

CHAPTER 2

TOURISM AND NATURAL RESOURCE CONSERVATION AND MANAGEMENT IN PERSPECTIVE

2.1 Introduction

Perhaps no other activity has grown world-wide during the past decades with the same speed and global dispersal as tourism. Such growth has inspired increasing dialogue among practitioners, policy-makers, academics and other tourism stakeholders about the form and function of tourism in the next millenium (Godde *et al.* 2000). Activities in the sectors of transport, accommodation, catering, retailing, historical and other attraction management, play a major role as part of the tourism industry. These well-known aspects make tourism one of the world's largest and most significant in terms of turnover, employment and visibility, and therefore does not require a long regurgitation of statistics (Brown, 1998).

The impacts on the natural environment of outdoor recreation, including ecotourism, are extensive and increasing, focusing more and more on the world's remaining natural areas (Liddle, 1997). Not only are we seriously starting to question the impacts of tourism on the biosphere, we are taking more directed action toward the sustainable maintenance of precious resources (Godde *et al.* 2000). These trends in natural resource management are very much applicable to ecotourism management and planning (Ryan, 1991), especially in an area like the Waterberg area, Limpopo Province, South Africa, where ecotourism might have impacts on sensitive areas. However, although certain human impacts might have a negative effect on the environment, the value of the natural resources of an area towards ecotourism cannot be underestimated and should be incorporated as part of the conservation, management and promotion of such areas.

2.2 The tourism phenomenon

From the dawn of time humans have been on the move. The first written record of an actual traveler is found in Genesis, the first book of the Bible. Cain, the son of Adam and Eve, was banished from the Garden of Eden for killing his brother and told he

was to become a wanderer of the earth. Two major factors in the overall evolution of tourism from here on are man's development of a system to transport himself rapidly over great distances and the development of an industry concerned with housing and feeding humans away from their homes (Kreck, 1972). Tourism today, can be viewed as:

- A social phenomenon, not a production activity
- The sum of the expenditures off all travelers or visitors for all purposes, not the receipt of a select group of similar establishment
- An experience or process, not a product - an extremely varied experience at that (Theobald, 1998).

The demand for tourism is determined by a number of economic, psychological and social factors (Ryan, 1991). Tourism has grown significantly in both economic and social importance, and today, tourism is most certainly the concern of a number of world governments since it not only provides new employment opportunities, but it also produced a means of earning foreign exchange.

2.3 Tourism worldwide

International tourism is emerging as a leading global economic driver for the 21st century [World Travel and Tourism Council (WWTTC), 1998]. In 1972, the tourism industry already totaled well over US\$ 20 billion which was expended by more than 110 million travelers from 125 countries (Kreck, 1972). Today, travel and tourism - encompassing transport, accommodation, catering, and services for travelers - is one of the world's largest industries and creators of quality jobs. Worldwide, in 1998, it was expected to generate US\$ 4.4 trillion of economic activity, forecast to grow to US\$ 10.0 trillion by 2010. Travel and tourism is a high growth activity, which is forecasted to increase its total economic activity by 4.1% per annum worldwide in real terms over the next twelve years (WTTTC, 1998).

Travel and tourism is also human resource intensive, creating quality jobs across the full employment spectrum. In 1998 1 in 10.7 jobs was generated worldwide by the

tourism economy. The travel and tourism industry accounted for about 3.2% of global employment at the time. It was also estimated that the figure of 79.2 million travel and tourism industry jobs held, would have increased to 116.8 million by 2010 (WTTC, 1998).

Tourism is an extremely complex endeavor. Not only are huge amounts of money at stake; in addition, economic incentives are provided to protect the natural environment, restore cultural monuments, and preserve native cultures. The tourism industry is in a small, but important way, contributing to understanding among people of very different backgrounds. But above all, it provides a break from the stress of everyday routine and fulfilling the dreams of leisure travelers (Theobald, 1998).

2.4 Tourism in South Africa

With a population of approximately 41 million and a land area of 1.27 million sq. km (nearly five times the size of the UK), South Africa's resource base for tourism is phenomenal (DEAT, 1996). In fact, the prospects for the tourism industry are better now than they have been for decades. Foreign tourism has experienced dramatic and sustained growth over the past few years and domestic tourism is set to grow steadily off a large base. This is in spite of some political instability in neighboring countries, and the lack of foreign investment and adequate economic growth over the last few years, as well as an increased perception of robberies and violence in certain parts of the country.

South Africa's tourism attractiveness lies in its diversity. Some of the features which make South Africa an incredibly attractive tourism proposition include: Accessible wildlife, varied and impressive scenery, unspoiled wilderness areas, diverse cultures (in particular traditional and township African cultures), generally sunny and hot climate, no "jet lag" from Europe, a well-developed infrastructure and virtually unlimited opportunities for special interest activities such as whale-watching, wild water rafting, hiking, bird-watching, bush survival, deep-sea fishing, hunting and diving. In addition, unique archaeological sites and battlefields, the availability of excellent conference and exhibition facilities, a wide range of sporting facilities, good communication and medical services, internationally known attractions (Table

Mountain, Cape of Good Hope, Sun City, Kruger National Park, Garden Route) and unrivaled opportunities to visit other regional internationally known attractions (e.g. Victoria Falls and the Okavango Swamps) make South Africa an almost complete tourist destination (DEAT, 1996).

Southern Africa also has 10% of all plant species in the world, even though our country's land surface is less than 1% that of the globe. South Africa is also the only country to totally contain one of the world's six Floral Kingdoms - The Cape Floral Kingdom which mostly consist of Fynbos. One third of South Africa's 24000 plant species occurs in this adverse, rich Kingdom. The vegetation of South Africa further consists of 7 biomes namely Fynbos, Savanna, Nama Karoo, Succulent Karoo, Thicket, Grassland and Forest (Low & Rebelo, 1996). According to Low & Rebelo (1996) these biomes can further be divided into 68 specific vegetation types as previously studied and described by several authors like Rutherford & Westfall (1986) and Rebelo (1994). This not only creates an absolute haven for botanists and field naturalists, but also adds aesthetic value to the country's rich landscapes as well as providing several opportunities for tourism, for example the annual flowering of the Mesembryanths and other plants in the Northern Cape or Namaqualand.

2.4.1 Strengths and weaknesses of tourism in South Africa

South Africa has tremendous advantages in the global tourism market and some critical challenges (WTTC, 1998).

The advantages for tourism in South Africa are:

- The characteristics of South African tourism products are in line with global market trends for adventure tourism, ecotourism and cultural tourism
- Since 1994 there has been significant increased capacity for tourism in accommodation, transport and airlinks
- There has been increased co-ordination of tourism initiatives in Southern Africa for expansion and increased diversity of products
- It represents exceptional value for money for visitors from key origin markets

- It has a positive international image for its democratic political transformations (WTTC, 1998)

Notwithstanding all the above-mentioned advantages, the country has not been able to realise its full potential in tourism (DEAT, 1996) due to the following reasons:

- Some parts of are increasingly seen as unsafe for tourists
- There are gaps in infrastructure and lack of capacity in some areas
- Product quality and service levels do not always meet international standards

The future prosperity of the "tourism industry" sector will be assured only if these advantages are consolidated and the weaknesses minimised (WTTC, 1998).

