# TOURISTS' WILLINGNESS-TO-PAY FOR BIODIVERSITY CONSERVATION ACCREDITATION

By

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## DECLARATIONS

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# ABSTRACT

*Imperfect information on aspects of biodiversity conservation will constrain the extent to which tourists' preferences for biodiversity conservation are revealed in game reserve (GR) tariffs, reducing the incentive for tourism businesses to invest in biodiversity conservation. Accreditation is an institutional approach to addressing the issue of imperfect information on biodiversity conservation. In this study, Choice Experiments (CE) and the Contingent Valuation Method (CVM) are used to estimate tourist's willingness-to-pay (WTP) to visit biodiversity conservation accredited terrestrial nature-based tourism (NBT) destinations in selected areas of South Africa (SA).*

*A survey of 97 domestic tourists and 96 foreign tourists was conducted at 16 private and public GR camps in north-eastern KwaZulu-Natal (NEKZN) and Mpumalanga/Limpopo Provinces (MP/LP) during October and November 2004. The survey captured socio-economic data to be used in discriminating between market segments, eighteen hypothetical CE questions and a CVM question. Analyses comparing the preferences of domestic tourists from foreign tourists, tourists visiting NEKZN from tourists visiting MP/LP and tourists visiting private GRs from tourists visiting public GRs were performed. In addition, Hierarchical Cluster Analysis (HCA) was used to identify groups of tourists with similar preferences. Respondents are grouped into three market segments according to their revealed preferences using HCA. Linear Discriminant Analysis (LDA) was used to discriminate the three groups based on socio-economic characteristics. These groups were named "Conservation Vacationers", "Incidental Sightseers" and "Big 5 Brigade" based on socio-economic characteristics unique to each group. The region (NEKZN or MP/LP), level of education and itinerary (independent travellers or part of tour group) were the most powerful in discriminating*

*"Big 5 Brigade" from the other two groups in the first function. The second function primarily discriminates Conservation Vacationers from Incidental Sightseers based on membership to a wildlife society, gender and education.*

*Results of the CE and CVM studies respectively, indicate that, overall, respondents were willing to pay premiums of R114.41 and R87.67 per person per night (all premiums are presented as per person per night, unless otherwise stated) to stay at a GR accredited with having a high standard of biodiversity conservation. Foreign tourists were, on average, willing to pay the highest premium of R136.35 for biodiversity conservation accreditation, while tourists visiting private GRs were, on average, willing to pay the lowest premium of R 96.42.*

*A further three market segments were identified using HCA. The average WTP estimates for biodiversity conservation accreditation for Groups 1(Conservation Vacationer), 2(Incidental Sightseer) and 3(Big 5 Brigade), identified by HCA were R171.41, R66.15 and R14.94, respectively. On average, respondents in all groups, game-viewing quality was most highly valued, followed by the level of congestion. Results of this study may be useful to NBT operators and managers in developing marketing strategies targeting specific market segments.*

*Analysis of the results by market segments indicates that CE may be a more reliable technique than CVM. Further research on the costs and benefits of biodiversity conservation accreditation is necessary to predict the extent to which NBT businesses are likely to adopt biodiversity conservation accreditation.*

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# LIST OF ACRONYMS

| Acronym | Full Phrase |
|---|---|
| **GR** | Game Reserve |
| **CE** | Choice Experiments |
| **CVM** | Contingent Valuation Method |
| **WTP** | Willingness-to-pay |
| **SA** | South Africa |
| **NEKZN** | North-Eastern KwaZulu-Natal |
| **MP/LP** | Mpumalanga/Limpopo Provinces |
| **HCA** | Hierarchical Cluster Analysis |
| **LDA** | Linear Discriminant Analysis |
| **UNEP** | United Nations Environment Programme |
| **NBT** | Nature-based Tourism |
| **KZN** | KwaZulu-Natal |
| **TKZN** | Tourism KwaZulu-Natal |
| **HPM** | Hedonic Pricing Method |
| **RP** | Revealed Preference |
| **SP** | Stated Preference |
| **TCM** | Travel Cost Method |
| **s.t.** | Subject to |
| **CVA** | Traditional Full-Profile Conjoint Analysis |
| **ACA** | Adaptive Conjoint Analysis |

| | |
|---|---|
| **TIEVD** | Type I extreme value distribution |
| **MDC** | Multinomial Discrete Choice Model |

# INTRODUCTION

South African biodiversity is increasingly under threat and many ecosystems have been degraded (DEAT, 1997). This study is concerned with the role of markets for Nature-based Tourism (NBT) - a private economic good - in the provision of biodiversity conservation - a public economic good. As set out by the United Nations Environment Programme, biodiversity conservation can be understood as the restoration or maintenance of the biological and functional integrity of entire eco-systems (UNEP, 1996, p. 4). The value many plants and animals have made to medicine and agriculture in the past, and the increasing role biodiversity is expected to play as more species are discovered, provides ample reason to conserve all species comprising eco-systems (Bothma, 2001, p. 2).

Over the past two decades, there has been a growing awareness among tourists of the need for *responsible tourism* (World Tourism Organisation, 2003; DEAT, 1996). Responsible tourism is tourism that is responsible socially, environmentally and economically. The environmental component of many responsible tourism labels encourages NBT businesses to reduce their environmental footprint, often with the use of an environmental management system. Biodiversity conservation however is seldom a significant focus of responsible tourism labels.

In particular, this study deals with the problem of asymmetric information on biodiversity conservation in NBT markets, why this may reduce the incentive for NBT providers to invest in biodiversity conservation, and the possible use of biodiversity conservation product labels to begin addressing this problem. Asymmetric information can be defined as information that is not equally available to all market participants (Akerlof, 1970; Marette *et al*, 1999; Stoneham *et al*, 2002).

During 2004, SA received 6.7 million foreign visitors, generating approximately R47.8 billion in direct spend (South African Tourism, 2005). During 2003, domestic tourists contributed R47 billion in direct spend (South African Tourism, 2006). Public and private game-ranching businesses make a considerable contribution to the rural economy in SA. For example: Aylward (2003) contends that NBT (primarily hunting and photo-tourism) contributes 21 per cent (R415 million in 2002) of the gross geographical product of the NEKZN economy; and six per cent (R5.4 billion in 2002) of gross domestic product in KwaZulu-Natal (KZN). The industry is dependent on foreign tourists for approximately half of direct tourism spend. Spenceley (2003) estimated that over 60 per cent of all South Africa's foreign tourists visit terrestrial NBT destinations (in 1998 and 1999) in SA and a study by Tourism KwaZulu-Natal (TKZN) revealed that 73 per cent of foreign air arrivals visited a nature reserve while in KZN in 2004 (TKZN, 2004). Mullins and Mulder (2003) estimated that foreign tourists account for R178 million (51 per cent in 2002) of annual expenditure on accommodation and catering, and have a share of over 56 per cent (2002) of the total tourism impact in NEKZN. Improved aggregate competitiveness of SA NBT in domestic and international tourism

markets is expected to ultimately benefit SA rural economies and wildlife conservation finance through increased revenue generation (Aylward 2003).

The existence of markets for NBT products, however, is not sufficient to promote private-sector biodiversity conservation, and NBT may even lead to degradation of the natural resource base upon which it is built (Aylward, 2003, p. 1). Unless the benefits of investing can be internalised, a private entity is unlikely to invest, similarly, NBT businesses only have an incentive to invest in improvements to biodiversity conservation on their property if their property rights in the natural resource base are exclusive and transferable (Krug, 2001). Even if these conditions are satisfied, the private sector may under-invest in ecosystems and species for which markets do not exist (Tisdel, 2003). For example, ostrich and venison ranching do not necessarily conserve these species' natural habitats, hunting tourism businesses may under-invest in game species that command relatively low prices in hunting markets, and NBT businesses may under-invest in plant and animal species that have relatively low appeal to tourists. Lindberg *et al*, (2003a, p. 239) established that the standard of biodiversity conservation is typically lower on privately owned GRs compared to public conservation areas in NEKZN.

Tourists may be willing to pay a premium for NBT products provided by businesses that are committed to environmental protection (Twinshare, 2004). A comprehensive knowledge of fauna and flora, geology, ecosystem functioning, management practices, grazing dynamics and conservation ethics, amongst other conservation topics, is required to assess the quality of biodiversity conservation on a particular. Many tourists

do not possess such knowledge and are therefore unlikely to be able to accurately assess the quality of biodiversity conservation at GRs they visit in the absence of expert information. A result of this hidden or asymmetric information is that tourists' preferences for biodiversity conservation may be understated in market-determined tariffs, thus providing game ranching businesses with reduced incentive to invest in biodiversity conservation.

Product accreditation labels present a possible economic solution to the problem of asymmetric information in markets (Akerlof, 1970). Product labels created to inform consumers that some products are relatively more environmentally friendly than other products within the same category are termed "ecolabels" (Bougherara & Grolleau, 2004). Environmental accreditation can be for product attributes (e.g., "organic" foods), for management standards (e.g., ISO14000 accreditation), or both (e.g., the "Blue Flag"). Hotel accreditation schemes are common in tourism markets, but typically only take account of accommodation and catering services provided. Ecolabels have been widely applied in food and product markets with varying success (Bougherara & Grolleau, 2004; Sedjo & Swallow, 2002; Lathrop & Centner, 1998; Church, 1994). The concept of ecolabels can be applied to biodiversity conservation in tourism markets. For example, the Office of National Tourism in Australia determined that five in ten people were willing to pay more for accommodation if the lodges' owners were committed to environmental protection (Office of National Tourism, 1997; Twinshare, 2004).

Although ecolabels are relatively common in NBT markets, ecolabels focusing on the quality of biodiversity conservation specifically are uncommon. This study focuses specifically on potential impacts of an ecolabel for *biodiversity conservation* and the value tourists may place on such information. Biodiversity conservation accreditation labels could be used to inform tourists of the status of biodiversity conservation of accredited GRs. Tourists who prefer visiting GRs with a relatively high standard of biodiversity conservation, *ceteris paribus*, may be willing to pay a premium to visit GRs that are reliably accredited with applying a high standard of biodiversity conservation (one of the objectives of this research is to test this assumption). This market-determined premium may provide NBT product providers with an incentive to become accredited, and therefore to ensure that biodiversity conservation exceeds a minimum specified standard and that management practices are consistent with conservation objectives.

A Hedonic Pricing Method (HPM) of 351 SA NBT product tariffs by Wright (2001) was unable to identify a statistical relationship between tariffs charged by SA NBT businesses and the standard of biodiversity conservation on their GRs. As one of the bundled attributes comprising a NBT product, the value placed on the quality of biodiversity conservation by tourists will not be reflected in the price paid to overnight at a particular GR if this information is not available during the decision-making process. The findings of this study indicate that *if* tourists do, on average, prefer visiting GRs with higher standards of biodiversity conservation, *ceteris paribus*, then SA NBT

markets may indeed be characterised by asymmetric information on biodiversity conservation (Wright, 2001).

The spectrum of NBT products in SA is diverse (luxury lodges, 4x4 safaris, wilderness trails, camping & hiking, hunting safaris, outdoor adventure, etc), reflecting a variety of competitive strategies used by wildlife tourism providers to try and gain a competitive advantage with the natural resources available to them. Darroch (2001) noted that whilst some NBT businesses in NEKZN have adopted a best-cost competitive strategy, other businesses have focused on product differentiation and niche markets. Accommodation tariffs range from a few hundred to several thousand rands per person per night. Products vary with respect to accessibility, exclusiveness, tourist congestion, activities provided, standard of catering and accommodation, game and bird species densities and variety, and the quality of scenery, amongst other attributes.

Previous analyses of SA NBT markets, (see Falkena (2000)) have analysed tourism products according to various categorisations of NBT businesses such as property size or market segment. This masks the heterogeneity of NBT products available in the market. Wright (2001) conducted a hedonic analysis of NBT (specifically photo-tourism) tariffs for overnight accommodation to disaggregate tariffs charged to tourists at NBT destinations in SA, in order to infer prices for individual characteristics of NBT products. However, the values estimated in this study may be unreliable due to problems of asymmetric information and price leadership by the government-subsidised public sector nature conservation bodies in SA NBT markets (Wright, 2001).

Lindberg (2003a) used a contingent behaviour analysis to determine the impacts that tariffs and tourism crowding have on the itineraries of overnight visitors to three public protected areas, Kruger National Park, Hluhluwe-Imfolozi Park and Ithala Game Reserve in SA. Results indicated that demand for NBT is highly price inelastic (-0.12 for South Africans and -0.03 for foreigners) and relatively insensitive to tourist congestion. However, the study did not explain why wildlife tourists vary in their preferences for various tourism products, e.g., why some wildlife tourists prefer to overnight at private sector tourism establishments, or why some tourists choose relatively more luxurious accommodation than others.

NBT products may be described within the framework of the Lancasterian approach (explained further in Section 2.1), in which a NBT product is described as being a composite bundle of often inseparable goods and services, such as service quality, view, atmosphere, game viewing quality, price, exclusivity, etc. Tourists' preferences for product attributes may be analysed using choice modeling techniques such as conjoint analysis and Choice Experiments (CE). The CE methodology has developed from conjoint analysis within the discipline of marketing and may be regarded as a stated preference (SP) valuation technique. The technique focuses on individuals' choices between hypothetical options characterised by specified attributes and levels (e.g., accommodation tariff, natural qualities, etc.), and is used to estimate the probability that consumers will choose a particular product (e.g., will visit a particular tourism establishment) based on the attributes of that product relative to those of others in the market. The ability of CE to model multiple attributes simultaneously makes this

method suited to analysing bundled goods such as NBT products. Due to the ability to include "price" as one of these attributes, CE can be used to estimate the responsiveness of visitation levels to price changes. Values of other product attributes included in the CE can be inferred from this estimate (Straub & Thomassin, 2006).

Straub & Thomassin, (2006), Hanley *et al*, (2002), Hanley *et al*, (2001), and Gregory (2000), have previously applied choice modeling in NBT markets in Scotland, and the USA, respectively. Straub & Thomassin, (2006) used CE to examine consumer perceptions of the potential benefits of products that are produced using an environmental management system in agriculture. Hanley *et al*, (2002) and Hanley *et al*, (2001) assessed rock-climbers' preferences for six attributes. Gregory (2000) assessed different options for fire control in Oregon's old-growth forests. This dissertation applies CE in the SA NBT market to estimate the premium that tourists are willing to pay to overnight at a GR that is accredited with having a high standard of biodiversity conservation. This dissertation also combines HCA with CE to investigate the heterogeneity of tourists' preferences within the market.

The objective of this study is to investigate the presence of asymmetric information regarding the standard of biodiversity conservation applied by tourism providers at selected NBT destinations in SA; to employ CE and CVM techniques to estimate the premium that tourists may on average be willing to pay to visit GRs that are accredited with having a high standard of biodiversity conservation; and to conduct an analysis of tourists' relative preferences for SA NBT products using CE. This study will contribute

to a growing literature on the demand for NBT in SA, e.g., Lindberg (2003a&b), Wright (2001), Day (2000) and Oldham *et al,* (2000). All of these studies analysed only the market behaviour of tourists and may, therefore, have excluded or understated tourists' preferences for some attributes that are incompletely captured in NBT markets. Findings of this study are expected to be useful to conservation authorities considering implementing biodiversity conservation accreditation for GRs in SA, e.g., Ezemvelo KZN Wildlife (Blackmore, 2004). In addition, knowledge of tourists' preferences can help NBT businesses in gaining a competitive advantage through improved product design and marketing. Improved aggregate competitiveness of SA NBT in domestic and international tourism markets, which may be gained through biodiversity conservation accreditation, may ultimately benefit SA wildlife conservation finance (other forms of conservation finance, e.g. pharmaceutical research are beyond the scope of this research).

In the first chapter of this dissertation, a Lancasterian approach (Lancaster, 1966) is used to present a conceptual economic model of the demand for NBT. This model describes NBT products as being composite bundles of often inseparable goods and services that are partially derived from attributes of the game ranching businesses, including characteristics of the natural resource base of the property. The model is used to demonstrate (i) that asymmetric information on biodiversity conservation amongst tourists may reduce tourism providers' incentives to invest in biodiversity conservation, and (ii) that product labels for biodiversity conservation may offer an economic solution to this problem. Chapter 2 present a conceptual/theoretical model of the demand for

NBT as well as the research methodology and data collection. Revealed Preference (RP) valuation methods, such as the Travel Cost Method (TCM) and HPM, are often preferred to SP techniques because RP are based on observed behaviour, whereas SP, such as include CVM and CE, are based on hypothetical questions to determine the impact relevant information would have on decision-making (Alpizar *et al*, 2003; Lindberg, 2003b, p. 46). However, because observed decisions incompletely reflect preferences for attributes for which asymmetric information is a problem, this study considers only SP techniques. The results for this study are presented in Chapter 3.

