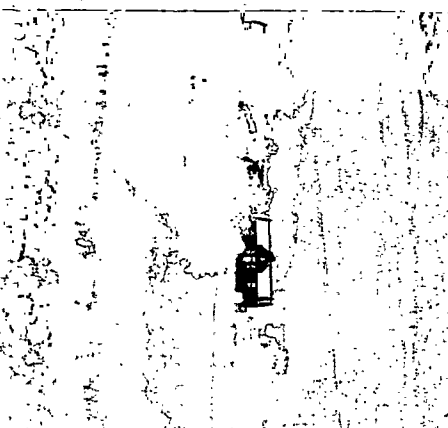


Mainstreaming Biodiversity in Development

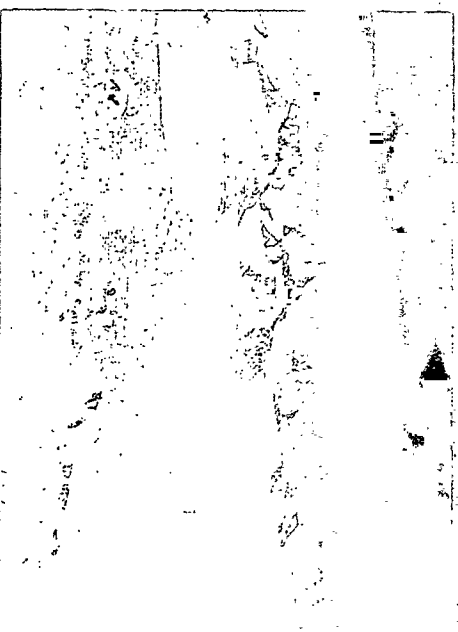
Case Studies from South Africa

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August 2002



Edited by
**S. M. Pierce, R. M. Cowling,
T. Sandwith, and K. Mackinnon**

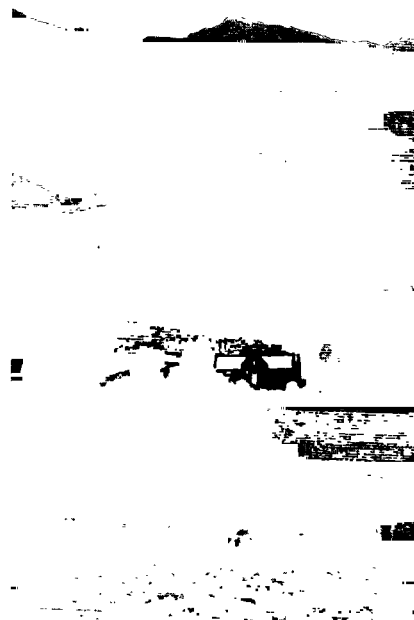
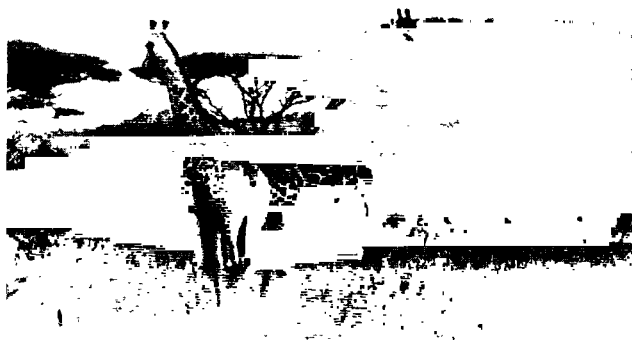


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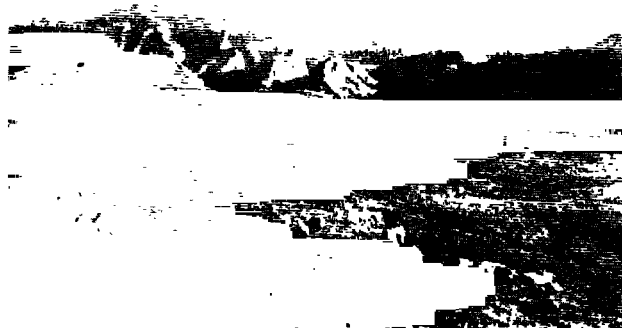
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Mainstreaming Biodiversity in Development

Case Studies from South Africa



Edited by
**S. M. Pierce, R. M. Cowling,
T. Sandwith, and K. MacKinnon**



**The World Bank
Environment Department**

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BIODIVERSITY SERIES

Impact Studies

These “Impact Studies” are a subset of the Biodiversity Series of the World Bank’s Environment Department Papers. These papers address topics related to the positive and negative impacts of human activities on biodiversity.

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Biodiversity Conservation in the Context of Tropical Forest Management
Hunting of Wildlife in Tropical Forests—Implications for Biodiversity and Forest Peoples
Mainstreaming Biodiversity in Development: Case Studies from South Africa

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Foreword

Ten years after Rio, South Africa is the venue for the World Summit on Sustainable Development. This is a welcome choice for the world's biodiversity community, as South Africa has also made impressive progress in integrating biodiversity issues and concerns into development projects, in the process achieving positive outcomes for both development and biodiversity.

These successes can serve as a model for other nations. Under Article 6 of the Convention on Biological Diversity, which has been ratified by South Africa and more than 170 other countries, states are required to integrate the conservation and sustainable use of biological diversity into relevant sectoral plans, programs, and policies. Many countries are wrestling with just how to achieve this objective.

Development and conservation are often trade-offs. Yet the South Africa case studies in this report illustrate many examples of best practice—such as the Working for Water program—and mitigation of biodiversity loss in sectors such as agriculture and forestry. How has this come about? Are the enabling factors and lessons learned peculiar to South Africa, or do the lessons have wider application?

South Africa has had an extraordinary political and development history. Although biodiversity was already being addressed in some sectors during the apartheid period, the change in government and democratisation in 1994 clearly led to innovative ways of integrating biodiversity with development needs.

The need to do something for the poor made innovations and linkages to socioeconomic benefits imperative. Scientists were able to convince politicians of the value of programs such as *Working for Water*, which simultaneously removed invasive tree species and helped restore water supplies, while also meeting social objectives through job creation and poverty alleviation. The high-level political appreciation of threats to biodiversity and ecosystem services, and the linkage of biodiversity conservation to socioeconomic delivery, were key factors in mainstreaming biodiversity.

The successful integration of biodiversity into mainstream development was not accidental. It can be attributed to four main factors: good scientific information and understanding; institutional capacity and commitment; strategic cross-sectoral and public-private partnerships; and a willingness by the scientific and conservation community to seize opportunities and demonstrate that biodiversity-friendly policies can provide socioeconomic opportunities for the poor.

South Africa inherited a core of dedicated and well-trained scientists. Because of apartheid and sanctions, these scientists were often isolated from the outside world. As a consequence, they became self-reliant, innovative, and developed broader perspectives. Encouraged by the innovative Co-operative Scientific Programs of the former Council for Scientific and Industrial Research (CSIR), widely differing professionals were brought together to solve practical problems. The small size of the biodiversity community in South Africa led to unique opportunities, where individuals could make a difference by working together across disciplines and sectors.

Good science led to an improved understanding of biodiversity and ecosystem values. Even more important, there was the institutional capacity, awareness, and commitment to take the science and reinterpret it in a form that was useful to decision makers and development agendas. This “marketing” of biodiversity and its relevance to sustainable development has been the primary factor in mainstreaming biodiversity in South Africa. Based on practical needs and pragmatic agendas, strategic partnerships have been formed between government agencies, NGOs, and the private sector. The scientific community and their partners have been able to seize opportunities across multiple sectors—water, tourism, forestry, agriculture,

urban and regional planning, energy, and even infrastructure—to illustrate that good biodiversity management is good for the economy, good for local development, and good for business.

Threats have been turned into opportunities. For example, a nuclear power plant on the Agulhas Plain triggered the development of a bioregional plan and a major conservation effort. Similarly, a cutback in government funds for conservation and protected areas led to more creative off-reserve solutions and new partnerships with private landowners. The approach was always pragmatic. Efforts were targeted not just to biodiversity “hotspots,” but also to areas where success could help build credibility, forge partnerships, and build political and conservation capital.

Since the change in government in 1994, scientists have risen to the challenge to disseminate information rapidly and effectively, demystifying and simplifying biodiversity, and making it manageable, accessible, and tractable. The primary lesson that South Africa can contribute to other developing (and developed) countries is that biodiversity conservation and sustainable use is a fundamental building block of sustainable development, not a luxury.

The World Bank is pleased to publish this volume as part of the *Biodiversity Series: Impact Studies*. The inspiring stories presented here can assist Bank client countries by providing examples of best practice and lessons learned in promoting biodiversity conservation in the context of sustainable development. Many of the case studies have relevance to other countries and other sectors, demonstrating synergies between biodiversity conservation and poverty alleviation, innovative solutions to shared needs, and opportunities to mainstream biodiversity at the local level as part of ordinary people’s lives.



Kristalina Georgieva
Director, Environment Department
The World Bank



Introduction

T. Sandwith

The Convention on Biological Diversity requires state parties to integrate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies. Over the past ten years, there has been considerable effort in many countries to ensure that this mainstreaming of biodiversity occurs, and to determine effective approaches towards meeting this goal. Although it might be difficult to provide a precise definition of this process, situations where mainstreaming of biodiversity has occurred might be characterised by:

- the incorporation of biodiversity considerations into policies governing sectoral activities;
- the simultaneous achievement of gains in biodiversity and gains in an economic sector (the “win-win” scenario);
- sectoral activity being recognised as based on, or dependent on, the sustainable use of biodiversity;
- situations where sectoral activities result in overall gains for biodiversity exceeding biodiversity losses.

Mainstreaming is, however, not necessarily a matter of intent or design that can be simply put in place as a policy measure. It may arise with a gradual and growing understanding of the dependence of a sector on biodiversity, or it may occur suddenly, when sectoral and biodiversity partners are presented with a shared need, and are opportunistic in their actions. More importantly, for mainstreaming to achieve lasting impact, it must occur at a very local level, and become a part of ordinary peoples’ lives.

Mainstreaming biodiversity in South Africa must be seen against the background of social and political change that has characterised the sub-continent. Only during the last two hundred years have such diverse communities as hunter-gatherers, pastoralists and colonial farmers and traders interacted and created the

current mosaic of settlement and land use activities. The results are not only the well-known conflicts and tragedies of the sub-continent, but also the “rainbow nation” described by Nobel laureate Desmond Tutu. The results, significantly, are etched into the very landscape itself. The enormous disparities of power and access to land and resources resulted in a system of racially-defined homelands, farming areas and cities, and a skewed distribution of population and wealth. This has had impacts on biodiversity and the sustainability of land use practices. In particular, South Africa’s apartheid past has resulted in low involvement and poor representation of black people as leaders in conservation and natural resource management institutions.

Since its democratic transformation in 1994, South Africa has provided fertile ground for policy review and innovation. In particular, there has been an enormous opportunity to consider creative solutions to ongoing challenges of social development and poverty alleviation amid the diversity of backgrounds and cultures. There have also been fundamental changes in political and administrative arrangements, with the incorporation of the communal areas of the former apartheid “independent” and “self-governing” homelands, the formation of nine new provinces, and the introduction of elected local government across state, communal and privately-owned land. Instead of “business as usual”, sectors have actively sought partnerships to increase their effectiveness in transforming the state and society. This is true also of the “biodiversity” sector. It is noteworthy that biodiversity has been identified as a sectoral activity, and as a natural resource for economic development by the South African Department of Arts, Culture, Science and Technology.

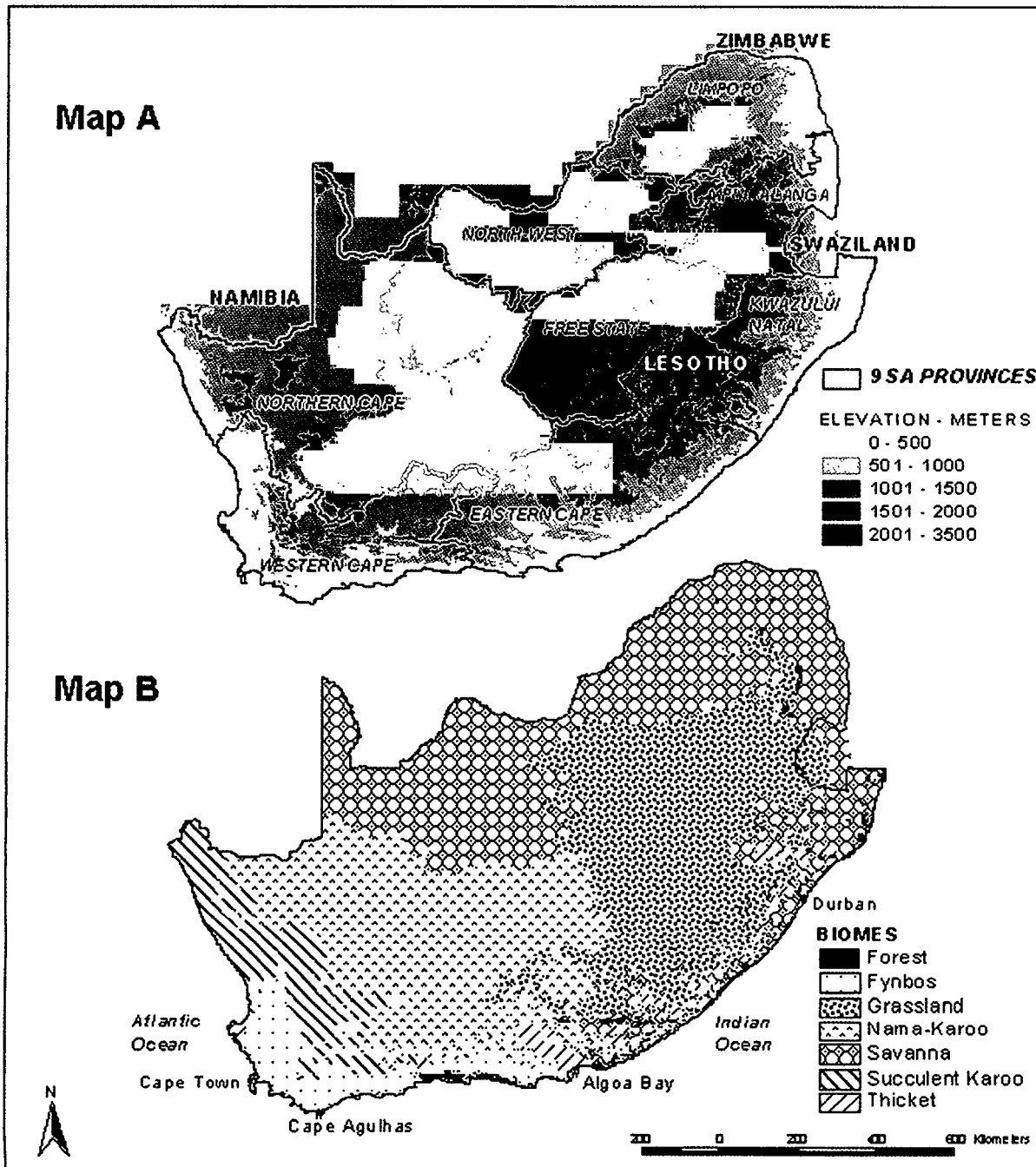
South Africa is a country with megadiversity, comprising an astonishing variety of biomes including Mediterranean-type, arid, alpine and tropical environments (see Figure 1.1). Within these biomes there is high species diversity and endemism. For example, the Cape Floristic Region is the smallest and richest of the world’s six floral kingdoms (known as the Cape Floral Kingdom) and the only one which is contained entirely within the borders of a single country. Other hotspots of biodiversity, emphasising both their importance

and threatened status, are the succulent karoo biome, the grasslands and shrublands of the Maloti-Drakensberg mountains, the moist grasslands of the interior and the north-eastern coastal wetlands and woodlands. There is a strongly felt responsibility on the part of South Africans to respond to the challenge of conserving biodiversity while meeting the country’s development needs. Nature conservation agencies, in particular, have acted proactively to make biodiversity conservation a force for rural development, and in so doing, to contribute more significantly to leveraging economic and social benefits and reducing the direct costs of conservation to the state.

Since 1994, the World Bank has been involved with South African partners in developing programmes under the biodiversity operational focus of the Global Environment Facility. Favourable perceptions of South African innovation and effective implementation have emerged, and therefore, the opportunity to tell these stories to a wider audience. Perhaps the classic tale is that of the *Working for Water* Programme developed by the Department of Water Affairs and Forestry with its state, private sector and civil society partners. This programme presents a “win, win, win” scenario, where not only has biodiversity conservation improved through the removal of alien plants, but community empowerment and entrepreneurship has been developed, and better quality and quantity of water supplies ensured. It is through such innovative programmes, that measures are being taken to address the legacies of apartheid, and, more specifically, to develop a new generation of conservation leaders who are representative of the diversity of people in South Africa. The situation is still woefully inadequate, but these programmes should be seen as a stage in this transformation.

The World Bank wishes to assist its client countries to meet their obligations under the Convention by providing examples of best practice and lessons learned in promoting biodiversity conservation in the context of sustainable development across multiple sectors in one country. South Africa provides this opportunity as a cluster of initiatives are being explored, providing a rich resource for reflection and analysis. To this end, a workshop was convened in June 2001 at Giants Castle in the uKhahlamba-Drakensberg Park World Heritage

**Figure 1.1. Map A: National and provincial boundaries of southern Africa
Map B: Biomes of South Africa**



Source: Information from National Botanical Institute, adapted by T. Wolf.

Site. It was convened by KZN Wildlife and the Terrestrial Ecology Research Unit (University of Port Elizabeth), and funded by the World Bank. It was intended that the workshop would consider mainstreaming stories from a number of sectors,

consider the elements which contributed to their identification as examples of mainstreaming biodiversity, and attempt to draw out some illustrations and lessons which could be shared by a wider audience in South Africa and elsewhere.

The set of papers included in this volume represent this thinking, and demonstrate to a greater or lesser extent, not only the diversity of contexts in which mainstreaming might occur, but also a sense of the conditions under which it occurs or could be stimulated to develop. The papers were prepared by the participants in their personal capacities, as professionals engaged in, and thinking about, the purpose and impact of their activities. Therefore, they do not represent the views, opinions or standpoints of any organisation or sector. Indeed, the workshop was regarded as a unique and rare opportunity for professionals to meet unhindered by pressing work programmes and deadlines and other constraints. Its findings are offered to colleagues in this spirit, with an invitation to engage further in the debate and development of a tentative framework of mainstreaming. Not all cases are shining examples of mainstreaming success stories. However, in the context of the workshop and this volume they point to the conditions under which mainstreaming might emerge and contribute to the debate while providing food for thought and speculation. The participants were inspired by the linkages between the processes of mainstreaming and the nature of change in South Africa, as well as the opportunities that emerge.

My thanks are due to Kathy MacKinnon and the World Bank for creating the opportunity and incentive to develop this initiative, to all of the authors and reviewers, who despite increasing de-

mands on their time were able to make a significant contribution, and to Carol Scheepers and KZN Wildlife for supporting and hosting this event. In particular, Shirley Pierce and Richard Cowling have made an enormous contribution towards encouraging and enabling these stories to be told in such a way that they contribute towards the conceptual development of this field. It is to be hoped that a wider community of professionals will be interested and motivated to reflect on this emergent field of work, and to contribute further to its development and impact.

EDITORIAL NOTE

In an attempt at standardisation of these case studies, certain monetary values have been expressed as United States dollars. It should be noted that there has been quite marked fluctuation in the Rand/Dollar exchange rate during the time period covered by this work. The range has been between US\$1 = R5.50 and US\$1 = R11.50. The reader is asked to interpret monetary values with this perspective.

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Win-Win-Win: South Africa's *Working for Water* Programme

B. W. van Wilgen, C. Marais, D. Magadlela,
N. Jezile and D. Stevens

SUMMARY

This chapter describes the birth and highly successful growth of the *Working for Water* (WfW) Programme which emerged from a history of earlier efforts to control the alien plant invasions that threaten biodiversity in South Africa. This programme is aimed at dealing with this threat, and at the same time, it provides opportunities for the social improvement of people formerly disadvantaged by apartheid. On the basis of catchment studies that showed the impacts of alien plants on the loss of water resources, scientists prepared a presentation explaining these impacts and how large numbers of jobs could be created in the clearance of invasive alien plants. This “road show” convinced the newly-appointed Minister of Water Affairs and Forestry in the first democratic government of South Africa of 1995. The worthiness of the proposal was much strengthened by the fact that such a programme would help to alleviate unemployment. This prime factor enabled further political support and initial funding equivalent to US\$6 million.

In this example of mainstreaming biodiversity, the key success factors included the dedication and farsightedness of a group of ecologists, a valuable phase of integrated and cooperative research, the unique opportunities for change offered by a new democratic government, political vision and support, seed funding by a conservation NGO, and the imaginative secondment of a core of committed people to drive the initial implementation of the WfW Programme. Although the protection of biodiversity is not its main purpose, it is an important

objective. The programme has had a number of problems associated with its rapid growth, and from an imperative to balance development needs in the post-apartheid South Africa with the need to comply with high professional standards. Nevertheless, it has found a reasonably successful mix in satisfying the needs for efficiency, social development, and political transformation towards democratisation and equity. If the programme continues the path it has followed to date, it will make a major contribution to the conservation of biodiversity in South Africa.

INTRODUCTION

South Africa is a microcosm of the world today, where the ratio of rich to poor within one country mirrors the global situation. The country is actively seeking to redress these imbalances, placing an emphasis on rural development and the elimination of poverty through economic development and job creation. In most developing countries, such an emphasis would work counter to the conservation of biodiversity, with short-term economic growth and social delivery taking precedence over ecosystem conservation. Therefore, placing a monetary value on ecosystem services is an important and politically expedient way of ensuring intervention. The challenge is to ensure that these interventions incorporate ecological sustainability, fairness and efficiency. There are few examples of such projects in the world, especially among the poorer and species-rich nations in the developing "south". It is therefore remarkable that one such example comes from South Africa in the form of the *Working for Water* Programme. This programme was developed with the dual function of controlling invasive alien plants and providing social improvement for ethnic groups who had been disadvantaged by apartheid. In this way, it maximises an ecosystem service (the delivery of water), protects biodiversity and enhances sustainability by eliminating invading alien plants, and promotes social equity through jobs and training for economically marginalised people.

This chapter presents a brief history of invasive alien plant control efforts in South Africa,

and outlines how the problem gained prominence, and substantial funding, following South Africa's first democratic elections. It outlines the birth and growth of the *Working for Water* Programme, a US\$160 million initiative to gain control of the problem. The chapter describes the factors that led to its success and achievements to date. It also outlines the problems and future prospects. Throughout there is a bias towards examples from the Cape region in South Africa. The *Working for Water* Programme originated in the Cape Floral Region, an area of unusually high biodiversity. In addition, many of the studies which underpinned the original arguments for initiating the programme were undertaken in the Cape. Today, however, the programme is a national one, and it has been successfully implemented throughout South Africa.

THE PROBLEM OF INVASIVE ALIEN PLANTS IN SOUTH AFRICA

Thousands of plant species from other parts of the world have been introduced to South Africa for a range of purposes: as crop species; for timber and firewood; as garden ornamentals; for stabilising sand dunes and as barrier and hedge plants. Many of these alien species have become naturalised, surviving in the South African landscape without the need for tending, and some of these naturalised species have become invasive. Invasive alien species are able to survive, reproduce and spread, unaided and sometimes at alarming rates, across the landscape.

South Africa has a serious problem with aggressively invasive alien plants. These affect almost 10 million hectares (8.28%) of the country, and are spreading rapidly (Table 2.1). These invasions come at a considerable cost to the economy and the environment, and affect the lives of all South Africans, either directly or indirectly. They convert species-rich vegetation to single-species stands of trees, increasing biomass and decreasing stream flow dramatically. For example, invasion of the catchment areas surrounding Cape Town, if left to spread at current rates, could reduce water resources for this rapidly growing city by 30%. Invasions on a national scale are estimated to be

Table 2.1. The most widespread invading alien plants in South Africa

Species	Origin	Reason for introduction	Impacts	Area invaded & distribution
Syringa (<i>Melia azedarach</i>)	Asia	Ornamental, shade	Displaces diverse native plant communities; excessive water use; frugivorous birds focus on the fruits at the expense of native species, preventing dispersal.	Occurs in 3 million ha along river banks, disturbed areas, roadsides, urban open spaces
Pines (<i>Pinus</i> species)	North America, Europe	Timber, poles, firewood, ornamental, shade	Displaces diverse native plant communities; excessive water use; increases fuel loads and fire impacts.	Occurs in 3 million ha; widespread in mountain catchments, forest fringes, grasslands and fynbos
Black wattle (<i>Acacia mearnsii</i>)	Australia	Shelter, tanbark, shade, firewood	Displaces diverse native plant communities; excessive water use; promotes destabilisation and erosion of stream banks.	Occurs in 2.5 million ha; widespread except in arid areas
Lantana (<i>Lantana camara</i>)	Central and South America	Ornamental, hedging	Displaces diverse native plant communities; poisonous to livestock.	Occurs in 2.2 million ha of forest and plantation margins, water courses and savannas
Gum trees (<i>Eucalyptus</i> species)	Australia	Timber, firewood	Displaces diverse native plant communities; excessive water use.	Widely scattered in 2.4 million ha in all areas
Rooikrans (<i>Acacia cyclops</i>)	Australia	Dune reclamation, shade, firewood	Displaces diverse native plant communities; increases fuel loads and fire impacts; prevents natural movement of sand, disrupting ecosystem-level dynamics.	Occurs in 1.9 million ha, mainly in the southern and western coastal belt.
Port Jackson willow (<i>Acacia saligna</i>)	Australia	Dune reclamation, shade, fodder, tanbark	Displaces diverse native plant communities; excessive water use.	Occurs in 1.9 million ha, mainly the coastal lowlands of the Western Cape
Prickly pear/cactus (<i>Opuntia</i> species)	North, central and south America	Ornamental, edible fruits, animal fodder	Displaces diverse native plant communities and severely reduces grazing potential	Occurs in 1.8 million ha in drier areas
Mesquite (<i>Prosopis</i> species)	North America	Fodder, shade and firewood	Displaces diverse native plant communities; depletes groundwater resources.	Occurs in 1.8 million ha in drier areas
Bugweed (<i>Solanum mauritanum</i>)	South America	Ornamental	Displaces diverse native plant communities; frugivorous birds focus on the fruits at the expense of native species, preventing dispersal.	Occurs in 1.8 million ha; widespread in wetter areas
Hakea (<i>Hakea</i> species)	Australia	Hedging, firewood, ornamental, dune reclamation	Displaces diverse native plant communities; increased water use; increases fuel loads and fire impacts.	Occurs in 0.7 million ha in mountain and lowland fynbos

using almost 7% of the country's runoff. These losses could mean that more (and expensive) dams have to be built much earlier to meet water demands, with serious economic impacts. Invasion of indigenous grasslands and shrublands by tall trees and shrubs also increases the amount of plant material (fuel load) that can burn. While ecosystems in South Africa are normally quite resilient to regular burning, these increased fuel loads lead to fires of higher intensity and a range of detrimental effects. Physical damage to the soil can occur, resulting in increased erosion after fire. Invasion also impacts directly on biodiversity by replacing diverse stands of indigenous vegetation with virtual monocultures.

THE COSTS OF INVASIVE PLANT SPECIES

Economic costs

Arriving at a comprehensive figure for the total costs of invasive plants is not possible at this stage. The indications, however, are that the total costs are substantial, and a number of studies support this contention. Some examples are listed below (see list for further reading at the end of the chapter).