2.4.2 The tourism industry in South Africa

The tourism economy of South Africa is estimated to be worth more than US\$ 10 billion per year, contributing more than 8% of the country's total Gross Domestic Product (GDP) (DEAT, 1998). The potential economic growth for tourism in South Africa is phenomenal in all aspects concerned, especially in the employment division. To secure the healthy and sustainable tourism growth in South Africa it is essential that a collaborative approach be followed in developing the industry. The White Paper (DEAT, 1996) and the Tourism in GEAR (DEAT, 1997) espouse such an approach by indicating that tourism should be led by the government and driven by the private sector, and be community-based and labour-conscious (DEAT, 1999).

2.4.3 Tourist Market segments in South Africa

As stated previously, the tourism sector of South Africa offers many attractions to tourists. The following tourism segments have been identified as offering the fastest growth potential for the international tourism market namely cultural, conference, sports, adventure and ecotourism (DEAT, 1998). Ecotourism is certainly one of the most popular tourist attractions in South Africa, and concerning the environment needs the most attention from an ecological point of view.

2.4.4 Ecotourism

There are generally few opportunities to earn income from protected areas. Therefore, constant problems arise in financing their establishment and management (Tisdell, 1999). Ecotourism involves the environmentally and socially responsible travel to such natural or near natural areas that promote conservation (DEAT, 1996). It further has low visitor impact and provides one of the few opportunities to earn income from these areas (Tisdell, 1999).

South Africa offers an incredible diversity of eco-attractions. South Africa has a total of 212 parks and game reserves that offer eco-tourism experiences, 17 of which are major national parks including the 2 million hectare Kruger National Park. Eco-tourism plays an important role with South Africa's wildlife and scenery remaining the enduring reasons for foreign visitors coming to the country. In 1997, the economic contribution of eco-tourism was estimated at R16.6 billion, and this figure was expected to increase to R30 billion in the year 2000 (DEAT, 1998).

Tourism to natural areas is economically important in many developing countries (Tisdell, 1999). However, the management and conservation of such natural resources needs priority in order to conserve the biodiversity and to sustain their present status.

2.5. Trends in Natural Resource management

Nature is under continuing threat from humankind and the world's biodiversity continues to decline at an alarming rate (Barbier *et al.* 1994). Natural resource development indicates the concept whereby environmental resources are given specific value owing to development. Resource management is an even wider concept, which involves controls relating to the amount, quality, timing, availability and the general direction of resource development. It examines strategies and technologies for resource development in order to sustain economic growth without causing environmental degradation and destruction (Hugo *et al.* 1997).

2.5.1 The importance of sustainable development

Like "tourism" the term "development" is complex embodying a number of ideas accumulated and revised in recent decades. Development implies change: "A Process that improves living conditions of people relating to non-material wants as well as to physical requirements" (Godde *et al.* 2000). The raised awareness of the destructive effects of development on the environment in the latter half of this century has led to the now generally inseparable adjective in the concept of "sustainable development" (Godde *et al.* 2000).

The objective of resource conservation is to manage natural resources sustainably. Sustainability involves the long-term maintenance of natural resources with minimal adverse environmental impacts and adequate economic returns (Jordan, 1995). Meffe & Carroll (1997) defined sustainable development as human activities guided by acceptance of the intrinsic value of the natural world, the role of the natural world in human well-being, and the need for humans to live on the income from nature's capital rather than on capital itself. They posed the question: "Can we make qualitative changes in complexity and configuration within existing human systems that do not place increasing quantitative demands on natural systems, and are in fact compatible with their continued existence?"

Viederman (1992) provided 7 principles of sustainability, to attain sustainability for the good of humanity and the natural world:

- Nature should be understood to be an irreplaceable source of knowledge, from which we can learn potential solutions to some of our problems
- Issues of environmental deterioration and human oppression and violence are linked in analysis and action
- Humility must guide our actions. Good stewardship begins with restraint
- We must appreciate the importance of "proper-scale". Place and locality are the foundation for all durable economics, and must be the starting point of action to deal with our problems. Solutions are local and scale-dependent.

- Sufficiency must replace economic efficiency. The earth is finite, and that fact must be accepted in order for humanity to adopt limits. Living within our needs on a planetary scale does not mean a life of sacrifice, but of greater fulfillment. We must distinguish between "needs" and "wants"
- Community is essential for survival. The global community should reflect and encourage diversity while being interdependent
- Biological and cultural diversity must be preserved, defended, and encouraged

As societies struggle to understand the term "sustainable development", it is believed that the two operational measures of sustainable ecosystem management, namely biodiversity and ecosystem processes, offer a way to a sound definition of sustainable development. If all ecosystems on earth were managed sustainably, the sum would be equivalent to sustainable development on a planetary basis (Meffe & Carroll, 1997).

2.5.2 The human presence

Humans are and will continue to be a part of both natural and degraded ecological systems, and their presence must be included in conservation planning. In recent years, considerable thought and effort have been given to devising development methods that are more culturally and environmentally suitable and thus more sustainable. Nature reserves are typically surrounded by lands and waters intensively used by humans, and therefore it is impossible to isolate reserves completely from these outside influences (Meffe & Carroll, 1997). Jordan (1995) believes that the only hope for preserving biological diversity of tropical forests is to allow people who live in the forest to sustain themselves from that forest. The users of the forest then become its guardians. The question remains however, whether the resources will remain sustainable, given an expected increase in the demand for those resources.

Although the human presence might be seen as negative towards conservation, there are benefits to be gained by explicitly integrating humans into the equation for conservation. This can be done by adopting the following strategies mentioned by Meffe & Carroll (1997):

- **Indigenous knowledge** is obtained from people who have been longtime residents in the region of a reserve, and often know a great deal about local natural history. The knowledge can be useful in developing reserve management plans
- Reserves should be **user-friendly** in order to build public support. If people do not perceive that the reserve has any value to them, they will not support it. Ecological knowledge about reserves should be presented both formally and informally in educational programs (Meffe & Carroll, 1997). The idea is to overcome the alienation of individuals from nature. It is believed that when humankind has the opportunity to co-exist with nature and achieve harmonious relationship with it that this leads to more harmonious and stable communal relationships. Supporters of the community concept of sustainability usually favour the preservation of biodiversity (Tisdell, 1999).
- Native human cultures are a part of the ecological landscape and have an ethical right to areas where they live. Some of these cultures have developed sustainable methods of existence that can serve as models for modern sustainable development. The incorporation of the problems of modern cultures should also be incorporated into conservation, since they have the largest influence on resource use (Meffe & Carroll, 1997).

2.5.3 Conservation of biodiversity

Biodiversity is a term that refers to the variety of living organisms, their genetic diversity, and the types of ecological communities into which they are assembled (Meffe & Carroll, 1997). Conservation of biodiversity is one of the most important aspects of ecologically sustainable development. It requires that economic development be consistent with preserving the diversity and integrity of nature (Tisdell, 1999).

