variables	Nature Experience Seekers (n = 628)	Passive Experiencers (n = 1091)	Nature Explorers (n = 1149)	Relaxing Socialisers (n = 742)
Activity undertaken at site				
Sightseeing	94	54	85	67
Bushwalking/hiking	86	23	84	58
Camping	77	17	74	75
Picnicking/barbecuing	56	17	30	49
Relaxing/fun/enjoyment	89	29	59	86
Fitness/health	46	3	17	15
Wildflower viewing	58	6	43	6
Bird watching	77	8	54	14
Wildlife viewing	69	12	38	20
Guided tours	9	7	6	5
Photography	87	27	75	41
Rock climbing/abseiling	8	1	4	4
Cycling/mountain bike riding	4	0	2	4
Four-wheel driving	30	7	17	24
Visit aboriginal/cultural sites	19	2	14	5
Visit the visitor centre	45	12	24	19
Swimming	40	13	26	58
Fishing	13	7	6	25
Canoeing/boating	8	2	3	17
Snorkelling/diving	10	4	7	15
Main purpose of visit				
To rest and relax	84	28	34	87
To learn about native animals and plants	55	14	18	11
To enjoy nature and the outdoors	97	31	73	81
To engage in recreational activities	55	7	10	36
To learn about the cultural heritage	37	5	12	7
To holiday	79	16	21	73
To spend time with family and friends	50	12	7	71
To have a break from everyday life	62	6	7	62
To see the sights	86	25	47	55
To get some exercise	70	6	17	35
For adventure	64	5	15	38

For all four segments, enjoying nature and the outdoors was one of the most important purposes of their visit. The largest segment was *Nature Explorers* with 32% of respondents (n = 1149, Table 2, Figure 1). Members of this segment participate in many activities that included sightseeing, bushwalking/hiking, camping, photography and bird watching. The main purpose of visit for this cluster is to enjoy nature and the outdoors (Table 2, column 4). This cluster has less focus on social connection and rejuvenation than other clusters. The next largest segment was *Passive Experiencers* with 30% of respondents (n = 1091, Table 2, Figure 1). The members of this segment were generally sightseers on a short visit (less than a day) with a focus on enjoying nature, generally at a specific scenic feature or attraction.

Nature Experience Seekers
• Immerse themselves in the park by participating in the widest range of nature activities and experiences that includes wildlife and wildflower viewing, photography, adventure and fitness/health with a focus on social connection and rejuvenation.

Passive Experiencers
• Generally sightseers on a short visit (less than a day) with a focus on enjoying nature at a specific scenic feature or attraction.

Nature Explorers
• Participate in a wide range of nature activities including bird watching and photography with less focus on social connection and rejuvenation.

Relaxing Socialisers
• Focussed on rejuvenation and sharing experiences in nature and the outdoors with family and/or friends.

Figure 1. Final cluster descriptions (images courtesy of Tourism Western Australia and Department of Parks and Wildlife).

Relaxing Socialisers (21%, $n = 742$, Table 2, Figure 1) contained respondents who were camping, sightseeing and bushwalking/hiking with a focus on rejuvenation and sharing experiences in nature and outdoors with family and/or friends. The smallest cluster, *Nature Experience Seekers* (17%, $n = 628$, Table 2, Figure 1) were respondents who immersed themselves in the park by participating in the widest range of activities and experiences of all four segments that included sightseeing, bushwalking/hiking, camping, wildlife and wildflower viewing, photography, adventure/exercise and fitness/health, with a focus on experiencing nature, social connection and rejuvenation. This cluster also had the highest proportion of respondents that identified most of the listed purposes of their visit as the main purpose (Table 2, column 2). They were also the cluster most involved in learning about native plants and animals.

Consideration of the clusters with respect to the 33 parks involved in the analysis was undertaken as an additional form of validation (Table 3). Parks were classified according to the recreation opportunity spectrum adapted and used by the Department of Parks and Wildlife. This is based on the recreation opportunity spectrum developed by Clark and Stankey (1979), which includes level of remoteness and naturalness, the level of contact with other visitors, acceptability of visitor impacts, and level of site development and regulation. The level of development as a basis for site classification has been adapted to Western Australian conditions as very few sites have non-motorised access due to the vast distances to travel from major population centres. The resulting distribution of clusters in the parks concurred with the Department-based researchers' knowledge of the parks, providing additional

Table 3. Cluster membership by park (%).