# 1. REVIEW OF LITERATURE

There is substantial literature on evaluating demand for outdoor recreation and NBT. Ideally, demand curves are estimated by varying the price of the good (in this case NBT products) and observing changes in consumers' purchasing decisions using time-series data. However, sufficient data for these analyses are seldom available in time series information. An alternative method is a cross-sectional approach that evaluates visitation at a set of different parks as a function of price and other attributes. However, it is difficult to measure and control for the numerous attributes, such as site-quality and proximity to markets, which affect visitation levels across individual sites. Consequently, various non-market valuation methods have been utilised to evaluate demand for outdoor recreation.

Although markets exist for specific species, no market currently exists for biodiversity conservation as a whole, nevertheless, in order to compare different policy options, the value of non-market goods can be expressed in monetary terms. Valuation techniques for non-market goods may be broadly grouped as RP methods, e.g., the TCM, and SP methods, e.g., CVM and CE[1] (Alpizar *et al*, 2003). This chapter provides a brief review of these techniques and past international and local research on the demand for NBT products, with emphasis on biodiversity conservation. A review of economic research

[1] Choice modeling can refer to the analysis of actual or hypothetical (scenario-based) choices. In this study, choice modeling refers to analysis of hypothetical choices. Other terms have been used for this type of analysis, including conjoint analysis, choice experiment, or experimental choice modeling (Lindberg, 2003: p.51).

analysing premia paid in markets for goods accredited with various ecolabels is also presented.

## 1.1. A Review of Demand Analysis Techniques

Possibly the most widely used RP approach has been TCM. The TCM uses expenditure on various trip costs (e.g. transportation) to trace out a demand curve. The value tourists receive from the destination can be inferred from the estimated demand curve. The variability required to trace out the demand curve for a single destination comes from the range of tourists' travel distances and costs (Lindberg, 2003b, p. 44).

TCM has often been favoured over SP models because RP techniques are based on actual behaviour. There are however many concerns. Although TCM has been applied to international ecotourism studies it is not well suited to these because TCM assumes tourists will make several trips in a given period, whereas in reality many international tourists make only one to a particular destination in a lifetime (Lindberg, 2003b, p. 45). Within international regions there is also little variation in terms of distance from SA. Using SA as an example, most international tourists come from Europe or North America. Within each of these regions there is little variability in distance to SA. There is greater variability across the two regions, but this provides only two points for estimating the demand curve (Lindberg, 2003b, p. 45).

Assumptions of the TCM add to these concerns. First, TCM assumes that all travel costs are accurately measured. Accurately measuring the opportunity cost of time, for example, still remains a challenge for TCM. Second, in the case of studies involving multiple destinations, which are common in international ecotourism, demand is allocated across all destinations. Third, to accurately trace the demand curve, all costs, including substitutes (e.g. other recreational activities) must be measured. Fourth, TCM assumes all tourists will react to all prices in the same manner (Lindberg, 2003b, p. 44).

The most widely used SP technique has been CVM. This method uses hypothetical scenarios to determine a tourists WTP for a given service or product. The hypothetical nature of CVM has allowed this method to be flexible but it is also the source of many concerns. The major concerns are that respondents do not take the task seriously; are unaccustomed to placing monetary values on non-market goods; and bias (both hypothetical and strategic bias). Hypothetical bias arises due to respondents not actually incurring real costs in the survey (unlike a real market situation), while strategic bias arises when an incentive is provided for the respondent not to reveal their true preference. The information provided by the researcher may result in a respondent developing an inaccurate or unclear market understanding. In cases where the scenario infers that the destination may no longer exist if the fee is not paid, use value as well as existence value (intrinsic value associated with the knowledge that a particular asset exists) will be measured and are not separable. This provides an inaccurate estimation of tourist response to price changes (Lindberg, 2003b, p. 46).

Choice experiments use hypothetical scenarios, which are described by attributes and attribute levels. Attributes are used to describe a particular product, e.g. land size, level of luxury, location, game viewing and bed capacity could be used to describe a GR; *attribute levels* reflect the variation within each *attribute*, e.g. land size could be 200 ha, 1,000 ha or 20,000 ha. As a SP method, CE suffers from some of the same criticisms as CVM. However the ability of CE to model several attributes simultaneously means it provides richer information than CVM and reduces the impact of embedding. Such evaluation is difficult or impossible using RP methods because these methods are restricted to levels of attributes that fall inside actual ranges (e.g. they cannot determine effect of increasing price above the actual level) (Lindberg, 2003b, p. 48). CE and CVM methodologies are discussed in greater detail in Chapter 2.

## 1.2. The Demand for NBT

An extensive literature on valuing consumers' preferences has developed since the late 1960s. Considerable research into many areas such as sustainable development, assessing policy implications, economic solutions to conservation, environmental asset valuation, etc, has been extensively published and serves to greatly advance knowledge about the environment in SA and internationally (Bateman & Kerry Turner, 1993). Numerous studies have been conducted to assess the demand for many environmental products and services, both locally and internationally however none have identified a relationship between NBT tariffs and biodiversity conservation. In addition, no research

has yet studied what NBT product attributes tourists demand and what they are willing to pay for them. Understanding this may help operators develop a competitive edge and make ecotourism more appealing to tourists.

The importance of investigating the demand for biodiversity conservation accreditation among nature tourists is in order to determine whether biodiversity conservation accreditation is likely to have any bearing on tourists WTP to visit accredited GR. Various methodologies are available, but require the use of SP methods as hypothetical questions are necessary. Use of CE to analyse demand for NBT products are uncommon in developing countries, and thus far only Lindberg (2003b, p. 47) has used this method to study the demand for NBT products in SA.

Lindberg (2003a) conducted a survey of domestic and international tourists in KZN and Kruger National Park to assess the market behaviour of nature tourists in SA in 2002. The study focused on factors affecting demand (e.g. region, race, age, price), but the quality of biodiversity conservation nor the type of biodiversity conservation system used at a particular site was included as a factor. For domestic and foreign tourists the most important factor in determining where they visited was the opportunity to see the "Big 5" (elephant, rhino, buffalo, leopard and lion). Of the factors considered by Lindberg (2003a) foreign tourists valued "Big 5" followed by "experience different cultures," "variety of attractions," and "reputation of specific sites" most highly. Domestic tourists displayed similar preferences but tended to place more emphasis on the birdlife than "variety of attractions." For both markets "service quality" was

considered more important than cost. CVM and contingent behaviour models were used to evaluate visitor demand (Lindberg, 2003b).

Locally, a study conducted by Oldham *et al* (2000) in southern Maputaland estimated the demand for tourism facilities. Demand was estimated by analysing all data relating to revenue earned by 20 private tourism operations. The study outlined tariff and occupancy rates and compared three different methods of calculating revenue. Revenue per bed and per hectare were compared between three categories of operations. In addition, the revenue per hectare earned by private tourism was compared to revenue earned by other private sector forms of land use, such as agriculture and forestry. The study did not investigate tourists' preferences for visiting well-conserved GRs, instead investigating their demand for different types of accommodation.

Troni (1995) attempted to use charitable contributions to the KZN Conservation Trust to reflect an individual's preference towards the good to which they donate. Under the assumptions that donations truly reflect the quantity and quality of the good and that free-riding is not exhibited to any strength, donations can be interpreted as a WTP figure. However this method is unsuitable for measuring tourists' preferences for use values because it measures use and existence values.

A study by Wright (2001) to determine the implicit market prices for environmental attributes of SA GRs shed some light on what tourist's demand. Twenty variables (attributes), with no direct market price were valued using the HPM. This method is

based on linkages between ecosystem attributes and markets for related private goods and services (Wilson & Carpenter, 1999). It was found that “catering”, “presence of the big-7” (big 5 including giraffe and hippo), “on-site facilities”, “presence of a nearby runway”, “number of beds in the camp” and “status of the reserve” were the most important explanatory attributes of tariff. The HPM was used to infer the monetary values for each of the 20 attributes.

Day (2000) studied the demand for wildlife viewing in KZN using an extension of the TCM (a multinomial logistic regression model). Similar to HPM, this method is based on linkages between ecosystem attributes and markets for related private goods and services (Wilson & Carpenter, 1999). The study included numerous attributes, which characterise the accommodation types in the GRs. Attributes presented below range from those having the greatest positive influence, to those having the greatest negative influence on the choice of accommodation. Households were more likely to choose a certain accommodation type if there was a shop in the camp, if the unit had a kitchen, and if the unit had a bathroom. Tourists were less likely to choose a particular accommodation type if it was in a bush camp (especially if juveniles and/or pensioners were in the party), if it was constructed from canvas tenting or if the accommodation involved splitting the household amongst several units (Day, 2000).

Darroch (2001) analysed business strategies of game reserves in NEKZN and identified five key sources of risk to game farmers: crime; the threat of a malaria outbreak; a decline in tourist demand (particularly from foreign tourists); the threat of land

expropriation; and changes in labour costs. Darroch identified a wide range of risk and information strategies, at business and provincial levels, which could be used to promote business growth and competitiveness. However, this study did not assess the impact of business strategy on the demand for recreation at each GR.

A study on tourists' WTP more for biodiversity conservation by the Australian Office of National Tourism reported that according to the results of a survey, five in ten people were willing to pay more for accommodation if the owners were committed to environmental protection (Twinshare, 2004; Office of National Tourism, 1997). The article made no mention of how much more tourists would be willing to pay, however the reported findings do suggest that some tourists do value biodiversity conservation.

Hanley *et al*, (2002) applied a recreational demand model to rock-climbing in Scotland using CE. Rock climbing sites and their relevant attributes were identified in focus groups of members of two mountaineering clubs. Eight climbing sites and six attributes were chosen for the study. The six attributes were: length of climb; approach time; crowding on climb; overall "quality" of climb; scenic quality; and distance (as a proxy for cost). Questionnaires were mailed to a random sample of climbing club members. Questionnaires were also administered at climbing walls in three locations. Implicit prices were used to calculate WTP amounts for individual attribute levels. These implicit price values were compared with the consumers' surplus of an "average" climb, which amounted to £30 for a day's climbing. The results obtained from the CE study compared favourably with RP results obtained from the same sample group. The methodology

applied in Hanley's study is very similar to that of this study but does not provide any information on the value tourists place on biodiversity conservation.

Numerous methods exist for evaluating non-market goods, all focusing on different aspects of social benefit associated with the environmental goods. Valuation methodologies are based on different underlying assumptions thus possessing unique limitations and uncertainties. Monetary estimates derived for non-market environmental goods from these studies tend to be specific to a particular method, ecosystem, and socioeconomic circumstance (Wilson & Carpenter, 1999). Despite focusing on different environmental goods, the studies cited above offer guidance on the appropriate method to apply in order to attain significant results. The review of literature revealed that studies assessing tourists WTP for NBT products are not uncommon; however the application of CE to such studies is uncommon.

## 1.3. Economic Analyses of Ecolables

When making purchasing decisions there is considerable information that is not easily accessible but which may nonetheless be of value to the consumer (Golan, *et al*., 2000). For example, a packet of rice could be grown locally or internationally, under organic farming practives or not, it could have been stored in hygienic or unhygienic facilities, etc. Through their purchasing power, consumers can influence what information producers make available to them. Producers seek out attributes that are attractive to consumers and voluntary provide information about these attributes when the benefits of

doing so outweigh the costs (Golan, et al., 2000). This information can be conveyed in a number of ways but is often most easily conveyed in the form of an easily recognisable label, seal or logo, which consumer's associate with meeting particular criteria. There are numerous reasons consumers may prefer to purchase products which display a particular label, including health concerns, environmentalism, concern for human rights, or altruism (Goodwin & Francis, 2003).

The need for greater sustainability within the tourism industry began growing in the 1990s and is now widely recognised at all levels (World Tourism Organisation, 2003; DEAT, 1996). The growing awareness and increasing demand for responsible tourism has led to the establishment and subsequent growth of ecotourism within the tourism market. *Responsible tourism*, as defined in the South African White Paper on the Development and Promotion of Tourism (DEAT, 1996), is the responsible development, management and marketing of the tourism industry to create socio-economic benefits for local communities and to provide the SA tourism industry as a whole with a competitive edge globally. *Biodiversity conservation* can be understood as the restoration or maintenance of the biological and functional integrity of entire eco-systems (UNEP, 1996, p. 4). The environmental component of this White Paper (DEAT, 1996) or the Responsible Tourism Manual (Spencely *et al*, 2002) focuses on reducing environmental impacts (footprint) rather than the more specific objective of actively conserving biodiversity.

Within the tourism industry and more specifically the ecotourism industry, the use of ecolabels has become more prolific in the last decade (Boulden et al, 2003; Goodwin & Francis, 2003). Ecolabels serve a number of purposes: to stimulate NBT product providers to introduce environmental, social and economic improvements to their operations; to differentiate NBT products that meet environmental, social and economic standards above those of similar NBT products or the law; and to provide tourists with information on the responsibility (sustainability) of individual NBT businesses (World Tourism Organisation, 2003). Ecolabels, including better known examples such as Tear Fund, Fair Trade, Fair Fund labels, ACTSA (Action for Southern Africa), Tourism Concern, VSO (Voluntary Servive Overseas), Blue Flag, Blue Angel labels, ISO 14001, Greenstop.net, Green Globe 21 and Heritage Ecotourism Rating, generally specify a combination of environmental, social and economic criteria which need to be met by NBT businesses in order to be awarded accreditation.

A review of the ecolabel requirements reveals that the ecolabels mentioned above and many others generally place an emphasis on socio-economic issues with ecotourism used as the vehicle to achieve social upliftment (TIES, 2005). Due to its size and interconnectedness with all parts of the economy, tourism is one of the largest sources of economic activity in the world and is therefore an important force in attempting to solve many world challenges (World Travel & Tourism Council, 2002). In cases where the environment is the emphasis of an ecolabel, the quality of actual biodiversity conservation is seldom a major criterion (although it and specifications of biodiversity management systems may be listed as one of many requirements). Generally, the

objective is to reduce the environmental "footprint" of a particular product using one of various Environmental Management Systems to improve the sustainability of ecotourism establishments (World Travel & Tourism Council, 2002).

The "Blue Flag" is an example of a successfully implemented ecolabel (although biodiversity conservation is not a specific objective). The project began in Europe in the mid-1980s as a means to encouraging local authorities to provide clean and safe beaches for local inhabitants and tourists. The project has become increasingly more environmentally focused since its inception and is now internationally recognised. The Blue Flag is awarded annually to beaches that satisfy certain standards in; water quality; beach management and safety; and environmental information and education (UNEP, 1996). In 2001, SA was the first country outside Europe to join the Blue Flag campaign.

Although no scientific publications were found documenting spin-offs from beaches having been accredited with Blue Flag status, several have been noted in semi-popular literature. These include increased numbers of tourists, lower levels of crime, local businesses using their local Blue Flag for promotional purposes and a rise in property prices for homes adjacent to Blue Flag accredited beaches (S.A., 2003). These observations suggest that tourists place some level of value on environmentally responsibly managed beaches.

Therefore, while it is acknowledged that ecolabels may be common in NBT markets and many consider systems used for biodiversity conservation, the literature has revealed

none that focus particularly on biodiversity conservation itself. Given the value many plants and animals (biodiversity) have made to medicine and agriculture in the past, and the increasing role biodiversity is expected to play as more species are discovered (Bothma, 2001, p. 2), ample reason exists to begin focusing conservation efforts on attaining more specific objectives such as conservation of biodiversity rather than just requiring NBT business to reduce environmental impacts.

This review of previous research on the demand for NBT products indicates that there is a gap in the literature concerning tourists' WTP for biodiversity conservation (as opposed to responsible tourism generally). Due to the expectation that asymmetric information may exist in the market, a study using the HPM (similar to that conducted by Wright (2001)) is inappropriate. The HPM is able to value individual product attributes of tourism products but assumes that tourists have perfect information. Asymmetric information about biodiversity conservation in tourism markets may explain why the results of Wright's (2001) study indicate that tourists are unwilling to pay a premium to visit wildlife destinations with a relatively high level of biodiversity conservation. TCM is limited in that it reveals consumer preferences for non-market goods only for current users, thus producing skewed results (Cameron, 1992). Consequently, it is necessary to use SP techniques, similar to those employed by Straub & Thomassin (2006) and Hanley *et al* (2002), to pose hypothetical questions to tourists regarding their WTP for biodiversity conservation. Whilst the use of CE to assess tourists' preferences for goods and services within the tourism industry and other markets is relatively common, CE has not been used to assess tourists WTP for

*biodiversity conservation*. This study adds to the literature in that it is the first application of CE to modeling the demand for biodiversity conservation. The following chapter proceeds to present a conceptual/theoretical model of the demand for NBT as well as the research methodology and data collection.