An important part of conservation is the preservation of species of flora and fauna that inhabit the earth. International treaties and national law protect species by making it illegal to kill them or trade them. On the international level, the most significant step has been the signing of the Convention on International Trade in Endangered Species (CITES) by the majority of the world's nations. In the United States, the Endangered

Species Act has attacked the problem of species loss (Jordan, 1995). Although individual species may be exterminated because of their commercial value, the major threat to world biodiversity comes from habitat destruction. Habitat destruction is the most prevalent cause of species endangerment (Wilson, 1992). Thus, although a focus on species conservation may be most effective in conserving charming species like pandas or commercially viable flora such as mahogany, conservation of biodiversity and ecosystem functions may be best achieved by preserving habitat (Jordan, 1995). The problems and challenges facing humanity with respect to conserving biodiversity can seem overwhelming, and consequently their solutions can appear diffuse and ineffective. However, Meffe & Carrol (1997) believe that concentration on the following five areas of effort could result in major advances toward conserving biodiversity and developing a sustainable human society, compatible with the natural world, at a reasonable standard of living:

- First stabilize, then reverse human population growth
- Protect tropical forests and other major centres of biodiversity
- Develop a more global perspective of earth's resources, while solving problems locally wherever possible
- Develop ecological economics to replace growth economics
- Modify human value systems to reflect ecological reality

It is necessary to recognize that the loss of species from a particular ecosystem may threaten the functioning of the system as whole, depending upon the paths of interdependence between species. Whether this loss is likely to create greater impairment to the functioning of ecosystems with less diversity than those with greater diversity is unclear. Nevertheless, as the diversity of species in a region is decreased, the sustainability of ecosystems in the region, and the services provided by ecosystems, are likely to be increasingly impaired (Tisdell, 1999).

2.5.4 Ecosystem management

Clark & Zaunbrecher (1987) defined ecosystem management as the management of natural resources using system-wide concepts to ensure that all plants and animals in

ecosystems are maintained at viable levels in native habitats and the basic ecosystem processes are perpetuated indefinitely. Jordan (1995) believes that natural occurring ecosystems are the nearest thing to sustainable systems. They are "ecologically sustainable" in the sense that there are no artificial energy, nutrient and water subsidies. However, as soon as humans begin to extract resources from a system, for example game or timber, output of the ecosystem is greater than the input, and the system is no longer sustainable.

Ecosystem management is essentially an expansion of natural resource management and human-land relationships in three dimensions: time, space and degree of inclusion. The temporal dimension is expanded because we are concerned with the health and vitality of ecosystems into the indefinite future. Management goals must include ensuring the ecosystem dynamics occur within ranges that do not exceed the resilience of the system. The second aspect, the spatial dimension, is expanded beyond a particular small plot of ground to include the larger landscape and connections to other landscapes (e.g. biosphere reserves). It is important to recognize and understand the spatial connections present in nature to more effectively manage these systems. Ideally, the spatial scale should include sufficient heterogeneity to provide resources for species during years of scarcity. Finally, the human dimension is expanded to include a broader diversity of interest, talents, and perspectives in natural resource decision making. Single-institution, top-down, command- and control decision making will not suffice in true ecosystem management, for it can exclude the majority of persons and interests affected by the decision and can ignore relevant information and talents that could contribute to problem solving (Meffe & Carroll, 1997). Jordan (1995) further believed that no countries in the world could survive based on ecological sustainable production systems alone. To maintain modern civilizations and present-day populations, production systems must be modified and subsidized.

2.5.5 Ecotourism, conservation and sustainable development

Various types of tourism that have arisen over the past few decades, such as ecotourism, nature-based tourism, alternative tourism and small-scale tourism are indicative of the higher level of awareness towards the natural environment. The need

for sustainable tourism development is gaining attention and "ecotourism" is being promoted by many developing countries as an impetus to expand both conservation measures and tourism development (Theobald, 1998).

2.4 Conservation of the Southern African savannas

Many individuals regard ecotourism as a tool for sustainable tourism development, combined with sound planning and management. Ecotourism can also help in the promotion of natural, social, cultural and economic improvement for sustained conservation efforts. With growing interests in nature conservation, interest in the economic possibilities of ecotourism has increased. The appeal of ecotourism is that it may allow nature conservation and economic gain to be combined, thereby providing an economic incentive for nature conservation (Tisdell, 1999). The original World Conservation Strategy (IUCN, 1980) pointed out that nature-based tourism may provide a means by which developing countries may at least recoup some of the costs of conservation of biodiversity. The future of ecotourism in such countries is bright, although the viability of such destinations may be largely dependent upon the extent to which those destinations are able to implement sustainable development practices while attracting their share of the international ecotourism market. Government policy makers and tourism industry officials must accept the challenge, the responsibility and the mandate of bringing market forces into congruence with the need for environmental protection and social equity. If this can be accomplished, ecotourism may well become an example of how development can be achieved on a sustainable basis to the benefit of visitors, hosts and industry alike (Theobald, 1998).

2.4.1 Potential negative impacts

Although ecotourism has the potential to encourage conservation of the natural environment, it is also true that tourism which utilizes the environment can result in its deterioration (Tisdell, 1999). It is therefore extremely important to know what the potential negative impacts of ecotourism can cause to natural environments, to implement management and planning procedures in time.

2.4.1 Biodiversity

The importance to conserve our natural resources to promote ecotourism, as well as the value of these resources as basis for ecotourism activities cannot be underestimated. Large conservancies in the Southern African savannas, like the Kruger National Park in South Africa contribute largely to ecotourism and conservation. These savanna systems are dynamic and need to be fully understood

when linked to ecotourism activities. Ecological management is therefore essential for the conservation of savannas.

2.6 Conservation of the Southern African savannas

Savannas in general can be defined as a vegetation biome with a continuous grass layer, usually scattered with trees (Bourliere, 1983). Savannas in Southern Africa can be described in more detail as all ecosystems in which C₄ grasses potentially dominate the herbaceous stratum and where woody plants, usually fire-tolerant, vary in density from widely scattered individuals to a closed woodland broken now and again by drainage-line grasslands (Huntley & Walker, 1982).

The vegetation ecology of the savanna biome in Southern Africa has been studied extensively in previous years (Rattray, 1962; Van Rooyen, 1978; Van der Meulen, 1979; Bredenkamp, 1982, Gertenbach, 1987, Scholes, 1997) and represent the largest biome in Southern Africa, occupying 46% of its area, and over one third of South Africa (Low & Rebelo, 1996). Most of these publications are strictly scientific, and there is a definite need to produce more books like "The Magnificent Natural Heritage of South Africa" (Knobel, 1999). This popular presentation brings information on the savanna and other biomes of South Africa to the public. The book combine photography with facts about the environmental aspects of the biomes, and presentations like this is important in making the public more aware of their surroundings and conservation.

The savanna functions as several dynamic ecosystems [25 vegetation types have been described by Low & Rebelo (1996)], and is rich in biodiversity, with conservation playing a major role in the many National Parks and reserves in this biome.