- One of the few detailed studies calculated the value of a hypothetical 4 km² (400 ha) mountain fynbos ecosystem at between US\$3 million (with no management of alien plants), and US\$50 million (with effective management of alien plants), based on six components: water production, wild flower harvest, hiker visitation, ecotourist visitation, endemic species and genetic storage. Given that there are over one million hectares of protected fynbos areas in South Africa, the potential reduction in value due to invasion could amount to over US\$11.75 billion.
- The value of lost water has been estimated at US\$163 per ha on the Agulhas Plain area of South Africa; therefore, if 20,000 hectares of this area became invaded (20,000 ha is the target area to be incorporated in the proposed Agulhas National Park), the total cost would be in the region of US\$3.2 billion. (See also Chapter 10).
- The economic value of stream flow lost to invasions of black wattle in South Africa has been calculated using the opportunity-cost approach. First calculated is the value added by water over the different demand sectors (irrigation, domestic and urban use, mining and industry, the environment and afforestation). Second is the estimation of the value added by additional water where black wattles were eradicated. These estimates were adjusted to allow for evaporation and spillage of flood water (33% of additional water was assumed to be unusable), changes in the numbers of downstream water-users over the next 20 years, and the degree to which water would contribute to the economic value added in each sector (assumed to be 10% of predicted growth in economic value added). This study revealed a "net present cost" of US\$1.4 billion attributed to black wattle invasions (it should be noted that this study considered only black wattles, and not the many other invasive trees in the country).
- In the only detailed study to date on the economic benefits of biological control of invasive alien plants in South Africa, scientists have shown that bringing the red water fern (*Azolla filiculoides*) under control has yielded a return on investment of 1130:1. Red water ferns, introduced from South America, rapidly covered reservoirs and resulted in damage to water pumps, the deaths of livestock and substantial clearing costs that totalled US\$58 million. This was compared to US\$51,000 to carry out the research that led to the release of the biological control agent, which in turn brought the problem completely under control within two years of release.
- The cost to clear the alien plant invasions in South Africa is estimated to be around US\$1.2 billion, or roughly US\$60 million per year for the estimated 20 years that it will take to deal with the problem. This expense is needed to offset the considerable costs due

to invasive plants. It should be emphasised that, should the programme not be funded, the costs will grow as invasive plants spread to occupy the full extent of invasible habitats. The country is therefore forced to incur these expenses or face the worse prospect of growing impacts.

These few examples indicate that the economic consequences of invasions are vast.

Biodiversity costs

Invading alien organisms are widely regarded as the second greatest threat to biodiversity after direct habitat destruction. There is only a handful of proven cases where alien plant invasions have resulted in the extinction of species in South Africa. Nonetheless, almost 1,900 of the 3,435 plant species listed in the Red Data List for southern Africa are threatened wholly or in part by invasive alien plants; and the greatest threat to endangered dragonflies comes from invasion of riparian habitats. Similarly, transformation of landscapes by alien trees has been shown to be a significant threat to 90 bird species in Mpumalanga, almost half of them categorised as threatened endemics. Biodiversity impacts will be most keenly felt in the Cape Floral Region (CFR), which covers 90,000 km² of south-western South Africa. This area, barely 4% of the land surface of southern Africa, contains 45% of the subcontinent's plant species, some 8,600 species of flowering plants and ferns, of which almost 70% (5,850 species) are endemic. Almost one third of the CFR has already been lost to urbanisation, agriculture and forestry, and the remaining areas (mainly in the mountains) are under severe threat from invading alien plants. In a scenario of limited or no funding for the control of invading alien plants, the prognosis for the future of this floral kingdom is grim.

Alien plants spread as a result of regular disturbance in the form of fires, as well as increasing levels of agriculture, road building, forestry and development. While spread rates are not fully understood, there are plenty of examples that illustrate the extent to which areas have become

invaded. Indications are that southern Africa could lose almost a quarter of its plant species due to alien plant invasion. Clearly, any programmes that reduce the extent of invasions will have large benefits for biodiversity, even if these are not the primary reason for the interventions.

THE HISTORY OF EFFORTS TO CONTROL INVASIVE ALIEN PLANTS

The realisation that invasive alien plants pose serious threats to the ecology of South Africa is not new. Early botanists, including Peter MacOwan (in 1888), and Rudolf Marloth (in 1908) raised concerns about the potential for introduced plants to replace natural vegetation, with detrimental consequences. Despite these warnings, the problem only became widely recognised as serious during the later part of the 20th century. When control efforts started in the second half of the 20th century, they were made for reasons of conserving natural vegetation, and not for any economic reasons.

Initial attempts to control invasive plants were at best uncoordinated and erratic, and did little to stem their spread. Although few campaigns were adequately documented, the existing evidence shows that poor understanding of the ecology of invasive species, as well as a lack of subsequent follow-through after clearing, led to much wasted effort and money. The early, erratic control efforts were replaced later by coordinated control programmes country-wide in the 1970s and 1980s. At the same time, considerable efforts were put into research, in order to develop sound, scientifically-based control options. At one stage, it appeared that the problem would be brought under control.

Sadly, the momentum of the integrated control programmes was lost in the late 1980s. Increasing demands on government spending in a beleaguered South Africa under economic sanctions led to funding cutbacks and a loss of momentum, despite the capacity that had been built to deal with the programme. Research programmes also suffered cutbacks, and the net result was that the substantial public investment in the control of alien plants in

mountain catchment areas was invalidated. Alien plants again began to re-invade cleared areas.

WATER USE BY INVASIVE ALIEN PLANTS— A HISTORY OF APPRECIATION OF THE PROBLEM

The effect of alien plants on water yield was not always seen as a major impact of plant invasion, although it had been recognised at an early stage. In 1945, the pioneer of forest hydrology in South Africa, Professor C.L. Wicht, identified invasive alien plants as “one of the greatest, if not the greatest, threats to Cape vegetation”. This view was based on the detrimental effects of invasive alien plants on the native flora and biodiversity although he did recognise that “the effect on water supply will depend mainly on the extent to which loss of moisture is increased, . . . at present an unknown quantity”. Currently, most evidence for water use by alien plants in South Africa arises from the efforts of the catchment research programme of the former South African Forestry Research Institute, and its successor, the Council for Scientific and Industrial Research (CSIR), Division of Forest Science and Technology. This programme had its beginning at Jonkershoek, where Prof. C.L. Wicht established world-renowned hydrological experiments. His work, and that of his successors, on the effects of afforestation laid a clear basis for calculating the effects of alien plants on water supplies. By 1977, it was clear that invasions of catchment areas by alien trees would probably result in reductions of 350 mm of run-off per year (expressed as rainfall equivalent), based on the results of catchment experiments at Jonkershoek.

These catchments have an average annual rainfall of about 1,500 mm, of which about 600 mm reaches the streams; the rest either evaporates or is used by the natural vegetation. Changing natural vegetation from low shrublands to tall woodlands through afforestation or invasion will increase this use by 350 mm, leaving only 250 mm for the streams. It was concluded that “extensive invasion of the Cape mountains is therefore very likely to have a serious impact on regional water supplies”. Although concerns over the impacts of invasions on water supplies were published in a number of scientific publications,

the problem was not appreciated in the influential circles of government decision-makers. Clearly something had to be done.

THE CONCEPTION OF THE *WORKING FOR WATER* PROGRAMME AND ITS SUBSEQUENT GROWTH

In 1992 a government-funded, cooperative research initiative was rounded off with the publication of a book on the ecology of the fynbos biome. In this publication the consequences of declining management funding were expressed in terms of increases in invasive plants and decreases in water supply. These predictions were again based on the results of catchment experiments at Jonkershoek. It was pointed out that the declines in water yield resulting from unchecked invasions of the catchment areas would be disastrous for the water supplies to cities, industries and agriculture.

These dire predictions prompted the Department of Environment Affairs to fund a project aimed at determining the true effects of alien plants on water resources in the region. With advances in computer technology, and a good understanding of the basic ecological dynamics of the area, it proved possible to develop a computer model to simulate the growth, spread and water use of alien plants in a fire-prone landscape. The results were convincing. Invasive plants would increase in density and extent over the next half century, resulting in reductions in stream flow of between 30 and 60%.

The predictions of serious water loss came at a time when South Africa had just elected its first democratic government. This single event of 1994 was arguably the biggest turning point in the country's history. It was accompanied by newfound optimism, and a willingness to accept change in a range of approaches and activities. It also proved to be a key factor in mainstreaming biodiversity, as it was against this background that scientists were able to approach politicians with proposals for new programmes that would otherwise not have been entertained.

The scientific community formed a special working group to produce a slide show to illustrate the problem and to mobilise additional funding. The original brief of the working group was simply to produce a slide show for use by anyone

Box 2.1. The catalyst —research, synthesis and communication of scientific knowledge to decision-makers

The communication of the severe impacts which invasive alien plants have on water resources was key to the initiation of the *Working for Water* Programme. The problem had been recognised for some time by scientists but was not widely understood. Ecologists, hydrologists, resource economists and engineers worked together in an interdisciplinary analysis of the problem. These implications were then effectively communicated to key and influential decision-makers.

The first aim was realised through the analysis of the problem, and the publication of the results in respected scientific journals. Studies showed, for example, that in the case of the proposed Skuifraam Dam (the preferred next option to supply water to Cape Town), water can be delivered at a cost of 54 and 57 cents per kilolitre (kl) with and without the management of alien plants, indicating that such management is cost-effective. Clearing invasive plants from the existing Theewaterskloof catchment would deliver additional water at only 10.5% of the cost of delivery from the new Skuifraam scheme (unit reference values of 6 and 57 cents per kl respectively).

The second aim was achieved through a targeted presentation to key politicians. The benefits were explained without using jargon or delving into the scientific complexities of the issue. Instead, use was made of attractive slides to make the important points, with immediate success. This simplified means of communication contrasted with the lack of progress made through scientific publication.

who wanted to advertise the problem (a so-called “road show”) but it was soon realised that a more strategic approach was needed. A conscious decision was made to target the national Minister of Water Affairs and the provincial minister responsible for conservation in the Western Cape Province. The slide show emphasised not only the threats of invasive alien plants to water resources, and therefore to economic growth and empowerment, but also the opportunity that a clearing programme would offer for job creation to alleviate the pressing unemployment problems in the country. The presentation was given on the 2nd of June 1995, and stimulated the Minister of Water Affairs (Professor Kader Asmal) to initiate a renewed campaign to control alien invasive plants in October 1995. This programme became known as the “*Working for Water*” Programme. The name captures the essence of the reasons for its support funding—to conserve water resources and to create jobs.

The programme began with a budget of US\$4 million to cover its first six months of operation. Under the guidance of a small, but dedicated and passionate, management team, the programme was

able to spend the budget within the allocated time, creating 6,163 jobs, and clearing 33,229 ha of infestations in 10 projects spread over six of the country’s nine provinces. The management team made a considered decision to establish a communications project within the programme, tasked with ensuring that the *Working for Water* Programme gained maximum exposure from the programme’s inception. The communications programme was instrumental in highlighting the achievements of *Working for Water* and raising its profile in a society keen to see concrete results from the newly-elected democratic government. This initial success guaranteed further funding, including funding from local government, the private sector, foreign aid and a significant grant from the government’s poverty-relief allocation, aimed at creating employment amongst the poorest of the poor. The budget rose to US\$11.5 million in 1996/97, and to US\$40 million in 1997/98, and the cleared areas increased to 71,289 ha and 220,884 ha in those years respectively. The 1999/2000 annual report put the total expenditure of the programme at over US\$120 million over five years, and the employment levels at 20,999 jobs.

Box 2.2. A key turning point: Initial funding for the *Working for Water* Programme

Professor Kader Asmal, Minister of Water Affairs and Forestry in the Mandela cabinet after 1994 was quick to grasp the development potential of the *Working for Water* project, and applied to his cabinet colleague (Jay Naidoo) for funding.

To quote Professor Asmal “Reinforced by the cogent arguments put forward by WWF-SA-funded individuals, I approached my dear colleague, Jay Naidoo, for funding. Jay was Minister without Portfolio in the first democratic cabinet of South Africa, and responsible for the Reconstruction and Development Programme. Minister Trevor Manuel had yet to take control of the finances of our country. I approached Jay Naidoo for initial funding of R25 million without a business plan. Jay is a wise person, and he saw the value of what was being proposed”.

The granting of the initial funding was based on trust and friendship between two cabinet colleagues with a history in the struggle for democracy in South Africa. It was a key turning point in the establishment of the *Working for Water* Programme.

FACTORS WHICH LED TO THE SUCCESS OF THE *WORKING FOR WATER* PROGRAMME

The *Working for Water* Programme is generally viewed as a highly successful initiative, both nationally and internationally. It addresses a serious environmental problem, and creates many employment and training opportunities. It was implemented at a time when many other initiatives of the new government were bogged down in bureaucracy and slow to establish. A number of factors contributed to the success of the *Working for Water* Programme including:

A unique opportunity: The opportunity offered by the new democratic government, and the climate of acceptance of change, was a critically important factor enabling the initiation of the *Working for Water* Programme. Under different circumstances, it is unlikely that it would have been possible to secure the necessary resources.

Leveraging political support: Cabinet-level support and political backing was key to the success of the programme. The backing arose from the decision to place a dedicated, persuasive and diligent person close to an influential and visionary cabinet minister (Professor Kader Asmal). The appointment to this extraordinary post was made possible through a grant from World Wide Fund

for Nature-South Africa (WWF-SA) to cover the appointee’s salary. Without high-level political support, it is doubtful whether the programme would have been able to command its subsequent status.

Emphasising the emergent benefits: A significant factor was the potential for job creation in an environment where unemployment is extremely high. The programme would have had significant benefits even with limited job creation, but the fact that it was able to create many jobs, and therefore directly affect the lives of many people, was a key factor in securing funding and sustaining political support.

Taking a novel approach: The idea of linking an invasive plant clearance programme to job creation, and aligning it with the new government’s Reconstruction and Development Programme, provided a new approach that made the package eminently saleable. Many people, especially environmentalists, were acutely aware of the problem of invasive plants, and the need to deal with the problem, but were unable to make an impression until this new approach was adopted.

Putting a dedicated team together: A core of visionary, dedicated people made the programme work. With the new funding, these dedicated conservationists, who included the management and communications team, the project managers, and

employees of several conservation agencies, were prepared to put in additional effort to initiate the programme and ensure its progress.

Publicising the initial successes: The dissemination of information about the *Working for Water* Programme was an important dimension and a key factor in the programme's success. Informative promotional brochures and newsletters were produced, "open days" were held, and valuable contacts were forged with key reporters who ensured that articles were carried in influential national and local newspapers. This "marketing" ensured significant awareness of the problem, and of the unfolding solution, and this, in turn, resulted in an ability to secure more funding from a range of sources.

Avoiding bureaucracy: The initiation of the *Working for Water* Programme outside existing structures as a special activity, accountable to the minister, helped to provide a measure of freedom from bureaucracy and procedures.

All of the factors listed above contributed to the programme's success. If any one of them had not been in place, the outcome could have been quite different. Some were a result of the unique set of circumstances in the country at the time. Nevertheless the *Working for Water* Programme does provide lessons for similar initiatives elsewhere in the world.

ACHIEVEMENTS OF THE WORKING FOR WATER PROGRAMME

The *Working for Water* Programme has achieved much in the first few years of its existence (Table 2.2). The major achievements encompass an array of fields: the conservation of biodiversity, as well as impacts in the political, economic, legislative, awareness, research and social fields. The programme has been particularly successful in diversifying its interests—see below.

Conserving biodiversity: The clearing of large areas infested by invasive alien plants is a tangible achievement of the programme (Table 2.2). Cape Town's Peninsula provides a good illustration. This area was severely infested with alien plants, but a significant proportion has been cleared over the past five years, heralding the rescue of one of the world's hottest hotspots of biodiversity, and creat-

ing highly visible results in, and around, a densely populated area.

Gaining political profile: The programme was initiated shortly after the first democratic election of a new government in South Africa. The new government was keen to produce success stories rapidly, but was hampered by the inability, inherent in large, bureaucratic government departments, to realign their priorities quickly enough. As a result, many well-intentioned schemes became bogged down and failed to deliver. The *Working for Water* Programme, on the other hand, employed people immediately, creating visible results; in this way it provided a refreshing success story to counter criticisms that the new government was not delivering on its promises. The programme has also become an international role model, further raising its political profile. Programme members have participated in international initiatives to deal with invasive alien species, including bi-national cooperation with the USA and Australia, the Global Invasive Species Programme (GISP), and the IUCN Invasive Species Specialist Group.

Delivering economic benefits: The programme has created significant employment opportunities amongst the poorest of the poor, and made a substantial contribution to combating unemployment. More than 60% of the total budget found its way into the pockets of workers. This is a significant achievement. Through a labour-intensive approach, targeting the poorest of the poor, the programme has had a significant impact on the redistribution of wealth. A study based on the demand created by the programme in 1996/97 showed that the household income of the poorest categories of employees would increase by more than 3% while that of the richest households would decrease by less than 0.1%.

Creating environmental awareness: The *Working for Water* Programme has created a high degree of public awareness of the value of natural ecosystems, and raised the profile of the problem of invasive alien weeds. The programme has won 25 national and international awards since it began in 1995. It has provided participating conservation agencies with opportunities to transform their personnel through the recruitment of staff from historically disadvantaged groups. This has enabled a broadening of understanding of issues

Table 2.2. Progress and achievements of the *Working for Water* Programme during the first 6 years

Year	1995	1996	1997	1998	1999	2000
Number of provinces	6	9	9	9	9	9
Total number of projects	10	38	239	No data	No data	313
Budget (Rand)	26,773	80,005	245,291	248,891	222,913	300,975
Area cleared (ha)	33,229	71,289	220,884	107,565	112,333	170,660
Area treated in follow-up (ha)	0	12,046	33,229	128,648	121,310	183,736
Number of people employed	6,686	8,386	42,059	23,662	20,999	23,998
Other achievements	Successful initiation	Green Trust Award (best conservation project of 1996); two other awards.	Significant increase in funding from poverty-relief fund. 3 more awards	Diversified activities, expansion of "secondary industries". Changeover from direct employment of labour to contractors.	Joint USA–South Africa symposium: management practices for alien plants.	Promulgation of new weed control regulations; initiation of a programme on wetland rehabilitation

relating to the conservation of biodiversity (see Box 2.3). An important impact in poor communities is the general increase in environmental knowledge and awareness from training programmes. The environmental spin-offs have the potential to help keep rural areas clear of invasive alien plants, while encouraging sustainable use of natural resources.

Improving legislation: The programme has aided in the revision of legislation such as the Conservation of Agricultural Resources Act, so as to deal with different categories of invasive plants. This includes novel approaches for allowing plants with commercial value to be cultivated provided that the landowners accept responsibility for clearing costs in surrounding areas; and phasing out popular ornamental invasives through banning further sales from nurseries.

Stimulating research: To provide a sound scientific basis, the programme funded a small, but very focused, research programme to investigate the benefits of clearing invasives. Results have been published in respected international journals, providing credible evidence in support of applications for further funding. In addition, *Working for Water* invested significant amounts into research on the biological control of invasive plants, a field in which South Africa is a world leader. Finally, the profile of the programme, and involvement of academics, has stimulated research interest in invasives, resulting in many students choosing alien plant control and ecology as topics for their post-graduate studies.

Enhancing social benefits: As well as concentrating on alien plant control using paid labour,

Box 2.3. Contributions to transformation—perceptions of participants.

The *Working for Water* Programme has provided many opportunities for self development for people from previously disadvantaged backgrounds, as well as opportunities for expanding understanding of biodiversity issues. The experiences of Nosipho Jezile and Desmond Stevens illustrate this impact.

Ms Nosipho Jezile is the regional programme leader for the Eastern Cape projects. Before she joined the programme she practised as a junior scientist (1994–1997) at Somchem—a government-owned explosives manufacturer. As a student she was actively involved with resistance politics and the promotion of gender equity at the University of the Western Cape.

Ms Jezile explains: “I became aware of *Working for Water* through the programme’s publicity campaign and through word-of-mouth. What intrigued me was the challenge of venturing into the field of environmental conservation after I worked in the “destructive” field of explosives. I knew very little of biodiversity even though I was trained as a natural scientist.”

Ms Jezile points to the mindset change of poor communities living within the proximity of nature reserves as an example of changing perceptions. The local communities at Dwesa Nature Reserve changed from destructive use of resources to a controlled system of use. At the same time, the community has developed pride and a positive outlook towards conservation. Ms Jezile comments further: “A classical example for me was being able to convert a member of the executive committee of the Eastern Cape parliament. I was able to convince him of the importance of biodiversity relative to water supply infrastructure, which is a government priority in rural areas. He developed an understanding of the positive impacts of biodiversity on the ecotourism potential of the Eastern Cape Province”.

Mr Desmond Stevens is currently General Manager: Operations Support Services with the Western Cape Nature Conservation Board. He was employed by the Provincial Department of Economic Affairs in 1995, where his activities were directed towards building institutional capacity in communities and government departments, with an aim to implementing RDP projects. His unit was invited in late September 1995 to attend a meeting to discuss the implementation of local alien invasive plant clearing projects. Mr Stevens comments: “At the time I was very reluctant to attend, because our experience was these meetings were always alienating. They always had middle-aged white males providing reasons why government cannot do certain things. Furthermore I had no clue about alien trees and their impact on the environment—as a matter of fact I did not care either. I could not understand why the government wanted to remove trees that provide for the greening of townships. For most of the meeting I did not pay much attention, but two particular statements of a certain Mr. Marais at the time caught my attention, when he talked about jobs and saving of water. Of course I did not know that this Marais fellow would rope me in to such an extent that both professional and personal life have become synonymous with “killing” invasive alien trees. I developed such an interest in the natural environment and the protection of our heritage that I started an environmental forum in our location. I can also now hold my own in debates with very experienced conservationists”. Mr Stevens states that the whole experience expanded his horizons, and resulted in his becoming involved in formal structures of the ANC’s environmental desk.

Working for Water developed complementary programmes, including a range of secondary industries, training courses to create opportunities for contractors and the development of small business opportunities, and employment schemes for

ex-offenders. The development of a “secondary industries” component, utilising the products of clearing has been coupled with small business training and development, enabling workers to exit the programme and run businesses on their own.

Among the social development interventions are programmes such as the childcare initiative to enable women to engage in labour for household income. Women are the most vulnerable social category in most poor communities, and most children in these poor communities do not get opportunities for an early start in pre-school education. The programme also employs social scientists working with communities, and especially youths, to raise awareness on HIV/AIDS and how to avoid infection. *Working for Water* linked up with the National Population Unit (NPU), the United Nations Population Fund (UNFPA), and the Planned Parenthood Association of South Africa (PPASA), to set up a reproductive health programme, targeting workers in poor communities to change sexual behaviour and increase use of contraceptives.

PROBLEMS EXPERIENCED, AND LESSONS IN AVOIDANCE

It would be unreasonable to expect that a programme of this nature would be without problems. A frank analysis should provide lessons for future initiatives.

Ensuring adequate management: The rapid growth of the programme led to management challenges, especially as the new, and independent, organisation had no corporate culture or history or experience to draw upon. The programme focused on delivery, and as a result, staff struggled with issues of immediate implementation. Not enough effort was put into the development of a strategy, or into medium-term planning. This led to some significant inefficiencies. Problematic projects were characterised by poor management practices, particularly those initiated without any advance planning. Inappropriate, or wrong, methods were sometimes used to deal with invasive plant species. Stands were sometimes cleared with no, or insufficient, follow-up, exacerbating the problems rather than improving the situation. In a few cases, valuable stands of indigenous trees were felled. Much of this could have been avoided by slower growth of the programme, but delivery in terms of job creation was seen as an over-riding imperative. An adequate investment in experienced management could serve to avoid some of these problems.

Planning for effective political/social transformation: The strong need to redress the legacies of apartheid had an effect on the programme. The need to satisfy political goals often dominated decisions on where to initiate projects. As a result projects did not necessarily target high biodiversity areas and a number of projects were undertaken in non-priority areas, or targeted non-priority species. Projects were initiated in many areas to demonstrate that jobs could be created quickly. The need to direct poverty-relief funding to the poorest areas often meant that the most infested areas did not receive adequate funding. More could have been achieved (in terms of biodiversity conservation) if projects had focused on highly-invaded hotspots of biodiversity.

Investing in training: The *Working for Water* Programme, in line with government policy, also had a high-priority focus on affirmative action and social transformation. The imperative to draw staff from previously disadvantaged groups (where skills and experience were rare due to past inequities in education and employment policies) exacerbated the management weaknesses and led to further inefficiencies. Strong discipline was often lacking in the projects, a reflection of inadequate training, lack of structures, and even various forms of intimidation. This led to inefficiency and low productivity in some cases. Such problems could be avoided in future by an early and adequate investment in training, even if initial operations are delayed slightly.

Ensuring adequate security of funding: In the first few years of the programme, funds were allocated late in the financial year, and the resultant pressure to spend them (especially poverty-relief funds) placed significant stress on already over-committed staff and resources. In addition, the annual allocations ended at the completion of the financial year, and there was a significant delay before the next round of funding was approved. This stop-start nature of the funding meant that work was stopped and re-started later, with negative consequences for the clearing programmes and the well-being of workers. The lesson here is that ecological projects need to obtain multi-year, secure funding to be more effective.

Avoiding conflicts of interest: Significant conflicts of interest have developed between the

programme and organisations or interest groupings that either use invasive alien plants or oppose their clearing. Conflict arises where invasive species underpin important commercial activities, such as plantation forestry; where they provide firewood (many *Acacia* species) or food (*Opuntia* species), fodder (*Prosopis* species), or nectar for bees (*Eucalyptus* species); and where they have aesthetic or utilitarian value (ornamentals, shade trees or windbreaks). Early consultations should be undertaken to seek partnerships and mutually acceptable solutions.

Ensuring wider buy-in: The programme was driven by a relatively small group of people, and there was understandable reluctance to grasp some of this enthusiasm more widely amongst some of the programme's key partners and implementing agents. In some instances, this equated to a "not invented here" syndrome. In addition, the solutions to water resource management through manipulating vegetation cover had to be adopted by a department staffed largely by engineers not accustomed to, or trained in, ecological solutions.

FUTURE CHALLENGES

Arguably the largest environmental programme in Africa today, the *Working for Water* Programme has had remarkable success but still faces some key challenges.

Avoiding bureaucracy: As a government-run programme, *Working for Water* faces the danger of becoming bogged down by bureaucracy. Its initial success was in part due to its location outside of the normal line functions of a government department. Current thinking is that the programme should be moved out of a line-function department to become an independent parastatal organisation. Achieving a smooth transition to this status will be a significant challenge.

Diversifying sources of funding: The programme has been remarkably successful in attracting significant funding, mainly from government, but also from the private sector. However, the vast majority of funding originates from central government, and is vulnerable to cut-backs. Sources of funding need to be diversified to include a wider range of funders, and different means of raising

funds. These include funds raised from users of water from alien-free catchment areas such as local municipal authorities, from levies (or voluntary donations) from growers of plantations of invasive plants, or from foreign aid. The projected cost of clearing is large (around US\$1.2 billion). This cost could be reduced in one of two ways: through the effective implementation of biological control solutions, and through the use of material or resources derived from clearing operations, i.e. developing "secondary industries". Both challenges require focused development if they are to succeed.

Developing a focus on professional management: It is essential that clear plans be in place before any control activities are initiated, in order to ensure that managers fully understand the consequences for long-term follow-up, and are in a position to anticipate and meet these demands. The adaptation of best practices to local conditions needs to be completed before medium and long-term planning approaches can be put in place. The importance of careful and detailed long-term planning for the success of the *Working for Water* Programme cannot be over-emphasised.