# 2. RESEARCH METHODOLOGY & DATA COLLECTION

## 2.1. A Conceptual Model of Tourists' Preferences for Tourism Goods & Services

The basis for most microeconomic models of consumer behaviour is the maximisation of a utility function subject to a budget constraint (Alpizar *et al*, 2003). CE approaches were inspired by the Lancasterian micro-economic approach (Lancaster, 1966), in which individuals are assumed to derive utility from characteristics of a good rather than directly from the goods themselves. Tourism products are comprised of a bundle of experiences (or probabilities of experiencing particular outcomes). Tourists do not generally directly experience biodiversity conservation during NBT experiences, however, their experiences are partially determined by the standard to which biodiversity on a property is conserved. In order to consider biodiversity conservation in an economy of tourist preferences for NBT products, the Lancasterian approach is applied in this chapter to link the characteristics of NBT experiences to attributes of the environment in which the tourism experience takes place. The model is then further developed to demonstrate the problem of asymmetric information on biodiversity conservation in NBT markets, and the potential use of product labels to remedy the problem of asymmetric information.

Tourists and recreationists directly derive utility from wildlife NBT experiences through consumption of a vector of non-separable goods and services associated with that

tourism experience, **Z**. Utility derived from a NBT experience can, therefore, be modelled as U = fn(X,**Z**), where X represents all other goods (i.e. any good from which a tourist can gain utility). Utility is maximised subject to a budget constraint, $P_xX$+ TC(**Z**), where $P_x$ is the price of X and TC(**Z**) is the cost of obtaining the collection of characteristics **Z**, including travel-costs. The proper specification of the utility function (or any demand function derived from the utility function) requires that **Z** is known**.** However, identification and measurement of elements of **Z** as perceived by tourists is problematic.

**Z** is derived from an exhaustive vector of commodity attributes, **B** = $\{B_1, \ldots, B_n\}$, that describe the natural resource base of the GR (e.g., scenery, game stocking densities or land size) and other attributes of the NBT business (e.g., exclusiveness and the level of service provided), and is expressed through the combination of the attributes in **B** with the vector of activities, **A** (e.g., game viewing, catering or hiking). If it is assumed that all relevant characteristics of a NBT experience can be measured in terms of levels of commodity attributes, then U = fn(X,**B**). In practice, utility is specified as a function of a subset of measurable attributes that contribute directly or indirectly to **Z**, $\mathbf{B}^* \subseteq \mathbf{B}$, and the model estimated is U = fn(X,$\mathbf{B}^*$), subject to (s.t.) m = $P_xX$ + TC($\mathbf{B}^*$). From a policy and management perspective, estimation of implicit prices of measurable attributes, $\mathbf{B}^*$, may be more useful than estimation of implicit prices of characteristics, **Z**.

According to Akerlof's (1970) theory of hidden or asymmetric information, tourists may be unable to easily differentiate between alternative NBT products with respect to one or

more elements of **B**, say attributes $B_1$ to $B_4$, due to high costs of information. Information provided by tourism providers relating to attributes $B_1$ to $B_4$ is likely to be ignored because consumers may anticipate that some NBT providers may make false claims about their products. The model of consumer choice is then specified as $U = fn(X,\mathbf{B''})$, s.t. $m = P_xX + TC(\mathbf{B'})$, where $\mathbf{B''} \subseteq \mathbf{B'} = \{B_5, B_6, \ldots, B_n\}$. In other words, tourists' relative preferences for attributes $B_1$ to $B_4$ are ignored in their product choices. It follows that tourism providers will then have relatively less incentive to provide high levels of attributes $B_1$ to $B_4$.

Product accreditation or certification can provide missing market information about production processes and product attributes, and may therefore reduce problems of asymmetric information. Products accredited with meeting specified standards are given the right to display an independently awarded quality brand or logo to inform consumers that those standards are met. If the covariance among $B_1$ to $B_4$ can be adequately described using a single dichotomous variable, (i.e., if $B_1$ to $B_4$ are interrelated attributes), then a product label, $B'_1$, may be used to (partially) inform consumers about the "hidden" attributes $B_1$ to $B_4$. The model of consumer choice may then be specified as $U = fn(X,\mathbf{B}^+)$, s.t. $m = P_xX + TC(\mathbf{B'})$, where $\mathbf{B}^+ \subseteq \mathbf{B'} = \{B'_1, B_5, B_6, \ldots, B_n\}$. The market determined price paid for products accredited with $B'_1$ indicates the value consumers place on the information conveyed by the label and provides producers with increased incentive to provide attributes $B_1$ to $B_4$ to levels necessary to obtain product accreditation for $B'_1$ (Bougherara & Grolleau, 2004). Once $B'_1$ becomes established as a product label (i.e., consumers recognise the label and associate it with a certain level of

product quality), the premium paid for products accredited with $B'_1$ will reflect consumers' preferences which are disclosed through the information for attributes $B_1$ to $B_4$ (Moon *et al*, 2002). Individuals will choose the NBT experience that maximises their utility. It therefore follows that option *j* will be chosen if $U_j = fn(X_j, \mathbf{B_j}^+) > Ui = fn(X_i, \mathbf{B_i}^+)$, $\forall i \neq j$. This equation completes the conceptual economic model.

Product accreditation alone is not sufficient to address the problem of asymmetric information in markets. Market participants must have an adequate understanding of the standards indicated by a product label, and these standards must be accepted and valued in the market. In addition, for an accreditation system to be credible, it must meet the requirements of objectivity, consistency, transparency and sound ethics (Maclaren, 2004). Besides poor design and implementation of product accreditation schemes, reasons why the demand for accredited products has often failed to meet expectations created through consumer marketing research (e.g. Bougherara & Grolleau, 2004; Sedjo & Swallow, 2002; Cason & Gangadharan, 2002; Morris, 1997; Church, 1994; Scarlet, 1994; and Environment Committee, 1991) include short-comings of approaches used to estimate consumers' WTP for accredited products.

## 2.2. Choice Experiment Method

In the presence of asymmetric information, observed decisions of tourists may not reflect their preferences for biodiversity conservation. Consequently, RP techniques, such as HPM, and TCM are inappropriate for estimating consumers' relative preferences

for biodiversity conservation. The objective of CVM and CE is to elicit the consumers' maximum price for a commodity or product attribute before he or she is willing to go without it (Haab & McConnell, 2003; Mitchell & Carson, 1993, p. 16).

SP use hypothetical questions to determine a respondents' WTP for a particular product or product attribute. The hypothetical nature of SP has allowed these methods to be highly flexible (Bishop & Heberlein, 1990), however, it is also the source of many concerns, including that (i) respondents may not take the task seriously, (ii) respondents may be unaccustomed to placing monetary values on non-market goods and (iii) responses may contain hypothetical or strategic bias. These problems often stem from faults in design of the hypothetical questions, resulting in respondents developing an inaccurate or unclear understanding of the situation. Problems of using hypothetical questions are most severe when respondents are unfamiliar with the good in question (Orme, 2003).

Two types of choice techniques have been developed: ratings-based and choice-based approaches. Generally speaking, ratings-based approaches are labelled with the global term of conjoint analysis while choice-based approaches are referred to as choice modelling. Ratings-based approaches require the respondent to rate or rank each alternative product. Choice-based approaches require the respondent to select one product from among a set of competing products - a task that consumers perform everyday (e.g. buying bread, a cricket bat or a car). Conjoint analysis methods were

developed within the marketing discipline where they were used primarily to gain an insight into respondent's preferences for different products rather than estimating economic values. Choice modelling methods on the other hand were developed within the economics discipline and have been widely used for estimating values placed on products and product attributes (Lusk & Norwood, 2005). One of the objectives of this study is to estimate economic values respondents place on various attributes. For this reason only choice modelling approaches in economic valuation studies are considered in this study.

The most widely used choice modelling approach is the CE valuation method. Other types of choice modelling also used in marketing and valuation studies include, Traditional Full-Profile Conjoint Analysis (CVA) (variation of contingent ranking) and Adaptive Conjoint Analysis (ACA) (variation of CE). However, CVA is not consistent with the random utility hypothesis (Adamowicz *et al,* 1998), and the application of ACA requires prohibitively expensive computer administered software (Orme, 2003). Consequently, CE is applied in this study.

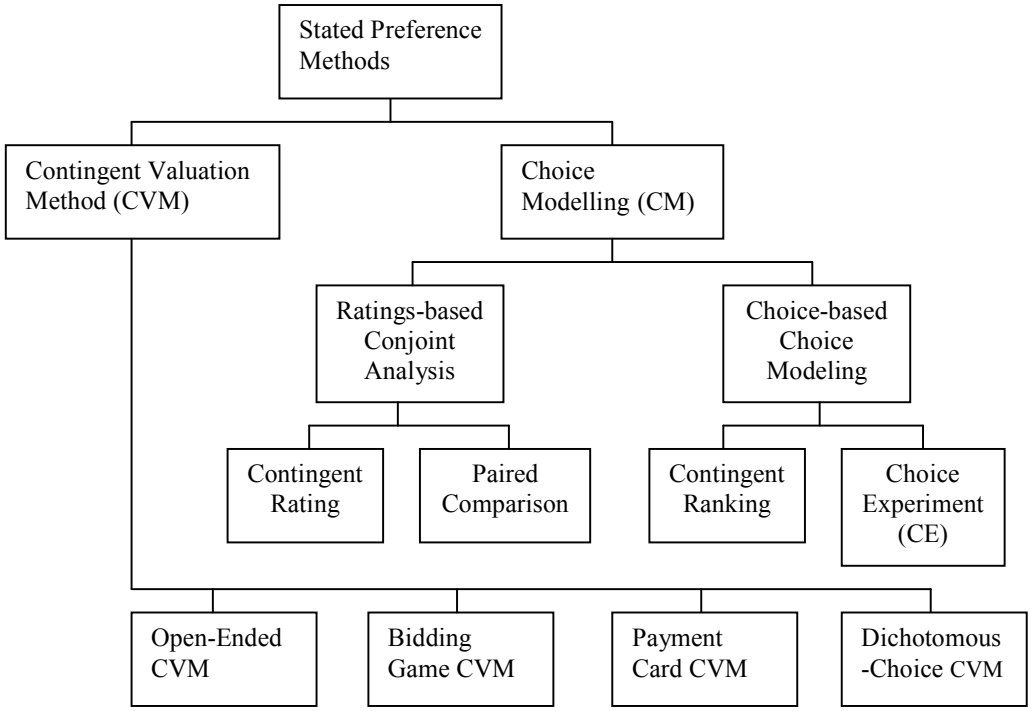


**Figure 1. A classification of stated preference methods used in economic valuation studies.**

CE requires respondents to state their preferred scenario from two or more profiles, which include all the attributes being measured. For this reason it is recommended that not more than six attributes are measured. Choosing between two (or more) scenarios is a more natural task than, for example, directly placing a monetary value on a non-market good. To further facilitate more realistic market transactions CE incorporates a 'none' option should the respondent decline to choose either scenario. By selecting the 'none' option the respondent contributes to information on the expected decrease in demand if a good becomes unattractive (e.g. price too high). The application of CE to determining

tourists' values for non-environmental and environmental attributes of tourism experiences has previously been demonstrated by Hanley *et al*, (2002).

## 2.3. Choice Experiment Design

The first step in designing a CE is to determine which product attributes will be varied across the choices, and which will be held constant. In this study the hypothetical product was described (to respondents) as three-star, overnight, self-catering accommodation at a 30-bed lodge in a SA GR, with tariffs quoted on a per person per night basis, excluding meals. Following recommendations by Orme (2003), the choice experiment was limited to six product attributes to limit the number of hypothetical choices posed to each survey respondent. The selected attributes and attribute levels are presented in Table 1 and defined in **APPENDIX 1**. The attributes were labelled: A (standard of facilities) with levels $a_0$, $a_1$, $a_2$; B (tourist traffic congestion) with levels $b_0$, $b_1$, $b_2$; C (game viewing) with levels $c_0$, $c_1$, $c_2$; D (accommodation tariff) with levels $d_0$, $d_1$, $d_2$; E (birding) with levels $e_0$, $e_1$; and F (conservation management) with levels $f_0$, $f_1$. Selection of the first five attributes was guided by (i) past studies of NBT in SA, e.g., Lindberg (2003a), Lindberg (2003b), Wright (2001) and Day (2000); and (ii) the frequency with which NBT product attributes were mentioned by businesses advertising tourism experiences on eight web sites and five travel magazines. The selected attributes were confirmed by five national travel agents as being among the most important to foreign and domestic tourists. The sixth attribute was included to investigate tourists'

WTP a premium to stay at conservation areas accredited with having a high standard of biodiversity conservation.

**Table 1: Attributes and attribute levels used in the study for tourists in NEKZN & MP/LP, 2004**

| Attribute | Levels | | |
|---|---|---|---|
| A = Fac (standard of facilities) | $a_0$ = Basic | $a_1$ = Good | $a_2$ = Excellent |
| B = Con (tourist congestion) | $b_0$ = High | $b_1$ = Medium | $b_2$ = Low |
| C = Gam (game viewing) | $c_0$ = Poor | $c_1$ = Average | $c_2$ = Excellent |
| D = Cos (Accommodation tariff) | $d_0$ = R400 | $d_1$ = R250 | $d_2$ = R150 |
| E = Bir (Birding) | $e_0$ = Not hotspot | $e_1$ = Hotspot | |
| F = Eco (Conservation management) | $f_0$ = not accredited | $f_1$ = accredited | |

The above specification of attributes and attribute levels implies 324 alternative hypothetical NBT products and, therefore, 52 650 possible hypothetical choices between alternative NBT products. The next step in finalising the choice questions, therefore, was to select a subset of all possible profiles using the D-optimal criteria (Lusk & Norwood, 2005). The D-optimal criteria assist in selecting the sets of profiles that will improve sampling efficiency. A D-optimal incomplete block design with 18 blocks (each of size 2) for estimating the main effects of a $2^2$ X $3^4$ mixed factorial was constructed with the help of the Proc Optex procedure in SAS Version 8 (Atkinson & Donev, 1992; Montgomery, 1984). The design generated by SAS was converted to a choice design by taking the blocks to be the choice sets (cset), the factors to be the attributes, and the factor level combinations within each block to be the alternatives (product). Each

participant in the CE was required to indicate his or her preferred alternative from each of the 18 choice sets (number of CE questions based on recommendations by Orme, 2003).

The choice set was coded by replacing each attribute with binary dummy variables (indicator variables taking values of 0 and 1). For example, attribute A = Fac (standard of facilities) was replaced by binary variables (see **APPENDIX 2**):

Fac0 = 1 if the level of attribute A is $a_0$, (1)

0 otherwise.

Fac1 = 1 if the level of attribute A is $a_1$, (2)

0 otherwise.

Fac2 = 1 if the level of attribute A is $a_2$, (3)

0 otherwise.