2.6.1 Biodiversity

Southern African savannas are rich in its biodiversity concerning several aspects of ecosystems. Firstly, savannas can be divided into Moist Savanna and Dry Savanna (Booth *et al.*, 1994) on the basis of biotic patterns, which coincide principally with moisture availability. The geographical distribution of many of these moist and arid

savanna plant species overlap widely, but their habitat preferences result in a clearly defined ecological separation which is only detectable in the field. The division of moist and arid savannas also conforms with the distinction between "sweet" and "sour" bushveld based on the maintenance or loss of grazing value through winter (Huntley & Walker, 1982). This is also reflected in Acock's (1988) classification of South African vegetation into sweet, mixed and sour bushveld and grassland types. Figure 2.1 shows the distribution of the arid and moist savanna types through Africa south of the Equator.

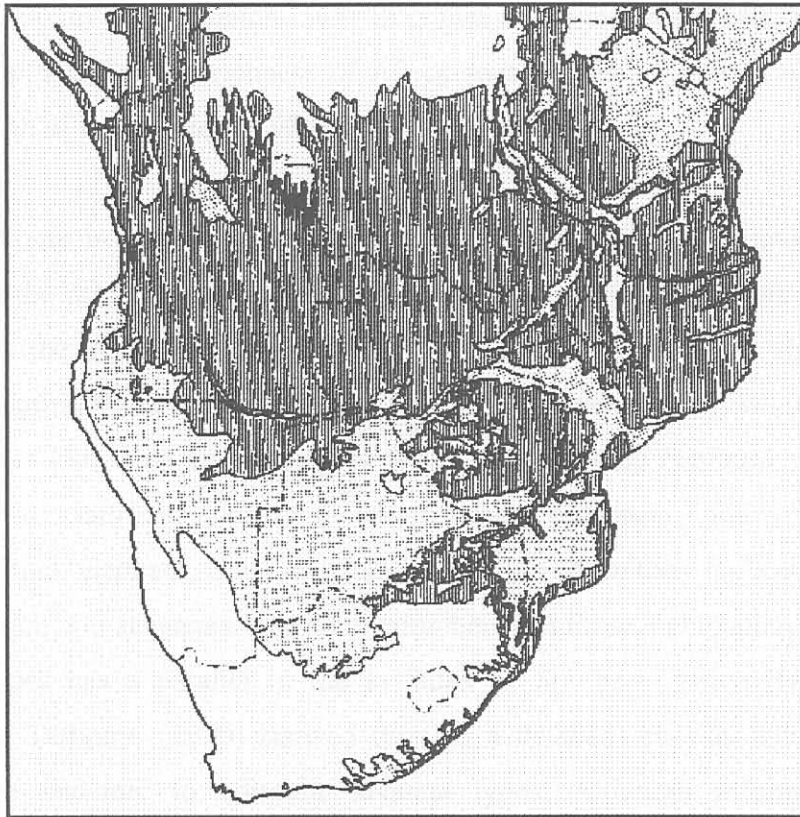


Figure 2.1. Distribution of arid (stippled) and moist (vertical stripes) savannas south of the Equator (Huntley & Walker, 1982)

The biodiversity of Southern African savannas is further emphasized by the concept of physiognomic structure of plant communities or vegetation types. Most savannas are characterized by a grassy ground layer and a distinct upper layer of woody plants (Rutherford & Westfall, 1986). Bredenkamp (2002) and Du Plessis (2001) showed how dynamic these different structural layers (especially the grassy layer) could be by interpretation through the Equilibrium- non-Equilibrium models. Where the upper,

woody layer is near the ground the vegetation may be referred to as Shrubveld, where it is dense as Woodland, and the intermediate stages are locally known as Bushveld (Rutherford & Westfall, 1986). Van der Meulen & Westfall (1980) further showed how aspects like altitude, soil type, overgrazing and fire can cause floristically similar woodland or bushveld vegetation in the western Transvaal, South Africa to be quite different structurally.

Most data on plant species richness apply to territories of varied area. The floristic richness of the African savannas stand out clearly: their average area richness (1750 species per 10 000km²) is not much lower than that of the rain forests (2020 species per 10 000km²). The floristic richness of Africa south of the equator is also much greater than north of it (Bourliere, 1983).

The savanna biome is also rich in terms of faunal patterns and relationships. An examination of the distribution of the mammals of Southern Africa shows a marked correlation with the moist and arid savannas. Certain species like black rhinoceros, red hartebeest springbok are more confined to arid savannas (sweet), while the low density ungulates like sable antelope, grey duiker and common reedbuck prefer the high bulk and low nutrient value of the moist (sour) savannas. Other widespread species like buffalo, elephant, eland and Burchell's zebra reach their highest densities in the nutrient rich arid savannas. The distinction between these mammalian faunas of the savanna types has a parallel in the avifauna of Southern Africa (Huntley & Walker, 1982). Tarboton (1980) showed through a detailed analysis how specific birds could be endemic to adjacent savanna types. Although information on invertebrate zoogeography of savannas in Southern Africa is scarce, Huntley & Walker (1982) pointed out that a clear distinction between nutrient and energy pathways are followed in the two savanna types. This should give a clear explanation to why specific insects and other invertebrates prefer certain habitats within the savanna types. For example, in moist savannas, primary production is high in structural materials and low in nutrients, consequently the value to herbivores like insects is very low.

The conservation of biodiversity within the Southern African savannas can never be overemphasized. Therefore the importance of the region's the National Parks and

reserves cannot be underestimated. An excellent example of a Southern African savanna in conserving biodiversity is the Kruger National Park, South Africa. The park constitutes an area of 20 000km² hosts almost 150 mammal species, more than 500 bird species, 51 fish species, 119 reptiles species, 35 amphibian species and more than 2000 documented plant species, including some 450 tree species and 235 grasses (Van Rooyen, 1999).

2.6.2 National Parks and reserves

Protected areas like national parks and game reserves were originally established for the conservation of large mammals, but also to cover representative samples of ecosystems and habitats, as well as the vast range of species of plants, mammals, reptiles, birds, amphibians and invertebrates (such as insects). Relative to its size the protected areas network is quite extensive, perhaps unequalled in the world. Over 90 percent of known mammal, amphibian and reptile species are represented in protected areas, mostly savannas, making Southern Africa a popular tourist destination. Of the region's total land area of almost seven million square kilometers, over one million square kilometers are designated as protected areas (Figure 2.2) (Booth *et al.*, 1994). Southern Africa has one of only two national parks larger than 50 000km² in Africa. It further has the greatest combined park area, the greatest percentage area accounted for by national parks and the highest perimeter: area ratio compared to other parts of Africa (Siegfried *et al.* 1998).