Park	Nature Experience Seekers	Passive Experiencers	Nature Explorers	Relaxing Socialisers	Recreation opportunity spectrum*
Cape Le Grand National Park (*n* = 74)	*32*	9	32	26	RN
Cape Range National Park (*n* = 135)	21	15	24	*40*	RN
Coalseam Conservation Park (*n* = 289)	20	14	*63*	3	SP
Francois Peron National Park (*n* = 163)	13	*44*	21	23	SP
Geikie Gorge National Park (*n* = 64)	14	*63*	20	3	RN
Hamelin Pool Marine Nature Reserve (*n* = 108)	6	*73*	13	7	RN
Karijini National Park (*n* = 226)	34	10	*40*	16	RN
Kennedy Range National Park (*n* = 214)	17	15	*53*	14	P
King Leopold Ranges Conservation Park (*n* = 56)	*34*	16	30	20	P
Lane Poole Reserve (*n* = 220)	8	12	13	*67*	RN
Millstream Chichester National Park (*n* = 83)	*42*	8	35	14	SP
Mitchell River National Park (*n* = 189)	25	4	*53*	17	P
Monkey Mia Reserve (*n* = 321)	12	*54*	14	20	D
Mount Augustus National Park (*n* = 111)	14	26	*49*	11	P
Mt Frankland South National Park (*n* = 188)	15	*32*	31	22	RN
Nambung National Park (*n* = 58)	5	*66*	22	7	D
Purnululu National Park (*n* = 98)	25	11	*52*	9	SP
Walpoe-Nornalup National Park (*n* = 360)	13	*49*	23	15	RN
William Bay National Park (*n* = 83)	6	*63*	16	16	RN
Windjana Gorge National Park (*n* = 87)	21	16	*39*	24	SP
Yalgorup National Park (*n* = 51)	12	16	25	*47*	RN
Yanchep National Park (*n* = 156)	14	*52*	20	14	D

Note: Numbers in bolded italics indicate for each park the segment with the highest proportion of sampled visitors.
*Recreation opportunity spectrum classifications: D, developed; RN, roaded natural; SP, semi-primitive; P, primitive.

support for the clusters identified. For example, the three parks classified as *developed* on the recreation opportunity spectrum had a high proportion of *Passive Experiencers*, while parks classified as *semi-primitive* or *primitive* had higher proportions of the *Nature Explorers* cluster.

Other variables which were used to more fully describe and differentiate between the clusters included visit and travel-related variables (Table 4), demographic attributes of respondents (Table 5) and perceived importance and satisfaction with park services and facilities (Tables 6 and 7). While the largest percentage of visitors in all four clusters was first-time visitors (Table 4), *Relaxing Socialisers* had the highest percentage of members that visited the parks once every three to five years and two to five times a year. In terms of length of stay, the *Passive Experiencers* cluster had the highest percentage of respondents who stayed at the parks for a short stop (32%) while the other three clusters generally stayed overnight with *Nature Experience Seekers* having on average the longest overnight stay (3.6 nights).

Regarding travel group, *Nature Experience Seekers* and *Nature Explorers* were generally travelling with family/partner, with the *Nature Experience Seekers* more likely to include children. These clusters also had the smallest average group sizes (2.9 *Nature Experience Seekers*; 2.7 *Nature Explorers*, Table 4). *Passive Experiencers* and *Relaxing Socialisers* generally travelled in a mixed group of family/partner and friends, and on average had the largest group sizes (3.8 *Relaxing Socialisers*; 3.7 *Passive Experiencers*, Table 4). *Passive*

Table 4. Visit and travel-related variables by cluster.