Developing adequate capacity to underpin the programme: The development of sufficient capacity to underpin a professionally-run programme is a significant challenge. Large numbers of people need to be trained in basic alien plant management skills, in ecology and ecosystem management, and in business and personnel management, at all levels. At the same time, the need for political/social transformation will remain an imperative. The means must be found to transfer existing knowledge to large numbers of people, through formal and on-the-job training, if the programme is to become an effective vehicle for this transformation.

Developing a stable environment: Effective alien plant control is a long-term undertaking that requires follow-up at regular intervals over several years. The programme must become stable enough to be able to take a medium- to long-term perspective on the work that it does, over and above the current focus on short-term goals. Depending on the species, felling of adult plants requires regular follow-up for several years to clear emerging seedlings. Therefore, initial clearing should only be undertaken if there is sufficient certainty that

funding will be available to cover the necessary follow-up over the next 10 years.

Maintaining a balance between objectives: If the programme is to achieve optimal effectiveness in dealing with the threat of invasive alien plants, it will have to be able to balance the need for development in poverty-stricken rural areas with the need to clear priority infestations (which may not always be in the poorest areas). A balance also needs to be found between the need to employ qualified and experienced people, and the imperative to bring in, and train, people from previously disadvantaged backgrounds.

Resolving conflicts of interest: Some possible approaches to avoid conflict and reduce the impact of invasive alien species include: recognition of the value of a vibrant forest industry and the active management of the spread of plantation trees; provision of well-managed woodlots in areas where fuelwood is scarce, the use of non-invasive species wherever possible, or ensuring that biocontrol is introduced at the start of new agroforestry projects; the use of biocontrol to reduce the invasive potential of otherwise useful species without killing them (for example, by reducing the number of seeds they produce); early recognition of potential invaders and precautionary measures; education on the dangers and costs of invasive species; and encouragement of the use of alternative, non-invasive species for ornamental and utilitarian purposes.

Empowering people: Clearing of invasive alien plants is often in the enlightened self-interest of landowners, but the challenge lies in getting landowners to understand the benefits. Understanding will, in turn, translate into changed attitudes and behaviour. People need to take ownership of the problem, rather than waiting for the government to deal with the problem.

Developing approaches aligned with the new water law: South Africa's new water law (Box 2.4) offers a framework for dealing with activities that impact on the sustainable use of water. Programmes aimed at clearing invasive alien plants are one such activity. Because invasive alien plants use excessive amounts of water, the clearing operations will assist in the goal of maintaining an environmental reserve, as required by the law. Funding the clearing operations can form part of the water pricing

strategy. The exact mechanism by which this will be achieved is still under discussion.

CONCLUSIONS

The *Working for Water* Programme has proved to be a triple-win initiative that addresses three important aspects of sustainable development. In the first place, it seeks to address economic aspects through the creation of employment, thereby making a contribution to the equitable sharing of benefits. The avoidance of the costs of impacts associated with invasive plants (such as the need to build more dams) is another economic benefit. Secondly, social improvement is enhanced through employment opportunities targeting people from previously disadvantaged sectors of society. Finally, it makes a significant contribution to the sustainable conservation of biodiversity and the ecosystem services that diverse natural communities deliver to humans. The supply of large volumes of clean water from catchment areas covered with healthy and diverse natural vegetation has been the focus of this particular programme.

The *Working for Water* Programme has made significant progress in dealing with a major environmental problem, and it has the potential to grow and become a global role model for dealing with invasive plants. Notwithstanding its growing pains, the programme has found a reasonably successful mix in satisfying the needs for efficiency, social transformation and development. There are no obvious better examples of this in South Africa today. Moreover a solid foundation has been laid for a significant conservation and socio-economic contribution, through a combination of political vision and support, a dedicated and driven workforce, a successful social development intervention programme, and growing public awareness.

ACKNOWLEDGEMENTS

The *Working for Water* Programme owes its existence and success to many people. Dr Fred Kruger, a former student of Wicht, led and inspired invaluable research on invaded catchment area experiments at Jonkershoek. The support, vision and leadership of the Minister of Water Affairs and Forestry, Professor Kader Asmal, was critical in

Box 2.4. South Africa's new water law

South Africa's 1998 National Water Act is a pioneering effort to incorporate sustainability and international cooperation into a national approach to water law. In the initial stages of discussion, it was suggested that the new law's core objective should be "to ensure that water is available in sufficient quantity, quality, and reliability for the development and well-being of the nation." That language reflected a traditional view emphasising infrastructure investment to expand water supplies.

As the discussion continued, there was growing consensus that emphasising further expansion of supplies was probably unrealistic. South Africa was already using nearly 60 percent of its available water, compared with just 5–10 percent in countries such as Namibia and Botswana. Furthermore, South Africa's water resources were enormously influenced by climate and topography. Only one-fourth of the nation has perennial rivers, another fourth has rivers that only flow periodically, and fully half the nation has rivers that only flow after infrequent storms.

After further debate, the law's core objective was changed to "managing the quantity, quality, and reliability of the nation's water resources . . . to achieve optimum long-term, environmentally sustainable, social and economic benefit for society from their use." The new language emphasised the need to manage the resource, to manage the tension between growing demand and finite supply, and to ensure that water was used not just productively and beneficially, but optimally.

The new law specifically reserves water to meet basic human needs and to maintain ecological functions. It states that the "quantity, quality, and reliability of water required to maintain the ecological functions on which humans depend shall be reserved so that the human use of water does not individually or cumulatively compromise the long-term sustainability of aquatic and associated ecosystems." The water required to meet basic human and environmental needs is identified as "the reserve," and enjoys priority of use. Provisionally, the law allocates 25 litres/person/day to each individual for drinking, food preparation, and personal hygiene.

After water required for basic human and environmental needs is assured, the law requires that remaining water be allocated so that all people have equitable access to the resource for productive purposes and to the benefits that flow from water use, such as jobs. The new law greatly broadens local participation in water management decisions. Within an individual watershed, the responsibility for allocating water to users rests with local Catchment Management Agencies, which are expected to operate with broad participation from all interested parties.

The law also requires the Department of Water Affairs and Forestry to develop water pricing strategies, such as charges to cover the full financial costs of providing access to water, including the costs of infrastructure; a watershed management charge, which can cover the use of rivers and water bodies for both water consumption and waste disposal; and a resource conservation charge, which can be applied where a particular water use significantly affects others in the watershed. Finally, the law recognises the need to manage transboundary water resources cooperatively.

the establishment and development of the programme. The ongoing support of his successor, Ronnie Kasrils, and the Ministers for Environment Affairs and for Agriculture (Valli Moosa and Thoko Didiza), has also been crucial. Dr Guy Preston, the *Working for Water* Programme's leader, deserves special mention for his leadership and energy. He

has been supported by an able team of managers, all of whom are characterised by dedication and commitment. The World Wide Fund for Nature (South Africa) funded critical interventions (including the appointment of Dr Preston as programme leader) that were catalytic to the establishment of the programme. Important implementing agents

supplied the bulk of the capacity needed to initiate the programme. These included South African National Parks, the Western Cape Nature Conservation Board, the KwaZulu/Natal Wildlife Service, Rand Water, the former Municipality of Cape Town, the Forest Owners Association, the Council for Scientific and Industrial Research (CSIR) and the Plant Protection Research Institute. Manyaka, Greyling and Meiring ran an exceptionally successful communications project that raised the profile of the programme. Over 40,000 people, including managers, field supervisors, and workers have contributed to the programme's success—a debt of gratitude is due to each of them.

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FURTHER READING

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Wildlife Utilisation: Its Role in Fostering Biodiversity Conservation in KwaZulu-Natal

P. S. Goodman, B. James and L. Carlisle

SUMMARY

In common with many landscapes in the world, those in South Africa have been colonised and transformed to the detriment of biodiversity. By the end of the 19th century, the destruction of the large mammal fauna through over-hunting and alien disease had advanced so far that the colonial rulers enacted legislation for the protection of wildlife. This included the establishment of the first formal protected areas in the Colonies of Natal and Zululand. Today, close to 9% of the province of KwaZulu-Natal (the amalgamation of the former province of Natal and the KwaZulu “homeland”) is under formal protection. From the mid-1950s onwards, areas outside the protected area network also became repositories of wildlife and biodiversity. Set in the north-eastern region of KwaZulu-Natal, this is the story of how surplus wild animals from formal conserved protected areas were made available to private land owners for re-establishment of wildlife populations on their properties, and how this sparked the growth of the wildlife industry in the region.

With the support of the former Natal Parks Board, through extension services for wildlife management and a supply of game at subsidised prices, the industry grew to cover 167,394 ha or 6.7% of the region. This growth in the wildlife industry has replaced conventional agricultural practices, primarily domestic stock farming. Apart from the incentives provided by the provincial wildlife department, this change has been brought about by the growing local and international demand for nature-based experiences (game viewing and hunting); a supportive policy and legal framework; a normalisation of the agricultural environment and withdrawal of perverse state subsidies; the willingness of business (both local

and international) to invest in land under wildlife; and the comparative advantage of wildlife over cattle operations in a semi-arid environment. This case study clearly demonstrates how biodiversity has been mainstreamed into a thriving local economy with clear benefits for the conservation of biodiversity in the long term.

INTRODUCTION

After nearly three centuries of transformation of the natural landscape for living space, food and raw materials to meet human needs, the biodiversity of South Africa is beginning to benefit from a new form of land use, based on the consumptive and non-consumptive use of wildlife. Game ranching is not only conserving biodiversity more effectively but is also yielding greater economic returns and employment opportunities than traditional uses such as livestock ranching and agriculture. This chapter describes how this came about, identifying the factors that underpinned this transition and, consequently integrated the sustainable use of biodiversity into rural land use practices. The study area is north-eastern KwaZulu-Natal, but a similar transition is evident in other provinces of South Africa, notably in the Eastern Cape and Limpopo Province (formerly named Northern Province). At present it is estimated there are approximately 9,000 properties associated with the wildlife utilisation sector in South Africa, covering 13% of the total land area. This compares to only 5% covered by statutory or formal protected areas (i.e. conservation areas formally protected by national, provincial and local level legislation). Corresponding data for KwaZulu-Natal Province are 8.4% and 2.5%. The growth in the wildlife utilisation sector on privately-owned land is growing at a rapid rate both in Kwazulu-Natal and other parts of southern Africa.

ECOLOGICAL AND HISTORICAL BACKGROUND OF NORTH-EASTERN KWAZULU-NATAL

Ecological background

KwaZulu-Natal, comprising an area of 94,860 km², is a province with a wide diversity of landscapes and vegetation communities. These range from the

coastal plains with subtropical forests, mesic grassland, sandy bushveld and sandforest in the east, to savanna in semi-arid river basins, and also montane (temperate) forests, grasslands and alpine heath on its high lying western boundary. The province is an important region for subtropical agriculture and plantation forestry, and its mountainous regions are a source of much of the country's water. It is also the most highly populated province in South Africa. Some 34% of the province has been transformed; the major agents of transformation are commercial sugar cane plantations (4.4%), commercial tree plantations (6.8%) and a diverse array of subsistence agricultural activities (8.8%).

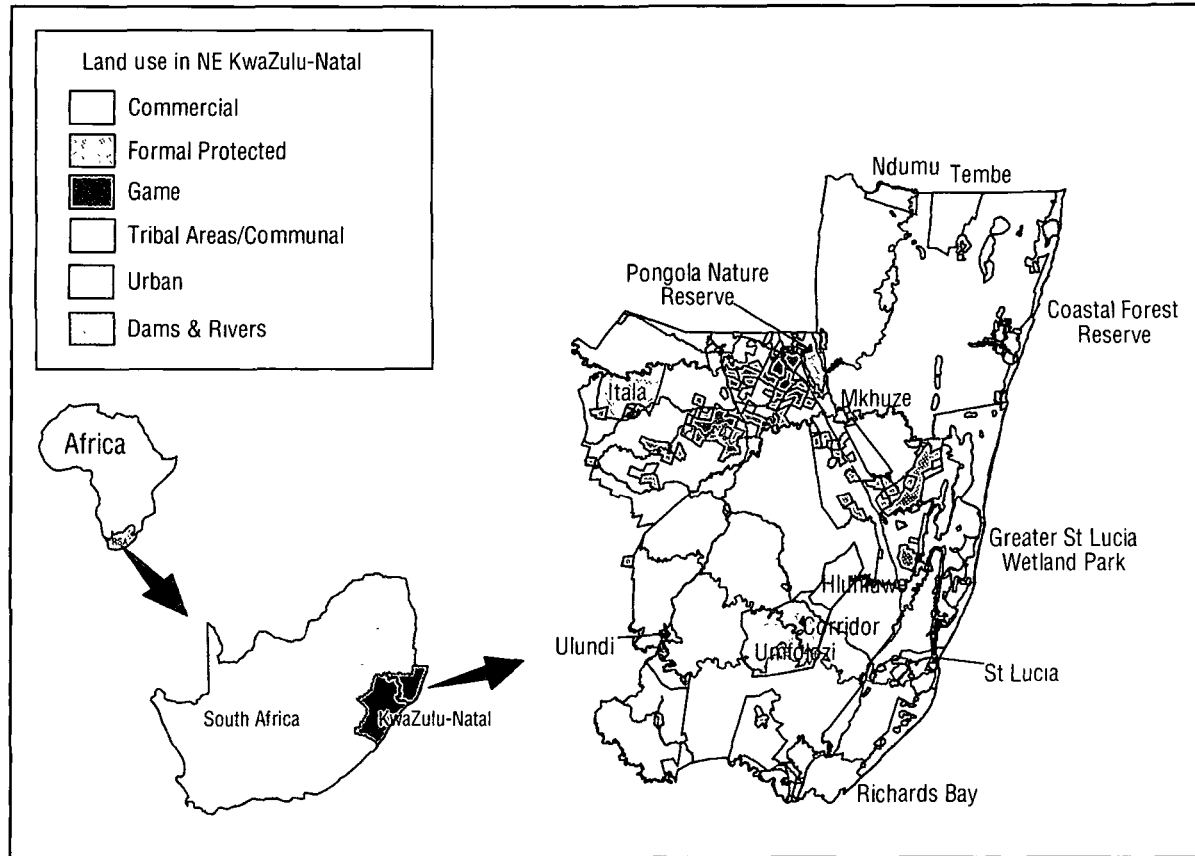
Our study area covers north-eastern KwaZulu-Natal and encompasses 24,960 km² or 26.3% of the province area (Figure 3.1). It comprises a broad, undulating coastal plain in the east which rises gradually to a 1200 m plateau in the west. The climate is sub-tropical; rainfall is highly seasonal, with 77% of annual rain falling in the hot summer season, between September and March. Rainfall varies from 1100 to 1200 mm per year along the coast, to 600 mm in the centre of the study area, and then rises to 1000 mm on the western plateau. Most of the wildlife utilisation sector is based in the central region where, owing to the torrid summer, conditions may be regarded as semi-arid.

This is an important area for biodiversity, making up a large proportion of the Maputaland Centre of Endemism for plants, and is undoubtedly the richest area for birds in South Africa. Prior to their extirpation, the area also boasted large herds of elephant, hippopotamus, rhino, buffalo, wildebeest, zebra, impala, nyala, waterbuck and reedbuck. The high biodiversity in the region is explained largely by its intermediate position along the tropical to sub-tropical gradient, a geological history spanning many millions of years, a diversity of geological substrata, and a varied climate.

Historical background

The original inhabitants of Zululand and Maputaland were hunter-gatherers, who lived with little impact on the rich plant and wildlife resources of the region. By about 200 A.D. communities of cultivators and livestock-keepers with

Figure 3.1. Location of the study area, north-eastern KwaZulu-Natal, with major forms of land use in the year 2000



knowledge of smelting and smithing had reached this area as part of a southerly migration down the eastern side of the continent. These people, who were to become the direct ancestors of today's Zulu-speaking communities, gradually expanded, displacing the original inhabitants to the environmentally harsh, mountainous terrain on the western escarpment.

Initially, settlements were small with few livestock, and were restricted to areas free from *Nagana*, the local Zulu name given to sleeping sickness or *Trypanosomiasis*, an indigenous disease of domestic livestock and humans which is harboured by wildlife and transmitted by the tsetse fly. As settlements expanded, cultivation of crops necessitated the clearing of natural vegetation. Although the people were largely sedentary, their practice of shifting cultivation resulted in the de-

velopment of extensive areas of secondary grassland and woodland. These habitats were then maintained by regular fires which also promoted new forage for livestock. Iron smelting also required large quantities of timber, especially the harder woods like umThombothi (*Spirostachys africana*); consequently, areas adjacent to smelting sites were cleared. As a result of these activities, parts of the study area may have changed from closed woodland and forest to more open woodland and grassland.

The expanding cattle population became an important cultural component of the emerging Zulu culture in the region, but epidemics of lung sickness in the 1860s and early 1870s decimated the Zulu herds. Hunting was an important part of Zulu culture and the people had many uses for wild animals. The impact of this hunting outside of the

cattle-grazing radius of the homestead was, in the long term, low and probably sustainable, since it was controlled by the king and his subordinate chiefs.

Before 1879, the only permanent residents of European origin in the study area were missionaries, storekeepers and traders, who hunted for subsistence, and some itinerant hunters. During Shaka's rule (1819–1828), fairly tight control was exercised over the hunters, but later, under Mpande (1840–1872), this control was all but lost. From the 1840s on, a lively trade in ivory, rhino horns, buffalo and other hides was conducted between local Zulu and Thonga hunters and the visiting hunter-traders. Within 50 years of the first permanent settlement of Europeans at Port Natal (Durban) in 1824, and its development as an active trading port, those species most sought after by hunters and traders, including the white rhino, were all but extirpated. The situation was exacerbated by a rinderpest endemic between 1895 and 1897 during which many animals, both wild and domestic, perished. Kudu, reedbuck and bushbuck were affected, but not to the same extent as buffalo. It was estimated that 746,000 head of cattle died or were destroyed throughout South Africa, and 80% of the cattle and game in the study area succumbed.

From the 1860s, conservation awareness in the colonies in Africa gained ground, along with the establishment of formally proclaimed "game reserves". Ironically, it was the British sportsmen-hunters and officials in the Colony of Natal who were the first to begin campaigning for the protection of game, largely as a result of the rapid decline of certain species in the region. A fledgling conservation movement lobbied for the enactment of the first legislation to protect wildlife in the colony in 1866 and 1884. These laws were extended to Zululand and Thongaland (Maputaland) after the destruction of the Zulu Kingdom in 1879, and the annexation of Zululand as a British colony in 1887. In 1895 the first Zululand game reserves (Umfolozi Junction Reserve, Hluhluwe Valley Reserve, St Lucia Reserve and Mdletshe Reserve), were established (Figure 3.1). Previously, in 1894, the Pongola Game Reserve was proclaimed by the government of the Zuid-Afrikaanse Republiek on the old Transvaal side of the Pongola River. Other

significant protected areas proclaimed in the region include Mkhuze Game Reserve in 1912 and Itala Game Reserve in 1972.

From the early 1900s, the remaining game populations outside protected areas continued to be drastically reduced by concession hunters and farmers. Nevertheless, game populations in the more remote areas were recovering from the rinderpest epidemic and expanding their range. At the same time sleeping sickness increased in the advancing livestock industry. Political pressure from farmers resulted in the initiation of game eradication programmes in the region; in 1917 alone, 25,000 wildebeest were shot in an effort to eradicate the disease. Further game eradication programmes were implemented in the study area, mainly in and around Umfolozi and Mkhuze Game Reserves and on the Makhatini Flats. Consequently, many thousands of indigenous herbivores were destroyed. From 1931 until 1950, extensive game eradication programmes (both inside and outside of protected areas), trapping of tsetse flies and later aerial spraying of DDT, eliminated the tsetse fly over large areas of its former range. This tsetse fly eradication programme, often referred to as the Nagana Campaign, had a major effect on the biodiversity of the region, with both protected areas and the surrounding countryside being severely depleted of wildlife. Subsequently, control of the game reserves was handed back to the Zululand Game Reserves and Parks Advisory Service (established in 1939) who, together with the Department of Agriculture, controlled the protected areas in the study area until the establishment of the Natal Parks, Game and Fish Preservation Board in 1947 (later the Natal Parks Board).

BIRTH AND GROWTH OF THE WILDLIFE UTILISATION SECTOR

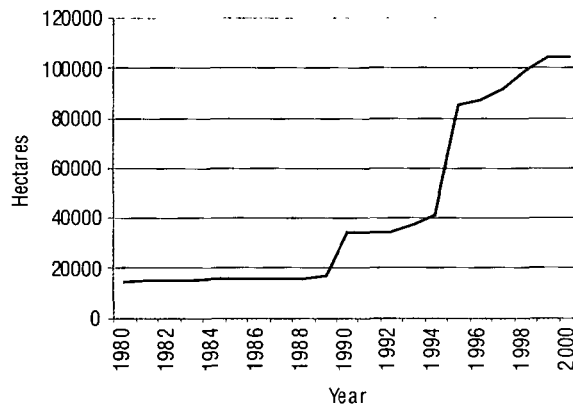
The first protected area managers in the study area had a "game keeper and protectionist mentality". Management involved a high degree of intervention, including destruction of predators ("vermin") and introduction to the reserves of alien species such as red deer, English pheasants and jacaranda trees (*Jacaranda mimusifolia*). Moreover, landowners strongly resisted conservation efforts in their local areas, where hunting for the production

of biltong (dried and salted meat) was (and still is to some extent) an important activity amongst many white farmers. Protectionist management approaches also denied access to wildlife and natural resources to neighbouring Zulu and Thonga communities, something that is still resented to this day.

With the practice of strict protective management in statutory protected areas, the remaining wildlife populations exploded. This coincided with the onset of a prolonged drought in the late 1950s. It was not long before game managers realised that in the absence of predators, the 'over population' of wildlife could cause severe environmental damage. The situation was particularly severe in Mkhuze Game Reserve; as a result, wildlife population control programmes were initiated. Night culling was the primary method of control, but some animals were captured live. Initially, captured animals were translocated to other protected areas in the region. Later they were made available free of charge to landowners who were able to provide a suitable means of transporting the animals to their farms. According to the reports of the Chief Conservator Zululand between 1956 and 1964, over 5,000 animals (primarily impala) were given to landowners to restock their farms. This proved to be the critical catalyst for the birth of the wildlife utilisation sector in the study area. Out of these modest beginnings, both the game capture and the game ranching industry in Zululand were born, and in the late 1960s the Natal Game Ranchers' Association was formed.

Up until the late 1970s, statutory protected areas were small and surrounded by large tracts of communal or privately-owned land that were used for agricultural purposes, primarily cattle husbandry, with lesser areas devoted to cotton, sisal, sugar and citrus fruits. From the mid-1970s, wildlife utilisation expanded on former agricultural land, encouraged by support from the Natal Parks Board in the form of subsidised game sales and a wildlife extension service which provided free advice on wildlife management. The area is now the major centre for wildlife utilisation in KwaZulu-Natal. In 2000, it was estimated that 16.6% of the land surface in this region was under formal protection while a further 6.7% comprised game ranches (see Figure 3.2). Virtually every farm,

Figure 3.2. Growth in the area under wildlife utilisation on privately-owned land in north-eastern KwaZulu-Natal



unless it is devoted to extensive cropping, utilises game to a greater or lesser extent for commercial gain.

Almost all wildlife commercialisation has occurred on privately-owned land, which historically had been set aside for white occupation by the Zululand Land Commission in 1904. By contrast, commercial game ranching of wildlife on communal land (land reserved for the Zulu people) has been negligible.

Over the last 200 years, land use in the study area has done a complete cycle. From largely wildlife-based (the wildlife utilisation and hunting era of the early 1800s) through various forms of agricultural use, including cattle and crop agriculture, it is now reverting back to wildlife. This shift in land use has been associated with many benefits for biodiversity conservation. A pertinent question is whether there are any overwhelming ecological, economic or social reasons for this change and whether these are likely to be sustained in the future. In other words, how has biodiversity been mainstreamed into land use in the study area?

ECOLOGICAL, ECONOMIC AND SOCIAL UNDERPINNING OF THE WILDLIFE UTILISATION SECTOR

The notion of wildlife utilisation as an alternative to domestic livestock emanated from early proponents of game ranching in the 1960s who based

their arguments on several untested assertions, namely:

- Wildlife herbivore communities would sustain a higher biomass than domestic stock on the same area of veld (rangeland) and, therefore, were assumed to be more productive than domestic livestock systems.
- Domestic livestock systems, largely dominated by cattle, would make use of only a small proportion of the available forage, namely grasses. This, in association with fire protection measures, would result in a relative imbalance between the use of the herbaceous and woody components of savanna ecosystems and lead to the encroachment and densification of woody vegetation. This would lead to a substantial reduction in the productivity of the grass component and an accompanying loss in the herbaceous diversity of rangelands. On the other hand, an intact wildlife community with a range of grazers, browsers and mixed feeders would utilise all fodder resources, thereby maintaining a balance between herbaceous and woody components, with greater productivity achieved and more diversity of both the herbivore community and vegetation.
- The wild herbivore community, comprising between 10 and 20 different species, each with their own dependence on water and preference for the available habitat, would be able to make better use of the spatial pattern inherent in savanna vegetation.
- Through utilising different plant species and plant parts, different species of wild herbivore, would make more even use of the available vegetation and thus lead to higher productivity while maintaining plant diversity.
- Having evolved with the suite of livestock diseases which are prevalent in Africa, the wildlife has become disease-resistant; consequently, the cost of controlling disease would be much less for wildlife than for domestic livestock systems.
- Secondary production from a wildlife system has, in all instances, been found to be inferior to that from domestic stock. In retrospect this is understandable, since domestic stock have been bred for productivity, while natural selection has favoured survival rather than production in wildlife.
- While spatial and temporal separation of habitat use has been demonstrated in wildlife systems, (i.e. different species use habitat in different ways and at different times) wildlife use is characterised by large degrees of overlap, with only a few species showing a clear-cut habitat separation. What is quite evident, however, is that there is not a heterogeneous mix of all species across the landscape, but instead, a dominance of a few species in different areas of the landscape.
- Similarly, studies of the diet of wild herbivores show large overlaps in the plant parts and plant species consumed by the different species. This leads to a more even spread of the utilisation pressure across plant species in wildlife systems.
- On the other hand, the distribution of feeding pressure has been shown to be more evenly spread by height class; consequently, there is a more even use of the available resources by wildlife than domestic livestock systems.

Thus while wildlife cannot compare with domestic stock in terms of secondary productivity, the broader but overlapping use of the landscape, plant height, species and plant part spectrum allows a greater flexibility in resource use in wildlife systems, imparting a greater degree of stability to the management system. As a by-product, the diversity of wild herbivores is maintained, along with the diversity of interactions and processes operating at the local and landscape levels.

Nevertheless, it is not the ecological merits of wildlife that have driven the shift in land use from domestic stock and other farming activities to wildlife, but economic and possibly social advantages. From an economic perspective, a growing body of work indicates that the financial returns from game ranching are comparable to returns from cattle ranching. However, the marginal nature of domes-

While many of these assertions have been challenged by researchers over the ensuing years, several important generalisations have emerged, namely:

tic cattle enterprises in semi-arid environments makes diversification to include wildlife a logical option. Multi-species production systems provide the manager with opportunities to lessen financial risk in a variable and unpredictable environment. This has been illustrated in Zimbabwe where it is argued that the comparative advantage of wildlife over cattle operations has fuelled the transition to wildlife. The comparative advantage of wildlife in rain-fed production systems lies in the addition of economic tiers to the production process through safari hunting and ecotourism. These are not available to cattle ranchers. In practice, whether by design or accident, there has been a gradual move from cattle-based land use to land use dominated by wildlife. The adoption of this land use over time can be recognised as a linear sequence of events on almost every ranch.