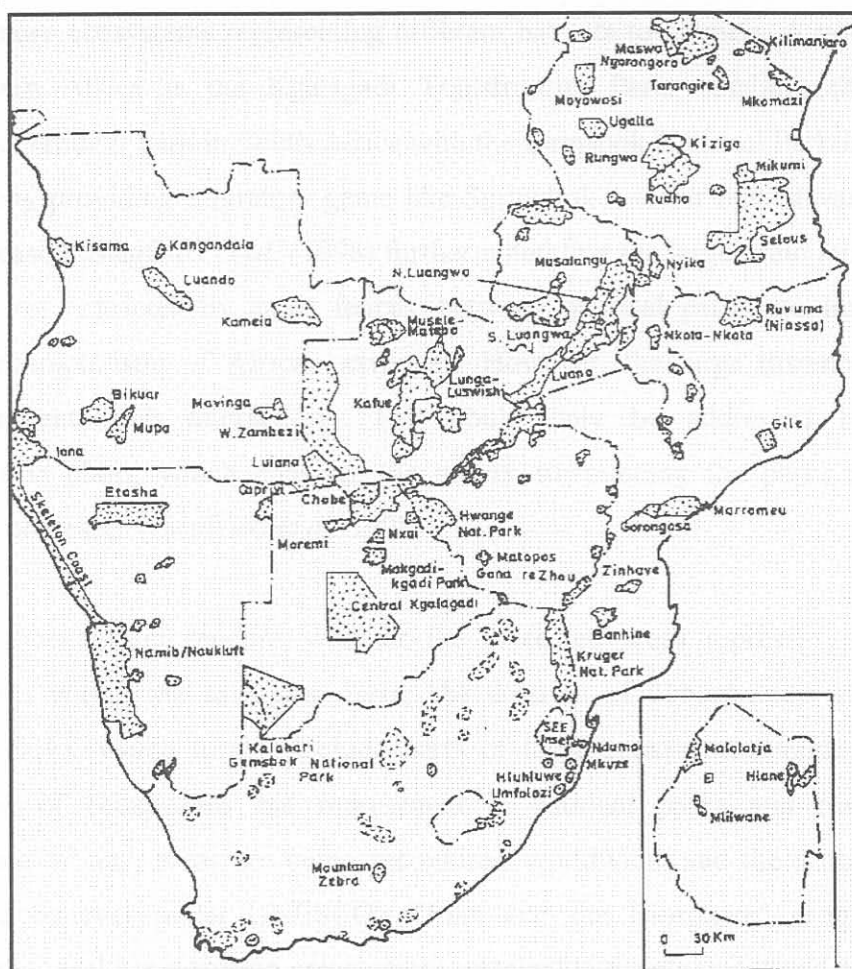


Figure 2.2. The protected areas network of Southern Africa (Booth *et al.* 1994).

The conservation of savanna is good in principle, mainly due to the presence of large parks such as Kruger, Hwange, Chobe and Kafue National Park. However, the large area conserved in South Africa, belies the fact that half of savanna vegetation types are inadequately conserved, in having less than 5 percent of their areas in reserves. However, much of the area is used for game farming and may be considered effectively preserved, if sustainable stocking levels are maintained. (Low & Rebelo, 1996).

Although the conservation of savannas is good in southern Africa, the area needed by wildlife is sometimes of concern. East (1981) have shown that very large reserves (> 10 000 km²) are necessary to ensure the survival of diverse large mammal communities characteristic of the African savannas. In this respect, developments such as transfrontier parks between countries provide animals with corridors and

include more ecosystems representing different habitats to animals. A good example in southern Africa is the Kgalagadi Transfrontier Park, combining the Kalahari Gemsbok National Park in South Africa with the Gemsbok National Park in Botswana and thereby providing migratory game like Springbok a wider habitat variety during the dry season. Siegfried *et al.* (1998) further noted that the large-scale movements of animals, not restricted by game fences, between national parks are important for species characteristic of African savannas. However, the large distances between parks prevent such interactions. This could only be addressed by regional conservation plans, which consider the matrix surrounding the parks and aim to maintain processes (Siegfried *et al.* 1998).

The question further remains whether the protected areas represent all types of ecosystems within the savannas. Here, the creation of conservancy areas outside national parks, which further include parts of these ecosystems, might ensure the protection of ecosystems not represented in national parks and reserves. The importance of such areas are being recognized worldwide, and the proclamation of biosphere reserves under UNESCO's "Man and the Biosphere" program, might provide the ideal conservation areas where sustainable development and conservation can take place.

2.6.3 The concept of Ecozones

The natural units, which make up the environment, are called ecological zones or "ecozones". An ecozone is a large natural unit, controlled by a set of common processes, mostly climatic, and is dominated by life forms with similar physical adaptations to these processes (Booth *et al.* 1994).

Scientists use geology, rainfall, vegetation and soil to define ecozones, but attach different importance to a combination of factors. In fact, scientists do not agree on exactly where ecozones are or how to define them (Booth *et al.* 1994). The identification of ecozones can be at a large scale. Rutherford & Westfall (1986) identified the biomes of South Africa as ecozones, while Huntley & Walker (1982) further divided the Savanna biome into moist and arid savannas, as previously described.

However, ecozones can also be defined on a smaller scale, especially in areas within a biome where climatic, geological or vegetation differences occur. Vegetation is considered being a good criterion for defining ecozones because it embodies all the conditions in which animals live. Soil provides nutrients and stores water that plants use. Sunlight, temperature and rainfall patterns affect the plant's ability to grow and survive. Animals which graze on grasses or browse on leaves affect the plants, and fire can stimulate vegetation growth or clear an area, making room for other plant species. Low & Rebelo (1996) identified 68 vegetation types within the 7 biomes in South Africa. The boundaries of the vegetation types were drawn from geological, pedological, climatological, satellite and other cartographic data known to be relevant to the vegetation type. These vegetation types can therefore also be referred to as ecozones.

The identification and mapping of ecozones can further defined on an even smaller scale, especially within conservation areas like national parks. Gertenbach (1983) identified 36 landscape within the Kruger National Park, South Africa and classified them according to vegetation communities that occur within the specific landscape. Certain of these landscapes were later grouped together to form ecozones according to specific similarities within vegetation, geology and climate. These ecozones were described in a tourism booklet and provided tourists with useful information on the vegetation within the landscape on a catena, animals to be seen, soils and geology (Jacana, 1997). The value of these ecozones within National parks, reserves and conservancy areas towards tourism, cannot be underestimated and might be useful as broad ecological management units.

From above mentioned aspects it is clear that vegetation is an integral part of ecosystems. An ecosystem is a functional natural system where there is an interaction between an abiotic component (the physical environment) and a biotic component (the living organisms in the physical environment). Every set of physical environmental variables on a particular site forms the habitat for a set of associated plant species, known as a plant community. Different ecosystem types thus represent different plant communities. These plant communities form the smaller units of the larger ecozone, distinguishable as the large unit within a certain area (Bredenkamp, 2002).

2.6.4 The Waterberg area as ecotourist destination in a South African savanna

Tourism in South Africa is growing rapidly, especially in the Limpopo Province where tourism potential has only been discovered in the past few years. Table 2.1 shows the tourism sector statistics:

Table 2.1 Tourism sector statistics of the Limpopo Province

	International Market	Domestic Market
Size of Market	98 000 visitors	1 132 200 trips
Value of Market	R382 million	R1051 million
Average duration of stay	5.4 nights	5.3 nights

As seen in Table 2.1 the size and value of the domestic tourism market in the Limpopo Province is much larger than the international market. However, since the international market's size is based on holiday trips, while the size of the domestic market is based on professional and holiday trips, the differences cannot be compared to each other substantially. The size of the domestic market is mainly thanks to the tourism developments in the Waterberg area in places like Lapalala Wilderness area, Mabula Game Lodge and Marakele National Park.