The binary dummy variable corresponding to the first level of each attribute is removed from the coded choice design to avoid over parameterising the model for the data. Respondents were asked to choose one alternative from each of the 18 choice sets. For $j$ = 1,2,…,18 and $i$ = 1,2,…,$n$ ($n$ = 193 respondents).

| **Product A** (alternative 1) | **Product B** (alternative 2) |
|---|---|
| Excellent on-site facilities | Basic on-site facilities |
| Medium congestion | Low congestion |
| Excellent game viewing | Poor game viewing |
| R400 pppn | R150 pppn |
| Birding hotspot | Not a birding hotspot |
| No ecolabel | Ecolabel |

**Figure 2: Example of a choice question presented to respondents.**

## 2.4. Analysis of CE using Conditional Logit Model

Suppose that $p_{jk} = P[Y_{ij} = k]$ is an unknown preference probability for alternative $k$ in choice set $j$. Furthermore, suppose that the value (utility) of alternative $k$ in choice set $j$ to any respondent is given by:

$$U_{jk} = \mu_{jk} + \varepsilon_{jk}, \qquad k = 1, 2 \tag{4}$$

where $\mu_{jk}$ is the mean utility of alternative $k$ in choice set $j$, and the $\varepsilon_{jk}$ are independent random errors which are usually assumed to have a Type I extreme value distribution (TIEVD). If these assumptions hold, and it is true that respondents always choose an alternative with the largest utility within a choice set, then the preference probability for

alternative $k$ in choice set $j$ ($p_{jk}$) and its mean utility are related by (Stat/Math Center, 2005):

$$p_{jk} = \frac{\exp\{\mu_{jk}\}}{\sum_k \exp\{\mu_{jk}\}} = \frac{\exp\{\mu_{jk}\}}{\exp\{\mu_{j1}\} + \exp\{\mu_{j2}\}}, \text{ k = 1,2} \qquad (5)$$

The mean utility $\mu_{jk}$ of an alternative is determined by the levels of the attributes in an alternative. From the coded choice design, let

$$x'_{jk} = [faca0, faca1, conb0, conb1, gamc0, gamc1, cosd0, cosd1, bire0, ecof0]$$

be the vector of the levels of the attributes in alternative $k$ (row $k$) in choice set $j$ in this design. For example in choice set 1,

$$x'_{11} = [0,0,0,0,0,0,1,0,0,1] \text{ and } x'_{12} = [0,1,0,1,1,0,0,0,1,0].$$

One common choice for the relationship between the mean utility $\mu_{jk}$ of alternative $k$ in choice set $j$ and the levels of the attributes in the alternative is:

$$\mu_{jk} = \beta' x_{jk}, \quad k = 1,2 \qquad (6)$$

where

$$\beta' = (\beta_{\text{fac0}}, \beta_{\text{fac1}}, \beta_{\text{con1}}, \beta_{\text{con2}}, \beta_{\text{gam0}}, \beta_{\text{gam1}}, \beta_{\text{cos0}}, \beta_{\text{cos1}}, \beta_{\text{bir0}}, \beta_{\text{eco0}})$$

is the unknown vector of the individual effects of the levels of the attributes in $x'_{jk}$. With this choice the conditional logit model for $p_{jk}$ is given by:

$$p_{jk} = \frac{\exp\{\beta' x_{jk}\}}{\sum_k \exp\{\beta' x_{jk}\}} = \frac{\exp\{\beta' x_{jk}\}}{\exp\{\beta' x_{j1}\} + \exp\{\beta' x_{j2}\}}, k = 1,2. \quad (7)$$

The assumption of this model is that the individual effects of the levels of all the attributes ($\beta$) on the preference probabilities of the alternatives within and between choice sets are the same. The individual effects of the levels of the attributes in $x'_{jk}$ have the following interpretations:

Example 1: Suppose that

$$x'_{j1} = [1,0,0,0,0,0,0,0,0,0] \text{ and } x'_{j2} = [0,1,0,0,0,0,0,0,0,0]. \quad (8)$$

Then the preference probabilities for alternatives 1 and 2 in choice set *j* are given by

$$p_{j1} = \frac{\exp\{\beta_{fac0}\}}{\exp\{\beta_{fac0}\} + \exp\{\beta_{fac1}\}} \text{ and } p_{j2} = 1 - p_{j1}. \quad (9)$$

The respective odds ratio and the *log* odds ratio of alternative 1 relative to alternative 2 are given by

$$\frac{p_{j1}}{p_{j2}} = \exp\left\{\beta_{fac0} - \beta_{fac1}\right\} \text{ and } log\left\{\frac{p_{j1}}{p_{j2}}\right\} = \beta_{fac0} - \beta_{fac1}. \quad (10)$$

Here the *log* odds ratio is a contrast of the basic on-site facilities versus good on-site facilities.

Example 2: Consider choice set 1 (**APPENDIX 4**) in the coded design. In the design,

$$x'_{11} = [0,0,0,0,0,0,1,0,0,1] \text{ and } x'_{12} = [0,1,0,1,1,0,0,0,1,0] \quad (11)$$

and hence

$$log\left\{\frac{p_{j1}}{p_{j2}}\right\} = \beta_{\cos 0} + \beta_{fac1} - \beta_{con1} - \beta_{gam0} - \beta_{bir0} - \beta_{eco0} \quad (12)$$

is a contrast of the R150 fee and no ecolabel on the one hand versus the good on-site facilities, medium congestion, poor game viewing and "not a birding hotspot" on the other. The unknown $\beta$ is estimated using the maximum likelihood method as follows. Let

$$Y_{ij} = \begin{array}{l} 1 \text{ if alternative 1 in choice set } j \text{ is preferred by respondent } i, \text{or} \\ 2 \text{ if alternative 2 in choice set } j \text{ is preferred by respondent } i \end{array} \quad (13)$$

Then given the data ( $Y'_{ij}$ ) the likelihood function of $\beta$ is given by

$$L(\beta) \propto \prod_{i=1}^{n} \prod_{j=1}^{18} p_{j1}^{y_{ij}} (1 - p_{j1})^{1-y_{j1}}, p_{j1} = \frac{\exp\{\beta' x_{j1}\}}{\exp\{\beta' x_{j1}\} + \exp\{\beta' x_{j2}\}}. \qquad (14)$$

The maximum likelihood estimate of $\beta$ is the value of $\beta$ which maximises $L(\beta)$. This estimate can be found with the help of Proc PHREG procedure in SAS Version 8. The procedure performs regression analysis of the survival data based on the Cox proportional hazard model, but can with some slight modifications, fit the conditional model to a CE. Alternatively one can use the Proc MDC (Multinomial Discrete Choice Model) procedure also in SAS Version 8. In this dissertation the Proc PHREG procedure was used.

## 2.5. The Contingent Valuation Method

CVM has developed into a relatively unrestricted and versatile valuation method for non-market goods and services (Mitchell & Carson, 1993). Although CVM is vulnerable to bias, the behaviour underlying CVM and the biases that the method suffers from are better understood compared to those of CE, and approaches to asking CVM questions have been developed to largely overcome its criticisms. The choice of elicitation formats for WTP questions in CVM questionnaires has passed through a number of distinct stages. Bishop and Herberlein (1990) identify four stages: open-ended questions, bidding games, payment-card formats and dichotomous-choice questions.

Open-ended question methods require respondents to state their WTP for a particular good. Respondents often find it difficult to place a value on a non-market commodity because most people have rarely, if ever, placed a monetary value on a non-market commodity such a view or cleaner air (Bishop and Herberlein, 1990).

The bidding game is the most frequently used style of CVM question. Respondents are iteratively asked whether they would be willing to pay a specified amount. If the answer is affirmative then the amount is successively raised until a maximum WTP is reached. Likewise if the initial amount is rejected then the amounts are successively lowered until an answer in the affirmative is reached. There remain concerns surrounding the influence of "starting-point" bias (Haab & McConnell, 2003). The initial bid (starting-point) serves the purpose of starting the bidding process. The bias exists when the initial bid stated by the researcher affects the final bid stated by the consumer (Bishop and Herberlein, 1990). The bias introduce by a starting point can be overcome to some extent by randomly selecting one of several starting points. Mitchell & Carson (1993) have presented empirical evidence for starting-point bias.

The payment card method was developed in an attempt to avoid the starting-point bias and to incorporate additional information (provide an improved context) by asking respondents to choose a WTP estimate from a list of pre-determined values (Haab & McConnell, 2003; Mitchell & Carson, 1993; Bishop and Herberlein, 1990 and Boyle & Bishop, 1988). The dichotomous-choice method to some extent overcomes the problem of asking consumers to place a value on something they have never valued before.

Consumers only have to answer 'yes' or 'no' to a given value with no further iteration. The dichotomous-choice method has an advantage over open-ended CVM questions, the bidding game and the payment card method in that it does not suffer from incentive compatibility problems and it lowers the incentive for respondent's to give a biased answer by not asking for a monetary value (Haab & McConnell, 2003; Mitchell & Carson, 1993).

The CVM question presented to all tourists in this study took the format of a dichotomous-choice question. The question was phrased "*If you had to make a choice to stay at one of two GRs which were similar in most respects except that one was situated in a more pristine environment and the other was on a former agricultural farm which was being rehabilitated. Would you be willing to pay R25 more per person per night to stay at the GR with a pristine environment?*" Tourists were required to indicate whether they would be willing to pay the premium or not and then to indicate how much more or less they would be willing to pay. The question was adapted from previous research conducted using CVM because of the reliable results it provided (Tisdell, 2003).

## 2.6. Comparing CE and CVM

The CE method suffers from similar criticisms to those of CVM (e.g., hypothetical bias), however, it provides richer information than CVM because it can model relationships between several attributes at a time. As in CVM, CE allows evaluation of attributes that are difficult or impossible to measure in RP studies, and levels of attributes that fall

outside actual ranges and thus cannot be measured using RP techniques (e.g., prices higher than those actually charged) (Lindberg, 2003a).

Figure 1, depicts a widely accepted classification of SP techniques (representing a summary of all reviewed literature). There are several notable differences between CVM and CE; the main difference being that the former analyses only one attribute of a product at a time, while the latter is able to analyse multiple product attributes simultaneously. If the objective of a study is to estimate values for a single attribute product then CVM is not necessarily limited. It is however an inefficient method of value estimation when multiple attributes are to be considered and when the values attached to each attribute and the trade-offs between attributes are of interest. For this reason, CVM is better suited to contrast the implications of different policies while CE is better suited to marketing due to the bundled nature of tourism products (Marino-Castello, 2003). Another notable difference between CVM and CE is that the latter does not require respondents to directly assign a monetary value to a non-market good. Instead, values are inferred from the hypothetical choices or tradeoffs that respondents make between attributes. By including cost/price as one of the product attributes, WTP can be indirectly estimated from respondent's choices.

Some advantages of CE over CVM are: (i) the only way CVM can estimate multiple attributes is to design different valuation scenarios for each attribute level. CE provides a natural way to do this because the method considers more than two alternatives; (ii) CE designs can reduce collinearity between attributes because attribute levels are usually

designed as orthogonal; (iii) CE avoids many of the response difficulties encountered by respondents in CVM studies (Marino-Castello, 2003). In comparison to CVM, it has been argued that CE more closely simulates the real world where consumers make decisions based on more than one attribute (Orme, 2003); and (iv) the values elicited using CE are more reliable than those elicited using CVM, especially for products for which consumers typically base their decisions on more than one product attribute because CE allows for substitution of attributes. This occurs because various attributes of a good may be substitutes, to some degree, in terms of the utility they generate (Adamowicz *et al*, 1998). Considering that Lindberg's (2003a&b) study established that tourists consider several attributes to be important in deciding which GR to visit, CE may be a more appropriate valuation technique than CVM for this study.

## 2.7. Analysis of Market Segmentation

Grouping respondents of a CE according to their choices is a means of identifying market segments (Vermeulen *et al*, 2004). The HCA technique is used to cluster observations (respondents) based on the Euclidean distances between characteristics of each observation. Using the complete linkage method, clusters are formed by a process of agglomeration or division (Manly, 1994). Accordingly, HCA was used to cluster survey respondents based on the similarity or dissimilarity of their responses to the 18 CE questions. Three distinct groups (market segments) were identified, respectively accounting for 64, 25, and 11 per cent of the respondents. The mean values of respondent characteristics for each group are presented in Table 8.

LDA is a statistical technique used to distinguish between two or more groups using characteristics on which the groups are expected to differ (Manly, 1994). A LDA was conducted to identify socio-economic characteristics, which varied significantly across the three groups in order to identify characteristics of these groups that wildlife tourism-businesses may use to develop focused marketing strategies. Discriminating variables presented in Table 2 are considered to be potentially useful in distinguishing between market segments from a marketing perspective. For example, businesses selling these characteristics may achieve greater success advertising in wildlife magazines than those who do not.

A linear discriminant function can be estimated as:

$$D = a_1X_1 + a_2X_2 + \ldots + a_pX_p \quad (15)$$

where;

D is the score of the discriminant function,

$a_p$ are the standardised weights or coefficients to be estimated,

$X_p$ are the discriminating variables.

The magnitude of the estimated coefficients ($a_p$) reflect the relative importance of each discriminating variable ($X_p$). The larger the coefficient of a discriminating variable, the more it contributes to the discrimination of groups. Discriminant variables presented in Table 2, which did not contribute meaningfully to discriminating between the groups, were omitted from Table 10.

**Table 2: Variables included in the discriminant analysis of market sectors in NEKZN & MP/LP, 2004**

| Variable | Description |
|---|---|
| Location | Dummy variable scoring 1 if the respondent spent the previous night at a privately owned game-ranch, otherwise 0. |
| Gender | Dummy variable scoring 1 if the respondent is female, otherwise 0. |
| Wildlife Society | Dummy variable scoring 1 if the respondent is a member of a wildlife organisation and/or subscribes to a wildlife magazine, otherwise 0. |
| Foreign | Dummy variable scoring 1 if the respondent is a foreign tourist, otherwise 0. |
| Region | Dummy variable scoring 1 if the respondent was surveyed in MP/LP; otherwise 0. |
| Travel Independent | Dummy variable scoring 1 if respondent is travelling independently of a tour group, otherwise 0. |
| Age | An index of the respondent's age, ranging from 0 (age < 25 years) 1 (age 25 to 55) to 2 (age > 56 years). |
| Race | Dummy variable scoring 1 if the respondent is a South African from a previously disadvantaged group, otherwise 0. |
| Education | An index of the respondent's formal education, ranging from 0 (high school graduate or less) to 2 (postgraduate qualification). |
| Itinerary | An index of the degree of independence with which the respondent planned the vacation, ranging from 0 (alone) to 1 (with other family members) to 2 (with external assistance). |

Note: Gender and Race were recorded by the enumerators to avoid any possible sensitivity on the part of respondents

## 2.8. Questionnaire Design

A pilot survey was conducted to ensure that questions and attribute levels were clearly understood by survey respondents. The first five attributes (on-site facilities, congestion, game viewing quality, price and birding quality) were well understood by the majority of respondents and needed no further explanation, however, the sixth attribute (ecolabel) was an unfamiliar concept to most tourists and did require further explanation. An ecolabel was described as a means of conveying information on the quality of the biodiversity conservation to tourists easily, in much the same way as a brand or product label (the hotel star rating system was used as an example). Consequently, two colour photographs were used by the enumerators as examples to explain to respondents difficulties in assessing the standard of biodiversity conservation in the absence of expert information (e.g. an ecolabel). **APPENDIX 3** shows the two photographs presented to survey respondents. Both pictures were taken as a part of the same study. "Veld A" is an example of the veld in a near pristine condition, while "Veld B" is a picture of severely degraded veld. When asked their opinion, almost without exception, tourists considered "Veld B" to be in a better ecological condition than "Veld A", with many expressing surprise at the correct answer, as "Veld B looks so much prettier". Very few respondents provided a more correct answer that it is difficult to assess the quality of biodiversity conservation from a photograph. The entire questionnaire as presented to the respondents is presented in **APPENDIX 4**.

## 2.9. Sample Selection and Data Collection

A survey questionnaire was designed to implement the choice experiment and to elicit socio-economic information about the survey respondents. One hundred and ninety-three foreign and domestic tourists were surveyed at private and public GRs in two geographical areas, NEKZN and MP/LP, from 23 October to 18 November, 2004. Respondents were identified at the selected public and private sector wildlife tourism destinations by inviting them to participate. Respondents were required to be (i) over the age of 18 years (ii) have had some influence in the decision making of the holiday (iii) currently staying overnight in a GR and (iv) willing to participate.

All surveys were administered by two informed enumerators, except at some privately owned GRs where management insisted that their own staff administer the questionnaires to minimise any inconvenience to their guests. No statistical difference in questionnaire responses was found between questionnaires administered by enumerators versus lodge owners or between the two enumerators themselves. The sampling procedure was to wait at reception and request guests to complete a questionnaire once they had booked-in. Alternatively, tourists were approached in as random a manner as possible at camps within the GR. In order to obtain statistically reliable results, it is necessary to have a sample of at least 40 respondents in each group (Sawtooth Software, 1999). It became apparent during the study that the number of non-white tourists being surveyed would not result in the minimum required sample size. As a result, the sampling of non-white tourists was given preference when the number of tourists

booking in exceeded the number of tourists that could simultaneously complete the survey. Table 3 reports the numbers of foreign and domestic tourists surveyed at the selected private and public NBT destinations in NEKZN and MP/LP (names of GRs withheld for confidentiality).