The land use on most northern Zululand farms or ranches in the early 1960s was dominated by cattle. Wildlife was generally sparse with restricted remnant populations of the more common species such as duiker, impala, kudu, common reedbuck and, in places, bushbuck and mountain reedbuck. This wildlife had little impact on farming activities and was generally ignored, except for the occasional animal that was taken for the pot.

As wildlife populations grew, some of the more common species (impala) were thought to be competing with cattle for grazing, while others (e.g. reedbuck and bush pig) started causing crop damage and low levels of 'problem animal' hunting began. As wild populations expanded, both in size and distribution, culling and hunting began, in the late 1970s and early 1980s, encouraged by the emerging market for game meat and the local market for game biltong. At the same time, rarer wildlife species (e.g. nyala and white rhino) became available for purchase at subsidised prices from local protected areas, and farmers began purchasing and restocking their ranches, specifically for the emerging trophy hunting market. In many instances the combination of the complementary land uses of meat and trophy hunting proved lucrative and comparable to the returns from cattle.

Gradually, cattle began to be phased out in favour of wildlife to cater for the safari hunting and nature tourism market. This involved much more active wildlife management, with ranchers

now establishing populations of plains game species such as wildebeest and zebra to replace the cattle. Finally, attention turned to the re-establishment of the 'Big Five' (elephant, rhino, buffalo, lion and leopard) sought after by the international tourist market. In order to accommodate these species in an environment where the adjacent farmers continued to carry out more conventional farming practices, land owners and investors had to expend large amounts of money on game fencing. To accommodate the more discerning tourist, upmarket lodges and camps were established. Crop agriculture, particularly irrigated crops, was abandoned or restricted to the more fertile soils close to water. These lands were also the most productive from a wildlife perspective and hence the competition between the two land uses, wildlife and crops, was greatest here.

The switch from cattle and crop agriculture to game was, in most cases, not complete. Most farmers (up to 80%) were more cautious and practised a mixed, flexible land use (cattle and game), with bed and breakfast accommodation catering for local tourists and hunters. The full transition only took place in instances which contributed to the security of the operation, involving either foreign investment or partnership in a larger cooperative venture.

BENEFITS TO BIODIVERSITY OF THE WILDLIFE UTILISATION SECTOR

Game ranching, or any other form of wildlife utilisation on private land, has the potential to contribute significantly to the conservation of biodiversity from the broad ecosystem and landscape level down to the genetic level. However, this contribution depends on the geographical position of the land, the position of the property in relation to formal protected areas, the size of the property, the management philosophy and the quality of management.

In north eastern KwaZulu-Natal, game ranches make many positive contributions to the conservation of biodiversity at the landscape and ecosystem levels. Probably most important is the facilitation of linkages or stepping stones between the somewhat isolated formal protected areas (see Figure 3.1). In a semi-arid landscape where survival

of species is subject to the vagaries of a variable climate, the ability for animals to move, either by migration or gradual colonisation, is an important survival strategy. A wildlife-friendly environment between strict protected areas is a critical, often unappreciated, contribution that game ranches make to enhancing biodiversity. Game ranches can also contribute to the conservation status of communities and habitats which are poorly protected in the formal protected area network. In the case study area, two plant communities endemic to the province, but not protected in the network of formal protected areas, were found on game ranches. Moreover the protection status of 17 of the 19 broad habitat types found in the region was enhanced.

With respect to landscape and community level processes, game ranching brings back many of the original large herbivore species. The most significant re-establishments are the megaherbivores, such as elephant and black rhino, which can have disproportionately large impacts on the environment. Large predators such as lion, leopard and cheetah have also been re-established. The re-establishment of the most important keystone species are vital in reinstating ecosystem-level processes such as herbivory, predation and competition.

At the species level, by actively establishing and managing the larger herbivore and predatory species, game ranch managers have not only enhanced the status of these species (e.g. elephant, white rhino, black rhino, lion, leopard, wild dog), but also enhanced the survival prospects of wider-ranging species, whose populations are not entirely secured in the formal protected areas. The most significant of these species are the mammalian predators and raptors, including the vultures and eagles that are still persecuted on land dedicated to agriculture.

On the down side, and stemming from the earlier land use of many of the ranches, many important landscape level processes have not been reinstated yet. These include the impact of the agriculturally-designed network of water points on landscape processes, such as the seasonal movement of large herbivore species that are water-dependent; and the use of fire, which plays an important role in plant succession, nutrient recycling and the patterns of veld utilisation. More-

over the erection of game-proof fencing has had a major impact on the mobility of large herbivores and carnivores. From the species perspective, many large herbivores and predators which are confined by the fencing exist in small non-viable populations. Without active management, these will not survive in the long term, and neither will they contribute to the viability and stability of the regional or meta-population. It is evident that the conservation of the genetic integrity of local wildlife populations is a rather low priority amongst private game ranch owners. This is evidenced by small population sizes, lack of meta-population management strategies and the common practice of acquiring stock from distant sources and from sources that are unlikely to be compatible with locally adapted stock.

Nonetheless, these apparently negative aspects, are far outweighed by the positive contribution that the game ranching industry makes towards the conservation of biodiversity in the region. Moreover, improvements which would reduce the negative impacts on biodiversity and enhance the positive contribution could be brought about by the following actions:

- Development of partnerships between landowners and conservation authorities, and between adjacent landowners, facilitating the removal of barriers between properties and the re-instatement of broader landscape level processes for the larger mammals. This would naturally enhance the effective population sizes of rare, wide-ranging species as well.
- Sensitising managers to issues affecting landscape and community level processes and dynamics, for example artificial water distribution, fire, predation, competition and the impacts of harvesting.
- Sensitising managers to the issues affecting short-term genetic integrity of populations.

THE ENABLING ENVIRONMENT

Biodiversity has been mainstreamed by switching from a land use dependent on alien domestic livestock and crop species, to one that depends on indigenous species and landscapes. This is not only enhancing the long term conservation of

biodiversity, but is the major driving force behind the economic growth and social development of the region. Critical factors in this process include:

- the commitment of early conservationists and legislators who recognised the need for formal protected areas which later provided the seed stock for re-establishing extirpated wildlife populations.
- the dedication and insight of the early Natal Parks Board officials who successfully pioneered live game capture techniques, and wildlife management solutions on private land through the farm game extension service.
- normalisation of the agricultural economy of the country through the withdrawal of government subsidies for domestic cattle ranching, fencing and transport subsidies for agricultural produce (e.g. sugar cane).
- development of formally-constituted bodies (e.g. the Natal Game Ranchers Association) to represent and further the interests of the game ranching fraternity.
- a legal framework that supported private land ownership, and private ownership of wildlife resources.
- support to, and incentives for, wildlife ranching as a land use, through the free and subsidised provision of wildlife and wildlife extension services to prospective and existing game ranchers.
- revenue generated from game sales by formal conservation bodies which has been returned to the organisations to fund improved biodiversity management. This has stimulated enlightened and efficient management of formal protected areas in the region.
- the opportunities created by the change in national governance, making the country acceptable and attractive to foreign investment, and a desirable tourist destination. The availability of foreign capital has been critical in the development of upmarket ecotourism destinations.

CURRENT AND FUTURE PROBLEMS

Perhaps the greatest disappointment thus far in the developing wildlife and ecotourism industry has

been the almost complete lack of its adoption by Zulu communities living in the communal areas. The most likely factors that have inhibited the development of game ranching and ecotourism in communal lands are:

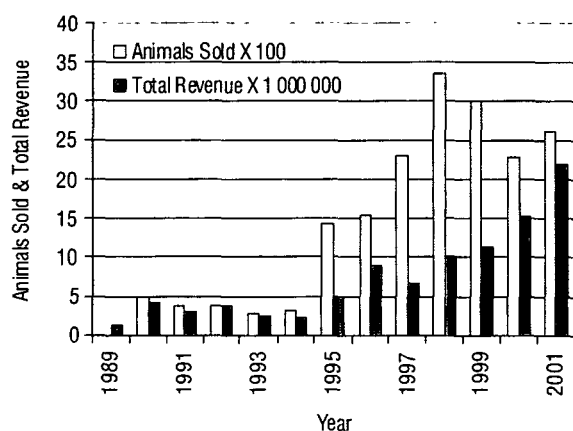
- lack of appropriate social structures and skills in the community to manage, on an equitable basis, a complex wildlife and ecotourism project on communal land.
- land hunger felt by a community that has been deprived of its land by a century of colonial, and then authoritarian and discriminatory, governments.
- the social and economic importance placed on the individual ownership of domestic livestock, whereas wildlife is customarily considered as owned by no one and free for all.
- distrust of the motives of government agencies seen to be furthering the cause of wildlife and biodiversity, apparently at the expense of people's livelihoods.

Despite the numerous attempts at developing community-based wildlife and ecotourism in the study area, none can truly claim long-term sustainability; this is an important challenge for the future. Indeed sustainability remains a challenge for the whole sector since the wildlife industry is directly linked to the ecotourism and hunting markets. While the current market appears far from saturated, a shift in the world economy, political acceptability or security status of the region could easily trigger a slump. The current growth in the industry would appear to be fuelling a high demand for live game. For instance, revenue from the annual KwaZulu-Natal wildlife game auction has continued to grow since its inception (Figure 3.3). This growth has resulted primarily from an increase in the per head price of the animals as opposed to an increase in the number of animals sold.

CONCLUSIONS

Game ranching and its supporting activities, namely sport hunting and non-consumptive nature-based tourism in KwaZulu-Natal, and South Africa as a whole, provides an excellent example

Figure 3.3. Growth in revenue from the KwaZulu-Natal wildlife annual game auction and animals sold at each auction



of the mainstreaming of biodiversity into the production landscape. Numerous policies instituted by the former Natal Parks Board and its successor, KwaZulu-Natal Wildlife, encouraged the development of the wildlife industry in the province and facilitated the wise use of this resource. These included granting of full ownership rights of wildlife to landholders; generous incentives such as free donations of wildlife and later wildlife at subsidised prices; and the provision of a free extension service for farm game that both encouraged and supported the rational use of wildlife under private ownership. Not only was wildlife management supported, but so too was hunter proficiency, through the setting of standards, hunter proficiency testing and training. At a national level, policy implementations such as the Lubombo Spatial Development initiative, which recognises the region's indigenous biodiversity as its primary asset, have reinforced government's commitment to conservation of biodiversity where this is appropriate.

To date there is little doubt of the synergy between this thriving economic sector and gains in the security of the province's biological resources. A wide variety of wildlife, managed under near pristine conditions, attracts the discerning nature tourist or hunter who demands high standards of service and accommodation, and is prepared to pay for it. This in turn creates the demand for high

quality service staff that are generally drawn from the local population and trained to provide this service. The growing demand for nature-based experiences from a large, interested and well-sensitised South African market, as well as a growing foreign clientele, has provided the economic incentive to transform land formerly under agriculture, and cattle, back to indigenous vegetation and wildlife.

Although some of the negative impacts of domestic livestock ranching and cropping still exist on most transformed lands, the gains in biodiversity have been enormous. For instance, in the space of 25 years Mkhuze Game Reserve, once isolated and surrounded by hostile land uses, is now connected to large tracts of private and jointly managed wildlife estate. Similarly, many species once rare in the region are now common or secure as a result of this extended estate. On the other hand, the direct impact of activities associated with game ranching and nature tourism has been negligible, and certainly smaller than that experienced under agriculture, being restricted mainly to the development of eco-friendly lodges and camps. There is little doubt that the activity depends on the sustainable and wise use of resources. Without wildlife and the natural landscape, there would be no hunters and no tourists; both biodiversity and the economy would be losers.

ACKNOWLEDGEMENTS

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Biodiversity Conservation in Plantation Forestry

K. E. Kirkman and R. McC. Pott

SUMMARY

This chapter traces the mainstreaming of biodiversity in the forestry industry since the early, unrestrained expansion of insensitive afforestation. South African indigenous forests covered only a very tiny area, and were heavily exploited by the European settlers. However, from 1888 onwards, the remaining forests were afforded legal protection. This restriction on natural timber resources, together with the increasing demand for timber by the developing gold mines, growing railways and expanding population, led to the birth of plantation forestry. The first plantings, using fast-growing exotic tree species, were often environmentally unfriendly with high water use, and led to habitat destruction and a local loss of biodiversity. Furthermore, these alien species proved to be aggressive invaders of natural habitats.

In 1972, the introduction of the Afforestation Permit System placed restrictions on the area that could be afforested. In 1988 a forestry industry working group was convened and self-regulating conservation guidelines were produced. With regular revisions, these guidelines have greatly improved forestry practices and reduced negative impacts. Legislative changes after 1994 reinforced the need to conserve biodiversity and minimise impacts. The Afforestation Permit System was revised to incorporate biodiversity through mandatory environmental impact assessment. In addition, international standards brought pressures to bear on forestry practices. As a consequence, formal environmental management systems, such as ISO 14001, were adopted and the industry strived towards Forest Stewardship Council (FSC) certification for good management, which includes the conservation of biodiversity. South Africa has the largest percentage of FSC-certified plantations in the world.

INTRODUCTION

South Africa's natural landscape is largely treeless, with only 0.33% of total land area covered in indigenous forest. The largest continuous forest is found around Knysna on the south coast, and the rest occurs as patches distributed across the subcontinent. The extent of natural forests has not been sufficient to provide the many wood products required to satisfy the country's needs. The limitations of the resource became evident soon after the arrival of the Dutch in the Cape in 1652, and the arrival of the English in the Eastern Cape and Natal in 1820. Colonisation led to rapid depletion of indigenous forest patches, and the uncontrolled exploitation of the forests of the Cape and Natal in the 1700s and 1800s. The indigenous forests in the areas later to become the provinces of the Eastern Cape, KwaZulu-Natal and Mpumalanga fared little better. Attempts to regulate exploitation led to the first comprehensive forest law in 1859, and to the Forest Act for the Cape Colony in 1888, aimed at slowing down the rate of exploitation and improving forest management.

During the late 1880s to the early 1900s, population expansion, gold-rushes, and the development of railways increased the demand for building materials, sleepers and mining timber. It was recognised that timber exploitation of slow growing and finite-resource indigenous forests in South Africa would never be sustainable. Most local indigenous tree species are not suited to plantation conditions. This necessitated the establishment of commercial plantations of fast growing exotic species, notably *Eucalyptus*, *Acacia* and pine species from Australia, North America and the Mediterranean basin to meet the need for timber products. Today, indigenous forests in South Africa are primarily maintained for conservation purposes, with limited and sustainable harvesting according to systematic, controlled methods. It is the plantation forests of alien species which provide much of the hard and soft wood requirements of the country.

PLANTATION FORESTRY AND BIODIVERSITY

Many plantation forestry areas of South Africa are situated in the country's most biologically diverse

regions (Box 4.1). These areas are often characterised by high levels of plant endemism. The rarity of some of these endemics makes them particularly vulnerable to extinction from drastic habitat alteration. The establishment of plantation forests has undoubtedly had an effect on biodiversity but quantification of the severity of this effect is difficult. Critics contend that afforestation creates "biological deserts" by replacing natural communities and species with alien trees. Proponents, however, point to the fact that modern plantations consist of both planted and unplanted areas in the ratio of about 3:1. This means that of the total plantation estate in South Africa, about 500,000 ha are in a natural state and will never be planted. They are, so to speak, in the biodiversity bank. Because of the mosaic configuration of this unplanted area, and because much of it is made up of species-rich wetlands, riparian zones and indigenous forest, the opportunities for conserving biodiversity in plantation forestry are actually higher than for most other forms of land use.

Prior to legislation

As knowledge and understanding of the value of unspoiled natural environments grew, there was increasing public pressure on plantation forestry companies to improve the conservation of biodiversity and threatened habitats. At the same time, within many plantation forestry companies, knowledge and understanding of the importance of biodiversity conservation also increased. Plantation forestry is intimately linked to the environment, and many staff within plantation forestry companies had a keen sense of environmental responsibility and an appreciation for the concept of sustainability. In 1975 S.A. Forest Investments Ltd.—later to become Mondi Forests—broke new ground by creating an Environmental Conservation Section. This was the first time that a private company became actively engaged in environmental self-regulation in South Africa. This was a voluntary development, and had its roots in the desire to manage the land and natural assets of the company in a wise and responsible manner.

The process of mainstreaming biodiversity within plantation forestry had already started before the decision to include biodiversity sustainability

Box 4.1. Plantation forestry in South Africa

Plantation forestry encompasses the planting, tending and harvesting of exotic timber species, notably pine, acacia and eucalyptus species, in a non-forest habitat. Plantation forestry is a long term investment, with tree rotations of up to 35 years. This industry is not to be confused with indigenous forestry, which would include harvesting trees from indigenous forests. In a country with limited indigenous forests, industrial-scale forestry plantations of exotic trees have been planted mostly in non-forest habitats such as grassland and fynbos shrublands, and are essential to provide the timber requirements of the country. The most important impacts of afforestation can be summarised as:

- effects on hydrology (e.g. reduced stream flow),
- changes to habitat and biodiversity,
- increase in habitat for species adapted to alien tree species plantations with a decrease in habitat for non-adapted species,
- possible changes in soil nutrient status and associated micro-organisms,
- changes to the landscape (e.g. plantation forest-covered hills instead of grasslands).

In the Southern Hemisphere, South Africa currently has the third largest, and one of the oldest, plantation resource areas and holds half of Africa's planted area. South Africa is among the world leaders in research on the management of industrial-scale timber plantations. Plantation forestry was also the first industry to include the environment in the formal training of its practitioners. The total plantation area of South Africa, comprising 1.5 million ha of equal areas of softwood and hardwood species, produces both softwood and saw-timber from the world's largest pruned softwood resource. Department of Water Affairs and Forestry statistics (August 1998) show that 41% of plantations are in Mpumalanga, 30% in KwaZulu-Natal and 11% in the Eastern Cape. Commercial plantations contribute significantly to the South African economy, adding 4.4 % to the Gross Domestic Product (for 1996). The industry provides employment, both directly and indirectly for nearly 200,000 people, mostly in rural areas. This equates to an economic support base for more than one million people.

within legislation. The forestry industry proactively formed a wide spectrum working group in 1988, which in 1990 produced a document, entitled "Guidelines for the Application of Conservation Practices in Plantation Forestry". The original working group later reconstituted as the Forestry Industry Environmental Committee, which revised the original work to produce the "Guidelines for Environmental Conservation Management in Commercial Forests in South Africa" in 1995. These guidelines were widely adopted as an industry standard, with different companies working together to improve their environmental management. A coordinated approach to environmental management proved a key factor in mainstreaming biodiversity in the forestry sector. The subscription to Forest Stewardship Council (FSC) prin-

ciples was also initiated in most major plantation forestry companies by 1995, while the implementation of environmental management systems such as ISO 14001, was being investigated by most of the major companies by 2000.

The development of forestry legislation in South Africa

During the development of the plantation forestry industry, management and legislation underwent numerous revisions, as knowledge, understanding and management improved. Prior to 1972 the main objective of the plantation forester was to plant up as much of a given area as possible. One of the inevitable impacts was a reduction in the mean annual run-off of rivers whose catchments were

heavily afforested, especially in low flow periods and in droughts (see Chapter 2). This led to a conflict situation with the agricultural sector, which claimed that they could not irrigate winter crops to the previous extent. Concern about limited water supplies became a key factor in mainstreaming biodiversity, and the government responded to agricultural concerns by amending the Forest Act. This led to the afforestation permit system in 1972, applied by an interdepartmental committee, which would scrutinise, and approve or reject, all applications to afforest new land, or to re-afforest land that had been fallow for more than five years. It was based solely on estimated water usage. Certain catchments were closed to future afforestation and a certain percentage of planting was allowed in others. The permit imposed restrictions on where trees could be planted and it specified areas that had to be left unplanted.

Although the permit system concentrated on streams, springs and wetlands, it had the additional benefit of creating inter-connecting corridors between open areas. This had the significant and immediate effect of ensuring a greater proportion of forestry estates remaining unplanted. While the original intention was to reduce water consumption, a beneficial consequence was an increase in the opportunity to conserve biodiversity. Improvements in the afforestation permit system, and the development of environmental impact assessment

(EIA) legislation (in terms of the National Water Act of 1998 and the National Environmental Management Act of 1998) have further refined the process, and integrated the conservation of biodiversity. Rigid process requirements, which include detailed fauna and flora surveys, and the determination of the minimum water reserve, ensure that forestry development will not take place without due consideration of conservation-worthy areas.

Prior to 1994, forestry policy focused largely on protecting man-made plantations on State forest land and to a much lesser degree woodlands. In 1994, the institution of a new government, keen to incorporate democratisation policies into legislation, brought the need for substantial forest policy revision, which became another key factor in mainstreaming biodiversity.

With the publication of the Forestry White Paper on Sustainable Forest Management (SFM) in 1996, government committed itself to a totally new task of identification, selection, consultation, monitoring and evaluation of acceptable sustainable forest development (Box 4.2). The national government recognised that the forestry industry should demonstrate its environmental sustainability, and commit to working with other stakeholders to develop legally-recognised principles, criteria and indicators for sustainable forest management (SFM) for South Africa.

Box 4.2. Principles, criteria and indicators (PCI) and sustainable forest management (SFM)

In South Africa the White Paper on Sustainable Forest Development identified the necessity to replace the Forest Act of 1984 with a bill which would reflect sustainable development of all forest resources. This led to the National Forests Act (Act No. 84 of 1998). In this Act, government recommends the development of a set of principles, criteria, indicators and standards (P, C, I and S), that can be used to monitor progress towards sustainable forest management, and set minimum regulatory standards for forestry. The process started in 1999 with a target date for the submission of the final set of P, C, I and S for the first quarter of 2002. Among other things, the P, C, I and S will provide the country with a tool for assessing changes and trends in forest conditions and management. P, C, I and S will serve to evaluate the degree to which the forest sector contributes to the nation's economic, environmental and social aspirations, as well as a practical interpretation of what constitutes sustainable forest management. Principle 2 specifically states that biological diversity in forests is to be conserved. P, C, I and S will enable the assessment of the effects of forestry on biodiversity. Thus, it will assist with the objective monitoring of the effect of afforestation on biodiversity.

The development of sustainability legislation will formalise the conservation and monitoring of biodiversity in the plantation forestry industry. Up to now, this is a process which has been undertaken voluntarily by plantation forestry companies through participation in international “green labeling” and the implementation of environmental management systems.

ADDITIONAL KEY FACTORS LEADING TO BIODIVERSITY MAINSTREAMING IN PLANTATION FORESTRY

In addition to legislation, several other key factors led to biodiversity mainstreaming in plantation forestry.

Conservation awareness in forestry training

In South Africa, forestry training at tertiary level has long emphasised conservation principles and this has influenced forestry practice within companies where graduates were employed. Moreover the transfer of the State’s commercial plantation forests to South African Forestry Company Limited (SAFCOL) in 1993 resulted in the re-assignment of many nature conservators and mountain catchment ecosystem managers to a now commercial forestry company. As a result environmental management has become an integral part of most forestry organisations. Most large forestry companies currently employ qualified environmental managers, with a practical or academic conservation background. Training includes the importance of conforming with environmental policy, procedures and management systems, and an understanding of the effect that forestry practice could have on the environment.

Forest certification programmes

During the past decade, industry, environmental groups and the public have become increasingly aware that consumer demands and market forces have the potential to exert influence on the management and use of natural resources. This is especially true for the forestry industry, where forest certification programmes are a product of this recognition.

In South Africa, the FSC label (Box 4.3) is seen as a proactive approach to selling timber and wood products to informed consumers, notably in Europe, where awareness of green labeling is on the increase. FSC certification is thus fast tracking improvement of the conservation of biodiversity in many forestry companies. Most of the major forestry companies within South Africa have attained and maintained FSC certification, with many smaller companies showing an interest in obtaining certification. This approach by forestry companies is proactive, as certification is not a mandatory requirement for all export products, and it has not been marketed in South Africa as a green labeling tool to consumers.

It is envisaged that reliance on FSC certification, mostly in the export trade, will escalate. The

Box 4.3. Forestry Stewardship Council (FSC) certification

The Forest Stewardship Council (FSC) was established in 1993. The programme relies on the choice of an informed public to boycott the use of non-sustainable wood, and proactively purchase products that are certified to be made from wood derived from forests that are sustainably managed. FSC certification provides a credible, independent guarantee to the consumer that a product originates from a well-managed forest. Consumer demand, therefore, ensures good forest management.

The primary goal of FSC is to conserve natural forests worldwide, and promote good forest stewardship. The conservation of biological diversity is a central theme in FSC certification. The FSC audit system requires proof that i) ecological functions and values are maintained intact, enhanced, or restored, ii) includes forest regeneration and succession, iii) genetic, species and ecosystem diversity, and iv) natural cycles that affect the productivity of the forest ecosystem. Representative samples of existing ecosystems within landscapes must be protected in their natural state.

maintenance of FSC certification, although incurring a cost, will hopefully become a prerequisite for economic sustainability in the forestry sector, and provide a competitive edge over those companies which fail to comply. At the same time, FSC will ensure that the conservation of biodiversity becomes integrated within forestry management.

BIODIVERSITY CONSERVATION WITHIN PLANTATION FORESTRY

Integrated conservation management on plantations ensures that representative and sensitive habitats, species and ecosystem processes are maintained. Within existing afforestation areas, the forestry industry strives, where possible, to minimise and negate the effect of plantations on biodiversity. Negative impacts are confined to afforested land; natural areas of the forestry estate are maintained in pristine form; and biodiversity is conserved on unplanted land. In practice, only about 60–65% of the average forestry estate in South Africa is afforested.

It is common within the industry to apply for suitable candidate sites to be registered as Natural Heritage Sites, a programme controlled by the national Department of Environmental Affairs and Tourism and provincial conservation authorities. The programme is a public-private sector conservation initiative. The only sites considered for registration are those that contain special plant communities, and aquatic habitats supporting threatened or endangered species, or areas with outstanding natural features. The forestry industry has made a major contribution to the programme. By the end of 2000 this sector had 70 registered Natural Heritage Sites, or 30% of a national total of 235. The cumulative area amounts to more than 47,000 ha, which allows for the effective protection of numerous rare and endangered species. Red Data Book species that are actively conserved and managed include the critically endangered blue swallow *Hirundo atrocaerulea* (7 sites), and wattled crane *Grus carunculata* (8 sites), as well as site-specific endemics, such as Hewitt's ghost frog *Heleophryne hewitti* (Box 4.4.), the Treur river barb *Barbus treurenensis*, the Karkloof blue butterfly *Orachrysops ariadne*, and the Prentjiesberg ostracod *Korannacythere ugiensis*. Other areas

Box 4.4. Conservation of Hewitt's ghost frog

Hewitt's ghost frog, an endangered species, was discovered only in 1988, in an area almost totally afforested with pine trees. The species has been recorded from only four rivers, all within the plantation area. In order to improve the conservation status of this species, the South African Forestry Company (SAFCOL) appointed an amphibian specialist to investigate the best method of removing plantations from the immediate habitat, without detrimental effects to the frogs. This has resulted in a long-term plan to remove plantation trees from a buffer strip of at least 25 m width on each riverbank for 14 km of river. Timber harvesting has been stratified so that only one of the four relevant rivers will be affected at any specific time, and effects on the frog population are constantly monitored.

protect oribi *Ourebia ourebi* (17 sites), palmnut vulture *Gypohierax angolensis* (1 site) and the gaboon adder *Bitis gabonica* (2 sites).