The Waterberg forms part of the Central Savanna of South Africa. Winterbach (1998) identified four major vegetation types representing phytosociological classes namely: the *Commiphoro mollis-Colophospermetea mopani*, the *Panico maximi-Acacieta tortilis*, the *Terminalio sericeae-Combretetea apiculati* and the *Englerophyto magalismontani-Acacieta caffrae*. The dominant vegetation type within the Waterberg area is known as Mountain Bushveld, representative of the *Englerophyto magalismontani-Acacieta caffrae* class, although the *Terminalio sericeae-Combretetea apiculati* class is also well represented within the area. The vegetation forms the basis for the ecological management of tourist destinations within the area. Several studies previously performed emphasize the importance of ecological management in the area (Westfall, 1981; Westfall, 1985; Schmidt, 1992; Joubert, 1998; Newberry, 1998).

The Waterberg area has a long cultural history of human occupation and has been inhabited by a succession of people over hundreds of thousands of years. From Stone Age people, the San (bushmen), Khoikhoi herders and Iron Age people, all have left traces in the form of paintings or iron smelting furnaces. It is becoming one of the most important San rock art sites in South Africa. The Waterberg cultural museum near Melkriver, houses fascinating information on the cultural history of the area (NPTB, 1999). These cultural resources contribute in promoting the area as tourism destination, although it is still the area's natural resources that mainly contribute to its splendor as destination.

The Waterberg basin supports part of the Savanna biome of 14 500 km² (NPTB, 1999). It lies in an area of the South African savanna consisting mainly of two vegetation types, namely Waterberg Moist Mountain Bushveld and Mixed Bushveld (Van Rooyen & Bredenkamp, 1996^{a,b}). Acocks (1988) described three variations namely Sour Bushveld, Sourish Mixed Bushveld and Mixed Bushveld. The northern part is somewhat drier and contains some elements of Arid Sweet Bushveld (Acocks, 1988). The vegetation of the Waterberg is well conserved and several plant endemics like *Encephalartos eugene-maraisii* and *Combretum nelsoni* occur in the area. The vegetation also creates suitable habitats for animals, birds and insects (Bredenkamp & Brown, 2001) and therefore the potential to create ecotourism destinations has great potential.

The Waterberg area as tourist destination, is still relatively unknown to many and has been described as South Africa's best-kept secret. The mountain range has great aesthetic values and is simply a geographical wonder. The area lies in the bushveld region of the Limpopo Province, South Africa and forms the "heart" of the game and cattle farming industry in the savanna biome of Southern Africa (Van Rooyen & Bredenkamp, 1998). Wildlife conservation has taken most of the place of early farming practices, and today, land-use on vast tracks of the Waterberg mountain range and plateau have changed from conservation in one form or another. Apart from the Marakele National Park and Provincial and tribal reserves, there are literally hundreds of exemption game farms within the area, with an ever increasing number of cattle farmers switching to game farming (Walker, 2000). The 75 mammal species encountered here include big game such as elephant, lion, white and black rhino,

leopard, buffalo (Big five) and hippo (NPTB, 1999). It is also a bird watcher's paradise with more than 300 bird species. Ecotourist activities such as guided bush walks, day and night game drives, farm tours, birdwatching, horse riding safaris, fishing, hunting and mountain bike trials are common and very popular (NPTB, 1999).

The Waterberg area, being a relatively under-populated area in terms of human numbers, unsuitable to forestry, without any mineral wealth is an unspoilt wilderness area with tremendous potential for ecotourism development. The area was previously known as the Waterberg Conservancy, consisting of about 150 000 ha. The Conservancy had some 25 members, employing more than 1000 people. However, the tourism industry was under tremendous pressure to generate direct and visible opportunities and benefits to especially the rural communities. It was therefore imperative that a balance was created between conservation and industry that generates visible and direct benefits, like job opportunities, to the local communities (Walker, 2000). These pressures led to the creation of the third South African biosphere reserve namely, The Waterberg Biosphere Reserve.

2.7. The concept of biosphere reserves

The concept of biosphere reserve emerged from the program of Man and the Biosphere (MAB) of which it constitutes an essential part (Batisse, 1982). A biosphere reserve is a protected area of representative environments, internationally recognized for their conservation value and for providing the scientific knowledge, skills and human values to support sustainable development (UNESCO, 1971). These areas can be terrestrial and coastal / marine ecosystems.

Biosphere reserves are designated to deal with one of the most important questions the world faces today: How can we reconcile conservation of biodiversity and biological resources with their sustainable use. It has three primary functions namely development, conservation and logistic. By combining the three functions biosphere reserves become living examples of the integration of sustainable development (like tourism) and conservation. To fulfil the three functions, biosphere reserves comprises

three distinct zones as shown in Figure 2.3 [United Nations Educational, Scientific and Cultural Organization (UNESCO), 1971].

The core areas are often publicly or private owned conservation lands such as wilderness areas or nature reserves. These provide a location where ecosystems, which are minimally disturbed, can be monitored and maintained for the future. The buffer zones often adjoin and may surround the core area. Here, research, education, recreation, and a variety of economic activities are conducted based on and agreed upon ecological principles, and within a legally based management framework. The transition areas are the third component in the relationship. These zones are also known as "zones of cooperation" where land-use, such as farms and urban areas, are found. It is within these zones that the development functions of a biosphere reserve are fulfilled within a framework of sustainable natural resource utilization (UNESCO, 1971). The design of these zones within the biosphere reserve will determine the different management practices applied within these reserves.