Visit and travel-related variable	Nature Experience Seekers	Passive Experiencers	Nature Explorers	Relaxing Socialisers
How often visit (%)				
First visit	77	67	79	62
Once every 3–5 years	6	7	7	10
Once every 1–2 years	4	3	3	4
Once a year	3	2	2	6
2–5 times a year	3	4	2	11
More than 5 times a year	1	2	1	3
On a weekly basis	0	0	0	0
Other	1	10	1	1
How long did you stay (%)				
Short stop	6	32	9	7
Half day	9	19	7	9
All day	5	8	3	6
Overnight	78	31	79	78
Travel group (proportion)				
Self	0.03[ab]	0.07[ab]	0.08[b]	0.03[a]
Friends	0.19[ab]	0.21[b]	0.14[a]	0.23[b]
Family/partner	0.77[b]	0.68[a]	0.76[b]	0.73[ab]
School/university group	0.00[a]	0.00[a]	0.00[a]	0.00[a]
Club/organisation	0.01[a]	0.01[a]	0.01[a]	0.01[a]
Tour group	0.00[a]	0.03[b]	0.01[a]	0.00[a]
Business associates	0.00[a]	0.00[a]	0.00[a]	0.00[a]
Residence (proportion)				
Western Australia	0.51[b]	0.47[b]	0.36[a]	0.69[c]
Interstate	0.40[d]	0.31[b]	0.50[c]	0.22[a]
International	0.09[a]	0.22[b]	0.14[a]	0.09[a]
Mean distance (km) by Western Australian residents	812.46[b]	534.84[a]	730.32[b]	499.71[a]

Note: Clusters with values that are not significantly different are designated with the same superscript letter.

Table 5. Demographic-related variables by cluster.

Demographic-related variable	Nature Experience Seekers	Passive Experiencers	Nature Explorers	Relaxing Socialisers
Gender (%)				
Male	65[a]	57[a]	58[a]	62[a]
Female	35[a]	43[a]	42[a]	38[a]
Age group (%)				
18–24	4	11	4	11
25–34	12	15	9	19
35–44	17	14	11	25
45–54	19	12	15	17
55–64	33	23	36	18
65 or older	11	15	21	8

Experiencers were the least likely to include children in their group. Proportionally, more *Relaxing Socialisers* cluster members were from Western Australia, *Nature Explorers* had the highest proportion of cluster members from interstate and *Passive Experiencers* had the highest proportion of international visitors relative to other clusters. Of the intrastate

Table 6. Level of importance assigned to attributes by cluster.

Mean level of importance assigned to attributes	Nature Experience Seekers	Passive Experiencers	Nature Explorers	Relaxing Socialisers
Pre-visit information attainment	3.76[b]	3.54[a]	3.65[ab]	3.63[ab]
Useful roads signs in park	4.23[b]	4.06[a]	4.11[ab]	4.09[a]
Friendly and responsive staff	3.96[a]	3.83[a]	3.81[a]	3.82[a]
Access to toilets	4.12[ab]	4.08[ab]	3.99[a]	4.15[b]
Clean and well-presented toilet facilities	4.32[b]	4.17[a]	4.17[ab]	4.27[ab]
Clean and well-presented picnic and BBQ facilities	3.73[b]	3.66[ab]	3.48[a]	3.81[b]
Clean and well-presented camping facilities	4.03[ab]	3.67[a]	3.88[bc]	4.09[b]
Well designed and maintained roads	4.00[b]	3.86[ab]	3.85[a]	3.91[ab]
Well designed and maintained walking tracks and trails	4.13[b]	3.90[a]	3.95[a]	3.91[a]
Ability to enjoy nature	4.52[c]	4.42[a]	4.36[b]	4.28[ab]
Wildlife sightings	4.18[c]	3.76[a]	3.99[b]	3.72[a]
Access to water	3.80[b]	3.68[b]	3.42[a]	4.06[c]
Healthy water condition	4.20[b]	4.01[a]	3.92[a]	4.34[b]
Broad range of activities available	4.05[c]	3.67[a]	3.79[ab]	3.84[b]
Interesting guided walks and talks	3.09[b]	3.15[b]	2.85[a]	2.82[a]
Interesting information on culture	3.48[c]	3.24[b]	3.19[b]	2.99[a]
Useful visitor guides/maps in park	4.18[b]	3.94[a]	4.05[ab]	3.95[a]
Useful information of plants and animals	3.97[c]	3.67[ab]	3.75[b]	3.55[a]
Clear information about visitor safety	3.96[c]	3.70[ab]	3.61[a]	3.83[bc]
Feeling safe in park	4.29[b]	4.06[a]	4.03[a]	4.29[b]
Not too many other visitors present	3.72[a]	3.63[a]	3.71[a]	3.65[a]
Other visitors well behaved	4.39[b]	4.20[a]	4.32[ab]	4.28[ab]
Value for money for fees to DEC	4.17[b]	3.98[a]	4.00[a]	4.09[ab]

Note: Clusters with values that are not significantly different are designated with the same superscript letter.