Some areas protect rare habitat types, and provide refuge for a wide range of rare vertebrates, invertebrates and plants.

Most companies have drawn up detailed management plans for their Natural Heritage Sites, designed specifically for the protection of key biodiversity components. Some conduct monitoring to ensure that the plans are being applied and are achieving conservation. Several companies also have programmes to re-establish extirpated game species (i.e. those that previously occurred in an area) with the ultimate objective of encouraging the sustainable use of the wildlife, through hunting. Such programmes can become self-supporting with revenues generated from hunting being ploughed back for the introduction of other species (see also Chapter 3). Forestry companies are actively involved in wetland rehabilitation programmes, and often support initiatives that are not on forestry land. Wetland-dependent birds such as crane and other species are expected to benefit from these initiatives.

Most companies have tried to standardise their integrated conservation management plans by collectively developing an Environmental Conservation Database (ECDB) which records the unplanted areas of each estate in terms of habitat type, such as wetlands, grasslands and forests. Areas that require restoration are identified, and management plans with allocated budgets are devised for all areas of natural habitat on the forestry estate (Box 4.5).

CONSTRAINTS ON MAINSTREAMING BIODIVERSITY IN PLANTATION FORESTRY

The mainstreaming of biodiversity within any industry will have its own unique problems and constraints. For plantation forestry, problems include financial and planning constraints and the spread of invasive organisms.

Financial

In South Africa, mainstreaming biodiversity within the forestry sector has taken place in most of the larger companies, but not in all the smaller companies where there are financial and personnel constraints. The current lack of enforced standards, and the concentration of public pressure on the larger, more visible companies has meant that

Box 4.5. Indigenous forest restoration

Indigenous forest covers only 0,33% of the surface area of South Africa. For this reason the conservation of indigenous forest patches within commercial forestry areas is essential. In the Tsitsikamma Region of the Eastern Cape Province, SAFCOL has actively restored indigenous forest patches by removing planted areas and weed species. The company has encouraged restoration of areas that form corridors between larger indigenous forest areas, or where plantations have reduced forest margins. A buffer zone between indigenous forest and plantations has also been introduced to protect indigenous forest margins.

biodiversity has been neglected where companies lack the will or resources to introduce conservation management actions. It is hoped that the enforcement of legislation and the increased need to obtain forestry certification to deal with foreign markets, will improve the situation.

Outdated planning

The management and design of natural areas within plantations significantly affect the contribution that these areas make to the conservation of biodiversity. Plantation forestry produces landscape level changes in habitat distribution and area. Poor planning can lead to fragmentation of habitats, which inhibits animal and plant dispersal processes and disrupts hydrological processes. Attention is therefore given to the importance of corridors of natural vegetation, linking remnant patches, and the maintenance of representative habitats, especially during new afforestation projects. Older plantations often lack effective landscape design and provision for corridors of natural vegetation. Corrections to corridor design, therefore, have to be made long after the original afforestation. These corrected corridors often comprise restored areas.

Natural ecosystem functioning

The application of appropriate processes essential for ecosystem functioning in natural areas, notably burning regimes, is another issue in natural areas on forestry estates. Generally, plantation forestry is practised in grassland and fynbos habitats, both of which are reliant on regular burning for biodiversity maintenance. Disruption of natural ecological processes, such as fire, can have a major impact on biodiversity at the landscape scale. Inappropriate fire regimes can lead to changes in species composition and the loss of biodiversity. An inflexible regime, often convenient to managers, will inevitably lead to the impoverishment of diversity by repeatedly favouring the same species at the expense of others. Variation in the fire regime is important for ensuring species diversity and coexistence. The challenge in plantation forestry is to apply fire as a tool to manage natural areas in order to prevent local extinction of species, without detrimentally affecting afforested

areas, which are very prone to fire damage. In this regard, research into the effects of fire on natural areas, and its application in the plantation environment, is crucial.

Invasive organisms

The spread of invasive organisms, both plant and animal, is an inevitable consequence of plantation forestry. Highly invasive woody, alien plants pose the greatest threat. They hamper silvicultural operations by suppressing plantation tree growth and they spread into unplanted areas. Major environmental costs arise from the spread of these plants. By replacing indigenous habitat and species, affecting river catchments, and changing the fire regime of natural vegetation, they not only degrade biodiversity (see Chapter 2) but also lead to increased costs for plantation forestry, and for conservation management. The control and eradication of alien invasive species within afforested and natural areas is a crucial component of biodiversity management within forestry estates. The need to coordinate and effectively manage an invasive weed control plan not only within plantations and associated natural areas, but also at a catchment and landscape scale, is essential. The ongoing research for sterile stock of invader forestry trees, as part of genetic improvement programmes, is a positive development for biodiversity conservation in the forestry sector.

Biological control

Biological control is one method of combating invasive species that has been successfully used in South Africa for a number of species. In the past, however, conflicts arose between commercial growers of invasive species and the conservation authorities who wished to eradicate; this situation delayed the use of biological control for commercially-grown invader species. The need for biological control has now been recognised by the forestry industry, and the release of bio-control species for commercial plants is encouraged, provided there is no damage to the commercial viability of plantation species (e.g. seed, not foliage is targeted).

Road construction

The construction of roads, a necessity within forestry areas, has a significant impact on the environment, and requires strict control, monitoring and management. Improper and badly designed roads lead to destruction of habitat and populations, increased siltation and poor water quality. The modernisation and technical improvement of forest harvesting operations have led to the neglect of road networks, and budgets often overlook improvements to road infrastructure. The combined effects of increased pressure from forestry certification bodies, the rehabilitation of unwanted roads, and the need to manage road networks proactively to minimise future costs, will bring about improvements in forestry estates in future.

Age of planted areas

Many older plantation areas in the country were planted on inappropriate soil types. In the past, there was limited understanding of species-site matching in order to maximise growth yields and hence profits. Indiscriminate planting resulted in a number of areas where, according to current forestry practices, trees should never have been planted. This legacy is currently contributing to alien plant invasion and excessive water use by alien species, as well as poor quality timber production. As part of improved forestry practices, unproductive areas are being converted to other land uses, including conservation. In the Cape Floral Region where entire plantations are uneconomical, a process of removal has begun. Future land uses include appropriate agriculture, ecotourism, housing development as well as conservation. In those areas designated for conservation, it is essential that an efficient, cost-effective system is implemented to ensure that the removal of plantation forests benefits biodiversity conservation. Conversion from plantation to conservation will only succeed if the forestry company has sufficient funds to sustain management. Funds will be needed for control of weed invasion of cleared areas, for road rehabilitation, and fire management of areas to encourage the recovery of fire-adapted species. The removal of plantation areas can be seen as either a positive development for the conservation

of biodiversity, if it is managed effectively, or as a potential hurdle, should appropriate management not take place.

FUTURE DIRECTIONS

Overall, plantation forestry has a negative impact on biodiversity, a cost that must be weighed against the need for wood and wood products. The challenges for the future are to ensure that a sustainable plantation forestry industry is developed which includes the monitoring of the impact of plantations on biodiversity, and the planning of future afforestation at a strategic scale, through the use of integrated environmental management (IEM) and strategic environmental assessments (SEA).

The use of the SEA process will greatly improve the decisions about where to expand the forestry industry in South Africa. Ultimately the intention of SEA is to ensure the best use of land, water and other resources, to the benefit of society and the economy, without unduly harming the environment or compromising biodiversity conservation. Forestry (with its alternatives) is placed in the context of the wider socio-economic environment, and decision-making is therefore given a very broad contextual base. SEAs best serve to identify suitable land, to assess the suitability of forestry in terms of the natural resources, the communities dependent on those resources, and possible alternative uses of those resources. SEAs have been completed for a number of areas in South Africa, where plantation forestry expansion could be a viable future economy. Afforestation should continue where justifiable, but with the correct assessment of its impacts on a regional and local scale. Afforestation should not proceed in areas important for the conservation of biodiversity, and the effects of plantation forestry should always be mitigated, monitored and managed.

There is an increasing need to determine the exact impact of plantation forestry on biodiversity. Coordinated biodiversity research, and the study of the effect of plantation forestry on biodiversity is currently being undertaken, and will help to improve management to lessen the impacts on biodiversity. Regional and national conservation planning processes are currently underway (see Chapter 11) to prioritise areas for conservation.

This will enable the wise choice of sites for future plantation forestry.

Affected habitats and species can be adequately conserved in appropriate reserves and non-forested areas, provided environmental management is integrated within commercial forestry operations. This is currently in place for all major forestry companies in South Africa. Effective monitoring programmes are a future requirement to ensure that existing and future management minimise the impact on biodiversity. This includes the monitoring of sustainable use of biological resources.

CONCLUSIONS

Forestry in South Africa started off as a high-impact form of land use, with economic gain as the prime objective, and where sociological and environmental acceptability and sustainability were hardly considered. Numerous contributing factors changed this, with one of the most significant being the introduction of the afforestation permit system in 1972. This led to a reduction in the area devoted to afforestation within a given catchment and special protection of riparian habitats. (Box 4.6). Although the main aim was the conservation of water resources, the reduction in allowable afforestation immediately presented opportunities for biodiversity conservation.

A number of other key factors have enabled the mainstreaming of biodiversity in the forestry sector, including qualified forestry staff well aware of

Box 4.6. Wetland and riparian zone management

All forestry companies recognise the importance of wetlands and riparian zones, as corridors for migration, as water filters, and for water quantity. To improve the protection of these areas a standardised system has been developed to delineate the edge of wetlands and riparian zones, and to determine the size of unplanted buffer zones required to protect the riparian habitat. This has resulted in the removal of thousands of hectares of plantation.

biodiversity issues who could drive improvements in management practice on forestry estates. External public pressure and the commitment of individual forestry companies resulted in a coordinated approach to environmental management and biodiversity conservation, including the preparation and implementation of self-regulatory guidelines. The institution of a new government in 1994 also led to major policy revision, with the opportunity to update existing laws to better reflect the international trend towards sustainable forestry management. At the same time, biodiversity considerations were incorporated into government policy. These factors are culminating in the production of principles, criteria and indicators for the forestry sector in South Africa in 2002, which will formalise standards and monitor progress towards sustainable forestry.

The global trend towards green labeling through consumer pressure has also resulted in most forestry companies in South Africa obtaining FSC certification. This qualification ensures that the conservation of biodiversity remains integrated within management. Consequently there has been a concurrent gain for biodiversity through improved environmental management systems, conservation of rare and endangered ecosystems, habitats and species, and an economic advantage through access to eco-sensitive markets. South Africa currently has a larger percentage of FSC-certified plantation forestry than any other country.

Modern plantation forestry practices in South Africa have evolved considerably from the high-impact developments in the early period (1900–1970). The percentage of the total plantation estate that is planted up has been progressively reduced, and now seldom exceeds 70% at any site. The opportunities for biodiversity conservation are thus considerably improved. Some companies have also adopted restocking policies and set aside areas specifically for the conservation of rare and endangered species. There is evidence in some areas that there has been a net gain in biodiversity following the advent of plantation forestry. The continuing challenge is to prevent further afforestation in sensitive areas, and to improve biodiversity conservation within existing afforestation areas through efficient integrated management systems.

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Biodiversity and Conservation Farming in the Agricultural Sector

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SUMMARY

An important feature of South African agriculture has been conservation farming, which seeks to maintain the balance between utilisation and conservation of agricultural resources above the level at which resources totally collapse. The implementation of conservation farming practices at the farm level is the outcome of agricultural policy, legislation, and other developments within organised agriculture, as well as the efforts of many committed farmers. Biodiversity issues have increasingly been incorporated into agricultural practice through conservation farming. The principle of optimal resource utilisation that underpins conservation farming means that the focus depends on how resources are defined. Initially soil was seen as the main resource, with value placed on species and processes that reduced soil degradation. Later, more emphasis was placed on vegetation and veld condition, agrobiodiversity, and sustainable rural livelihoods (not just agricultural production) which incorporated far more elements of biodiversity.

The development of conservation farming in South Africa indicates that biodiversity conservation is not merely a by-product of better agricultural practice, but that agricultural practice has been shaped by the need to secure ecosystem goods and services linked to biodiversity. Droughts, economic crises, scientific advances, and political developments have been key events in the development of conservation farming. The net benefits of conservation farming have been achieved through legislation, scientific and technical support for farmers, effective communication about conservation farming practices, and involvement of

the broader farming community. Where conservation farming has failed, it has often been where support was withheld for political reasons, where the needs of farmers were not taken into consideration, where financial and technical support was inadequate, and where there was insufficient knowledge to implement conservation farming practices.

INTRODUCTION

Farming affects a greater proportion of the Earth's land surface than any other human activity and, therefore, influences the structure and function of many ecosystems. One of the impacts of agriculture is the loss of biodiversity. Yet this loss is not necessarily an inevitable consequence of agricultural activity and many farming systems may even rely on biodiversity to sustain agricultural production. Through the application of appropriate conservation farming practices, many of the negative impacts of agriculture on biodiversity may be overcome or mitigated, and the benefits of ecosystem services maintained. The objective of conservation farming has been described as the maintenance of the balance between utilisation and conservation of agricultural resources above the level at which resources totally collapse. The key element is the balance between current production and future potential.

With 91% of the country classified as arid, semi-arid, or dry sub-humid, South Africa is essentially a dry country. Only 1% is classified as humid, and the remaining 8% is considered to be hyper-arid. Croplands account for about 25% of land use in South Africa and they occur predominantly in the wetter eastern and southern parts of the country, although cropping does occur in marginal arid areas. Grazing lands account for about 60% of land use in South Africa and they are more common in the drier parts of the country.

South Africa was once described as "the best example of the liquidation (of natural resources) of lowlands through uplands of any land I have seen anywhere", of having "mutilated landscapes", and using farming methods "more primitive than those used 2000 years ago" (Dr H. Bennett, Chief of the United States Soil Conservation Services, 1944). This was stated at a time when South Af-

rica had begun to realise the consequences of losing its soil and the ecosystem services required to maintain agricultural productivity in croplands and grazing lands. Declines in agricultural production, desert encroachment, and the high impact of disaster droughts were linked to the loss of ecosystem services associated with soil fertility, soil structure, and the resilience of natural systems. The response was the promotion of conservation farming practices.

For its size, South Africa has a disproportionately high number of species of plants, mammals, birds, reptiles, and amphibians and much of this diversity occurs on farmland. Agricultural land use (including afforestation) is the probable cause of extinction for 15 plant species (10 due to cultivation, three due to grazing, and two to afforestation) and is one of the major reasons why South Africa is ranked third in the world for the number of threatened plant species. Habitat transformation and habitat loss, which are often direct consequences of agricultural activity, are also the main threats to birds, reptiles and small mammals in South Africa.

Biodiversity has been one of the main victims of poor land use practices. Any improvement in farming practices in South Africa would, therefore, probably have benefits for biodiversity. But is biodiversity conservation merely an incidental by-product of better agricultural development? The development of conservation farming practice in South Africa suggests that agricultural practices have increasingly been shaped by the need to secure ecosystem goods and services linked to biodiversity.

This chapter looks at the development of conservation farming practices in South Africa over the past 80 years, and the key events, enabling factors, and constraints that have shaped conservation farming and its importance for the conservation of biodiversity.

DEVELOPMENT OF CONSERVATION FARMING

In South Africa, the basic principle of conservation farming practice underpinned a 1970s policy of optimum resource utilisation, which implied that agricultural production should meet three basic conditions:

- be in harmony with the natural environment
- not be practised at the cost of other natural resources
- be based on sound economic principles.

Biodiversity conservation has never been an explicit aim of conservation farming practice in South Africa, but the principle of optimum resource use requires a constant re-evaluation of resources, and therefore reflects changes in perceptions and values, including those related to biodiversity.

The formal origins of conservation farming practice in South Africa can be traced back to the Drought Investigation Commission report of 1923 (Figure 5.1). The report noted that farming practices had a significant effect on the outcome of droughts and that large financial losses were associated with inappropriate farming practices. As a result, farmers were encouraged to change their land use practices. This led to the first recommendations for conserving the resource base on agricultural lands and the adoption of conservation farming practices. The Soil Erosion Advisory Council was established in 1930, and subsidies were provided for anti-erosion projects, small dams for stock watering, and the erection of fences. Soil conservation was expected to limit soil loss, reduce the loss of nutrients and organic matter, and improve plant growth and successional processes.

Ongoing degradation resulted in further developments. The Soil Conservation Act of 1946 provided the legislative framework for enforcing conservation work on farms and the Division of Soil Conservation and Extension was set up within the Department of Agriculture to support the implementation of conservation measures on farms. At this time, conservation farming practice was focused almost entirely on soil conservation. Concerns about soil loss continued to dominate the thinking within the agricultural sector for at least another two decades. The Soil Conservation Act was revised in 1969 to deal with ongoing problems.

From 1952 until the late 1970s, the concerns of agriculture moved beyond soil to other issues (Figure 5.1). There were particular concerns about the spread of desert shrublands known as the karoo, bush encroachment, and noxious weeds. Studies showed greater water infiltration, lower soil loss,

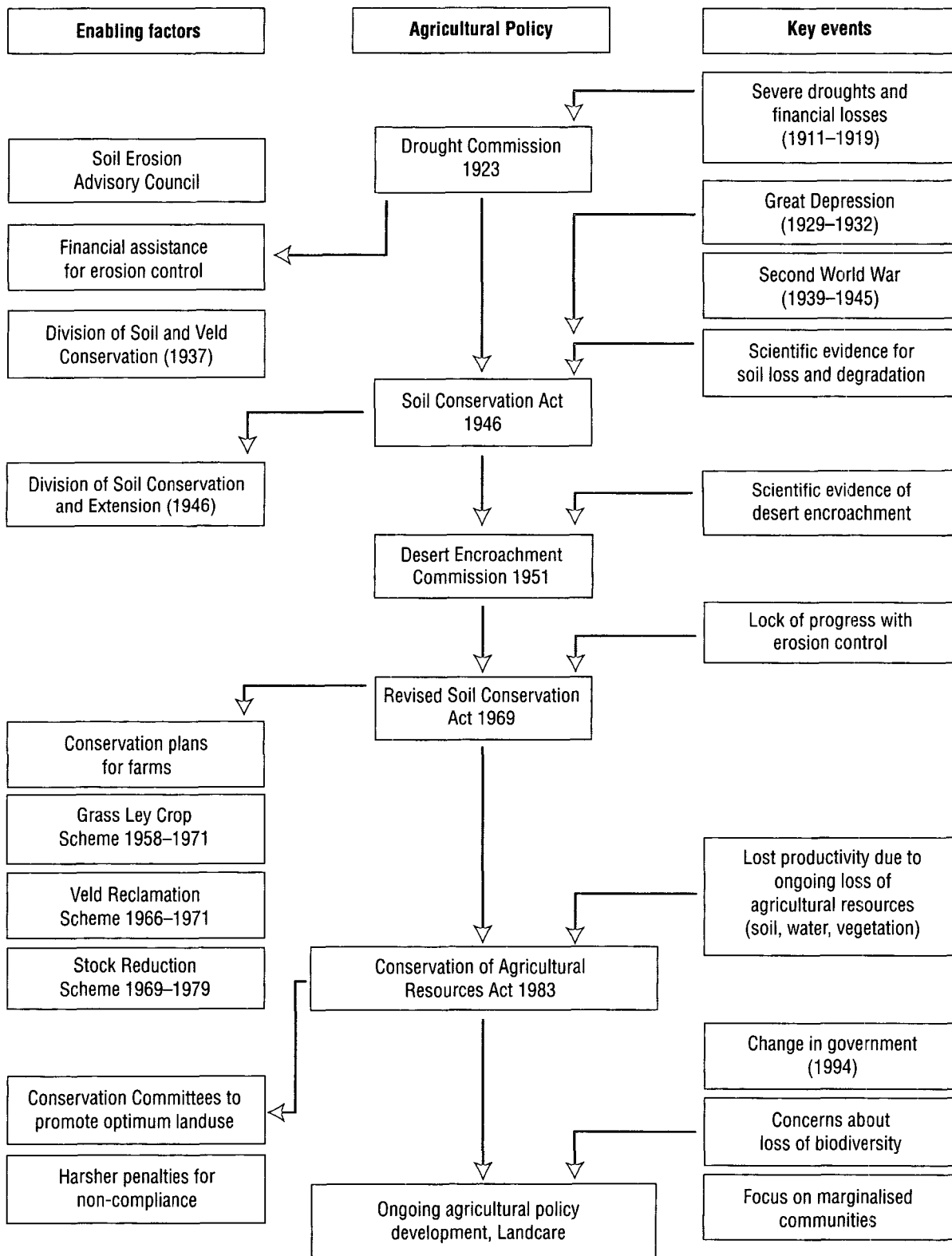
higher production, and better water-use efficiency from veld in good condition. At the same time, it was shown that many alien invasive species altered the ecology and water balance of natural and agricultural systems (see Chapter 2). It was recognised that farmers needed to manage their lands not only to reduce soil erosion, but also to deal with other environmental problems that impacted on agricultural production. During the 1970s, the Department of Agriculture implemented its policy of optimal resource use to ensure that agricultural production was in harmony with the natural environment. The broader concept of conservation farming practice, which focused on soil, water, and vegetation, was formalised in the Conservation of Agricultural Resources Act 43 of 1983.

Biodiversity issues have been much more evident over the past decade, especially since the 1992 Rio Earth Summit and the global focus on sustainable development. The agricultural sector has focused particularly on agrobiodiversity—new crops, wild relatives of existing crops, commercialisation of indigenous stock, pollinators, and biocontrol agents. This has happened at the same time that South Africa elected its first democratic government (in 1994), resulting in changes in policy and the allocation of resources. The focus on agrobiodiversity, together with emerging government policies to support the sustainable use of South Africa's wildlife and promote sustainable rural livelihoods, have once more increased the perceived value of biodiversity and the range of ecosystem goods and services associated with healthy ecosystems.

OUTCOMES

How successful has conservation farming practice been? The effects of conservation farming are relatively easy to measure in physical terms. By 1970, 819 soil conservation districts had been proclaimed, representing 98.2% of the land managed by white commercial farmers (during apartheid, farms in the “independent” homelands and communal lands belonging to other race groups were excluded from official statistics). At the same time, 43,973 farm plans had been prepared as a basis for conservation works and optimum resource use, comprising an area of 50.5 million ha. By 1980,

Figure 5.1. A time line for the development of conservation farming practice and the mainstreaming of biodiversity in agriculture in South Africa



262 district conservation committees had been established and more than 1,000 members of these committees had received training on conservation farming. By that time, 73% of all agricultural land had farm plans. Thousands of farmers participated in various conservation schemes.

One of most important endeavours was the Stock Reduction Scheme which attracted thousands of participants. This arose due to concerns about the degradation of the veld as a result of poorly managed grazing by domestic stock. This voluntary scheme ran from 1969 to 1978. Farmers who joined the scheme were required to reduce their stock numbers to two-thirds of the number recommended by the Department of Agriculture and to rest one third of their grazing lands every year. In compensation, they were paid a nominal fee per animal. The scheme applied to about 46% of the country, covering an area of 56.8 million ha. Initially, 7,025 farmers applied to join the scheme but only 4,905 completed the full term. The government spent close to R48 million on the scheme, mostly for the removal of some 15 million animals. In reducing stock numbers by a third across an area of 20.3 million ha, this scheme was possibly the most far-reaching and beneficial act of implementing conservation farming in South Africa.

The actual benefits of conservation farming practice to the conservation of natural resources (including biodiversity) and ecosystem services are more difficult to assess. There has been no overall monitoring programme and so success or failure is often in the eye of the beholder. However, in 1996, a nation-wide survey among a wide range of stakeholders, found an overall impression that there was a general improvement in veld condition (increased cover of palatable plant species) as a result of conservation farming practices. In the late 1990s a series of workshops were carried out to assess levels of desertification in 367 magisterial districts in South Africa. The conclusion of these workshops was that veld degradation was generally stable or improving in six of South Africa's nine provinces but getting worse in three provinces (Eastern Cape, KwaZulu-Natal, and Limpopo Province), while soil degradation was stable or improving in five provinces and deteriorating in four provinces. The areas with highest

rates of degradation were mostly former black "homelands" and communal rangelands where there had been little support for conservation farming during the apartheid era.

In one of the few quantitative assessments of conservation farming, aerial photographs of the Reitz district of the Free State showed a 20% improvement in soil and veld condition between 1975 and 1991. It was also found in the 1996 survey, that levels of consciousness about soil erosion were the highest ever in the early 1990s. Asked to identify peak periods of awareness, respondents pinpointed 1940–1949, 1970–1979 and post 1980, which coincided with key events in the development of conservation farming practice.

FACTORS AFFECTING THE DEVELOPMENT OF CONSERVATION FARMING

Key events

a) Natural disasters

Recurrent droughts (1914, 1919, 1933, 1948, 1960) are a regular feature of the South African climate. The impact on the agricultural economy meant that the plight of farmers frequently entered the public domain and resulted in political action by the regime at the time. The relationship between the impact of droughts and poor land use practices was recognised as early as 1873, but it took severe droughts and crippling economic losses in the period between 1911 and 1919 before the government appointed a Drought Investigation Commission in 1920. The commission delivered the final report in 1923 and the main recommendations were aimed at improving cropping and grazing practices to reduce the impact of disaster droughts.

b) Scientific studies

The scientific community has played a significant role in the development of conservation farming practice. At the time of the Drought Investigation Commission of 1920, it was estimated that misuse of land was costing South Africa 187,000 tons of soil per year. Subsequent research by hydrologists provided more detailed and accurate data that set the loss of soil at close to 400,000 tons

per year by 1937. The Soil Conservation Act of 1946 addressed many of the concerns raised by scientists.

As the need to deal with the biological aspects of veld reclamation and management became more apparent, conservation farming benefited from the support of many distinguished South African scientists. Several eminent botanists made submissions about the need to adapt farming activities to the types of vegetation found in different areas. The so-called 'donga doctors' became strong advocates for more ecologically-sound land use practices (a donga being the colloquial term for erosion gully). Between 1948 and 1979, scientists, in particular John Acocks (who compiled the first detailed vegetation map for South Africa), argued that poor grazing practices were resulting in substantial vegetation change and a rapid eastward movement of the arid karoo. These ideas initiated a vigorous debate about the impact of grazing by domestic livestock that had a strong influence on public opinion and political decision making, including the report of the Desert Encroachment Commission in 1951. The Stock Reduction Scheme and National Grazing Strategy, which covered vast areas of South Africa's grazing land, were outcomes of these debates.

c) First democratic government (1994)

The switch from the apartheid regime to a democratic government in 1994 has substantially affected conservation farming practice. State subsidies for agriculture were withdrawn. The commercial white farmers, who had been the chief beneficiaries, found that it was imperative to identify the most economically viable land use practices in the absence of subsidies. Conventional farming was no longer seen as the only form of land use. Game ranching, hunting, flower tours, fishing, and guest lodges, have all become potential forms of land use with profound effects on the way that land is managed (see also Chapters 3, 7 and 10). Extension services were re-aligned to help small-scale farmers and emerging black farmers who had been marginalised under apartheid. This has

resulted in a more experimental approach amongst many farmers whose support from extension services has declined, and a move away from government recommendations that were previously linked to subsidies.

Black farmers had very little support during apartheid and they had to rely on traditional knowledge and their own experience. This knowledge and experience needs to be documented and assessed since the use of indigenous livestock (e.g. Nguni cattle), traditional methods of pest control, and traditional cropping systems could make a valuable contribution to the development of conservation farming in South Africa. For example, studies of Nguni cattle indicate that they can provide a sustainable income under African conditions and have a lower impact on natural systems than other breeds. This is because they are suited to extensive farming conditions, have less reliance on supplementary feeding (no grain supplements or planted pastures), and have higher resistance to parasites and diseases (need less dipping).