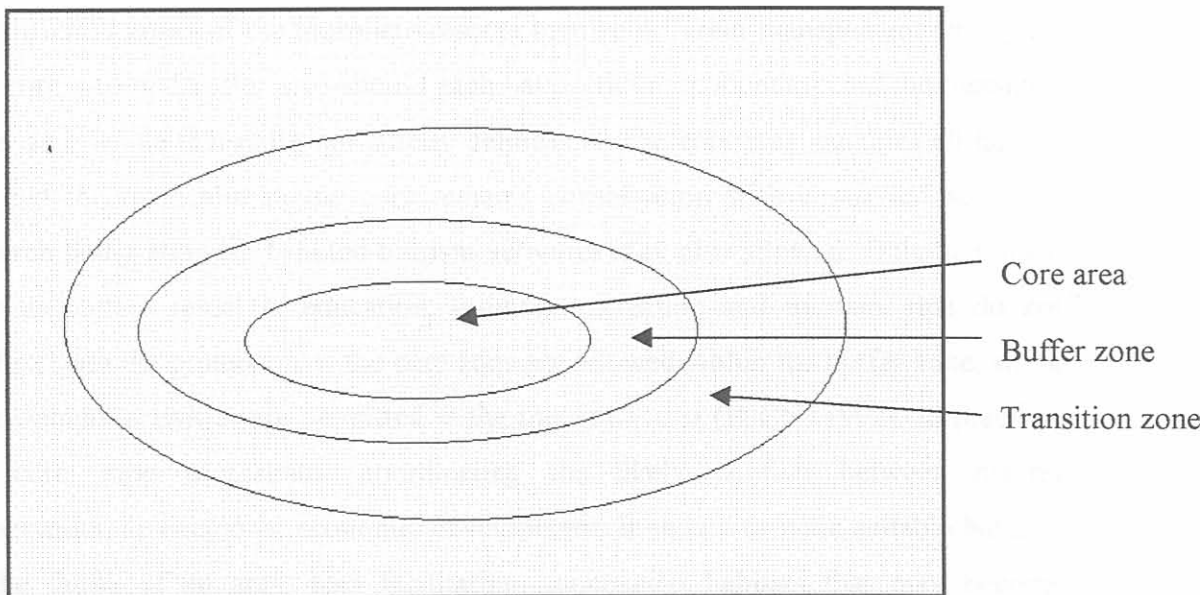


Figure 2.3 Zoning of biosphere reserves

2.7.1. Management of Biosphere reserves

The conservation strategy of biosphere reserves focuses on managing protected areas as well as adjacent lands and communities (Solecki, 1994). It is widely recognized that managing environmentally sensitive land that may represent biosphere reserves, requires incorporating the needs of area residents into the planning process and forging links between the reserves and local residents (Batisse, 1982).

The primary function of Biosphere Reserves remains the *in situ* long-term conservation of plant and animal genetic resources, together with research on ecosystem management and conservation, monitoring of changes in the Biosphere, training of specialists, and environmental education. As representative zonal and azonal ecological areas covering as far as possible all types of natural, semi-natural, and modified ecosystems, biosphere reserves constitute a significant way of improving the partnership between humans and nature (Batisse, 1982).

The different zones of the biosphere reserve involve different management strategies. The core area and buffer area should each have a definite boundary and the transition zone, as a whole is usually not strictly delineated. The core area excludes all human use and the main aim in the core remains conservation with controlled scientific research being allowed. Limited tourism activities may also be allowed. Only activities, such as certain research, education, training, recreation and tourism, that do not conflict with the protection of the core zone are allowed within the buffer zone, while development activities are permitted in the transition area (IUCN, 1992). In practice, the core zone necessitates coordinating the likely conflict between natural conservation and regional economic development. It should provide suitable habitats to the fauna of an area, also facilitating unoccupied habitats that may become available when the population of species increases or food resources are scarce. For practical conservation, any suitable or potentially suitable habitats should not be neglected in the design of the core (Li *et al.* 1999^a). The buffer zone is a further key aspect for reserve management because it is a link between the reserve managers and local inhabitants. Experiences show that failure in conservation in a reserve often result from poor design of the buffer zone or no buffer zone around a core (Li *et al.* 1999^b).

The management of Biosphere Reserves is complicated, and different management policies will mostly be dependent on socio-economic considerations of the local communities.

2.7.2. Socio-Economic issues

Attitudes and incentives of people living around protected areas are widely considered to constrain successful management of these areas (Richards, 1996). It cannot be overstressed that conservation measures- especially those that involve productive lands- will not succeed without the agreement, support, and participation, of the population directly concerned. The biosphere reserve concept is built upon the establishment of a dynamic interaction between scientists, resource managers, decision makers, and the local people who should ultimately benefit from the protection measures and from the results of research (Batisse, 1982). The success of the Mapimi Biosphere Reserve in Mexico was emphasized by the involvement of the local population actively participating in the creation and management of the reserve (Halfpter, 1981). This should be seen as an encouragement to all other biosphere reserves around the world.

A primary challenge of biosphere reserves is to educate the public about the concept, while retaining existing support and understanding of other forms of land protection. Any response to this challenge, however, will need to consider somewhat different perceptions and values attached to land protection in industrially developed, as compared with developing - in particular third world countries (Kellert, 1986).

In the industrial nation's context, the primary need is to resolve the tension of a largely aesthetic as contrasted with ecological appreciation of land protection. Considerable public support exists for protecting areas of aesthetic, historic, and humanistic, values, although relatively little understanding is apparent regarding the ecological benefits of land protection, or the potential worth of designating core and buffer zones to assure that relatively pristine areas are adequately conserved. Any effort at increasing public support for the biosphere reserve concept in socio-economically developed nations should emphasize the values derived from preserving

biological diversity and representativeness, and the dangers associated with creating isolated reserves and island ecosystems (Kellert, 1986).

The primary tension in developing nations however, is reconciling land protection objectives with the resource-dependent needs and utilization traditions of often impoverished subsistence-oriented populations. It is the potential of the biosphere reserve concept to address the socio-economic needs of developing nations that renders such a land protection strategy as a potentially important effort in this social and political context (Kellert, 1986). Lusigi (1981) noted that most of the public in developing countries perceives the conservation of land and wildlife as often a choice of animals and plants over people. The justification for parks as a way of promoting tourism and, thus obtaining needed 'hard' currency is often viewed as taking land from native people for the pleasure and benefits of the foreigners. Of primary concern is how management of protected areas with resident populations can reduce the social consequences of involuntary relocation, residency without access to resources, and assimilation (Rao & Geisler, 1990). Therefore, Batisse (1982) suggested that the biosphere reserves in developing countries should rather be an open system, looking out towards the management problems of the surrounding areas, and incorporating land-use management concerns of the local populations. The major land protection challenge in third-world nations, however, is to incorporate the socio-economic needs and utilitarian values of local populations into the establishment and management of preserves (Kellert, 1986). It seems as though the policies of governments of both developing and industrial nations might play an important role in the solving of some of these socio-economic problems surrounding biosphere reserves.

2.7.3. Government policies

It is important to note that a biosphere reserve is run by the community and not by a government agency. The government plays a facilitator and advisory role only (Walker, 2000). For example in the lake St. Lucia area, South Africa the government had the role of making the decision on whether the development of mines in an area rich in biodiversity will go ahead (Preston-Whyte, 1996). The state of politics within countries could play a major role when decisions regarding funding for the creation and management of natural areas like parks and reserves have to be made. In the

United States for example, the change in political climate in 1994, caused major budget cuts on natural resources programs to balance the federal budget. Changes in governments could, on the other hand, also have positive impacts. In Russia, after the break up of the former Union of Soviet Socialist Republics (U. S. S. R.) in 1991, the amount of protected areas was drastically increased and at that time, no other country in the world added a greater amount of land area to its system of protected areas (Peine, 1999).

Batisse (1985) noted that despite vigorous action to make governments aware of the importance of biosphere reserves and to promote their establishment, there are still many gaps and deficiencies in the network and that governments should be invited to undertake activities which will improve and expand the international biosphere reserve network, to develop basic knowledge for conserving ecosystems and biological diversity, and to make biosphere reserves more effective in linking conservation and development in fulfilling the broad objectives of MAB.

2.7.4. Ecological Importance

Although these issues described in the previous sections play a significant role in biosphere reserves, one of the main aims within these reserves still remain conservation and maintenance of genetic diversity of plant and animal species and the need to help manage natural resources on a sustainable basis (Dhargalkar & Untawale, 1991). Batisse (1982) showed the importance of biosphere reserves as a tool for environmental conservation and management. The biosphere reserve concept has been put forward by conservationists and land-use planners hoping to improve management of large regional super-ecocomplexes such as the greater Yellowstone "Ecosystem" (Clark *et al.* 1991).