Table 7. Level of satisfaction assigned to attributes by cluster.

Mean level of satisfaction assigned to attributes	Nature Experience Seekers	Passive Experiencers	Nature Explorers	Relaxing Socialisers
Pre-visit information attainment	3.91[b]	3.76[ab]	3.7[a]	3.78[ab]
Useful roads signs in park	4.09[a]	3.99[a]	3.96[a]	4.09[a]
Friendly and responsive staff	4.11[b]	3.65[a]	3.98[b]	4.06[b]
Access to toilets	4.33[b]	4.04[a]	4.20[ab]	4.10[a]
Clean and well-presented toilet facilities	4.21[a]	3.45[c]	4.07[ab]	3.90[b]
Clean and well-presented picnic and BBQ facilities	3.58[c]	2.74[a]	3.10[b]	3.53[c]
Clean and well-presented camping facilities	3.87[b]	2.46[a]	3.61[b]	3.85[b]
Well designed and maintained roads	4.11[b]	3.95[ab]	3.93[a]	3.89[a]
Well designed and maintained walking tracks	4.01[b]	3.10[a]	3.77[b]	3.85[b]
Ability to enjoy nature	4.40[b]	4.16[a]	4.24[a]	4.28[ab]
Wildlife sightings	4.05[b]	3.64[a]	3.75[a]	3.76[a]
Access to water	3.62[b]	3.03[a]	2.99[a]	3.84[b]
Healthy water condition	3.55[b]	3.06[a]	2.90[a]	3.88[c]
Broad range of activities available	4.2[c]	3.18[a]	3.78[b]	3.95[b]
Interesting guided walks and talks	2.11[b]	2.23[b]	1.62[a]	2.15[b]
Interesting information on culture	2.74[b]	2.13[a]	2.21[a]	2.34[a]
Useful visitor guides/maps in park	4.07[b]	3.70[a]	3.84[a]	3.87[ab]
Useful information of plants and animals	3.47[c]	2.82[a]	3.05[ab]	3.18[bc]
Clear information about visitor safety	4.10[b]	3.80[a]	3.91[ab]	3.86[a]
Feeling safe in park	4.50[b]	4.28[a]	4.40[ab]	4.39[ab]
Not too many other visitors present	4.07[a]	3.96[a]	4.06[a]	3.96[a]
Other visitors well behaved	4.3[b]	4.17[ab]	4.24[ab]	4.09[a]
Value for money for fees to DEC	4.16[b]	3.39[a]	3.92[b]	4.11[b]
How pleased about visit	4.58[c]	4.30[a]	4.41[ab]	4.53[bc]
Recommendation of park to friends with shared interest	4.69[c]	4.35[a]	4.47[ab]	4.59[bc]

Note: Clusters with values that are not significantly different are designated with the same superscript letter.

visitors in each segment, *Nature Experience Seekers* travelled the furthest from their place of residence with a mean of 812 km, with *Nature Explorers* travelling 730 km (Table 4).

Key differences between the clusters based on the demographic variables are evident for the age of cluster members, but there are no significant differences between the clusters based on gender ratios (Table 5). *Nature Explorers* were generally older, while *Relaxing Socialisers* had higher percentages in the younger and middle-age ranges.

The importance of and satisfaction with 23 park attributes relating to services and facilities, as assigned by respondents, were also used to characterise the clusters (Tables 6 and 7). There were variations between responses for most of the attributes with some more apparent than others. However, for three of the four clusters, 'Ability to enjoy nature' was the attribute given the highest level of importance, with *Relaxing Socialisers* assigning a greater level of importance to 'Feeling safe in the park' (4.29, Table 6). Visitors across all clusters also placed high levels of importance on 'Other visitors well behaved' (4.39, 4.20, 4.32, 4.28, Table 6).