Enabling factors

a) Legislation

Is there a 'good time' to introduce legislation to effect land use change? Has legislation been effective in South Africa because it was introduced at a time when farmers perceived that poor land use was leading to degradation? In a nation-wide survey, it was concluded that the opposite was in fact true. Whenever new legislation was enacted, it resulted in heightened awareness about resource conservation and greater conservation activity. Special inspectors were appointed in 1969 to monitor adherence to the Soil Conservation Act. A number of people who failed to comply with conservation guidelines were prosecuted and this resulted in a large increase in requests from farmers for assistance with planning according to conservation farming practice. The immediate impression is that the threat of punishment made the legislation effective but, in fact, only 36 people were prosecuted under the Act be-

tween 1969 and 1983. Instead, farmers identified legislation as the key enabling factor because it resulted in increased funding and support. Under the Conservation of Agricultural Resources Act 43 of 1983, the Minister could establish schemes to achieve conservation objectives. The schemes allowed the payment of subsidies for, amongst others, the construction of soil works, the reparation of damage to natural resources caused by natural disasters, the reduction of animals on the land, the restoration of eroded, denuded or damaged land, and the combating of weeds and invader plants.

Even under the most extreme conditions, governments do not always act on their own initiative. Among the many factors that finally led South Africa to develop conservation farming legislation, 26 years after the Drought Investigation Commission, was a model bill commissioned by the National Veld Trust, a national NGO. Three lawyers drew up the model bill in 1945 as a plan for an independent soil conservation authority. Although the government did not accept the plan, it prompted them to come up with their own plan, which formed the basis of the Soil Conservation Act of 1946.

b) Subsidies

The government recognised early on that farmers alone could not bear the costs of conservation farming practice. When the Soil Erosion Advisory Council was established in 1930, subsidies were provided for anti-erosion projects such as small dams for stock watering and the erection of fenced camps on grazing land. After the promulgation of the Soil Conservation Act in 1946, further subsidies were introduced. Additional aid was made available via the Grass Ley Crop Scheme (1958–1971), the Veld Reclamation Scheme (1966–1971), and the Stock Reduction Scheme (1969–1979) which were all introduced to achieve specific objectives. By 1985, the government had spent more than R140 million on loans and subsidies to support conservation farming practices.

Ironically, agricultural subsidies probably also restricted the development of conserva-

tion farming in terms of sustainable development. Subsidies for disaster relief and debt relief meant that farmers could exploit marginal land, or persist with non-sustainable land use practices, in the knowledge that they would reap profits in the good years and receive subsidies in the bad ones.

c) Scientific and technical support

The development and implementation of conservation farming practice has been underpinned by scientific institutions and extension services. Many leading scientists undertook research on veld management, grazing practices, agronomy, and hydrology. Scientific and technical support have been identified as important enabling factors for conservation farming practice. One of the most powerful tools was a detailed classification of soil types. This became one of the most important contributions to land use planning and improved land management. The agricultural policy of optimum resource use required even more detailed knowledge of both the physical and biological attributes of farms to assist with farm planning.

The role of technical support and communication needs to be highlighted as effective communication can lead to good agricultural practice. This is an area where talented and dedicated individuals can make a real difference. Between 1972 and 1991 aerial photographs from the Reitz District show a 20% improvement in veld condition. Farmers and extension officers attributed the changes to the dedicated efforts of one conservation technician. In KwaZulu-Natal, farmers of the Mpendle and Kranskop districts, in an area with highly erodible soils, stopped cropping on marginal land and stabilised erosion on old lands. Their actions were as a result of a change of heart and mind brought about by the activities of local conservation officers. In the southwest corner of South Africa, in the highly threatened vegetation known as renosterveld, research showed that communication was the key to whether conservation actions were implemented or not. Biodiversity-friendly practices were most likely to be implemented when conservation

Box 5.1. Scientific and technical support for conservation farming

Tempelhof, a once beautiful farm situated in the foothills of the Maluti Mountain near Ficksburg, was one of the first conservation farms in South Africa. Devastated by dust storms in 1948, and scarred by water erosion, the farm was in a dire state by the time the Soil Conservation Act of 1946 was passed. Ficksburg was the first area to be declared a Soil Conservation District in 1946. A soil conservation extension officer was appointed and began to work with the farmer to restore Tempelhof. They started their planning using a national soil map drawn up in 1941 that showed that Tempelhof had highveld prairie soils with crumbly loam topsoil and friable sandy loam subsoil. An agro-economic map placed it in the dryland crop farming area of the so-called Maize Triangle, and rainfall maps showed that the area typically received between 600 and 750 mm of rain in good years and as little as 400 mm in drought years. According to the vegetation maps, Tempelhof fell into veld type 56, dominated by grasses such as *Themeda triandra*, *Tristachya leucothrix*, and *Eragrostis racemosa*. This information was used to develop a farm plan for Tempelhof, which included stabilising exposed soils with grasses and storm water drains, introducing crop rotation, growing new and more productive varieties of maize, and erecting fences to allow rotational grazing as recommended by grazing trials at the Ermelo research station. In essence, the farm plan relied on the outcomes of at least six research programmes (soil mapping, agro-economic potential, vegetation maps, rainfall maps, maize breeding, grazing trials).

objectives were communicated in person (not by letter), by someone who would listen to the farmers' needs, be able to speak the same language, and communicate at an appropriate level for the farmer (without scientific jargon).

d) Non-governmental support and communication
 NGOs have also played an important role in communication and support for conservation efforts. The National Veld Trust, established in 1943, became a credible voice for conservation farming with the publication of a regular newspaper, *Veld Trust News*, and various booklets, and through organising conferences around key land use issues. There is often a need for specific information to induce a change in land use or farmer behaviour. The Endangered Wildlife Trust has been particularly good at reaching farmers. The Trust works with farmers through a series of conservation groups for cranes, raptors, and vultures, as well as a working group to reduce the impact of poisons for problem animal control. Even small changes brought about through farmer education can have large effects. For instance, a remarkable number of vultures and birds of prey drown in farm reservoirs. Placing a net over the reservoir, or

simply providing a branch for birds to climb, prevents these unnecessary deaths.

e) Community involvement

It was soon realised in South Africa and elsewhere that conservation projects on farms would not succeed simply through demonstration projects or the isolated conduct of progressive farmers. Conservation objectives will only be achieved if the entire farming community is mobilised and if farmers realise that "good farming and conservation farming are one and the same thing". Conservation projects often require considerable modification of land use practices and this requires a link between state-sponsored conservation projects and farmer operations. The Soil Conservation Act of 1946 made provision for conservation districts and the establishment of Conservation District Committees, elected by the farming communities and made up of farmers and technical experts. They had the power to initiate research projects, monitor adherence to government policies, set up demonstration projects and approve conservation projects for government subsidies. Conservation committees were regarded as successful in implementing gov-

ernment recommendations for conservation. Although many of these committees are now defunct, there are plans to use the same model to set up Landcare committees as part of a new Landcare initiative in South Africa.

f) Progressive farmers

Wherever you travel in South Africa, you are likely to meet farmers who have tried something different. The outcome is not always beneficial for conservation farming, but the experimental approach to farming is important. Farmers are often sceptical of scientific studies undertaken on experimental farms because there is no economic risk for the researcher. Experience from real farms is far more convincing. A Conservation Farming Project, funded by the Global Environment Facility (GEF), is recording and analysing the practices of some of these experimental farmers in areas with high biodiversity (Box 5.2).

CONSTRAINTS

Despite the tremendous inputs to conserve natural resources on agricultural land, there is a widespread perception that the objectives of conservation farming and optimal resource use have not been fully met and that agricultural ecosystems continue to deteriorate. Is it that the grand ideal of stable or improving agricultural ecosystems is not attainable, or that the net benefits outweigh the net losses, given some significant constraints? It is helpful to identify these constraints to see how they have limited implementation of conservation farming and its application to biodiversity conservation.

The human dimension

One of the criticisms of conservation farming initiatives is that they focus too strongly on technical analyses and solutions, without taking farmers' needs into consideration. As a result, they tend to have a top-down approach. Conservation interventions are more likely to succeed if they meet the needs of farmers and rural communities. One alternative may be an ecosystem services approach, in which stakeholders identify the ecosystem goods and services that are important to them. They can then see the link between what they want to get

out of their environment and how they need to manage their land to ensure that these services and goods are retained. Pilot studies using this approach are underway in Australia and South Africa (see Box 5.2).

Politics

The political history of South Africa has meant that different racial groups have been treated differently, and inequitably, in terms of land ownership, access to land, and access to resources. The development of conservation farming has taken place mainly in white communities on commercial farms. Attempts to change land use practices in other areas were often coupled to greater schemes of social engineering (forced removals, "betterment" schemes) and these generally failed.

Lack of support

Farmers from Nieuwoudtville in the Northern Cape Province of South Africa utilise some of the most endangered vegetation types in the country. They say that lack of support is one of the main reasons why they do not implement conservation farming practices. When Dr Bennett visited South Africa in 1944, he estimated that 1000 officers were required to implement an effective conservation programme. Although the objectives of conservation farming have become more ambitious and wide ranging since 1944, the number of officers has never exceeded 200. The result is that farmers may be able to improve physical infrastructure such as dams and anti-erosion works, but they lack specific knowledge that will enable them to apply ecologically-sound farming practices.

Financial constraints

Most farmers have a genuine love of the land but they invariably have to choose between spending their money on the implementation of conservation farming practices, which will maintain the resource base, or the purchase of commodities (e.g. seed, fertiliser) to support their current production. This choice between long-term targets and short-term needs has been an ongoing problem during the development of conservation farming, starting with erosion works and extending to the control of

Box 5.2. Conservation farming in practice

There are farmers in South Africa who practice farming in a biodiversity-friendly way, harnessing a wide range of ecosystem services. As a result, they are able to reduce input costs, increase profits, and improve sustainability. These farming practices also conserve biodiversity, contribute to carbon sequestration, and improve the quantity and quality of water runoff. The GEF has funded a three year research project to assess the benefits of selected farms located in areas rich in biodiversity.

Farming for flowers on the Bokkeveld Plateau

One of the sites selected for study is on the Bokkeveld Plateau, an extraordinary place. From its western rim to the eastern margin, the rainfall decreases from 500 mm to 200 mm per year over a distance of some 15 km. Over this transition the vegetation changes from fynbos on infertile sandy soils through renosterveld to succulent karoo. The area supports about 1350 plant species, 97 of which are endangered and listed as Red Data Book species.

The small village of Nieuwoudtville on the Bokkeveld Plateau, is the “bulb capital of the world”. The village lies in an area which is home to a staggering 241 bulb species which are amongst the most beautiful flowering bulbs that can be seen anywhere. The richest concentration of bulbs, both in terms of species and individuals, occurs on the highly fertile clays derived from dolerite. Investigations have revealed thousands of bulbs per cubic metre of soil. Nowhere else in the world is there vegetation where bulbs are the predominant growth form, a bulb land or bulb veld!

Unfortunately it is precisely these bulb-rich areas that are targeted by agriculture owing to their rich soils. As a result, large areas of bulb veld have been ploughed up and replaced with cereals and pasture crops. However, some 30 years ago, a farmer named Neil McGregor, on the farm Glen Lyon, decided that this form of agriculture was not sustainable. Instead he began to nurture the indigenous veld, as this provided a better plant cover from an agricultural point of view. With the diversity of indigenous plants, McGregor was able to maintain productivity for much longer through the dry summer season than his neighbours did with their planted crops. Thus, by abandoning biodiversity-unfriendly practices, and by refraining from the use of pesticides for over 30 years, he was able to boost sheep productivity and reduce his inputs. Moreover, he found that aardvark and porcupine, considered troublesome on crop farms, actually promoted the proliferation of bulbs and hence forage for his livestock. Therefore, he abandoned attempts at controlling these so-called problem animals.

One consequence of this conservation farming was unparalleled displays of wild flowers with a profusion of bulb species flowering from mid-winter through to late spring. It was not long before the hordes of tourists to Namaqualand, drawn to the greater region for its spring shows of wild flowers, began to seek out the superb floral displays on Glen Lyon. Soon Farmer McGregor realised this could be an additional source of income and he started his fabled flower tours of the farm. This has added significantly to his farm income. Importantly, his farm has become a role model in the region and many farmers are now following his example, with net benefits for biodiversity conservation. This form of conservation farming provides important biodiversity benefits while also providing economically-sustainable farm production.

invasive alien plants and bush encroachment. Originally, subsidies were provided to support specific actions such as anti-erosion works and stock reduction schemes, but these subsidies were phased out after 1994.

When farmers are totally reliant on their own resources (or loans) to implement conservation farming practices, their personal risk is much greater and they become far more critical of advice and recommendations. They are, therefore,

Getting the most out of the veld

The semi-arid summer rainfall area of South Africa known as the Nama Karoo is characterised by rainfall which is highly variable from year to year. The natural veld comprises a very diverse flora of palatable shrubs and grasses and also unpalatable shrubs. This area also supports an extremely important livestock industry, based mainly on wool and mutton production.

Over the last century, the condition of the ranch land over much of the Nama Karoo has deteriorated, with the proliferation of a few unpalatable species replacing more palatable species. This is the result of many years of mismanaged livestock farming practice leading to selective grazing and local extinction of the palatable plants. More than 40 years ago, John Acocks, the doyenne of South African plant ecology, made the astonishing comment that the karoo veld was “overgrazed but understocked”.

Acocks had given careful consideration of the functioning of the natural veld, and devised a grazing regime which simulated the natural system. The rich veld had developed under the grazing impacts of huge herds of springbok and wildebeest that had roamed the karoo plains in pre-colonial times. These large herds moved around the landscape in response to the productivity of the veld that varied in time and space according to rainfall events. Thus, a specific area with high productivity would be subject to a short period of intensive grazing and then the herd would move elsewhere, That patch would be free from grazing for years to come.

In seeking to simulate the natural regime, Acocks devised a non-selective grazing system. He recommended that existing farms (e.g. a 3,000 ha farm with 4–8 camps) be further subdivided into many more, smaller camps. These should be stocked at very high densities, in excess of those recommended by the authorities of the Department of Agriculture. Acocks predicted that the condition of the veld or rangeland would improve for two reasons. Firstly, livestock would be forced to eat both palatable and unpalatable plant species. Since the unpalatable plants are not adapted to being grazed, they would lose their competitive edge, become weakened, and their numbers would be reduced. Secondly, the higher number of camps would ensure a lengthened rest period between exposure to grazing, thereby enabling much of the range land to recover. This provision of a fodder bank would aid the grazier through drought periods which could extend for as long as 3 to 4 years.

Unfortunately the agricultural authorities were not convinced by Acocks’ model, possibly because of the huge costs involved in establishing the infrastructure (namely the enormous fencing costs). Furthermore, this grazing system required extremely judicious decision-making e.g. camps would have to be inspected on a daily basis and stock removed at exactly the right time before animals had a “second bite” at the plant material. Nonetheless, a few farmers decided to implement this system.

One such farmer was Mr A. Lind, on the farm Elandsfontein in the Beaufort West district. Studies show that implementation of this system on his farm has resulted in the highest productivity in the district, and ecological buffering and greater resilience of the veld against drought. Again benefits for biodiversity conservation are linked to production benefits.

less likely to implement innovative practices unless there is good evidence of tangible benefits. Even where the benefits are obvious, farmers may be unable to switch to alternative practices because of the high conversion costs. For example, in the

drier parts of the country, wheat production is often marginal and stock farming may be more productive. However, the switch to stock farming depends on whether the grazing potential of cultivated lands can be restored. Natural regeneration

is too slow while sown pastures or enhanced regeneration of natural veld can require an investment of between R100 and R300 per hectare. In many cases, farmers cannot afford these conversion costs so they continue with existing land use practices.

Knowledge

Farmers require knowledge in order to implement innovative land-use practices. Research has identified three types of knowledge that are necessary to facilitate conservation actions:

- basic knowledge or knowledge of principles;
- knowledge about the advantages and disadvantages of different farming practices;
- knowledge about the application of an innovation or practice (i.e. practical knowledge).

From a conservation farming perspective, basic knowledge, and knowledge about the advantages and disadvantages of farming practices are key factors influencing farmers' behaviour. At a broad level, farmers know that healthy soil and good veld condition are beneficial. However, land-use decisions often benefit from more specific information, especially where biodiversity issues are important. Farmers are fascinated by information on the diversity of life forms on their farms but have very little knowledge of threatened species or important functional groups such as pollinators, parasitic wasps, and soil fauna. The history of conservation farming has shown that soil classification and land type classification have been essential for effective farm and land use planning. Effective mainstreaming of biodiversity concerns into agriculture will require more accessible information on the distribution of biodiversity and its importance for particular types of farming.

CONCLUSIONS

Four criteria have been used to determine whether biodiversity has been successfully mainstreamed through conservation farming.

1. *The incorporation of biodiversity considerations in policies governing activities in the ag-*

ricultural sector. The implementation of conservation farming practices at the farm level is the outcome of agricultural policy, legislation, and other developments within organised agriculture, as well as the efforts of many committed farmers. As conservation farming has developed, biodiversity considerations have become more important. Early policies focused on soil and erosion control, but the biological factors started to be incorporated into policy from the 1950s onwards. Nevertheless, the agricultural sector views biodiversity in terms of agricultural resources, and policy tends to incorporate elements of biodiversity only once their value to agricultural production has been demonstrated.

2. *The simultaneous achievement of gains in biodiversity and gains in agricultural economics.* The focus of conservation farming has been on core agricultural business, namely the productive use of agricultural land, with the proviso that current production should not jeopardise future production through the attrition of agricultural resources. This principle has not changed over the last 80 years. What has changed has been perceptions about ecosystem goods and services, and the effect that specific elements of biodiversity have on agricultural production. Developments in conservation farming have often arisen when the 'win-win' relationship between sustainable agricultural production and the management of biodiversity have become evident. Thus farmers are very aware that changes in plant species composition can influence the carrying capacity and resilience of their grazing lands.

3. *Net biodiversity gain exceeds net biodiversity loss caused by agricultural production.* Agricultural production remains one of the main threats to biodiversity because of habitat conversion and secondary impacts. Nevertheless, the net gains for biodiversity derived from the development of conservation farming have been immense. Agricultural production, land quality and biodiversity conservation in South Africa would have been in much worse shape without the long-term strategy and implementation of conservation farming.

4. *Agricultural activity depends on sustainable use of biodiversity.* There is no doubt that agricultural production depends on a range of ecosystem goods and services. There is a growing awareness

of the role of soil biota in maintaining productive soils in cropping and grazing systems, of the importance of pollinators in vegetable and fruit production systems, of the role played by parasites and predators for pest control, and the value of heterogeneous vegetation in natural grazing systems. Conservation farming practices already reflect some of this greater awareness of the value of biodiversity. Wild relatives of domesticated crops and animals are also becoming increasingly important as sources of breeding material. The development of genetically-modified organisms (GMOs) in the agricultural sector means that agriculture is looking far beyond the traditional range of useful plants and animals for genes that could benefit agricultural production. The number of species that will be used to improve agricultural production is certain to increase and agriculture is, therefore, likely to be one of the main beneficiaries of biodiversity conservation. The onus is on the agricultural sector to ensure that these resources are conserved in agricultural landscapes.

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remarkable biodiversity of the Nieuwoudtville district.

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The Greater Addo National Park Initiative: Linking Biodiversity Conservation to Socio-economic Development

G. I. H. Kerley and A. F. Boshoff

SUMMARY

The Greater Addo National Park (GANP) initiative proposes the consolidation and expansion of two protected areas to form a single larger one. These conservation areas originally served to conserve a single species (i.e. Addo Elephant National Park for the African elephant) and forestry resources (i.e. Woody Cape and Tootabie Provincial Nature Reserves). The proposed park will conserve a spectacular range of terrestrial and marine biodiversity, including representative areas of six of South Africa's terrestrial biomes and the Albany hotspot of endemism. It will be the most diverse conservation area in South Africa. The park lies within the poverty-stricken Eastern Cape Province where government has repeatedly expressed its commitment to supporting viable and sustainable economic development opportunities.

Tourism is being actively promoted as a major development option by the South African government, and the proposed park will create significant tourism opportunities with associated socio-economic benefits. The GANP proposal, which emphasises the explicit link between the expansion of the park for biodiversity conservation and the socio-economic development potential, was publicised through a focused campaign of information dissemination and stakeholder participation, aimed particularly at key decision makers, including politicians. The fact that the GANP proposal was effectively mainstreamed is evidenced by explicit statements of support by provincial and national government. Some

lessons learned include the importance of maintaining momentum through a high public and media profile, and ensuring the availability of adequate human and financial resources to implement a project of this magnitude. The success in the mainstreaming of the GANP initiative is a direct result of the explicit linkage between biodiversity conservation and socio-economic development opportunities.

INTRODUCTION

The Eastern Cape Province is recognised as the poorest, in socio-economic terms, of South Africa's nine provinces. However, it is also the most biodiverse province—a diversity that reflects its climatic, topographic and geological gradients. It supports examples of all seven of South Africa's biomes (forest, savanna, grassland, succulent karoo, Nama karoo, fynbos, thicket) as well as areas of the Cape Floristic Region and Succulent Karoo plant diversity “hotspots”, and encompasses the Albany, Pondoland and Eastern Mountain (Drakensberg) IUCN centres of endemism. The Addo region reflects this diversity on a smaller scale, with no fewer than six of the seven biomes represented there. A large proportion of this area comprises thicket, a diverse, low-growing, evergreen and spiny vegetation type. Despite the high levels of biodiversity, only 3% of the province falls within formal conservation areas. The all-pervading poverty has contributed to the high level of threats to biodiversity, as people struggle to make a living from the natural resource base, with most of the threats to biodiversity arising from the currently dominant land use of commercial and subsistence pastoralism. Within the thicket biome there is clear evidence that pastoralism is ecologically unsustainable, and often leads to desertification. This results in a loss, not only of biodiversity but also of other resources, and exacerbates the problems of poverty, particularly in rural areas.

There is therefore an urgent need to provide land use options that address the development needs of the province, while contributing substantially to the conservation of its globally significant biodiversity. Here we present the initiative for the establishment of the Greater Addo National Park (GANP) as an example of mainstreaming

biodiversity conservation by means of socio-economic development in the Eastern Cape.

Historical perspective of the Addo Elephant National Park

The Addo Elephant National Park (AENP) was established in 1931 to protect the last remaining 11 African elephants in the region. The elephants were, however, still vulnerable to persecution by farmers when they left the unfenced park, and the population only showed significant recovery after it was successfully fenced into an area of 2270 ha in 1954. During the 1970s and 1980s the park was expanded to provide additional habitat for the growing population of elephants, and in 1994 the nearby (but not contiguous) Zuurberg National Park was amalgamated with the AENP. During this period, the management objectives focused primarily on the conservation of ‘viable populations’ of the Addo elephants (although this is not a subspecies), black rhinoceros, and Cape buffalo, and on the conservation of thicket vegetation. Of secondary importance was the conservation of other fauna characteristic of the area. Conservation of biodiversity *per se* was not listed as a priority, although it was considered important. Despite the stated importance of the vegetation, the focus appears to have been on megaherbivores, to the extent that, by the early 1970s, plant biomass and biodiversity was being lost as a result of elephant impacts.

The purchase of land in the 1970s and 1980s for the expansion of the AENP was initially to provide additional habitat for elephants, and subsequently to establish a link with the Zuurberg National Park. In 1994, the Director of Conservation and Development of the then National Parks Board (to become South African National Parks or SANP) made a public statement regarding his idea of expanding the AENP, through the purchase of additional land, to allow the elephants to move across the landscape from the desert to the coast. This (undocumented) idea was not supported by a biodiversity conservation or socio-economic rationale. Thus, the purchase of land for the expansion of the AENP focused on providing additional area for elephants, and was conducted on a non-systematic basis, as there was no strategic biodiversity conservation plan in place.

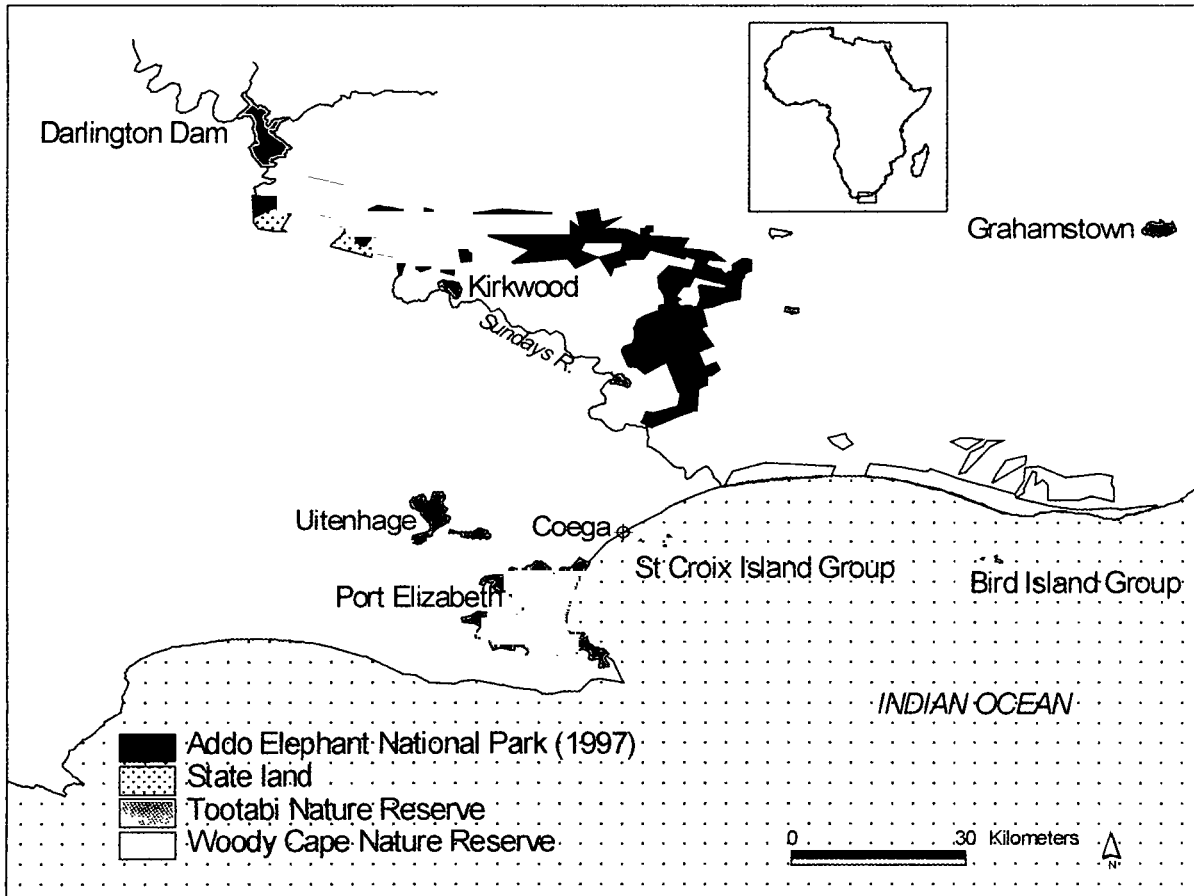
The background to the GANP initiative

Owing to evidence that stock farming leads to desertification in the Addo area, the University of Port Elizabeth (UPE) initiated a study (using the AENP as a model) comparing the ecological and socio-economic viability of conservation/tourism versus stock farming as alternative forms of land use in the thicket biome. This showed that conservation/tourism is ecologically sustainable whereas stock farming leads to a loss of the natural resource base. Furthermore, conservation/tourism provided more employment at higher income levels than stock farming. An assessment of the economic value of the AENP in 1996 showed that conservation was an important economic activity. The consumer surplus (i.e. what individuals are prepared to pay for an experience, as estimated by the costs of their travel, accommodation, etc) was valued as

US\$60 million per annum at that time. Thus, it was apparent that conservation/tourism could both conserve biodiversity and provide sustainable socio-economic development opportunities. The challenge was to present this in a framework that could be effectively implemented.