Biosphere reserves play an important role in several ecological aspects of ecosystems. Habitat preferences and distribution of animals and birds often exceed the fences of game reserves, and when the fences do not restrict the animals, the buffer zone of the biosphere reserve provides the added habitat requirement. Grimbeeck (1991) showed that the territories of leopards in the Waterberg area, South Africa, are far larger than only game reserve fences and could be up to 303 km², with one leopard per 53 km².

Studies done on habitat preferences of animals and birds within larger ecosystems in biosphere reserves also provide useful information on behavioral patterns, distribution and feeding ecology and several studies have been done (Sasvari & Moskat, 1988; Johnson & Franklin, 1991; Aranda & Sanches-Cordero, 1996; Solazano *et al.* 2000). Povilitis (1993) further showed the importance of biosphere reserves in the restoring of megafauna to areas where they occurred before human intervention. This could play an important role in an area like the Waterberg, where a lot of animals were hunted in previous times, and some completely disappeared from the area.

Studies on vegetation within biospheres or large ecosystems have not been done extensively and in future, this aspect should be emphasized. However, some research on large data sets have been performed within Southern Africa biomes by Bredenkamp & Bezuidenhout (1995), Winterbach (1998) and Du Plessis (2001). These studies have showed the value of ecological classification of vegetation types for a better understanding of the system dynamics, management and conservation over larger areas. Phytosociological studies have also been done and described in the larger conservation areas such as the world-famous Kruger National Park (Gertenbach, 1978, Van Rooyen, 1978, Coetzee, 1983, Gertenbach, 1987). Gertenbach (1983) used these vegetation studies, combined with studies on the geology (Schutte, 1982), climate (Gertenbach, 1980) and animal life (Pienaar, 1963) to identify 35 landscapes in the Kruger National Park. These 35 landscapes were later combined to form 16 ecozones based on similarities between the 35 landscapes (Jacana, 1997). The ecozones were presented in an ecozone map, providing tourists visiting the Kruger National Park with valuable information on vegetation patterns, geology and animals to be seen in ecozones.

Krizek & Krizova (1995) showed that taxonomic studies on rare and endangered flora within a Biosphere Reserve provide useful information about the distribution of endangered, very vulnerable, vulnerable, rare, endemic and indeterminate vascular plants. Biosphere reserves further provide a large area for vegetation descriptions along environmental gradients as shown by Springuel *et al.* (1997).

From above mentioned aspects it becomes clear that Biosphere Reserves play a major role in ecosystem management of large ecosystems. One of these aspects that is

becoming more and more dominant within the reserves is land-use planning for sustainable tourism.

2.7.5. Tourism within biosphere reserves

One of the fastest growing sectors in the tourism industry is ecotourism, where people are particularly seeking a more intimate experience with nature and/or indigenous culture closely tied to the natural environment. Several aspects should be taken into account when applying ecotourism within conservation areas, as it might have an adverse impact on the environment (Peine, 1999).

Tourism within biosphere reserves plays an important role, not only in the economic aspect, but also in the providing of job opportunities, upliftment and resource development of local communities (Walker, 2000). The ecotours provided to tourists should strive to demonstrate by experience the interconnectedness of indigenous cultures and the natural environment (Peine, 1999). However, the importance of tourism, especially in developing countries has not yet been realized, due to different priorities towards natural resources. Often in these countries, wrong approaches towards local communities can result in missed opportunities to implement ecotourism in suitable areas as shown by Richards (1996).

However, in developed countries, tourism plays an important role, and the opportunities provided, especially within the buffer zones of Biosphere Reserves for tourism development are immense, and might provide an alternative to solving ecological problems. In the Lake St. Lucia area, South Africa, it is argued that wealth creation through development of ecotourism and mining would achieve sustainable development objectives if these resources were to be privatized within a biosphere reserve (Preston-Whyte 1996). The approach towards tourism within developed countries is usually positive, and therefore tourism might play an ever-increasing role within Biosphere Reserves of these countries.

2.7.6. South Africa's Biosphere Reserves

South Africa can neither be classified as a developed, nor a developing country. Tourism and conservation do however play a major role within South Africa and continue to provide opportunities for the creation of Biosphere Reserves.

South Africa currently have three biosphere reserves, namely the Kogelberg Biosphere Reserve in the Western Cape Province, West Coast Biosphere Reserve in the Western Cape Province, and recently proclaimed in March 2001 the Waterberg Biosphere Reserve in the Limpopo Province. Other biosphere initiatives in South Africa are in the following areas: Wakkerstroom, Maputoland, Tugela and the Kruger to Canyons. However, considering the rich biodiversity in its national parks and protected areas, South Africa could promote more areas as possible biosphere reserves, especially considering several wilderness areas where humans co-exist with nature.

2.7.7. The Waterberg Biosphere Reserve

On The 23rd March 2001, UNESCO officially proclaimed the Waterberg area: The first Savanna Biosphere Reserve in Southern Africa. The Waterberg Biosphere Reserve includes protected areas like Masebe Nature Reserve, Moepel Farms, Mokolo Dam, Marakele National Park, Lapalala Wilderness and Touchstone Game Ranch. The whole biosphere reserve, previously known as the Waterberg Nature Conservancy, stretch over an area of 150 000 hectares [Northern Province Tourism Board (NPTB), 1999].

Walker (2000) noted that there is no other area within the country with comparable attributes and potential for conservation. The area is unexplored, vast, largely unknown and should meet the growing needs of a certain sector of the tourism industry. However, Walker (2000) further stated that the Waterberg cannot compare with the traditional hotspots of South Africa, and that it should not attempt to do so. It should rather try to retain its own unique blend of wild country with its multi cultural diversity catering for budget as well as international tourists.

According to UNESCO's standard application form for membership to the Waterberg Biosphere Reserve, the primary objectives identified by Limpopo Nature Conservation are as follows:

- Participate in the Man and the Biosphere program of UNESCO
- Generate interest and active participation in environmental conservation amongst all its members
- Conserve and enhance the scenic environment, indigenous fauna and flora and cultural history of the Waterberg mountains
- Implement strategies for the sustainable utilization of the natural and cultural resources of the area
- Improve the quality of life of the people within the Waterberg area through the creation of job opportunities and the execution of education and training programs
- Enhance the tourism potential and tourism information network in the Waterberg area
- Maintain the Biosphere Reserve centre (office) that will provide a local scientific and technical support service to the biosphere reserve members relating to all environmental and tourism issues
- Participate in joint ventures to promote the biosphere reserve on a regional and global scale
- Subject itself to national and provincial legislation and policies relating to environmental issues (NPTB, 1999).

The Limpopo Province Tourism Board Chairperson Charles Maluleke envisaged that the reserve would become an increasingly important component of the Limpopo Province tourism product. He stated that the close proximity of the fascinating Waterberg region to the Gauteng Metropolitan area, absence of malaria and excellent tourism infrastructure already in place, make the region an ideal holiday destination for city dwellers in search of relaxation (Waterberg Newsletter, 2001).

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