The greatest difference between the mean scores for importance, for the clusters, was for 'Access to water (e.g. lake, river, ocean)' (Table 6). *Relaxing Socialisers* had the highest mean level of importance for this attribute (4.06) with this attribute seeming to be of lesser importance to *Nature Explorers* (3.42), however, this may be in-part due to the

types of parks these segments had chosen to visit, as some may not have natural water sources. Large differences were also seen between the clusters for 'Interesting information on culture' and 'Wildlife sightings' with these being of greater importance to *Nature Experience Seekers* (3.48, 4.18, Table 6) than to *Relaxing Socialisers* (2.99, 3.72, Table 6).

For many of the attributes, there were also differences in mean levels of satisfaction for the clusters (Table 7). For the three attributes relating to clean and well-presented facilities, there were clear differences between the four clusters. *Passive Experiencers* had the lowest levels of satisfaction with clean and well-presented toilets (3.45), picnic/barbeque facilities (2.74) and camping facilities (2.46). Conversely, *Nature Experience Seekers* and *Relaxing Socialisers* had much higher levels of satisfaction with these three attributes and were also more likely to recommend the park they had visited to friends with shared interests. A large difference between the clusters was also identified for 'Broad range of activities available' with *Nature Experience Seekers* (4.20) expressing greater satisfaction with this attribute than *Passive Experiences* (3.18). *Nature Experience Seekers* were also more satisfied with 'Healthy water condition' than *Nature Explorers* (2.90). Overall, *Nature Experience Seekers* were the most satisfied and *Passive Experiencers* were the least satisfied (Table 7).

Validation of clusters by managerial staff

The descriptions of the segments were presented to Department of Parks and Wildlife staff for comment in relation to two general considerations – first did the segments make sense and reflect the reality for the parks they were most familiar with and second, how might this segmentation information be used in managing parks and associated visitor services. For the first consideration, the results were well received and there was general consensus among the staff that the segments made sense at both the park and agency level based on their collective experience of the individual parks and across the range of parks. It was acknowledged that there may be some visitors who may be under-represented in the survey process, particularly mountain bike users and other visitors that would be difficult to intercept or who utilise less-frequented locations in some of the sampled parks.

For the second consideration, the staff suggested that the information could be used in a number of park- as well as agency-level applications. At the park level, the information could be used to inform allocation of funding for the construction and maintenance of facilities and services of importance to particular segments of visitors within the parks or be used in the design phase of construction to attract new segments to a location. Additionally, because the segmentation was done by activity and purpose of visit, staff commented that the segmentation gives greater insights into the desired experience that a visitor is seeking when visiting parks. This then assists in the design phase of a recreation site through ensuring that the facilities provided match the desired activities and purpose. For example, *Nature Experience Seekers* and *Relaxing Socialisers* placed greater importance on spending time with family and friends than the other clusters, therefore in designing a site where these visitors frequent (or where they may want to attract them), the design phase should give consideration in ensuring that there are sufficient social spaces such as barbeque areas and other gathering places.

It was also suggested that the information could be used to guide the extent and focus of interpretive facilities within the parks. Again, managers of parks with a particularly high proportion of *Nature Experience Seekers* may place greater attention on the provision of interesting information on culture and useful information of plants and animals as this cluster placed higher importance on interpretation than the other clusters. Additionally, where *Relaxing Socialisers* are the more dominant cluster, less effort could be tasked to

providing interpretative facilities, or alternative methods of communicating with these visitors should be considered at these parks.

At the agency level, staff proposed the segmentation information could better inform marketing opportunities for the parks leading to opportunities to grow segments, attract new segments to particular locations or to cross-promote to distribute visitation should visitor carrying capacity become a concern at a given recreation site. For example, natural parks with roads could be promoted as places where *Relaxing Socialisers* can enjoy nature while relaxing and enjoying experiences with family and friends. More developed parks where visitors can experience specific scenic features or attractions could be marketed to *Passive Experiencers*. Coupled with this is a potential re-design of the Department's marketing material and website to reflect the types of experiences that correspond to the four segments in order to better target these particular segments.