In addition to the AENP, a number of other protected areas (PA) exist in relatively close proximity in the area (Figure 6.1.). These are (a) the 23,938 ha Woody Cape Provincial Nature Reserve on the coast, comprising six separate pieces of land as well as the St Croix and Bird island groups, (b) the 343 ha Tootabie Provincial Nature Reserve and (c) two pieces of state land abutting the southwestern boundary of the western arm of the AENP. The situation existed where one PA (AENP) was expanding, explicitly for elephant conservation, and another (Woody Cape) was moribund, due to a severe lack of management capacity (human,

Figure 6.1. Map of the Addo Elephant National Park and surrounding protected areas at the time of the publication of the GANP report (1997)



material, financial) and strategic planning. Both these PAs contain globally important biodiversity, particularly the Albany hotspot (see details below).

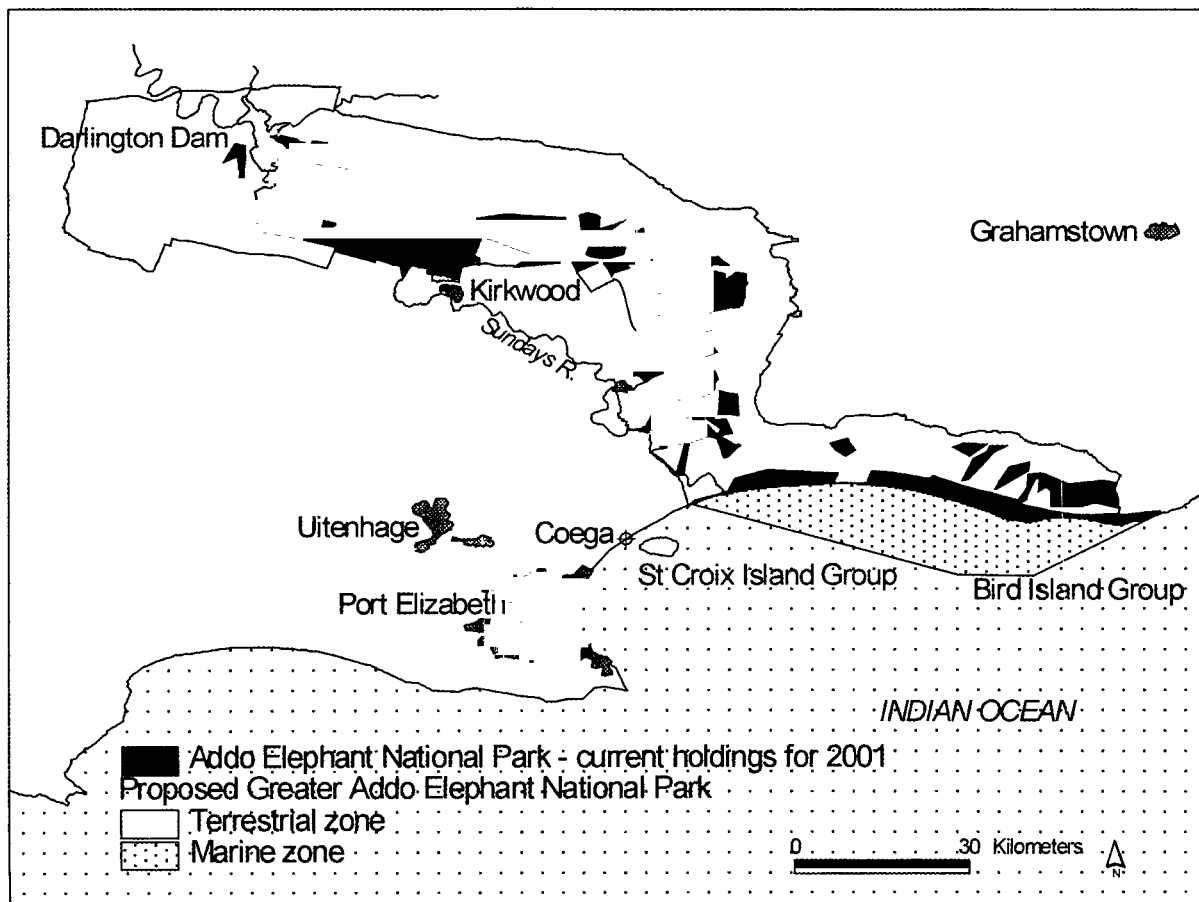
In 1997, a proposal was put forward to incorporate the aforementioned conservation areas and the intervening areas into a single protected area—the Greater Addo National Park (GANP). This vision would contribute profoundly to the conservation of biodiversity—namely, species patterns, ecological and evolutionary processes and landscapes—while at the same time significantly enhancing tourism opportunities. The concept proposal for creating a reserve for biodiversity was linked to socio-economic development.

THE GANP PROPOSAL

The vision underpinning the GANP proposal sees the amalgamation of the three aforementioned ex-

isting PAs, namely the AENP (60,000 ha at that stage) and the Woody Cape and Tootabie Nature Reserves, to form a core conservation area, and the expansion of this core area to include other important elements of biodiversity, thereby creating the “greater” Addo National Park (Figure 6.2.). The selection of the “footprint” of the proposed park was based on national and international environmental legislation and treaties, and on 11 recognised criteria. These address the issues of biodiversity, spatial complexity and representativeness, ecosystem functioning, naturalness and uniqueness, protection of flagship species, multi-purpose (buffer) zones, financial viability, economic potential, ecotourism and management factors. The vision for the GANP is comprehensively motivated on the basis of sound conservation, ecotourism and economic principles, perspectives and information. A brief synopsis of

Figure 6.2. The proposed boundaries of the park (July 2001)



the key features and advantages of the GANP follows (details are available at <http://www.zoo.upe.ac.za/teru>).

The proposed park will be some 398,000 hectares in size, comprising a 341,000 ha terrestrial zone and a 57,000 ha marine zone (Figure 6.2). The former includes almost 90 km of the Sundays River, while the marine zone includes the Bird and St Croix island groups in the Indian Ocean. This continuous conservation area, over 200 km in length, will be the third largest national park in South Africa. It will be geomorphologically and biotically the most diverse conservation area in South Africa, and probably one of the most diverse in the world. It will be unique in including examples of six of the seven biomes in South Africa, as well as a diverse marine component, and it will contribute significantly to South Africa's conservation requirements. The near pristine Alexandria coastal dunefield is the largest, most impressive, coastal dunefield in South Africa, and one of the most spectacular in the world. The GANP will also offer some protection to fragile and threatened river systems, with the Sundays River estuary being of particular conservation significance.

The Bird and St Croix island groups are of great conservation value. They support the largest population of the threatened African penguin, and the largest Cape gannet colony, in the world, as well as a range of other species of special conservation significance, e.g. the Cape fur seal. The marine zone also supports populations of threatened, and ecologically and economically, important species, e.g. reef and game fish, bottle-nosed dolphins and humpback dolphins, southern right whales and Bryde's whales, and great white sharks, which are also all important ecotourism draw cards.

Particular attractions in the proposed park will be the megaherbivores (elephant, black rhinoceros, hippopotamus) and other charismatic animals, ranging from the large predators such as lion and cheetah, to an endemic, flightless dung beetle. The park will include the "Big Five" (lion, leopard, elephant, rhinoceros, Cape buffalo), a feature critical for tourism success. With over 400 species, it will provide habitat for almost half of the bird species recorded in South Africa, and it will also play a significant role in conserving the region's diverse

reptilian and amphibian fauna. The proposed park's domain will hold five species of tortoise, the most diverse land tortoise fauna in the world within a single conservation area. The proposed park will also contribute significantly to the conservation of a range of threatened freshwater and estuarine fish species, and also a number of threatened invertebrates, including two rare butterfly species, an endemic dune grasshopper and the flightless dung beetle.

The proposed park will conserve an impressive array of plant species, ranging from the desert-adapted succulents in the Karoo to the stately trees of the Alexandria coastal forest. It is characterised by a wide range and high diversity of plant species, and by the close proximity of several very different and unrelated vegetation types. Part of the Albany Hotspot, recognised as a global centre of plant biodiversity, falls within the park. The proposed park and its surrounds also include an important and interesting palaeontological record, consisting of a range of plant and animal fossils; these include dinosaur bones and unique fossil fish deposits.

The fact that the GANP includes areas of six biomes ensures that at least some of these bioclimatic regions will persist there in the face of global climate change. In this regard the marked altitudinal variation over a relatively short distance within the proposed park boundary is noteworthy. It will also provide an array of ecosystem services, ranging from the conservation of biodiversity to the provision of clean air and water, retention of soil and opportunities for carbon sequestration.

KEY FACTORS IN MAINSTREAMING THE GANP INITIATIVE

The national government has been vigorously promoting tourism in South Africa since 1994, as it regards tourism as a major economic development opportunity for the country (Box 6.1). The GANP proposal was therefore timely, and was formulated in full recognition of this national priority. The successful mainstreaming of the GANP initiative has come about because of recognition in key political circles that it has outstanding potential to provide sustainable socio-economic development options in an area where poverty is rife and increasing.

Box 6.1. Linking biodiversity and socio-economic development: The case of GANP

The key feature to the acceptance of the GANP initiative by government and other sectors has been the explicit recognition of the tourism potential of the proposal. The opportunity to experience examples of Africa's spectacular fauna in their natural environment, in a malaria-free zone, is recognised as a major attraction. A unique feature is the combination of the terrestrial "Big Five" with elements of marine fauna such as whales, dolphins and sharks. The variety of landscapes has the potential to extend the tourism value of the proposed park, with tourists being able to spend a number of days at a single destination while their experiences range from desert to rainforest to the sea, and from lions to penguins. The GANP proposal explicitly links the conservation of biodiversity with human development, with the focus on the long-term sustainability.

The GANP proposal was launched in a briefing to the National Parliamentary Portfolio Committee for Environment and Tourism, an influential body in the political arena. As part of the strategic approach to mainstreaming GANP, the following actions were undertaken.

- The GANP report was widely disseminated, by making it available on the internet and circulating copies to key stakeholders, including local, regional and national politicians and government agencies, conservation authorities, NGOs, academics and land use decision-makers.
- Wide coverage in the local and national print and electronic media was achieved through the dissemination of the proposal, and through the proponents making themselves available for interviews.
- Numerous presentations were made to a wide range of stakeholders and interest groups.

Prime targets included politicians, local communities, farmers groups, service groups, academics, and conservation NGOs. A critical feature of this process was the proponents' willingness to engage these groups in open debate and argue the merits of the proposal, and pay attention to the concerns and issues raised by these stakeholders.

- A NGO support group specifically for GANP was established and it has been actively lobbying for the initiative.

An important step was the involvement of donor agencies. The Humane Society of the United States and International Fund for Animal Welfare (IFAW) were already supporting the AENP land purchases (for elephant habitat), through the initiative of SANP. The GANP proposal reinforced IFAW's commitment to provide financial support for the expansion of the AENP for elephant conservation. Additionally, the GANP initiative provided the incentive for the donation of US\$ 750,000 by the Leslie Hill Succulent Karoo Trust for land purchases specifically for succulent plant conservation, the first expansion of the park for biodiversity conservation in the broader sense. During 1998, representatives of the World Bank recommended that the GANP concept be developed for GEF support; a project was prepared and approved for GEF support in 2002.

During February 1999, a GANP stakeholder workshop was held at the University of Port Elizabeth (UPE), supported financially by GEF, SANP, UPE and the University of Cape Town, and with participation by 170 delegates representing a wide range of stakeholder interests. Arising from the extensive debate at this workshop, there was a unanimous declaration of support for the concept by the stakeholders. SANP was tasked with the implementation of the GANP proposal.

Subsequent to the workshop, the Addo Forum (a community liaison body previously established by SANP) was reconstituted in order to maintain and promote the ongoing interaction between SANP and GANP stakeholders. Besides SANP, stakeholders include the Eastern Cape Department of Economic Affairs, Environment and Tourism, Eastern Cape Agricultural Union, Department of Land Affairs, local and regional municipalities,

Department of Water Affairs and Forestry, Eastern Cape Tourism Board, the Wildlife and Environment Society of South Africa and representatives of local communities and business interests.

MEASURES OF MAINSTREAMING THE GANP INITIATIVE

Support for the GANP proposal was formalised in a documented declaration of support from the stakeholders workshop in 1999. Public support has been strong, and importantly has included that of politicians from across the political spectrum. The GANP proposal is included in the national bio-regional policy of the Department of Environmental Affairs and Tourism. Although some stakeholders (primarily agriculturalists) have raised concerns, these have been of a relatively minor nature and there have been no major dissenting voices. Concerns include such issues as the timing of the implementation of the concept, the fate of farm workers, family burial graveyards and the mechanisms of change of landownership.

A number of awards made to the proponents of the GANP proposal provide evidence of the enthusiastic support for this initiative. These include the Mayor's Citizen of the Year Award (1998—Conservation category), the Mail & Guardian Green Trust Award (1999—Emerging category), and a Special President's Award by the Wildlife and Environment Society of South Africa.

Subsequently SANP established a Scientific Services office in Port Elizabeth and a loan was provided by the Industrial Development Corporation to SANP for land purchases and development, an indication of the strong perceptions of the economic viability of the proposed park. The allocation of funds by the Department of Environmental Affairs and Tourism (DEAT) in its 2002/2003 budget, for the purchase of land, indicates the extent of national support for this initiative. This is the first time in decades that the national budget has included funds for land purchases for conservation as a line item. The importance attached to the GANP proposal was highlighted by a presentation on the project at a GEF-DEAT workshop in June 2001. DEAT has now allocated human and financial resources to expedite implementation of the project.

PROBLEMS ENCOUNTERED

After the GANP stakeholder workshop there was a loss of momentum for the GANP proposal, largely due to a nine-month delay in establishing and staffing the SANP project office in Port Elizabeth. Furthermore, SANP scientific staff transferred to Port Elizabeth have had to deal with the GANP proposal in addition to their previous responsibilities in parks beyond the borders of the Eastern Cape Province. As a consequence, landowners in the GANP domain became disgruntled due to the lack of follow-up information about SANP's commitment to, and progress with, the GANP proposal. At the same time there was a lack of follow-up media coverage. Thus, the GANP proposal, which had a very high public profile up to this point, virtually disappeared from the public eye. This is in strong contrast to the competing Coega development (see below) which maintained a very strong media profile, thereby assuring itself of strong and ongoing political support, at national, provincial, regional and local levels.

The GANP initiative unwittingly found itself in competition with the Coega Development. The latter comprises plans for a deep-water port and adjacent 17,000 ha industrial development zone (IDZ), the boundary of which will be less than 10 km from the park boundary. Since 1999, this development has received significant support from politicians and from the business community, mainly because it was marketed on the basis that it would provide substantial employment opportunities, both locally and regionally. It was initially supported by substantial seed funding from government and it has been able to employ top consultants to market the project through a slick and aggressive media campaign, thereby allowing it to maintain a high media profile. As a result the Coega Development has received significant and ongoing political, sectoral and financial backing from the national government. To date, that project has already cost in excess of US\$6 million and final approval has been provided by the relevant government authorities. The deep-water port, alone, is expected to cost in the region of US\$300 million, this being about six times the amount that is required to fully develop the proposed park.

In contrast, the absence of an ongoing, and high profile, media campaign for the GANP proposal by SANP, meant that the initiative largely faded into obscurity and the focus of the public and private sector, including organised business, politicians and poor communities, was fixed firmly on the adjacent Coega Development. Thus, the GANP initiative, which is widely considered to be socially, environmentally and economically viable, was largely replaced, in the eyes of the public and private sector, by an initiative that is unlikely to meet any of these criteria. Consequently, the implementation of the GANP proposal had to be supported by relatively meagre financial contributions from government, and by loans and grants from international donors. This shortage of resources has delayed implementation.

This delay has led to problems from incompatible developments within the planning domain of the proposed park. For example, private entrepreneurs have purchased land, or used existing land holdings, to develop wildlife-based ventures. Although an environmental impact assessment (EIA) is now required for land use zoning changes, and for major structural developments in rural areas, most developers have proceeded without authorisation, or have attempted to conduct EIAs on a *post hoc* basis. Consequently, a number of developments that are incompatible with the conservation goals of the GANP have taken place. Examples are the introduction of extra-limital game species and the erection of structures (e.g. lodges) that are neither aesthetically nor ecologically appropriate. In addition, some landowners have cleared the thicket vegetation, subsequent to the initial announcement of the GANP proposal in an effort to claim higher land prices (for “improvements”) if their land is purchased for inclusion in the park. Any further delay in implementing the GANP proposal is likely to exacerbate these problems, leading to greater aesthetic and ecological damage and increased restoration costs.

WIN-WIN PERSPECTIVES

The GANP initiative has resulted in a number of actions that have benefited many sectors:

- Conservation combined with nature-based tourism is the only realistic sustainable de-

velopment option for the region and it is already attracting resources to this impoverished part of South Africa. This includes investments from the tourism industry, direct income from tourism and international donors.

- GANP will result in increased conservation of biodiversity, specifically providing for the re-introduction of a range of extirpated species (particularly the carnivores), as well as conservation of a range of ecosystem processes that could not be conserved at a smaller scale. The large carnivore species are particularly important for successful tourism operations.
- It has stimulated the development of private conservation/ecotourism initiatives in the region. This is evidenced by the establishment, since the GANP report in 1997, of a plethora of hospitality (mainly bed-and-breakfast B & B facilities) and game-based ventures in the area surrounding the present AENP. The number of B & B establishments in the GANP domain has increased from two in 1997 to 38 in 2001.
- In addition to providing a range of critical ecosystem services, the proposed park will contribute significantly to the fulfillment of South Africa’s obligations to the international Convention to Combat Desertification and the Convention on Biological Diversity.
- The GANP proposal is being implemented in an inclusive manner, involving a wide range of inputs from the social, economic and academic sectors, and all interested and affected parties are developing “ownership” of the GANP concept. As a consequence, biodiversity conservation has become relevant and important to a wide range of sectors in civil society and government.

MAINSTREAMING LESSONS

Notwithstanding some of the problems mentioned earlier, the mainstreaming of the GANP initiative is considered to have been successful. It has strong sectoral support, there are no major dissenting voices, and significant progress in its implementation has been made. However, a number of important lessons have been learned.

- Economic development and environmental protection are inter-dependent and indivisible. Biodiversity has economic value, through tourism, and therefore conservation can be justified in human socio-economic development terms. Therefore, the socio-economic benefits of an environment-based project in a third world country must underpin its mainstreaming strategy.
- It is critically important to produce a document that concisely and clearly enunciates, and motivates, the vision and concept of an initiative for biodiversity conservation and associated socio-economic development.
- Sympathetic print and broadcast media are extremely powerful tools in garnering public support, both locally and nationally, for an initiative of this nature, and politicians, decision makers, funders, and local communities are greatly influenced by the coverage obtained. However, once an initiative has been launched, its media profile must be maintained, and even expanded, via an aggressive and pro-active campaign.
- Adequate resources, especially human, must be dedicated to the implementation phase.
- A comprehensive and effective public relations strategy is essential; marketing and mainstreaming of a project will be less successful if it is done on an *ad hoc* basis.
- Once an initiative has been launched the momentum achieved must be sustained, or even expanded, lest interest be lost by key stakeholders, or the project supplanted by a competitor. The public relations strategy must take this aspect into account.
- Likely problems in the expansion of conservation areas include the stimulation of the market value of properties, through mainstreaming the conservation value of an area, and the need to purchase these properties with limited funds. Furthermore, the expectations of landowners and tourism operators, in terms of opportunities arising from the project, need to be carefully managed.
- It is critical that biodiversity conservation initiatives be informed by, and where feasible complement, government policy and initiatives.

CONCLUSIONS

Prior to the unveiling of the GANP proposal, there was little public expression of government desire to expand conservation areas falling within the GANP domain. Land acquisition for the park took place on an *ad hoc* basis and was not driven by a conservation plan underpinned by biodiversity issues. Subsequent to the GANP proposal, SANP, and provincial and national government, have explicitly stated their support for the development opportunities provided by the proposal, which is based on biodiversity considerations. Thus, the GANP proposal has brought about the simultaneous achievement of gains in biodiversity and gains in an economic sector (tourism). This is evidenced by the fact that the park has more than doubled in size, as a result of land purchases and the consolidation of conservation areas, thereby providing for the creation of an additional four tourism nodes. Thus, the so-called “win-win” scenario is being achieved.

The incorporation of formerly agricultural areas into GANP has undoubtedly resulted in net biodiversity conservation gains, since research has highlighted the loss of biodiversity under unsustainable agricultural practices. This research has also demonstrated that conservation and tourism is sustainable in terms of the use of biodiversity.

The GANP initiative has provided a number of useful lessons and insights into the mainstreaming of conservation. Most importantly, the GANP proposal has boosted an awareness of biodiversity and generated a general acceptance of the concept of expanding conservation areas, and the ability of such areas to provide sustainable socio-economic benefits. Finally, the success that has been achieved in mainstreaming the GANP initiative is a result of the explicit linkage between biodiversity conservation and socio-economic development opportunities.

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Democratisation: Biodiversity Conservation for all People— A Case Study from KwaZulu-Natal

G. R. Hughes

SUMMARY

In 1895, the practice of conservation was initiated in the region now known as KwaZulu-Natal through the formal protection of designated natural areas. Some 106 years later, the concept of biodiversity conservation and its sustainable use has been mainstreamed into policy and practice in virtually every sector of the province (public, private and traditional). This has been achieved through deliberate and structured participation policies created by the nature conservation authorities, culminating ultimately in the proclamation of legislation governing such participation. The nature conservation authority, KZN Wildlife, is now publicly accountable for these policies—a unique achievement, ensuring democratisation in conservation. Because the sustainable use of wildlife has been a fundamental policy of conservation in KwaZulu-Natal, wildlife, especially the large mammal component, has thrived. Through partnerships with the private and traditional sectors, wildlife farming has become a driving economic force producing direct financial benefits and creating jobs. Partnerships include direct liaison committees, conservancies, biosphere reserves, community conservation, local boards and business profit-sharing arrangements. This has led to gains in biodiversity and gains in the private sector. With the guaranteed participation of all levels of society, there is a growing realisation that all activity is dependent upon the sustainable use of biodiversity.

INTRODUCTION

The Convention on Biological Diversity promotes sustainable living through conservation, sustainable use and equitable sharing. The focus of this chapter is

on the third element although success may not have been achieved without the efforts made to practice conservation and promote the sustainable use of wildlife.

The traditional indigenous peoples who have inhabited the province of KwaZulu-Natal (formerly known as Natal—see Box 7.1) for the past 5000 years have applied varying constraints to the use of wildlife (in this context wildlife means animals and plants). The ‘San’/Bushman¹ or “First People” lived as hunter-gatherers. With the arrival of the pastoral ‘Nguni peoples with their cattle and agriculture, at least some four hundred years ago, came the possibility of over-exploitation, especially of large mammals. Also threatened were more rare species, for example the African weasel. This led to control by tribal consensus and decrees by the amakhosi (tribal leaders) restricting the use of, or access to, certain species, and limiting traditional and communal hunts to those authorised by the amakhosi. The best known example of this was the definition of a hunting area, at the confluence

of the Black and White Mfolozi Rivers, reserved solely for the use of King Shaka (see Box 7.1).

Many of these consensual relationships began to degrade and in many cases ultimately disappear with the arrival of white settlers in the early 19th century. Virtually all large mammals and many smaller species were hunted or exploited to near extinction by the late 1800s. Whilst this was happening, any role played by indigenous communities in managing the use of wildlife was eliminated as these communities were progressively disempowered. The scene was set for total disaster and the alienation of wildlife from the day-to-day living of the majority of citizens—a scene which was to endure for nearly a century

THE LONG ROAD BACK TO CONSENSUAL CONSERVATION

By the 1890s it was apparent that some large mammal species were on the brink of extinction and irrational exploitation was sending many other

Box 7.1. Historical notes on KwaZulu-Natal

Today, KwaZulu-Natal is a province of South Africa, on the eastern seaboard of South Africa, and served by the main port of Durban. Back in 1800, the region’s inland mountainous area, the Drakensberg, was sparsely populated by San hunter-gatherers, while the eastern and northern areas were occupied by the cattle-owning ‘Nguni tribes. By the year of 1818, all of the area’s many traditional clans had been amalgamated into the Zulu nation through the manoeuvrings and skilled generalship of Shaka of the Zulu clan.

By 1879 the growing tension between the British colonial settlers who had come to occupy the southern and midlands of the region resulted in the Anglo-Zulu War which saw the subjugation and annexation of that part formerly known as Zululand. Natal (including Zululand) became one of the four provinces of South Africa in 1910 and remained unchanged until 1975 when a plethora of pieces of Zululand and Natal became established as KwaZulu. Despite the attempts by the apartheid government, KwaZulu never accepted full “homeland” status, but was a self-governing territory. In 1994 KwaZulu and Natal were once again united under a single legislative body and became KwaZulu-Natal.

Conservation control followed a similar route: colonial until 1910, then provincial until 1947 when a parastatal authority, the Natal Parks Board, was established. The Board was responsible for all nature conservation, protected areas and the use of wildlife. In 1982 the KwaZulu government established the KwaZulu Bureau of Natural Resources which had a wider mandate, involving brown as well as green environmental issues. The Natal Parks Board handed over a number of protected areas that were more conveniently managed by the Bureau. In 1998, following several years of negotiation, the two conservation bodies amalgamated into the KwaZulu-Natal Nature Conservation Service which changed its name in 2000 to KZN Wildlife.

species in the same direction (see also Chapter 3). For the first time in the region which was to become the Province of KwaZulu-Natal, some concerned citizens made their voices heard. After considerable lobbying, the first four parks for game were established in the province on 30th April 1895, an action influenced by a tiny minority of voting citizens, none of whom came from indigenous communities. The proclamations by the Colony of Natal were certainly well-intended, even if not universally supported. Without them the path of conservation in the province would have been dramatically different and the possibility of mainstreaming biodiversity conservation could never have been realised.

For nearly seventy years, from 1895–1960, the dominant philosophy driving nature conservation was law enforcement and protectionism. As a result, nature conservation became a foreign concept to all indigenous peoples as access to living natural resources, especially large mammals, became ever more remote. The marine component of biodiversity remained in a healthy state. It was not traditionally used by the Zulu people and was not to be perceived as over-exploited until the latter part of the 20th century.

Following the Second World War, biodiversity conservation began to attract more attention at the global level. South Africa, because of its role in the development of the United Nations, was drawn into this paradigm, becoming a founder member of the International Union for the Conservation of Nature (IUCN). As a result, political parties at the local level began to take an interest in conservation. In 1947, in the region now known as KwaZulu-Natal, the Natal Parks Board, a parastatal body, was established. As was typical of most conservation bodies at this time, its structure was militaristic, its primary goals being order, protection and expansionism. A strict top-down management order was in place, there was little formal participation from the public at large and none at all from indigenous communities.

The only traceable influence from outside individuals was through the offices of one or two non-government organisations (NGOs), especially the African Wildlife Society (now the Wildlife and Environment Society of South Africa WESSA), then the most effective and powerful nature-based

NGO in South Africa (see Box 7.2). WESSA's influence continued to grow for the next thirty years.