**Table 3: Number of survey respondents by geographic region, location of the interview, and origin of the respondent, 2004**

| | NEKZN | | MP/LP | | Total |
|---|---|---|---|---|---|
| | **Domestic** | **Foreign** | **Domestic** | **Foreign** | |
| **Private** | 27 | 21 | 10 | 27 | 85 |
| **Public** | 26 | 31 | 34 | 17 | 108 |
| **Total** | 53 | 52 | 44 | 44 | 193 |
| **Total** | 105 | | 88 | | 193 |

The proportion of respondents surveyed at public conservation areas was targeted at 60 per cent in accordance with Aylward's (2003) finding that 60 per cent (in 2002) of wildlife tourists in NEKZN overnight at public GRs. Market statistics indicate that 30 per cent of wildlife tourists in SA were foreigners in 2003 (South African Tourism, 2004).

# 3. RESULTS

The following section presents the results of the study, which have been divided broadly into two sections, namely, "Traditional Market Segments" and market segments identified based on responses to the 18 CE questions. The traditional market segments were domestic and foreign tourists; tourists visiting NEKZN and MP/LP and tourists staying at private and public GRs. Section 3.1 (traditional market segments) assesses attribute preferences and WTP (CE and CVM) for the ecolabel by tourists within each of the market segments. Section 3.2 assesses the attribute preferences and WTP (CE and CVM) for the ecolabel by tourists within each of the market segments identified using HCA. These market segments were identified according to the choices respondents made in the 18 choice questions.

## 3.1. Analysis of Tourists' Preferences within *Traditional* Market Segments

### 3.1.1. Respondent Characteristics

Table 4 presents descriptive statistics of the respondents in this study and those of a recent study of NBT in NEKZN by Lindberg (2003a&b). The findings indicate that on average the composition of all categories is similar except for race, which differs markedly from Lindberg's who sampled a higher proportion of non-white tourists. The income profile is similar for tourists visiting NEKZN and MP/LP however tourists visiting private GRs tend to earn higher incomes than tourists visiting public GRs, while

foreign tourists earn relatively higher incomes than domestic tourists. Several trends are identifiable within the age profile. Private GRs tend to attract a slightly higher proportion of middle aged tourists (41-65 years), while public GRs tend to attract a higher proportion of tourists in the lower (18 – 30 years) and upper (>65 years) age groups (Lindberg 2003a&b). Domestic tourists tend to be on average younger than foreign tourists (Lindberg 2003a&b). Compared to the sample of Lindberg (2003a&b), this study had a more even distribution of tourists across the age profile. Domestic tourists and tourists visiting NEKZN, on average, had a higher level of education than foreign tourists and tourists visiting MP/LP respectively. Tourists in this study, on average, had a higher level of education than the sample of Lindberg (2003a&b).

**Table 4: Respondent characteristics for this study (NEKZN & MP/LP) and those of Lindberg (2003a&b), 2004**

| | | This Study | | | | | | | Lind-berg |
|---|---|---|---|---|---|---|---|---|---|
| **Market** | | Private | Public | NEKZN | MP/LP | Domestic | Foreign | All | |
| ***n**** | | 85 | 108 | 105 | 88 | 97 | 96 | 193 | 841 |
| **Gender** | Male | 56.5 | 47.2 | 48.6 | 54.5 | 50.5 | 52.1 | 51.3 | 70.0 |
| **Education** | High school or less | 23.5 | 29.2 | 15.2 | 40.7 | 30.2 | 22.9 | 26.4 | 40.5 |
| | Diploma/ Degree | 53.0 | 47.2 | 50.5 | 48.8 | 40.6 | 58.3 | 49.2 | 35.5 |
| | Postgraduate | 23.5 | 23.6 | 34.3 | 10.5 | 29.2 | 17.7 | 23.3 | 23.5 |
| **Age (years)** | 18-30 | 25.9 | 28.7 | 35.2 | 18.2 | 37.5 | 17.7 | 27.6 | 16.5 |
| | 31-40 | 21.2 | 23.1 | 14.3 | 31.8 | 22.9 | 21.9 | 22.4 | 29.5 |
| | 41-50 | 12.9 | 12.0 | 11.4 | 13.6 | 12.5 | 12.5 | 12.5 | 21.0 |
| | 51-65 | 35.3 | 22.2 | 29.5 | 26.1 | 18.8 | 37.5 | 28.1 | 26.5 |
| | 66+ | 4.7 | 13.0 | 9.5 | 9.1 | 8.3 | 10.4 | 9.4 | 6.5 |
| **Gross Income (R'000)** | < 50,000 | 12.7 | 9.2 | 9.4 | 12.3 | 19.6 | 0.0 | 10.7 | 4.0 |
| | 50,001-100,000 | 8.5 | 12.2 | 10.4 | 11.0 | 19.6 | 0.0 | 10.7 | 20.0 |
| | 100,001-150,000 | 5.6 | 9.2 | 9.4 | 5.5 | 9.8 | 5.2 | 7.7 | 23.0 |
| | 150,001-500,000 | 31.0 | 40.8 | 36.5 | 37.0 | 46.7 | 24.7 | 36.7 | 44.0 |
| | > 500,001 | 42.3 | 25.5 | 34.4 | 34.2 | 4.3 | 70.1 | 34.3 | 4.0 |
| **Nationality and Race** | White South African | 95.3 | 89.8 | 88.6 | 96.6 | 87.6 | 96.9 | 91.7 | 68.6 |
| | Previously disadvantaged South African | 4.7 | 10.2 | 11.4 | 3.4 | 12.4 | 3.1 | 8.3 | 31.3 |
| | Foreigner | 50.0 | 50.0 | 54.2 | 45.8 | - | - | 49.7 | |

*Apart from the first row of figures (row "n") all figures presented are percentages

### 3.1.2. Tourists' Preferences for Attribute Levels

In this study the Proc PHREG procedure was used to fit the conditional logistic regression models for the pooled data and for the market segments. The estimated coefficients for these models were used to estimate the average WTP for each attribute. Table 5 presents the parameter estimates for the attribute levels. The likelihood ratio test for testing the significance of the overall effects of the attributes on preference probabilities shows that the preferences were statistically significantly affected by the joint effects of the attributes in all market segments.

When fitting the model, one level of each attribute was set to zero in order to avoid numerical instabilities during optimisation. When computing the tourists' WTP, the zero level of each attribute served as a reference level for the other levels. The following formula was derived to estimate monetary values for each attribute level:

$$\text{Monetary Estimate} = \frac{1}{2}\left[\frac{400-150}{0-Utility_{150}} + \frac{400-250}{0-Utility_{250}}\right] \times Utility(attribute) \qquad (16)$$

**Table 5: Parameter estimates and goodness of fit statistics of the estimated conditional logistic regression model for the pooled data for tourists in NEKZN & MP/LP, 2004**

| **Attribute** | Pooled data |
|---|---|
| **Good on-site Facilities** | 0.60619 (0.9497) |
| **Excellent on-site Facilities** | 0.61044 (<.0001) |
| **Medium Congestion** | 1.15262 (0.1078) |
| **Low Congestion** | 1.26608 (<.0001) |
| **Average Game Viewing** | 2.07610 (<.0001) |
| **Excellent Game Viewing** | 3.15384 (<.0001) |
| **Birding Hotspot** | 0.48111 (<.0001) |
| **Ecolabel Accreditation** | 0.42462 (<.0001) |
| **R150** | 1.00402 (<.0001) |
| **R250** | 0.51748 (<.0001) |
| **R400** | 0 |
| **-2 LOG L** | 2887.10 |
| **D.F.** | 10 |
| **Pr > ChiSq** | <.0001 |

*Note*: Values in parentheses are the p-values for attribute levels.

The assumption of equation (16) is that there is a linear relationship between utility and price, however, for all attributes the relationship was not found to be perfectly linear. For the purpose of determining an average value for the utility, the utility was calculated over the price ranges R400 to R150 and R400 to R250. Using the pooled data as an example, the price ranges R400 to R150 and R400 to R250 yield "Rand/parameter unit"

estimates of R248.99 and R289.87, respectively, with an average of R269.43/parameter unit. This value was then multiplied through by the parameter estimate associated with each attribute level. For example, to compute the monetary value of the ecolabel accreditation for the pooled data, the parameter estimate (0.42462) is multiplied by R269.43 to obtain an estimate of R114.41 per person per night, as presented in Table 6 together with monetary values for the other attribute levels. The signs and relative magnitudes of the estimated premia (Table 6) tourists' are willing to pay for various product attributes are consistent with *a priori* expectations. Estimated values for the quality of on-site facilities varied less than expected, however, this may be because the CE in this study did not allow for variation in the *quality* of accommodation and all products were for self-catering accommodation. The estimated premia for attributes were all highly significantly different from zero ($H_0$: Z = 0).

In general, the accuracy with which CE estimated the importance of the attributes relative to one another in this study is supported by the findings of Lindberg (2003a&b). The likelihood ratio test for testing the statistical significance of the overall effects of the attributes on preference probabilities concluded that the preferences were significantly affected by the joint effects of the attributes in all market segments. The CE model estimated that game viewing quality most affected tourists decisions when making reservations at a GR and that on average tourists would be willing to pay R849.74[2] more to stay at a GR with excellent game viewing as opposed to a GR with poor game viewing.

[2] All premia estimated in this chapter are calculated on a Rands per person per night basis.

The level of congestion was the second most important attribute considered by tourists, who would be willing to pay R341.12 more on average to stay at a GR with low congestion as opposed to a GR with high congestion. Interestingly, the most preferred option was medium congestion. A possible explanation for this could be the increased possibility of seeing game, which had been sighted by other vehicles first (some tourists actually mentioned this as their strategy for finding game). So while tourists generally avoid high congestion, the results indicate that they will tolerate moderate congestion and may even value a few other tourists on the road to increase game sightings.

The quality of the on-site facilities, as defined in the survey questionnaire, is estimated to be ranked third most important of the product attributes considered. The results indicate that tourists would be willing to pay R164.47 more on average to stay at a GR with excellent on-site facilities as opposed to a GR with only basic on-site facilities. It is interesting to note that tourists were only willing to pay R1.15 more to stay at a GR with excellent on-site facilities as opposed to a GR with good on-site facilities. A possible reason for this may be that many of the additional on-site facilities (e.g., restaurant, entertainment room, 4x4 trail, etc) come at additional cost to the guest and so should theoretically not be reflected in the results of the study. Tourists' value for these extra on-site facilities would be reflected in the amount they pay (in addition to accommodation) to gain access to those on-site facilities. The small difference between these two levels therefore serves to strengthen the reliability of the results.

**Table 6: Monetary premia (Rands per person per night) tourists in NEKZN & MP/LP are willing to pay for product attributes computed from the conditional logistic regression models, 2004**

| Attribute | Pooled | Foreign | Domestic | NEKZN | MP/LP | Private | Public |
|---|---|---|---|---|---|---|---|
| **n** | 193 | 96 | 97 | 105 | 88 | 85 | 108 |
| **Good on-site Facilities** [3] | 163.32 | 396.43 | 100.16 | 238.94 | 99.82 | 182.42 | 146.27 |
| | (24.83) | (121.67) | (21.75) | (91.02) | (33.09) | (41.78) | (30.42) |
| **p-value =** | 0.0 | <0.001 | 0.0 | <0.01 | <0.01 | 0.0 | 0.0 |
| **Excellent on-site Facilities** [4] | 164.47 | 408.39 | 97.29 | 186.36 | 156.6 | 209.29 | 131.09 |
| | (25.80) | (125.03) | (22.33) | (42.17) | (34.30) | (43.81) | (30.94) |
| **p-value =** | 0.0 | <0.001 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Medium Congestion** [4] | 310.55 | 484.14 | 248.29 | 274.95 | 349.61 | 300.46 | 317.72 |
| | (36.63) | (138.44) | (28.75) | (56.22) | (48.25) | (56.6) | (43.09) |
| **p-value =** | 0.0 | <0.001 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Low Congestion** [5] | 341.12 | 561.84 | 272.44 | 336.51 | 355.38 | 351.57 | 332.32 |
| | (34.44) | (144.84) | (30.55) | (52.38) | (48.80) | (52.6) | (45.54) |
| **p-value =** | 0.0 | <0.001 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Average Game Viewing** [5] | 559.50 | 1109.25 | 401.42 | 677.61 | 485.43 | 517.75 | 586.63 |
| | (82.96) | (475.18) | (58.45) | (153.05) | (96.59) | (119.81) | (111.88) |
| **p-value =** | 0.0 | <0.01 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Excellent Game Viewing** [6] | 849.74 | 1783.22 | 573.11 | 1012.95 | 722.00 | 809.47 | 863.42 |
| | (79.81) | (471.88) | (54.52) | (149.28) | (90.83) | (116.18) | (106.73) |
| **p-value =** | 0.0 | <0.001 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Birding Hotspot** [6] | 129.63 | 333.82 | 67.09 | 180.88 | 83.41 | 224.04 | 51.12 |
| | (20.10) | (103.54) | (16.57) | (37.00) | (23.56) | (40.74) | (20.56) |
| **p-value =** | 0.0 | <0.001 | 0.0 | 0.0 | <0.001 | 0.0 | <0.01 |
| **Ecolabel Accreditation** [7] | 114.41 | 136.35 | 115.25 | 130.47 | 105.95 | 96.42 | 132.00 |
| | (16.65) | (50.41) | (16.45) | (26.24) | (22.12) | (23.91) | (22.51) |
| **p-value =** | 0.0 | <0.01 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

*Note*: Values in parenthesis are the standard errors of the monetary estimates

[3] Relative to basic on-site facilities
[4] Relative to high congestion
[5] Relative to poor game viewing
[6] Relative to non-birding hotspot
[7] Relative to no ecolabel

Birding was the next most valued attribute. Tourists, on average, were willing to pay R129.63 more to stay at a GR considered to be a birding hotspot as opposed to a GR that was not. Generally, the results indicate that tourists either place a very high value on the birding quality - in fact that is the sole purpose of the trip in some cases - or they place almost no value on the birding quality. From the results in Table 6 it is evident that certain groups of tourists would be willing to pay substantially more than R129.63, while the rest would be willing to pay very little.

Table 7 presents the estimates for an ecolabel obtained for each market segment. The ecolabel was on average the least valued attribute in this study (CE) although it was positive and estimated to be large enough in monetary terms to be of interest to GR owners. Tourists were on average willing to pay R114.41 more to stay at a GR with an ecolabel than they would be to stay at a GR with no accreditation. CVM estimated a lower value of R87.67 as the value tourists place on an ecolabel. Possible reasons for this difference are best explained by examining individual market segments.

**Table 7: Tourists' mean WTP (Rands per person per night) to visit an ecolabel accredited game reserve in NEKZN & MP/LP, 2004**

| | Pooled Data | Foreign | Domestic | NEKZN | MP/LP | Private | Public |
|---|---|---|---|---|---|---|---|
| **CE** | 114.41 | 136.35 | 115.25 | 130.47 | 105.95 | 96.42 | 132.00 |
| **CVM** | 87.67 | 115.91 | 59.43 | 69.71 | 109.33 | 117.61 | 63.88 |

#### 3.1.2.1. Foreign vs. domestic tourists' preferences

A notable trend in Table 6 is that foreign tourists were willing to pay more for all attributes than were domestic tourists. This may be because upper income foreign tourists are more likely to travel overseas or because the accommodation cost constitutes a much smaller proportion of their total expenditure than domestic tourists. The relative importance of each attribute, however, is similar for both groups with game viewing quality rating first. Domestic tourists, however, expressed a relatively higher preference for tourism products accredited with the ecolabel.

Although domestic tourists are willing to pay less than foreign tourists, the results would suggest that domestic tourists are more likely to take ecolabel accreditation into account (third most valued attribute) when booking accommodation than foreign tourists (for whom the ecolabel was the least important attribute). The CVM estimates for the ecolabel (Table 7) were lower in both cases and comparable only for foreign tourists (R115.91). In the case of domestic tourists (R59.43) there is a large discrepancy in the CE and CVM estimates. Foreign tourists have less incentive to report lower WTP estimates in the CVM question than domestic tourists because they are less likely to return to the same destination (Lindberg 2003b, p. 46).