Discussion

This paper had two primary aims – to identify segments of visitors to a range of Western Australian protected areas and to validate these segments through discussions with protected area agency staff. As a result of combining 3610 valid surveys from 33 protected areas across Western Australia, four visitor segments were identified based on their purpose for visiting and activities undertaken. These segments included *Nature Experience Seekers, Passive Experiencers, Nature Explorers* and *Relaxing Socialisers. Nature Experience Seekers* immerse themselves in the park by participating in the widest range of activities that include active activities, such as adventure activities, and have a focus on social connection and rejuvenation. *Passive Experiencers* are generally sightseers visiting for less than a day who enjoy nature and the outdoors. *Nature Explorers* also participate in a range of nature activities that include more passive activities, such as bird watching, with less focus on social connection and rejuvenation. Finally, *Relaxing Socialisers* are focussed on rejuvenation and sharing experiences in nature with family and/or friends.

While three of the four segments identified here indicated that enjoying nature and the outdoors was one of their primary purposes for visiting, although how they want to experience nature differs greatly. *Passive Experiencers,* for example, wanted to rest and relax in nature in a social setting and not necessarily participate in a wide variety of activities. How visitors experience nature is one of the main differences between *Nature Explorers* and *Nature Experience Seekers. Nature Explorers* often participated in more passive nature-based activities and had fewer identified purposes for visiting while *Nature Experience Seekers* undertook many activities and wanted a sense of adventure from their nature-based experience. Another difference between the two segments is that *Nature Experience Seekers* have a greater focus on social connection and resting and relaxing than *Nature Explorers* and that this may be mostly due to the travel group, with *Nature Experience Seekers* travelling in larger groups and *Nature Explorers* generally travelling as couples or small groups.

Nature Experience Seekers have similarities to Marques et al.'s (2010) self-centred cluster. This self-centred cluster comprising visitors who were motivated by personal fulfilment aspects as well as nature enjoyment, regardless of the distance travelled. Of the intrastate or Western Australian visitors in each segment, *Nature Experience Seekers* were the segment that travelled the largest distance from their place of residence and visited to get some exercise or experience adventure, which could be likened to personal fulfilment needs. This cluster could also be compared to the harder and structured ecotourists identified by Weaver and Lawton (2002). In their study, Weaver and Lawton described the

harder ecotourism cluster as those who rated highly with typically harder ecotourism dimensions such as self-reliance and enjoyment of a risk or challenge. The structured ecotourists rated ecotourism dimensions highly but also liked a level of structure to their ecotourism experience, for example, adequate provision of infrastructure and interpretation. Similarly, the *Nature Experience Seekers* identified in this study also rated the provision of some facilities important (e.g. clean, well-presented toilets) as well as the ability to enjoy nature and having a broad range of activities available.

Conversely, *Nature Explorers* could be akin to structured and softer ecotourists according to Weaver and Lawton's (2010) typologies. Softer ecotourists like some aspects of the **AQ2** harder ecotourism experience, but would be just as comfortable spending time at natural places but without the self-reliance or adventure, with *Nature Explorers* in this study rating feeling safe in the park as one of the more important aspects of their experience. Marques et al.'s (2010) sociable naturalists also have some infinity with the *Nature Explorers* cluster. These were visitors who enjoyed the natural environment and the scenery of places, but were influenced family and friends to visit Portugal national parks. They too were not adverse to travelling long distances to enjoy their experiences. There are also some similarities with Konu and Kajala's (2012) nature-orientated relaxation seekers who were not only motivated by natural experiences but also wanted to relax and be with their own group.

Passive Experiencers were those visitors who had low responses to both the purpose of visiting and the activities undertaken. This is similar to the passive players as identified by Palacio and McCool (1997) or the low-activity-orientated cluster from Mehmetoglu (2007), with respondents in these clusters providing low scores to all of the benefits or activities listed in the studies. *Passive Experiencers* also resemble the hedonistic cluster identified by Arnberger et al. (2010) in that the main motivation for visiting a park or protected area may be partly based on the natural environment, however they are also interested in the other features of a destination. Similarly, the description of softer ecotourists by Weaver and Lawton (2010) could be used to describe this cluster in that they like some aspects of ecotourism (e.g. enjoy nature and outdoors) but also enjoyed other more structured experiences.

Finally, *Relaxing Socialisers* were those who wanted to rest and relax while enjoying nature and the outdoors with family and/or friends. This is similar to Palacio and McCool's (1997) comfortable naturalists who were interested in nature and the ability to escape, but wanted to do it in relative comfort. Marques et al.'s (2010) urban visitors are also similar, with this segment describing those visitors to Portugal's national parks who were heavily influenced by family and friends to visit the parks but did enjoy the resultant contact with nature.