#### 3.1.2.2. Public vs. private GR tourists' preferences

The two most important attributes for tourists visiting private and public reserves were the quality of game viewing and the level of congestion, the estimates for which are

comparable in both cases (Table 6). A notable difference between preferences of tourists at private or public GRs is the greater value tourists at private reserves place on birding quality. Respondents staying at private GRs were willing to pay R224.04 more per night to stay at a GR with excellent birding as opposed to a GR without excellent birding, while tourists at public reserves were only prepared to pay R51.12 more for excellent birding. Tourists visiting public reserves on the other hand seem to place greater emphasis on the game viewing quality. This is seen in the slightly higher WTP for excellent game viewing by tourists at public GRs (R863.42 *vs.* R809.47).

The WTP estimates for the quality of on-site facilities is also of some interest. Tourists visiting private GRs were willing to pay R209.29 more for excellent on-site facilities over basic on-site facilities but only R26.87 more for good on-site facilities over basic on-site facilities. A possible reason for this was discussed in Section 3.1.2 where it was proposed that the reason could be that many additional facilities (e.g. 4x4 trail) are charged for over and above accommodation. Tourists visiting public GRs were willing to pay R131.09 more for excellent on-site facilities, which, as expected, is less than tourists visiting private GRs are willing to pay. It is, however, interesting to note that tourists visiting public reserves appear to value good on-site facilities over excellent on-site facilities suggesting that the embedding problem is not completely overcome by CE as respondents may have difficulty separating quality of on-site facilities from price.

The CE and CVM (Table 7) estimates for the ecolabel conflict with one another. CE estimates that tourist's at public reserves were willing to pay R132.00 more for an

ecolabel, while tourists at private reserves were willing to pay R96.42. CVM however estimates that tourists visiting private GRs (R117.61) were willing to pay more than tourists visiting public GRs (R63.88). The significantly higher estimate for private GRs possibly illustrates the susceptibility of CVM to "yea-saying" (Carlsson and Martinsson, 2001). It is therefore expected that the CE results provide more accurate estimates of tourists' true maximum WTP.

#### 3.1.2.3. Tourists' preferences in NEKZN vs. MP/LP

When comparing tourists in NEKZN and MP/LP the most important attribute once again was the quality of game viewing, followed by the level of congestion in the case of both groups (Table 6). The estimates for low congestion were comparable; however tourists in MP/LP appear to be indifferent over moderate or low congestion. Tourists' WTP for excellent on-site facilities over basic on-site facilities was also comparable however there was a notable difference in WTP for good on-site facilities over basic on-site facilities. The results indicate that tourists in NEKZN were willing to pay R52.58 more to stay at a GR with good on-site facilities as opposed to a GR with excellent on-site facilities, while tourists in MP/LP were willing to pay R56.78 more to stay at a GR with excellent on-site facilities over a GR with good on-site facilities. There is also a significant difference in the WTP estimates for the quality of game viewing and birding. For both attributes, tourists in NEKZN were willing to pay more than tourists in MP/LP.

The ecolabel (Table 7) to a large extent reflects the values placed on the other attributes. Tourists surveyed in NEKZN were willing to pay R130.47 more to stay at a GR with an ecolabel, while tourists surveyed in MP/LP were willing to pay R105.95 more. Based on the estimates for the other attributes in Table 6, tourists visiting NEKZN appear less interested in additional activities (e.g., restaurant, entertainment room, 4x4 trail, etc), which may compete for time spent game viewing or bird watching. Tourists in MP/LP place relatively greater value on the quality of game viewing and birding and less on excellent on-site facilities, relative to tourists in NEKZN. Tourists in NEKZN appear to be more interested in the actual wildlife and would therefore be expected to have a higher maximum WTP. As in the case of private/public GRs, CVM conflicts with CE estimates. The conflict in these results may once again be attributed to yea-saying (see Chapter 3.1.2.2) with the CE results appearing to be more reasonable and reliable than those of CVM.

## 3.2. Analysis of Tourists' Preferences within Market Segments

### 3.2.1. Respondent Characteristics

Mean values of the descriptive statistics of the respondents in each group shown in Table 8 indicate that, on average, wildlife tourists in all three groups are relatively well educated and earn relatively high incomes. The age and race profile of all groups are also similar. It is, however, apparent that females and members of wildlife societies/subscribers to wildlife magazines are relatively more likely to be in Group 1

(Conservation Vacationers) than in Group 2 (Incidental Sightseers) or 3 (Big 5 Brigade). Relatively higher-level educated respondents within the sample were less likely to be in Group 2 than in Groups 1 or 3, and relatively wealthy respondents within the sample were more likely to be in Group 3 than in Groups 1 or 2. Respondents in Group 3 are least likely to be part of a tour group but are, on average, most reliant on external assistance in planning their trips. The respondent characteristics of this study (Table 8) support the findings of (2003b&c) but cannot necessarily be considered representative as neither study were able to use a recognised sample survey method.

**Table 8: Mean values[8] of respondent characteristics for each market segment in NEKZN & MP/LP, 2004**

| Groups | | Group 1 | Group 2 | Group 3 |
|---|---|---|---|---|
| **Group size** | | 124 | 48 | 21 |
| **Gender** | Male | 46.0 | 62.5 | 57.1 |
| **Education** | High school or less | 23.6 | 37.5 | 20.0 |
| | Diploma/ Degree | 48.9 | 47.9 | 60.0 |
| | Postgraduate | 27.5 | 14.6 | 20.0 |
| **Age (years)** | < 25 | 8.9 | 10.4 | 4.8 |
| | 25 – 40 | 41.1 | 39.6 | 47.6 |
| | 41-56 | 25.8 | 29.2 | 23.8 |
| | > 56 | 24.2 | 20.8 | 23.8 |
| **Gross Annual Income (Rand)** | < 150,000 | 26.9 | 35.7 | 26.3 |
| | 150,000 – 500,000 | 40.7 | 33.3 | 21.1 |
| | > 500,000 | 32.4 | 31.0 | 52.6 |
| **Holiday planning** | Individual Decision | 39.51 | 33.33 | 23.81 |
| | Family Decision | 37.10 | 52.10 | 23.81 |
| | Other Decision | 23.39 | 14.58 | 52.38 |
| **Respondents classified as previously disadvantaged South Africans** | | 8.1 | 10.4 | 4.8 |
| **Wildlife Society/ Magazine Subscriber** | | 26.61 | 6.25 | 14.29 |
| **Surveyed in NEKZN** | | 58.88 | 56.25 | 23.80 |
| **Members of a Tour Group** | | 16.94 | 22.92 | 4.76 |
| **Foreign tourists** | | 49.19 | 45.83 | 61.90 |

### 3.2.2. Linear Discriminant Analysis

The assumption of a multivariate normal distribution for the discriminating variables is important for tests of significance. Tests of significance compare a statistic computed

[8] All figures presented in this table are percentages with the exception of the number of respondents in each column.

from a sample with a critical value of the theoretical probability distribution for that statistic. When this assumption is not met, the sampling distribution for the statistic will deviate to some extent from the theoretical normal distribution, possibly resulting in the contribution of some variables to the discriminant functions being exaggerated or underestimated (Lachenbruch, 1975 and Klecka, 1980). In the case of categorical variables, the sample distribution cannot be known. The selection of discriminant variables in Table 9 was therefore based on the Chi-squared test of association between each variable individually and the whole group in order to identify variables that were associated with the three market segments. Attributes with p-values greater than 20 per cent were omitted.

**Table 9: Variables that discriminate between the three market groups in NEKZN & MP/LP, 2004**

| Attribute | Chi-Sq | d.f. | P-value |
|---|---|---|---|
| **Wild. Society Member** | 9.411 | 2 | .009 |
| **Itinerary** | 13.501 | 4 | .009 |
| **Region** | 8.987 | 2 | .011 |
| **Education** | 5.980 | 4 | .200 |
| **Gender** | 4.108 | 2 | .128 |
| **Travel Independent** | 3.403 | 2 | .182 |

Despite the underlying multivariate assumption, discriminant analysis has been shown to be a robust technique, which performs fairly well with categorical variables (Klecka,

1980 & Lachenbruch, 1975). Statistical tests of significance in discriminant analysis can be questionable if the multivariate normality assumption is violated. However, the interpretation of the descriptive statistics yields valuable information, which in this study is supported by the respondent characteristics in Table 8. The purpose of conducting the discriminant analysis in this study was not primarily to establish statistically significant relationships. Instead, the aim being to identify group characteristics which could be useful from a marketing perspective (hence the reason for variables with higher than usual p-values (20 per cent) being considered).

The first discriminant function accounted for 57.2 per cent of the total between group variance, reducing Wilkes' Lambda to 0.885. The second discriminant function reduced Wilkes' Lambda to 0.806 (second discriminant function alone reduced Wilkes' Lambda to 0.911).

Based on the information summarised in Tables 7 and 8, Group 1 was named the "Conservation Vacationers" because they were typically the most interested and informed tourists concerning conservation matters. Group 2 was named "Incidental Sightseer". The motivation for these tourists visiting a GR appeared to be because it was a good idea or a good family vacation more than due to any particular interest in wildlife or conservation itself. Group 3 was named the "Big 5 Brigade". These tourists were very interested in seeing the larger, more popular game species but displayed almost no concern for conservation in general. The unique characteristics of each of these groups are discussed in greater detail below.

The first discriminant function in Table 10 primarily discriminates Conservation Vacationers and Incidental Sightseers from the Big 5 Brigade, while the second function discriminates Conservation Vacationers from Incidental Sightseers. Table 10 presents the coefficients of each variable in the discriminant functions. For the first function, Region, Education and Itinerary had the most power in discriminating Conservation Vacationers and Incidental Sightseers from the Big 5 Brigade. The Big 5 Brigade were on average more likely to (i) visit a GR in MP/LP; (ii) have a higher level of education; and (iii) travel independently of a tour group than Conservation Vacationers and Incidental Sightseers. There appears to be little difference between Conservation Vacationers and Incidental Sightseers and the Big 5 Brigade in terms of the proportion of males surveyed or the likelihood of being a member of a wildlife society or subscriber to a wildlife magazine.

**Table 10: Coefficients of the discriminating variables in the two canonical discriminant functions, and values of the discriminant functions for the three market segments in NEKZN & MP/LP, 2004**

| Discriminating Variables | Discriminating Functions | |
|---|---|---|
| | 1 | 2 |
| **Gender** | .040 | .590 |
| **Wildlife Society Member** | .042 | .673 |
| **Region** | .705 | -.158 |
| **Education** | .543 | .354 |
| **Travel Independent** | .329 | .058 |
| **Itinerary** | .716 | -.173 |
| **Group centroids:** | | |
| **Conservation Vacationers** | -.037 | .228 |
| **Incidental Sightseers** | -.317 | -.459 |
| **Big 5 Brigade** | .987 | -.301 |
| **% variance** | 57.2 | 42.8 |
| **Wilkes' Lambda** | 0.885*** | 0.911*** |

*Note:* *** represents significance at 1% level of statistical confidence.

The second function primarily discriminates Conservation Vacationers from Incidental Sightseers and to a lesser extent the Big 5 Brigade. Conservation Vacationers were on average more likely to be (i) female; (ii) a member of a wildlife society or subscriber to a wildlife magazine; and (iii) have higher levels of education than Incidental Sightseers. Incidental Sightseers were on average more likely to (i) visit a GR in NEKZN; and (ii)

form part of a tour group compared to Conservation Vacationers. The absence of attributes "Foreign" and "Location" in the discriminant function indicate that there is little statistical difference in the group membership of tourists for these traditional market segments.

The analysis thus far has clustered respondents into market segments based on heterogeneity amongst their stated preferences for NBT products, and has demonstrated that these groupings are related to various observable characteristics of the respondents. The following section takes the analysis further to consider how preferences for NBT product attributes vary between the three market segments.

### 3.2.3. Tourists' Preferences for Attribute Levels

The relative signs of the premia in Table 11 reflect considerable homogeneity in the relative mean preferences of tourists in all three groups. For example, for all market segments, game viewing quality was identified as the most important product attributes (of those considered in this study) considered by tourists when choosing which NBT destinations to visit. However, Conservation Vacationers (Incidental Sightseers) as a group were, on average, prepared to pay the highest (lowest) premia for all excellent on-site facilities, low tourist congestion, excellent game viewing, to visit a birding hotspot, and to visit a conservation area accredited with having a high standard of biodiversity conservation. For example, Conservation Vacationers were willing to pay a higher premium (R1199 per person per night) than Incidental Sightseers and the Big 5 Brigade

(R378 and R646 respectively) to experience "excellent game viewing" rather than "average game viewing".

Some heterogeneity in the relative ranking of attribute preferences across the groups is evident. For example, birding hotspot was ranked the third most important attribute for Conservation Vacationers, while it was ranked fourth and fifth, in the other two groups. Likewise, the quality of on-site facilities is relatively more important to Incidental Sightseers than Conservation Vacationers and the Big 5 Brigade. The relative preferences of the Big 5 Brigade differ from Conservation Vacationers primarily in that Conservation Vacationers valued biodiversity conservation accreditation as third most important, whereas the Big 5 Brigade valued it as being least important.

The majority of the estimated premia for attributes were statistically different from zero ($H_0$: $Z = 0$). In the case of the Big 5 Brigade, the premia estimated for good on-site facilities, birding hotspot and ecolabel accreditation were not statistically different from zero, however, predictably excellent game viewing and low congestion were highly significant. The Big 5 Brigade comprised a relatively small sample of tourists so while the results may provide some insight into different market segments, caution should be exercised in drawing conclusions from this particular market segment.

**Table 11: Estimated premia (Rands per person per night) tourists in NEKZN & MP/LP are willing to pay for various product attributes, 2004**

| Attribute | Pooled Data | Conservation Vacationers | Incidental Sightseers | The Big 5 Brigade |
|---|---|---|---|---|
| **Good on-site Facilities** [9] | 163.32 | 219.86 | 114.33 | -23.91 |
| | (24.83) | (42.27) | (27.56) | (73.68) |
| **p-value =** | 0.0 | 0.0 | 0.0 | <0.4 |
| **Excellent on-site Facilities** [10] | 164.47 | 171.24 | 156.52 | 83.57 |
| | (25.80) | (44.33) | (28.42) | (67.36) |
| **p-value =** | 0.0 | 0.0 | 0.0 | 0.1 |
| **Medium Congestion** [10] | 310.55 | 490.39 | 52.84 | 392.10 |
| | (36.63) | (87.68) | (25.08) | (146.87) |
| **p-value =** | 0.0 | 0.0 | <0.2 | <0.01 |
| **Low Congestion** [11] | 341.12 | 504.21 | 102.89 | 447.80 |
| | (34.44) | (82.38) | (25.29) | (127.53) |
| **p-value =** | 0.0 | 0.0 | 0.0 | 0.0 |
| **Average Game Viewing** [11] | 559.50 | 773.09 | 264.51 | 391.04 |
| | (82.96) | (212.12) | (43.28) | (208.44) |
| **p-value =** | 0.0 | <0.001 | 0.0 | <0.03 |
| **Excellent Game Viewing** [12] | 849.74 | 1199.90 | 377.61 | 645.88 |
| | (79.81) | (197.13) | (42.69) | (178.06) |
| **p-value =** | 0.0 | 0.0 | 0.0 | <0.001 |
| **Birding Hotspot** [12] | 129.63 | 228.60 | 30.31 | 37.36 |
| | (20.10) | (47.44) | (17.84) | (44.21) |
| **p-value =** | 0.0 | 0.0 | <0.04 | 0.2 |
| **Ecolabel Accreditation** [13] | 114.41 | 171.41 | 66.15 | 14.94 |
| | (16.65) | (33.21) | (17.48) | (47.21) |
| **p-value =** | 0.0 | 0.0 | <0.001 | <0.4 |

*Note*: Values in parenthesis are the standard errors of the monetary estimates.

[9] Relative to basic on-site facilities
[10] Relative to high congestion
[11] Relative to poor game viewing
[12] Relative to non-birding hotspot
[13] Relative to no ecolabel

## 3.3. Typical Overnight Tariffs at Selected GRs in NEKZN and MP/LP in 2005

Table 12 presents the overnight tariffs at seven GR in NEKZN and MP/LP. The GRs have been described using the same definitions for attribute levels as those given to respondents. The objective of this exercise is to provide some support for the estimated premia presented in Tables 6 and 11. At the NBT destinations at which tourists were surveyed in this study, overnight tariffs ranged from R370.00 to R4,425.00 per person per night (peak season). Price is anticipated to vary depending on the level of attributes offered by individual destinations. For example, GRs 1 and 4 are similar except for one of the measured attributes – quality of birding. Assuming all other attributes are held constant, excellent birding quality is associated with a R525.00 premium over average birding quality (see Table 12). Similarly, tourists are willing to pay R5, 470.00 more to stay at GR 6 compared to GR 2, which vary only in the quality of game viewing offered. A comparison of GRs 1 and 2 provides an estimate of R4, 055.00 for excellent game viewing over poor game viewing. GR 7 includes an elephant back safari, which is a unique experience and expected to significantly increase overnight tariffs. This is reflected in the higher accommodation price (R9, 000.00 per person per night) despite being similar to GR 1 in terms of the attributes used in this study.

While it is inevitable that individual GRs may have unique attributes for which tourists are willing to pay high premiums, the six attributes measured in this study have been shown to be among the most important and therefore among the most influential in

determining overnight tariffs. Directly comparing GRs, using the selected six attributes to describe the experience may not take into account an important value-adding attribute (e.g. elephant back safari), however it is still believed the figures presented in Table 12 do provide some support for the estimated premia tourists are willing to pay as presented in Tables 6 and 11.

**Table 12: Typical overnight tariff's for GRs in MP/LP and NEKZN, 2004**

| | Rate/Person/ Night (Rand) | Star Rating | Quality of Facilities | Level of Congestion | Quality of Game Viewing | Quality of Birding |
|---|---|---|---|---|---|---|
| **GR 1** | 4,425.00 | 4 | Excellent | Low | Excellent | Excellent |
| **GR 2** | 370.00 | 3 | Excellent | Low | Poor | Excellent |
| **GR 3** | 540.00 | 2 | Good | High | Average | Average |
| **GR 4** | 3,900.00 | 4 | Excellent | Low | Excellent | Average |
| **GR 5** | 460.00 | 2 | Basic | Medium | Average | Average |
| **GR 6**[14] | 5,840.00 | 5 | Excellent | Low | Excellent | Excellent |
| **GR 7**[14] | 9,000.00 | 5 | Excellent | Low | Excellent | Excellent |

[14] Tourists were not sampled at GRs 6 and 7 in this study.

# DISCUSSION AND CONCLUSIONS

Data analysed in this study were collected outside of the domestic peak holiday seasons. Findings may therefore differ from studies conducted during different phases of the annual domestic and foreign tourist season cycles. However, unless the demographics of tourists change significantly from those presented in this study, results of this study provide an estimate of tourists' WTP. The results of future studies (less limited by time and financial constraints) would be more representative if similar surveys were conducted amongst tourists at regular intervals during the annual tourism cycle completed by tourists several times during the year.

This study estimated tourists WTP for six attributes, of NBT products. Tourists' decisions to visit wildlife destinations were, on average, primarily influenced by the quality of game viewing and the level of tourist congestion. These two attributes were important determinants on the wildlife experience of tourists in this sample. This implies that amongst other factors, management of game stocking densities, road networks, number of beds per camp and the area of land available for game viewing, is key to providing a competitive NBT product and charging relatively high monetary premia.

Within the NBT market, this study has identified three distinct groups of wildlife tourists according to their preferences for various NBT product attributes using HCA. The largest group, Conservation Vacationers (64 per cent of respondents in the sample) were,

on average, prepared to pay a premium of R170 per person per night to visit a GR that was accredited with having a high standard of biodiversity conservation. These tourists were on average well informed and interested in wildlife and conservation. The high premiums Conservation Vacationers were willing to pay for low congestion and their relative preference for good on-site facilities over excellent on-site facilities indicate that they prefer more secluded and possibly more rustic NBT experiences.

The second largest group, Incidental Sightseers (25 per cent of tourists in the sample) were, on average, relatively less interested in wildlife and wildlife conservation than the Conservation Vacationers. These tourists were relatively more likely to travel independently (without assistance from a tourism operator) and visit a GR in NEKZN. The smallest group, the Big 5 Brigade (11 per cent in the sample) have similar preferences to Conservation Vacationers with the exception that they were willing to pay a relatively lower premium for biodiversity conservation accreditation at a GR. The majority of tourists in this group were surveyed at tourist destinations in MP/LP, had a higher level of education and were more likely to form part of a tour group or decide their destinations with the help of a tourism operator than tourists in the other two groups.

Foreign tourists constitute an important market share, although the origin of tourists did not have a statistically significant effect in discriminating between market segments. Despite this, marketing towards foreign tourists is of necessity distinct to marketing towards local tourists. Domestic tourists were found to have a relatively large share of

the market (approximately 50 per cent) despite this survey being conducted during the domestic tourism off-season. However, it is evident that currently few South Africans from previously disadvantaged groups visit wildlife tourism destinations. Research conducted by Lindberg *et al* (2003b) revealed a surprising degree of uniformity in desired experiences and facilities across race groups, with income and household size being identified as factors contributing to low participation. This suggests that wildlife tourism destinations do not need to undergo major change to appeal to a greater number of previously disadvantaged tourists than they currently attract.

Although biodiversity conservation accreditation, on average, ranked lowest amongst the attributes, results do indicate that tourists are willing to pay a premium to visit GRs accredited with having a high standard of biodiversity conservation. CE estimated that tourist's would be willing to pay R114.41 more per night to stay at a GR accredited with biodiversity conservation while CVM provided a lower estimate of R87.67. The two methods used in this study (CE and CVM) differ somewhat in the estimates obtained. CE, however, appears to be better suited to estimating the utility associated with individual attributes in a study of this nature. It was found that CE provided results that were better supported by the demographic data for each group than those of CVM. Based on the findings of this study, CE would be the recommended choice of SP method for evaluating non-market nature-based goods in future studies.

The results indicate that the majority of tourists in the sample are willing to pay a premium for biodiversity conservation. The tourism and wildlife conservation

authorities in SA should investigate establishing a biodiversity conservation accreditation programme. If a biodiversity accreditation scheme were introduced, the premium tourists may be willing to pay could encourage GRs to meet higher standards of good biodiversity conservation and obtain accreditation. However, further research on the costs and benefits of biodiversity conservation accreditation will be necessary to estimate the extent that such an accreditation scheme may be adopted by NBT business. Authorities responsible for this scheme further need to ensure that it is correctly implemented or premia realised in markets will fall short of those estimated in this study.

# SUMMARY

Biodiversity conservation is becoming increasingly important as ecosystems are increasingly degraded due to human influence. The conservation of biodiversity (a public economic good), within private sector markets poses many problems, however NBT businesses could make a valuable contribution. Asymmetric information concerning the level of biodiversity conservation prevents the average tourist from expressing their preferences by choosing to make reservations at biodiversity conservation accredited GRs.

The basis for the microeconomic model of consumer behaviour is the maximisation of a utility function subject to a budget constraint. CEs are based on the Lancasterian micro-economic approach, in which individuals derive utility from characteristics of the good rather than directly from the goods themselves. As tourism products are comprised of a bundle of experiences, tourists do not directly experience biodiversity conservation during NBT experiences, however, their experiences are partially determined by the standard to which biodiversity on a property is conserved. The model demonstrates the negative effect asymmetric information has on tourists expressing their preferences for biodiversity conservation accreditation. Ecolabels are an institutional approach to providing tourists with the relevant information concerning biodiversity conservation.

In the presence of asymmetric information, tourists' decisions may not reflect their preferences for biodiversity conservation. Consequently, RP techniques are

inappropriate for estimating consumers' relative preferences for biodiversity conservation. SP techniques, i.e., CVM and CE, are able to estimate values for non-market goods in the presence of asymmetric information. The objective of CVM and CE is to elicit the consumers' maximum price for a product attribute using hypothetical questions to determine a respondents' WTP for a particular product attribute. The hypothetical nature of SP techniques has allowed these methods to be highly flexible, however, it is also the source of many concerns.

A choice-based type of choice modelling, known as CE was used in this study. CE requires the respondent to select one product from a set of competing products - a task performed daily by consumers. Choice modelling methods were developed within the economics discipline and have been widely used for estimating values placed on product attributes. Ratings-based methods on the other hand were developed within the marketing discipline and have been used to gain an insight into preferences for different products rather than estimating economic values. CE is a more appropriate technique for this study as the objectives are to estimate values for product attributes.

CE requires respondents to state their preferred scenario from two or more profiles. Choosing between two scenarios is a more natural task than, for example, directly placing a monetary value on a non-market good. To further facilitate more realistic market transactions CE incorporates a 'none' option should the respondent decline to choose either scenarios. The application of CE to estimating tourists' values for non-

environmental and environmental attributes of tourism experiences has previously been demonstrated.

Following recommendations from past research, the number of product attributes considered in the CE was six. Selection of the first five attributes was guided by (i) past studies of NBT in SA; and (ii) the frequency with which NBT product attributes were mentioned by businesses advertising tourism experiences on web sites (8 websites) and travel magazines (5 magazines). The selected attributes were confirmed by five national travel agents as being among the most important to foreign and domestic tourists. The sixth attribute was included to investigate tourists' willingness to pay a premium to stay at conservation areas accredited with having a high standard of biodiversity conservation. The next step in finalising the choice questions was to select a subset of all possible profiles using the D-optimal criteria.

A D-optimal incomplete block design with 18 blocks (each of size 2) for estimating the main effects of a $2^2$ X $3^4$ mixed factorial was constructed with the help of Proc Optex procedure in SAS Version 8. The design generated by SAS was then converted to a choice design by taking the blocks to be choice sets, the factors to be the attributes, and the factor level combinations within each block to be the alternatives (product). Respondents chose one alternative from each of the 18 choice sets. The preference probabilities for each alternative (product) within each choice set are related to the mean utility (assuming respondents always choose the alternative which maximises their utility) by the levels of the attributes in the alternative. Given the binary response data,

the vector of the individual effects of the levels of all the attributes can be estimated with the help of the conditional logit model.

The CVM was used to estimate tourists' WTP for the biodiversity conservation accreditation attribute only. Several forms of CVM have been developed, however the CVM question in the survey took the form of a dichotomous-choice question. This method is known to overcome many of the biases other CVM techniques suffer from. There are several differences between CVM and CE. The main difference being that CVM analyses only one attribute of a product at a time, while CE is able to analyse multiple product attributes simultaneously. This renders CVM an inefficient technique when multiple attributes are to be considered. Another notable difference is that the CE does not require respondents to directly assign a monetary value to a non-market good, instead values are inferred from the choices or tradeoffs made by respondents between attributes.

In addition to analysing the preferences of tourists in traditional market segment, viz. foreign vs. domestic, private vs. public and NEKZN vs. MP/LP, tourists were grouped according to the responses to the 18 choice questions. The HCA was used to cluster respondents in order to identify market segments consisting of tourists with similar preferences. LDA was then used to distinguish between groups using socio-economic data to identify characteristics of groups that may assist with focused marketing strategies. Conditional logistic regression models were estimated for all market segments to estimate the average WTP for each attribute by each group. The signs for all attribute

levels were consistent with *a priori* expectations. The likelihood ratio test for testing the significance of the overall effects of the attributes on preference probabilities concluded that the preferences were significantly affected by the joint effects of the attributes in all market segments.

The CE model estimated that overall, game viewing quality was the most important attribute tourists considered when making reservations at a GR, and on average, would be willing to pay a premium of R849.74[15] for excellent game viewing as opposed to game viewing. The level of congestion and on-site-facilities, with premiums of R341.12 (low congestion) and R164.47 (excellent on-site facilities), respectively, were the next most important attributes. Birding quality and the ecolabel were, on average, the least valued attributes, with premiums of R129.63 and R114.41, respectively. Excellent game viewing and low congestion were consistently the most preferred attributes across all market segments.

A comparison of foreign and domestic tourists revealed that foreign tourists were willing to pay higher premiums for all attributes than were domestic tourists. The relative importance of each attribute, however, is similar for both groups. Domestic tourists, however, expressed a relatively higher preference for the ecolabel than foreign tourists. A comparison of tourists at private and public GRs revealed that tourists at private reserves place a higher premium on birding quality. Tourists visiting public reserves on the other hand seem to place greater value on the game viewing quality. A possible

[15] All premia in this chapter are calculated on a Rands per person per night basis

reason for this is that many public GRs restrict tourists to vehicles which is less conducive to birding activities. Interestingly, tourists visiting public GRs appear to prefer the more rustic "good on-site facilities" to "excellent on-site facilities". When comparing tourists visiting NEKZN from those visiting MP/LP the ecolabel to a large extent reflects the values placed on the other attributes. Tourists visiting NEKZN and MP/LP were willing to pay R130.47 and R105.95 more, respectively, to stay at a GR with an ecolabel for biodiversity conservation. Estimates for the other attributes indicate tourists visiting NEKZN appear less interested in on-site facilities (activities) which may compete for time spent game viewing or birding, while tourists in MP/LP prefer on-site facilities over the quality of game viewing or birding.

The WTP estimates obtained from CVM for the ecolabel often conflicted with the CE estimates. The CE estimates appeared to be better supported by the demographic information obtained for each market segment and were therefore considered more reliable.

A discriminant analysis was used to divide respondents into market segments. The first discriminant function primarily discriminates tourists in Groups 1 (Conservation Vacationers) and 2 (Incidental Sightseers) from tourists in Group 3 (Big 5 Brigade). For the first function, Region, Education and Itinerary had the most power in discriminating Conservation Vacationers and Incidental Sightseers from the Big 5 Brigade. The Big 5 Brigade are on average more likely to (i) visit a GR in MP/LP; (ii) have a higher level of education; and (iii) travel independently of a tour group than Conservation Vacationers

and Incidental Sightseers. The second function primarily discriminates Conservation Vacationers from Incidental Sightseers and to a lesser extent the Big 5 Brigade. Conservation Vacationers are on average more likely to be (i) female; (ii) a member of a wildlife society or subscriber to a wildlife magazine; and (iii) have higher levels of education than Incidental Sightseers. Incidental Sightseers are on average more likely to (i) visit a GR in NEKZN; and (ii) form part of a tour group compared to Conservation Vacationers. The absence of attributes "Foreign" and "Location" in the discriminant function indicate that there is little statistical difference in the group membership of tourists for these traditional market segments.

A comparison of tariffs charged by existing GRs in the sample area revealed that the premia estimated for the attributes in each market segment are realistic. If a biodiversity accreditation scheme were introduced, the premium tourists are willing to pay would encourage GRs to meet standards of good biodiversity conservation and obtain accreditation. Further research is required on the costs and benefits of biodiversity accreditation and the extent to which such an accreditation scheme may be adopted. Authorities responsible for instituting an ecolabel further need to ensure that it is correctly implemented to realise the estimated premia. From the results obtained, CE appears to be better suited to estimating the utility associated with individual attributes in a study of this nature and is therefore the recommended valuation technique for future studies.

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# APPENDICES

## APPENDIX 1: Definitions of attributes and attribute levels included in the choice questions

1) Ecolabel (2 levels)

- No: The quality of the management or environment is not known
- Yes: The GR has a high quality of nature conservation management and a pristine environment

2) Birding (2 levels)

- Average birding: birding is average with few rare species
- Birding hotspot: the GR is widely recognised as a birding hotspot

3) Price (3 levels)

- R150 pppn.
- R250 pppn.
- R400 pppn.

4) Game viewing quality (3 levels)

- Poor: GR has at least 3 of the "Big 5", low probability of being sited during the day's game viewing.
- Average: GR has at least 3 of the "Big 5", average probability of being sited during the day's game viewing.

- Excellent: GR has at least 3 of the "Big 5" high probability of being sited during the day's game viewing.

(Assume a day's game viewing involves two three hour drives/walks - at dusk and dawn)

5) Congestion (3 levels)

- High Congestion: More than 5 other cars are encountered at a Big 5 sighting
- Medium congestion: Between 3-5 other cars are encountered at a Big 5 sighting
- Low congestion: Not more than two other cars are encountered at a Big 5 sighting

6) On-site facilities (3 levels)

- Basic: nothing apart from accommodation and reception
- Good: nearby game viewing hides, organised walks/horse trails and drives, shop.
- Excellent: in addition to the above, swimming pool, restaurant, petrol station, information centre, entertainment centre (e.g. pool tables, table tennis, darts, etc) and 4x4 course.