The data analysis conducted by the Department of Parks and Wildlife research staff and then presentation of the results of the segmentation analysis to Department of Parks and Wildlife management staff provided validation for the clusters identified. Most staff indicated that these clusters made sense based on their dealings with the Department of Parks and Wildlife protected area estate. This is an important cross-over between research and managerial knowledge. Through a combination of university and agency-based researchers, meaningful segments congruent with the theoretical literature and previous agency research were developed and then validated, potentially improving the uptake of these segments in the design, planning and marketing of the Western Australia protected area estate.

Comments made by agency staff on how this information could be used correspond with suggestions in the academic literature. For example, Marques et al. (2010) suggested

that segmentation information could be used to develop infrastructure and appropriate promotional actions to support the identified segments within parks, as well as adapting and creating programmes to encourage visitation to parks that fit the needs and characteristics of the identified segments. This reflects the intentions of Department of Parks and Wildlife staff to use the segments identified in this study to inform the design and build phase of site and park development so they reflect the facilities and services important to the particular segments known to frequent particular parks.

Other advantages also flow from segmentation efforts. As well as assisting in identifying suitable management practices, including the provision of infrastructure as outlined above, segmentation also highlights the range of visitors that frequent protected areas and assist managers in better understanding the experience visitors are seeking at a particular destination. Additionally, providing the cluster membership per park surveyed provides an indication as to whether the resource capabilities actually match or suit the visitor clusters frequenting that park (Hvenegaard, 2002).

Typologies of visitors also provide clear information on what visitors expect to obtain from their experiences in protected areas. This is an important aspect in developing and maintaining sustainable visitor practices, as it identifies the values of importance to visitors as well as the larger scale societal benefits that need to be supported and sustained (Palacio & McCool, 1997). Given that managers now need to be more proactive in positioning parks in the publics' and governments' collective conscience in order to compete for funding (Weiler, Moore, & Moyle, 2013), knowing the type of experiences visitors are seeking can inform marketing and promotional campaigns and applications for government funding (Palacio & McCool, 1997).

Conclusion

To successfully manage visitor use in protected areas, managers need to know the diversity of experiences that are sought in order to determine the diversity of settings in which these experiences can be undertaken (Weiler et al., 2013) to assist the management agency with strategic planning and management. This study has provided such information based on the partnership of university and agency-based researchers. First, through the analysis of survey responses from visitors across 33 parks in the Western Australian protected area estate, four visitor clusters and their associated nature-based experiences have been identified based on the psychographic variable of 'purpose of visit' and the behavioural variable of 'activities undertaken while visiting'. Utilising Department of Parks and Wildlife data and researchers, who have a detailed knowledge of the visitor types through internal research, and the subsequent presentation of the clusters to Department of Parks and Wildlife management staff were integral to this research process, enabling validation of the identified clusters. Such an outcome was possible through this crucial cross-over between research and managerial knowledge.

Through applying the segments at the park level, it became clear that visitors will not always fit into a single segment when they visit parks. Which segment a visitor will occupy for a given visit will depend largely on the travel group, the desired experience and the attractions of the park they are visiting at that time. Some researchers are investigating the linkages between researcher-based clusters and visitors' self-selecting the cluster with which they most closely affiliate. A further interesting avenue for study would be examining these self-selected clusters in relation to the park setting, group type and the life-cycle stage of the visitor to determine their influences on their choice of segment. Additionally, a park will also have a mix of visitor segments depending on the activities and attractions on

offer. For protected area managers, the challenge is to determine the site design, facilities and activities on offer that best services the mix of segments that are already visiting or that they desire to attract.

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Note

1. Copies of the survey instrument can be obtained on request from Dr Amanda Smith (Amanda.Smith@DPaW.wa.gov.au)

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Appendix

Table A1.   Euclidean distances and cluster differences for different numbers of clusters.

Number of clusters	2	3	4	5	6	7	8
Sum of Euclidean distance from cluster centres	7714.83	7527.68	7320.12	7202.56	7116.21	7037.24	6980.75
Difference in cluster convergence		187.15	207.56	117.56	86.35	78.96	56.49