**APPENDIX 2: The SAS generated design (first eight columns) and coded choice design (last ten columns)** [16]

| cset | product | fac | con | gam | cos | bir | eco | intercept | faca0 | faca1 | conb0 | conb1 | gamc0 | gamc1 | cosdo | cosd1 | bire0 | ecof0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | a2 | b2 | c2 | d0 | e1 | f0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1 | 2 | a1 | b1 | c0 | d2 | e0 | f1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2 | 1 | a0 | b1 | c1 | d2 | e1 | f0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2 | 2 | a2 | b0 | c0 | d0 | e0 | f1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 3 | 1 | a2 | b0 | c1 | d1 | e1 | f0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 3 | 2 | a1 | b1 | c0 | d2 | e0 | f1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 4 | 1 | a0 | b0 | c2 | d2 | e0 | f0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 4 | 2 | a2 | b1 | c0 | d1 | e1 | f1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 5 | 1 | a1 | b0 | c1 | d0 | e1 | f1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 5 | 2 | a2 | b2 | c0 | d2 | e0 | f1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 6 | 1 | a1 | b2 | c0 | d2 | e1 | f0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 6 | 2 | a0 | b0 | c2 | d1 | e0 | f1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 7 | 1 | a0 | b1 | c0 | d0 | e1 | f1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 7 | 2 | a2 | b2 | c1 | d1 | e0 | f0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 |
| 8 | 1 | a1 | b1 | c0 | d1 | e1 | f0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 8 | 2 | a0 | b2 | c1 | d2 | e0 | f1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 9 | 1 | a1 | b0 | c2 | d2 | e0 | f1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 9 | 2 | a0 | b2 | c0 | d0 | e0 | f0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 10 | 1 | a2 | b1 | c1 | d0 | e0 | f1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| 10 | 2 | a0 | b0 | c0 | d1 | e1 | f0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |

[16] cset=block (choice set); Product= factor level combinations within a block; A=fac (Standard of facilities); B=con (Level on congestion); C=gam (Quality of game viewing); D=cos (Accommodation cost); E=bir (Birding); F=eco (Ecolabel).

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 1 | a0 | b1 | c1 | d1 | e0 | f0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 |
| 11 | 2 | a2 | b2 | c2 | d2 | e1 | f1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 1 | a0 | b1 | c1 | d2 | e1 | f1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 12 | 2 | a1 | b0 | c0 | d0 | e0 | f0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 13 | 1 | a1 | b2 | c1 | d1 | e1 | f1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 13 | 2 | a2 | b1 | c2 | d0 | e0 | f0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 14 | 1 | a2 | b1 | c2 | d1 | e1 | f0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 14 | 2 | a0 | b2 | c0 | d1 | e0 | f1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 15 | 1 | a1 | b2 | c2 | d1 | e1 | f1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 15 | 2 | a2 | b0 | c0 | d2 | e1 | f0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 16 | 1 | a1 | b0 | c1 | d2 | e0 | f0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 16 | 2 | a0 | b2 | c2 | d0 | e1 | f0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 17 | 1 | a2 | b1 | c0 | d1 | e1 | f1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 17 | 2 | a1 | b2 | c1 | d0 | e0 | f0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 18 | 1 | a2 | b0 | c1 | d0 | e1 | f1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 18 | 2 | a1 | b1 | c2 | d1 | e0 | f0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |

**APPENDIX 3: Color photographs used to illustrate the need for expert advice when assessing biodiversity conservation**

Veld A

Veld B

## APPENDIX 4: Questionnaire as presented to respondents

### Choice Experiments

You will be presented with 18 choice questions. Each question describes two hypothetical Game Reserves (GRs) using six characteristics. In each case you are required to consider the characteristics and choose your most prefered. Opion (in other words the GR you would choose in real life). As far as possible please try to make a decision between the two GRs . In some instances, neither option may be preferable, you can indicate this by writing "none" in the space provided. It is important that you realise that all *other* characteristics do not change between the GRs.

**In all hypothetical cases**, the accommodation is assumed to be *three star* with *30 beds* per camp. All GRs are *located in a similar area* to where you are now and so would require equal traveling in both cases. The *quaility of service* experienced at all GR and the *scenery* is of the *same good quality*. All GRs are *self-catering* but there is a *room service* that comes around once a day. *Guided walks* and *drives* are provided *at additional* cost. The rates indicated in the choice questions *do not include* meals or game drives/walks. The GRs are all *1000ha* in size and are situated in *malaria free areas*.

It will take some time to familiarise yourself with the choice questions but once you get used to the concept, it will take between 15-20 seconds to make each choice.

**1) Ecolabel (2 levels)**

- No: The quality of the management or environment is not known.
- Yes: The GR has been evaluated by independent conservation conservation scientists and met high standards of nature conservation management and biodiversity.

**2) Birding (2 levels)**

- Average: Fewer than 250 recorded species with no rare species.
- Birding hotspot: The GR is widely recognised as a birding hotspot.

**3) Price (3 levels)**

- R150 per person per night.
- R250 pppn.
- R400 pppn.

**4) Game Viewing (3 levels)**

- Poor: GR has at least 3 of the "Big 5"; low probability of being sited during the day's game viewing.
- Average: GR has at least 3 of the "Big 5"; average probability of being sited during the day's game viewing.
- Excellent: GR has at least 3 of the "Big 5"; high probability of being sited during the day's game viewing.

(Assume a day's game viewing involves two three hour drives/walks – at dusk & dawn)

**5) Congestion (3 levels)**

- High Congestion: More than 5 other cars are encountered at a Big 5 sighting.
- Medium Congestion: Between 3-5 other cars are encountered at a Big 5 sighting.
- Low Congestion: Not more than two other cars are encountered at a Big 5 sighting.

**6) On-site facilities (3 levels)**

- Basic: Nothin apart from the accommodation and reception.
- Good: Nearby game viewing hides, organised walks/horse trails and drives, shop.
- Excellent: In addition to above, swimming pool, restaurant, petrol station, information centre, entertainment centre (e.g. pool tables, table tennis, darts, etc) and a 4x4 course.

# University of KwaZulu-Natal

Pietermaritzburg Campus

School of Agricultural Sciences & Agribusiness

SASLUCE DANIDA FUNDED

**Wildlife Conservation Research**

Research is being conducted by the University of KwaZulu-Natal to establish which aspects of wildlife tourism experiences are the most important to tourists. The study aims to survey approximately 400 randomly selected tourists in KwaZulu-Natal, Mpumalanga and Limpopo provinces. The results of this study will be used to guide policy on nature-based tourism in South Africa. We would greatly appreciate it if you would assist us. The questionnaire is expected to take 10-12 minutes to complete. We are interested in finding out about the types of reserves you have visited and why. We will also be asking you some hypothetical questions. All information is **strictly confidential** and used only **for scientific purposes**. There are two researchers conducting these questionnaires, Tim Fannin and Allen Seymour.

In order to obtain accurate and meaningful results we need to survey tourists who (1) are **over the age of 18 years** and have had some influence in the **decision making** of this holiday, (2) are currently staying **overnight** in a game reserve and (3) are **willing** to participate. If any one of these criteria do not apply to you, please would you indicate this to the enumerator.

Date_____2004

Time_____

Location_____

Respondent code

*(Capture gender and race)*

**1.** Age of respondent_____years.

**2.** Highest level of education:

- Some high school or less
- High school graduate
- Degree/Diploma from University, College or Technical school
- Postgraduate diploma or degree

**3.** Do you subscribe to any wildlife related magazine or are you a part of any wildlife society or similar organisation?

- No
- Yes

If yes, which one_____

_____

**4.** Occupation (if retired please indicate previous occupation)?_____

_____

_____

**5.** Your family income level per annum (indicate range in home currency)

- Less than 10, 000
- 10,001-20,000
- 20,001-35,000
- 35,001-50,000
- 50,001-75,000
- 75,001-100,000
- 100,001-150,000
- 150,001-200,000
- 200,001-300,000
- 300,001-500,000
- More than 500,001

Please indicate the currency in which you receive your income_____

**6.** Origin of tourist

- Domestic: Please state province _____
- Foreign: Please state country _____

**7.** Please indicate whether you are part of an organised tour group or independent?

- Tour group
- Independent

**8.** Who was primarily responsible for deciding the itinerary of your current trip?

- Self
- Self and other family member
- Self and other non-family member
- Travel agent
- Tourism operator
- Other_____(specify)

**9.** Do you know what **Biodiversity Conservation** is?

- Yes, I'm confident I know what the term refers to
- Yes, I think I know what it means
- No, never heard the term before

**10.** Please would you state your definition of **Biodiversity Conservation:**

_____

_____

**11.** Suppose that conservation scientists were considering rating the standard of conservation at GRs and making the information available to prospective tourists (much like the star rating system used in hotels). Would you prefer that they based their evaluation on:

- The current state of the environment and biodiversity (i.e. how pristine it is)
- The quality of nature conservation management
- I don't care/ the information isn't important to me.

**12.** Please tick the appropriate column to indicate how important each of the following attributes are to ***you*** in deciding which game reserve to stay at overnight?

| | **Very Important** | **Important** | **Neutral** | **Little Importance** | **No Importance** |
|---|---|---|---|---|---|
| Pristine natural environment | | | | | |
| Good scenery | | | | | |
| Good nature conservation practices | | | | | |
| Price | | | | | |
| Absence of exotic plants & invasive weeds | | | | | |
| Likelihood of seeing the Big 5 | | | | | |
| Low congestion at camps | | | | | |
| Lack of human impact | | | | | |
| On-site facilities | | | | | |
| The quality of birding | | | | | |
| Low congestion at game sightings | | | | | |
| Option to go on walks in the bush | | | | | |

**CHOICE QUESTIONS**

Each of the following 18 questions present you with two hypothetical GRs. Each GR is described by six characteristics that can vary. In each case you are required to consider the characteristics and choose your most preferred option (Product A **or** Product B) If you do not prefer either of the GRs, please indicate this by writing "None" in the block on the right. It is important that you realise that all other characteristics do not change between the GRs.

**13.**

| **Product A** | **Product B** | |
|---|---|---|
| Excellent on-site facilities | Good on-site facilities | |
| Low congestion | Medium congestion | |
| Excellent game viewing | Poor game viewing | |
| R150 pppn | R400 pppn | |
| Birding hotspot | Not a birding hotspot | |
| No ecolabel | Ecolabel | |

**14.**

| **Product A** | **Product B** | |
|---|---|---|
| Basic on-site facilities | Excellent on-site facilities | |
| Medium congestion | High congestion | |
| Average game viewing | Poor game viewing | |
| R400 pppn | R150 pppn | |
| Birding hotspot | Not a birding hotspot | |
| No ecolabel | Ecolabel | |

**15.**

| **Product A** | **Product B** | |
|---|---|---|
| Excellent on-site facilities | Good on-site facilities | |
| High congestion | Medium congestion | |
| Average game viewing | Poor game viewing | |
| R250 pppn | R400 pppn | |
| Birding hotspot | Not a birding hotspot | |
| No ecolabel | Ecolabel | |

**16.**

| **Product A** | **Product B** | |
|---|---|---|
| Basic on-site facilities | Excellent on-site facilities | |
| High congestion | Medium congestion | |
| Excellent game viewing | Poor game viewing | |
| R400 pppn | R250 pppn | |
| Not a birding hotspot | Birding hotspot | |
| No ecolabel | Ecolabel | |

**17.**

| **Product A** | **Product B** | |
|---|---|---|
| Good on-site facilities | Excellent on-site facilities | |
| High congestion | Low congestion | |
| Average game viewing | Poor game viewing | |
| R150 pppn | R400 pppn | |
| Birding hotspot | Not a birding hotspot | |
| Ecolabel | Ecolabel | |

**18.**

| **Product A** | **Product B** | |
|---|---|---|
| Good on-site facilities | Basic on-site facilities | |
| Low congestion | High congestion | |
| Poor game viewing | Excellent game viewing | |
| R400 pppn | R250 pppn | |
| Birding hotspot | Not a birding hotspot | |
| No ecolabel | Ecolabel | |

**19.**

| **Product A** | **Product B** | |
|---|---|---|
| Basic on-site facilities | Excellent on-site facilities | |
| Medium congestion | Low congestion | |
| Poor game viewing | Average game viewing | |
| R150 pppn | R250 pppn | |
| Birding hotspot | Not a birding hotspot | |
| Ecolabel | No ecolabel | |

**20.**

| **Product A** | **Product B** | |
|---|---|---|
| Average on-site facilities | Basic on-site facilities | |
| Medium congestion | Low congestion | |
| Poor game viewing | Average game viewing | |
| R250 pppn | R400 pppn | |
| Birding hotspot | Not a birding hotspot | |
| No ecolabel | Ecolabel | |

**21.**

| **Product A** | **Product B** | |
|---|---|---|
| Average on-site facilities | Basic on-site facilities | |
| High congestion | Low congestion | |
| Excellent game viewing | Poor game viewing | |
| R400 pppn | R150 pppn | |
| Not a birding hotspot | Not a birding hotspot | |
| Ecolabel | No ecolabel | |

**22.**

| **Product A** | **Product B** | |
|---|---|---|
| Excellent on-site facilities | Basic on-site facilities | |
| Medium congestion | High congestion | |
| Average game viewing | Poor game viewing | |
| R150 pppn | R250 pppn | |
| Not a birding hotspot | Birding hotspot | |
| Ecolabel | No ecolabel | |

**23.**

| **Product A** | **Product B** | |
|---|---|---|
| Basic on-site facilities | Excellent on-site facilities | |
| Medium congestion | Low congestion | |
| Average game viewing | Excellent game viewing | |
| R250 pppn | R400 pppn | |
| Not a birding hotspot | Birding hotspot | |
| No ecolabel | Ecolabel | |

**24.**

| **Product A** | **Product B** | |
|---|---|---|
| Basic on-site facilities | Good on-site facilities | |
| Medium congestion | High congestion | |
| Average game viewing | Poor game viewing | |
| R400 pppn | R150 pppn | |
| Birding hotspot | Not a birding hotspot | |
| Ecolabel | No ecolabel | |

**25.**

| **Product A** | **Product B** | |
|---|---|---|
| Average on-site facilities | Excellent on-site facilities | |
| Low congestion | Medium congestion | |
| Average game viewing | Excellent game viewing | |
| R250 pppn | R150 pppn | |
| Birding hotspot | Not a birding hotspot | |
| Ecolabel | No ecolabel | |

**26.**

| **Product A** | **Product B** | |
|---|---|---|
| Excellent on-site facilities | Basic on-site facilities | |
| Medium congestion | Low congestion | |
| Excellent game viewing | Poor game viewing | |
| R400 pppn | R250 pppn | |
| Birding hotspot | Not a birding hotspot | |
| No ecolabel | Ecolabel | |

**27.**

| **Product A** | **Product B** | |
|---|---|---|
| Average on-site facilities | Excellent on-site facilities | |
| Low congestion | High congestion | |
| Excellent game viewing | Poor game viewing | |
| R250 pppn | R400 pppn | |
| Birding hotspot | Birding hotspot | |
| Ecolabel | No ecolabel | |

**28.**

| **Product A** | **Product B** | |
|---|---|---|
| Average on-site facilities | Basic on-site facilities | |
| High congestion | Low congestion | |
| Average game viewing | Excellent game viewing | |
| R400 pppn | R150 pppn | |
| Not a birding hotspot | Birding hotspot | |
| No ecolabel | No ecolabel | |

**29.**

| **Product A** | **Product B** | |
|---|---|---|
| Excellent on-site facilities | Average on-site facilities | |
| Medium congestion | Low congestion | |
| Poor game viewing | Average game viewing | |
| R250 pppn | R150 pppn | |
| Birding hotspot | Not a birding hotspot | |
| Ecolabel | No ecolabel | |

**30.**

| **Product A** | **Product B** | |
|---|---|---|
| Excellent on-site facilities | Good on-site facilities | |
| High congestion | Medium congestion | |
| Average game viewing | Excellent game viewing | |
| R150 pppn | R250 pppn | |
| Birding hotspot | Not a birding hotspot | |
| Ecolabel | No ecolabel | |

**CVM QUESTIONS**

**31.** Suppose you are given R10, 000 but can only donate it to other organisations. You have a choice of donating the money to support conservation, research into better nature conservation management or to help people in need. What percentage would allocate to each of the following:

____% to current nature conservation to maintain near pristine environments

____% to research to improve nature conservation management on GRs

____% to charity to help people in need

**32.** If you had to make a choice to stay at one of two GRs which were similar in most respects except that one was situated in a more pristine environment and the other was on a former agricultural farm which was being rehabilitated. Would you be willing to pay R25 more per person per night to stay at the GR with a pristine environment?

- Yes, I would, in fact I would be willing to pay as much as R_____ more per night (in addition to the R25 already mentioned).
- No, I would pay the same at both GRs or possibly even R_____ less per night at the pristine GR (compared to the rehabilitated farm).

**Thank-you very much for taking the time to fill out this questionnaire**