During the 1960s two significant shifts in policy occurred in the Natal Parks Board. Firstly, in 1962, a “farm game” extension service was launched. The goals of field officers operating outside of protected areas were thus changed from strict law enforcement to the promotion of wildlife as an integral part of sound land management (see also Chapter 3). It was a difficult transition, with support from very few private landowners (the main target of the policy), despite the fact that it was focused on “useful” species i.e. those that could be hunted. The second policy shift was the decision to make surplus game available to other parks and for sale to private landowners. With this incentive began the first hesitant steps in bringing

Box 7.2. NGO partnerships: key factors in mainstreaming biodiversity

No discourse on the democratisation of biodiversity conservation in KwaZulu-Natal would be complete without reference to the non-government organisations operating in the province. For many years the African Wildlife Society and its successor, WESSA, played an invaluable role in conservation. In the early part of the 20th century its founders were the promoters and provokers of conservation action. The province owes the Society an enormous debt, not only for those critical early activities but for its continued, and still growing, contribution to biodiversity conservation in KwaZulu-Natal, including representation on the boards of conservation bodies.

In recognition of the significant added value that can be derived from NGOs and their members, the Natal Parks Board formally endorsed, in 1998, the establishment of a Board–NGO Forum which has resulted in the registration and recognition of 30 NGOs. As this relationship matures, considerable benefits are envisaged, not the least of which is the democratisation of biodiversity conservation.

biodiversity conservation into the mainstream of formal agriculture (see also Chapters 3 and 10).

Encouraged by support for conservation from white landowners and believing that conservation was for all communities, during the 1970s the Natal Parks Board began to open its governance to a wider range of citizens. In 1974 for the first time a province-wide Committee on Conservation and Recreation was initiated with all four dominant race groups deliberately represented: black, white, Indian and coloured. It was an interesting experiment (especially given the apartheid government of the time) but with limited success for a number of years. The committee enjoyed good province-level support and was promoted and endorsed by the Provincial Administrator-in-Executive Committee. There is little doubt that those persons involved, including provincial politicians, enjoyed participating but they were handicapped by the fact that their role was purely advisory and lacked any real power. There was also a disincentive for people of colour participating in any formal structure under apartheid, although the stigma of participation was not as severe as it became in later years as the political struggle gained strength and momentum.

Of far greater significance, and a giant step in mainstreaming biodiversity into the white community activities, was the establishment of liaison committees in 1974. These liaison committees effectively brought those with a focused interest in the use of natural resources directly into mainstream conservation. Examples of such committees were the Hunters, Coastal Fishing, Inland Fishing, Trout Fishing and Yachting Liaison Committees. In later years others were added, including the Traditional Healers Liaison Committee and the Conservancies Liaison Committee. There were no constraints on participation but only a few committees (e.g. coastal fishing) had significant membership from groups disenfranchised through apartheid. The Traditional Healers Committee, however, is dominated by black citizens.

These committees attracted a range of influential citizens who saw this development as a real opportunity for participation in conservation decision-making. For the first time, policy, legislation (both amendment and development) and management action was considered and debated by those most affected, and prior to Board and Provincial

Council approval through the usual parliamentary processes. This was a major step in democratisation. The committee system proved to be a major success and remained remarkably effective over nearly thirty years.

Three important steps in the democratisation process took place from 1977–1985. They involved both internal changes and change initiated from outside.

Within the Natal Parks Board, the first Staff Representative Committees were established in the Drakensberg region in 1977 by the Chief Conservator West. These committees were intended to give a voice to, and open up formal communication channels for, the black members of staff. Until this stage, black personnel had no voice. They were not represented by the Staff Association which was restricted to officer class, which in effect meant whites only. At that stage, people of colour were only employed as game guards (i.e. field rangers), clerks, and general assistants, yet comprised by far the majority of staff. The move for black staff to be heard was not universally supported by white staff, nor was it backed by all members of the Board itself. In certain parts of the province there was hostile resistance.

Of equal importance to internal transformation was the invitation to the Government of the Self-Governing Homeland of KwaZulu to appoint two members to the Natal Parks Board. This move, in 1978, was a first in the history of Natal nature conservation, when staff became answerable and accountable to black South Africans. This was initiated by the member of the Executive Committee of the Province responsible for nature conservation and supported by the Natal Parks Board in a sincere effort to bring all communities into conservation. The first black appointees made an enormous impression, inspiring black staff and provoking a dramatic paradigm shift in attitudes amongst the white staff. It was a pivotal moment in mainstreaming biodiversity in KwaZulu-Natal.

The external development of significance was the start of the *Conservancies System* by a group of local farmers in the Dargle area in 1977. Loosely based upon a "Farm Patrol Plan" written by staff of the Natal Parks Board, a conservancy is an association of landowners, each paying an annual levy into a central fund from which expenses are

drawn for staff, wildlife purchases and collective action towards conservation on their combined landholdings. In essence, conservancies have mainstreamed biodiversity conservation into the daily management of landholdings which are not normally devoted to conservation activity. Some of the most successful conservancies are those devoted to intensive agriculture, such as sugar or tree plantations. This is because of the care that now goes into protecting and managing the undamaged or untransformed components of the landholdings. The landowners have taken responsibility for conserving the biodiversity that falls within their jurisdiction. The importance of this mainstreaming should not be underestimated. Today there are 227 conservancies covering over 20% of the province (in addition to the 8.16% of formally protected areas). The Conservancies Association, representing nearly 200 landowners, has become an important NGO whose influence goes far beyond its membership. Regular monitoring of conservancy activities has shown significant and valuable increases in important and threatened mammal and bird species. No province-wide conservation endeavour would even consider excluding conservancy members, whose vision has gone beyond rural land holdings and inspired the formation of urban office-park, industrial, marine and even suburban conservancies.

The Natal Parks Board encouraged conservancies to reintroduce large mammals to properties where they were compatible with economic practice—(you can't put elephants on a maize farm!)—by offering a 25% discount off normal prices for founder wildlife populations. This policy remains in force in KZN Wildlife, the successor to the Natal Parks Board, and has succeeded in establishing new populations of large mammals (see also Chapter 3).

During this period, South Africa had no access to United Nations environmental support, such as the Man and the Biosphere (MAB) Programme, and could not register biosphere reserves. Nevertheless, the Natal Parks Board promoted the concept in KwaZulu-Natal, and established seven biosphere reserves, based on its formally protected areas. In effect they became “super conservancies”. In due course, their formal recognition will be sought from UNESCO.

At the political level, the staff and the Board of the Natal Parks Board were actively turning against the national policy of apartheid. In flagrant violation of existing laws, they made a decision in 1982 to stop applying racist legislation in visitor lodges within protected areas controlled by the conservation division. Following on from this, the same action was taken in the more visible recreation resorts in 1983. Although supported by the Provincial Executive Committee, the Board was requested not to publicise these actions for fear of a vicious response from central government. There is no doubt that these changes did become public; it is noteworthy that there was never any pressure brought to bear to revert to apartheid constraints.

Nevertheless, this action did not lead to a significant growth in black usage of the province's protected areas although there are now clear indications of the acceptability of such destinations, especially the beaches within the parks. It is now possible to record up to 50,000 black visitors on a single public holiday on beaches within protected areas. By 2001 a dramatic paradigm shift in black attitudes towards protected areas can be perceived. This is probably due to three factors: more leisure time, greater mobility and a growing understanding of the role of protected areas and the opportunity to see large mammals.

From 1985–1990 was a period of rapid expansion in the participation of informed citizens and the first indications of efforts to include, and consider the needs and aspirations of, black communities. Within KwaZulu, the Bureau of Natural Resources was established to promote nature conservation within traditional communities which had previously received no encouragement or consideration for nearly a century.

It is noteworthy that in the homeland of Bophutatswana, there existed a parastatal board similar to the Natal Parks Board (staffed by many ex Natal Parks Board staff) which, in the 1980s, started innovative and exciting programmes to include black citizens. Some wonderful results were achieved, which further inspired the Natal Parks Board's own desire to democratise conservation. Severe criticism by citizens of KwaZulu-Natal about a lack of sharing of resources and the fast developing “struggle” press created the impetus for another dramatic change of Natal Parks Board's

policy. From the passive but slow, evolutionary democratisation process, the Board adopted an aggressive and focused outreach programme.

Between 1991–2000 further changes in internal practice and external policy promoted the democratisation of biodiversity conservation. In 1989, the Natal Parks Board decided to establish a province-wide forum or seminar, led by the CEO in which as many staff as possible could participate and a “state of conservation” overview would be delivered. It was expected that real and meaningful dialogue would develop between executive and field management, resulting in improved joint decision-making. This did not prove to be the case for numerous reasons, including the difficult logistics of amassing enough staff in a central location. Furthermore, inhibitions arose as a result of the mix of disparate communities of staff, often for the first time.

To try to overcome these problems the CEO’s seminar was changed to a series of seven regional seminars (including one at head office), carried out in both English and Zulu, which proved to be more

intimate and allowed peer and association groups of staff to participate in a supportive manner, drawing strength from one another. There is no doubt that these inclusive seminars, attended by staff of all races and a CEO who was accessible and accountable to all staff, facilitated the continuation of the democratisation process.

These internal adjustments were essential to the external process. In 1991 there was consensus amongst the staff about the need for a more aggressive and dynamic outreach programme to involve traditional communities. This led to the creation of the first multi-racial and multi-level group of staff to formulate what was to become known as the *Neighbour Relations Policy* (see Box 7.3). This process of democratisation was not always easy and was greeted by some staff with cynicism, and even open hostility. Nevertheless, a policy and action plan was produced by the most representative group of staff ever assembled and sent to outside institutes and NGOs for review. In spite of criticism from some academics that the plan was top-down and illegitimate, most external

Box 7.3. The goals of the Neighbour Relations Policy, 1991

The Natal Parks Board launched an extensive series of programmes to make conservation in general, and in protected areas in particular, more relevant to poor communities. These aim to:

1. encourage participation in protected area management and planning by creating Neighbour’s Forums to:
 - create trust
 - discuss boundary and land uses
 - create wildlife resource harvesting programmes
 - provide controlled free access
 - formalise and honour commitments.
2. foster economic and social development, thus contributing to an improved quality of life by:
 - addressing basic social needs of neighbouring communities
 - encouraging preferential employment
 - involving local entrepreneurs
 - developing wildlife resource areas on the periphery of protected areas.
3. enhance environmental awareness by:
 - developing environmental education and interpretation programmes
 - creating an appropriate problem-animal policy
 - undertaking training of staff
 - creating a Neighbourhood Trust to fund such actions

bodies were enthusiastic. The proposals were endorsed by the Board as policy and the Board's outreach programme was underway. Flawed as it may have been, it was another fundamental step towards making biodiversity conservation a mainstream activity for all citizens.

At the heart of the policy was the creation of trust between conservation staff and communities. This was a huge challenge given the history of conservation worldwide as a practice that often alienated indigenous communities, rather than included them. In South Africa, this was exacerbated by the iniquitous apartheid policies pursued by central government. It is to the credit of many members of staff that significant and measurable improvements in trust were made. Through this closer dialogue came greater understanding which was invaluable for future progress.

Staff of the Natal Parks Board began to understand the depth of bitterness ingrained in the psyche of traditional communities regarding the fact that their ancestral lands had been declared protected areas without consultation, and thereafter made inaccessible to them. This bitterness was admitted and discussed more openly than ever before, and this discourse pointed the way to possible solutions. The Neighbour Relations Policy empowered staff to find solutions, including the establishment of local forums and a development fund to be generated by a levy system on tourism.

(1) The Tourism Levy and Community Development Fund

Two of the goals of the Neighbour Relations Policy were to establish a trust fund and to facilitate donations for community development. An amount equivalent to more than US\$3.75 million² was raised by staff for various projects across the province. As a result water schemes, electrification programmes, nutritional gardens, schools, clinics and equipment were built and supplied. Such programmes are still continuing. Early in the programme it was made clear that the money came from donors. Although this was appreciated, it did not assuage the resentment directed towards people using ancestral lands without direct benefits flowing to communities. As a result, there were attempts to determine a way of involving tourists in a scheme

that would address this resentment. A previous request in 1987 to impose a tourist levy had been turned down. After considerable debate a proposal for a structured system of levies was approved by the Board and implemented by the Natal Parks Board in February 1998 (Box 7.4).

The important features of the levy were that it was modest, well-structured, accountable and did not affect the basic budget of the organisation itself. Staff were thoroughly trained in the principles, all tour groups/agents were sent copies of the planned levy and staff met with influential groups throughout the province to explain the policy. The concept was enthusiastically promoted by staff of the outreach programme and neighbouring communities alike. In three years it has raised over R13 million for community development and is possibly the most effective and sustainable such programme in Africa.

The question of sustainability was all important because a previous attempt to direct financial benefits direct to communities in KwaZulu through the Nature Conservation Act had failed. That structure was flawed in that the Act stated that 25% of gross revenues should be paid annually to appropriate communities. This was unsustainable. (Had it been 25% of net profits from revenues earned it might have worked.) Following amalgamation of the Directorate with the Natal Parks Board in April 1998, this option fell away and the tourist levy replaced it.

The tourist levy has a number of strong advantages:

- It encourages communities to value tourists—the more tourists, the more money for their benefit.
- A proportion (10%) of the levies accumulates in a capital fund, namely the Community Development Fund and the interest generated provides grants to communities distant from tourist areas; it is used to supplement worthy projects at the discretion of the trustees.
- As the funds are allocated according to communities' wishes, there is growing cooperation between adjoining communities sharing the boundaries of the protected areas and thus sharing the fund.

Box 7.4. Notice to inform the public of the importance of a "...

Natal Parks Board Community Levy

With effect from 1 February 1998, visitors will be required to pay a community levy when entering certain protected areas administered by the Natal Parks Board. The levy will apply to those reserves where an entry fee is payable and where hatted accommodation or camping is offered. The levy will be used to assist neighbouring communities with capacity-building and development of their surrounds. It will be a **once-off payment per camp per reserve**, i.e. the levy will be applicable at each Natal Parks Board reserve where an entry fee is paid. The levy will be:

- R10 per person per camp for hatted accommodation;**
- R5 per person per camp for camping;**
- R1 per person per entrance gate for gate entry.**

Children under the age of three years will not be subject to the levy. Education groups visiting protected areas will not be subject to the levy.

A community levy will also be payable for the following Natal Parks Board facilities:

Crocodile Centre, St Lucia	R1 per person per entry
Santa Lucia, St Lucia	R1 per person per entry
Giant's Cup Trail	R5 per person
Overnight Hiking	R5 per person
Aircraft entry	R1 per person
Aircraft entry (overnight)	R10 per person

Background information

South Africa's protected areas are vital to the ongoing success of this country's world-renowned wildlife conservation programmes. In economic terms, our protected areas are our greatest tourism asset. They attract ever-growing numbers of both foreign and local visitors for the unique experience of life in the wilds. As members of the world's conservation community, we must safeguard these protected areas. They are a priceless heritage which can benefit us all.

Our protected areas can only thrive if they have the support of our people. This includes disadvantaged communities who live around these areas. The Natal Parks Board recognises the needs of these communities and has thus committed itself to their development and upliftment through one of the largest conservation social responsibility programmes in Africa. However, direct cash injection from tourism into these communities is also sorely needed. The community levy would go directly towards fulfilling this need.

(2) Local Forums to Local Boards

The local forums established under the Neighbour Relations Policy encountered several problems. Their success depended upon the keenness of local officers-in-charge (which varied from outstanding to negligible) and, to an even greater extent,

on the enthusiasm of the local, influential, traditional community leaders. The forums were certainly not a universal success.

In 1995 a symposium held under the auspices of the Wildlife and Environment Society of South Africa (WESSA) and entitled "Parks and People", sought ways forward for full participation of all

people in conservation activities. After several days of deliberation and debate, the establishment of local boards was proposed.

Following the symposium the concept was presented to one particular leader whose relations with formal conservation had been very hostile. He pointed out very bluntly that the forums/boards were all very well but that all the real power was still held by the Natal Parks Board and its staff. He noted that the Board had decided that there would be forums (see the criticism by academics, above), the Board decided when and where they would be held, and who would attend and when. He ended his expression of dissatisfaction by saying that after 300 years his communities were tired of having no real powers. His views wiped out any complacency that might have been engendered by some apparent successes in neighbour forums. It was clear that a clear and discernable shift in power relations was needed. As a result it was proposed that local boards be enshrined in legislation, thus making their establishment obligatory and accountable through a public process. This would mean a true transfer of power from the Natal Parks Board to the people.

AMALGAMATION OF THE CONSERVATION BODIES IN KWAZULU-NATAL

In 1994 following South Africa's first democratic election and the creation of the Province of KwaZulu-Natal, the then Minister of Traditional and Environmental Affairs, instructed that all nature conservation bodies in the province should be amalgamated into one single authority. Two major organisations quite different in structure, were involved. These were the Directorate of Nature Conservation of KwaZulu, a government department, and the Natal Parks Board, a semi-autonomous parastatal body with an independent board.

The Joubert Commission was established by consensus and recommended that the new authority should be a parastatal structure, with appointment of board members by public process to ensure broader representation. This differed greatly from the selection of the members of the old Natal Parks Board who had been handpicked for their enthusiasm for conservation, and their expertise, and who received no remuneration or

allowance for their services other than for costs incurred.

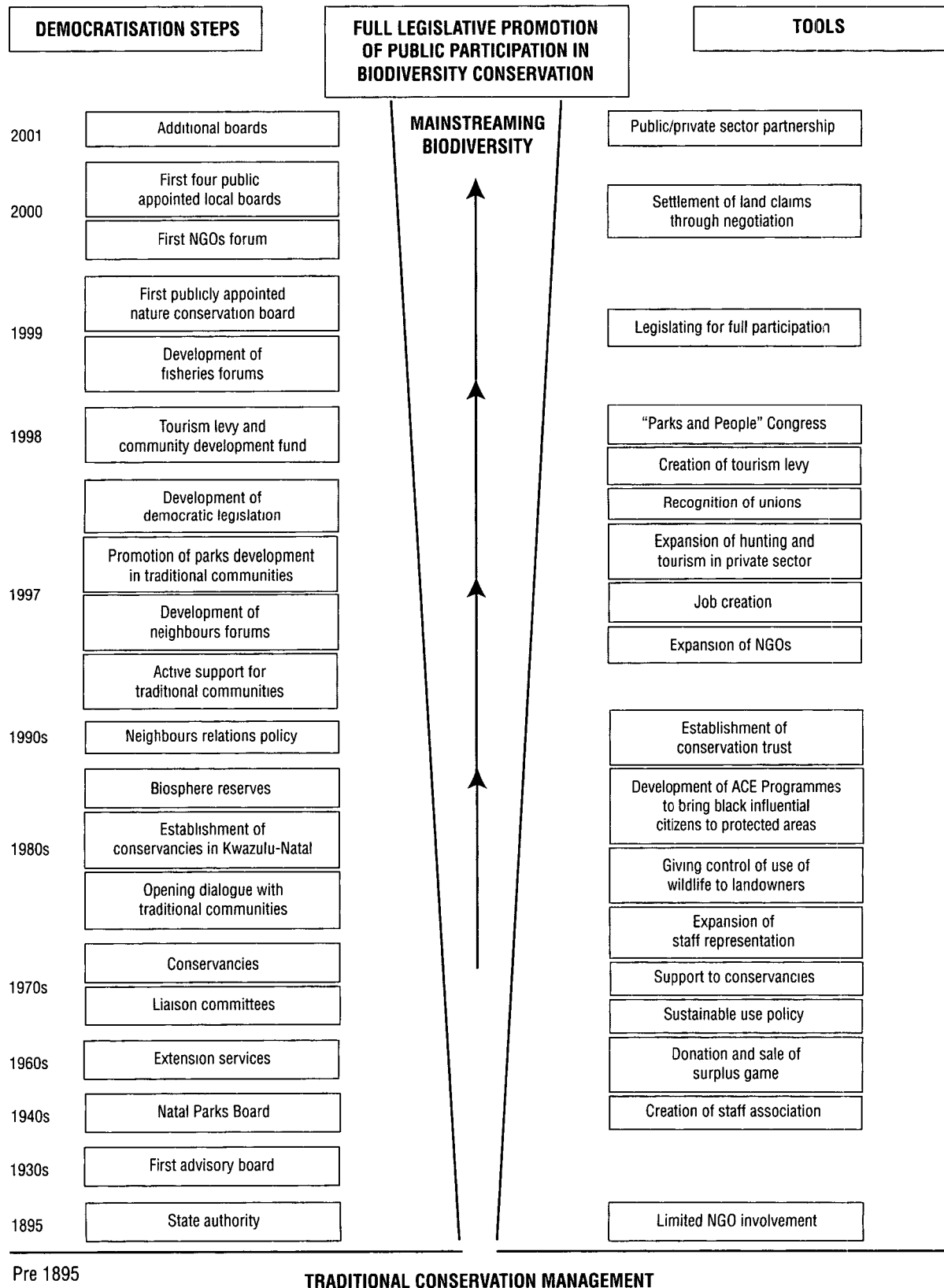
Amalgamation took place on 1 April 1998 following the publication of Act No 7 of 1997 with the establishment of a parastatal board, the KwaZulu-Natal Nature Conservation Board. The staff serving the new board would be known as the KwaZulu-Natal Nature Conservation Service, which became KZN Wildlife in August 2000. At the same time the legislation provided for the establishment of local boards, thus effectively completing the democratisation of nature conservation in KwaZulu-Natal. After a long and thorough preparatory period, the first four local boards were established in September 2000 and were followed by others, eventually covering the entire province.

The establishment of a legitimate provincial board and the local boards had major impacts in steadily eroding entrenched positions and expanding cooperative governance. Their timing could not have been more opportune as protected areas were now faced with a new threat, namely land claims. Following 1994, over 30,000 land claims, posted by victims of apartheid, raised great alarm for the survival of protected areas in the province. The efforts of conservation bodies to democratise, however, has resulted in a positive shift in political attitudes which, coupled with the clear economic benefits flowing from protected areas, have convinced the state to deflect land claims for conservation areas.

The opening up of dialogue had permitted conservation staff to display genuine and sincere empathy with claimants which, coupled with the fast developing Community Development Fund, made pursuit of just and equitable solutions relatively smooth. Two important land claims have already been settled. In both cases the existence of the development fund played an important role.

There is no doubt that staff of KZN Wildlife have developed the skills necessary for constructive participation in such sensitive negotiations. Those claims that have been settled have set a trend towards greater democracy and the empowerment of traditional communities, giving them rights over conservation land without the right to resettle on ancestral land. This has had two challenging results. The first has been the establishment of new community bodies called *Community Property*

Figure 7.1. Key factors in the process of democratisation which influenced the mainstreaming of biodiversity in the Province of KwaZulu-Natal



Associations bringing yet another, more focused, suite of stakeholders to the conservation scene. The second development has seen democratic struggles within the communities themselves as traditional loyalties are threatened by progressive forces. Conservation staff in KwaZulu-Natal have learned to adapt to these circumstances and are today welcome participants in seeking solutions. Years of policy development and hard-earned experience have undoubtedly paved the way for the full participation of all people in biodiversity conservation.

THE FUTURE

The democratisation of conservation in KwaZulu-Natal has taken decades to achieve but biodiversity has undoubtedly now entered the mainstream of economic growth, politics and community life at all levels. This direction can now be followed with confidence, free of so much of the baggage of the past, as sound conservation practice has so much to offer the province and its people. The economic benefits have been dramatic, leading to increases in tourism and substantial job creation. Nevertheless, for conservation to succeed, understanding must go beyond simple economics. The end result of the democratisation of conservation would be the appreciation of the aesthetic benefits of conservation and the understanding of the necessity of sound environmental management

CONCLUSIONS

From this account of KwaZulu-Natal, it can be concluded that a process of democratisation has been a key factor that has enabled the mainstreaming of biodiversity conservation into land use decisions (Figure 7.1). Through the ceding of power to all stakeholders, biodiversity has featured in both formal policy and informal process.

In South Africa, and in particular KwaZulu-Natal, there are outstanding examples of sustainable use of wildlife. The economic sector has benefited from wildlife populations restored by conservation agencies. The shift in land management from marginal agriculture to wildlife as an economic generator through photo tourism or hunting is resulting in net biodiversity gain for the Province of KwaZulu-Natal. An additional 10% of the surface area has been converted to pure wildlife

management (see also Chapter 3). Finally, there is a widespread, and growing understanding of the dependence of human survival on the sustainable use of biodiversity.

The key factors for mainstreaming biodiversity in this case study have been a progressive policy over 40 years, starting with the Natal Parks Board, focusing on bringing benefits derived from biodiversity through a broad range of participatory programmes, eventually involving all communities and stakeholders. In this pursuit the province has been served by committed staff, enthusiastic NGOs and a sympathetic citizenry and some commendable political leadership that has given financial support to this essential cause.

NOTES

1. Considerable controversy exists around the names San and Bushman to describe these early inhabitants. Some surviving groups prefer San (mainly South African) others Bushman (Botswana and Namibia). San is used in this paper.

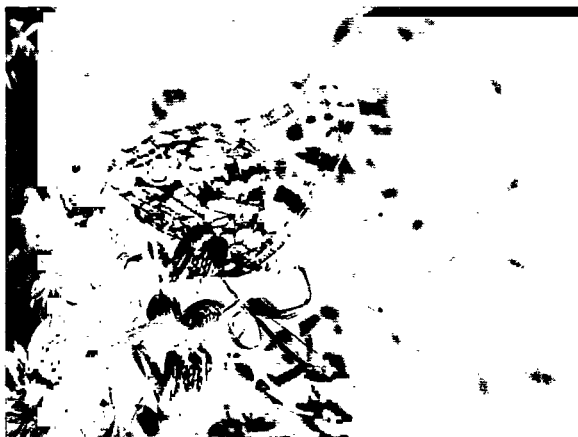
2. US\$1 = R8 at time of writing.

ACKNOWLEDGEMENTS

After nearly a century of democratisation, it seems unworthy to list some individuals and not others because positive results come from team efforts. The conservation team of the Province of KwaZulu-Natal deserves praise from its very origin in 1895 to today. Thanks to all the staff we know and those we never met. Additional thanks must go to the many citizens of the province whose support was invaluable and to the many board members of the Natal Parks Board and successor boards who set the policies. Inkosi Simon Gumede and Professor Paul Luthuli, the first black members of the Natal Parks Board, deserve special thanks. Finally thanks should go to the political leaders in the province who have made it all possible.

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An Urban Challenge: Conserving Biodiversity in the eThekweni Municipality, KwaZulu-Natal

D. Roberts, M. Mander and R. Boon

SUMMARY

Over the last three decades, open space planning has provided an important vehicle for mainstreaming biodiversity issues in the Durban metropole, now known as the eThekweni Municipality. In the early 1980s, the focus was primarily on the protection of areas of conservation significance. By the mid-1990s this had developed into a more holistic understanding of the contribution of urban open space to sustainable development. This change in approach has been driven by political transformation (i.e. the move from apartheid to democracy in South Africa) and the international prioritisation of environmental issues. The Durban experience has also underscored a number of factors important in the mainstreaming of biodiversity concerns, namely the value of partnerships between non-governmental and governmental institutions; the significant role played by individuals in championing biodiversity issues; the need for detailed ecological data to guide urban planning; and the need for biodiversity planning to be sensitive to changing social, cultural and political needs.

INTRODUCTION

Today, for the first time in human history, urban dwellers outnumber those in rural areas. It is currently predicted that the global urban population will double from 2.5 billion in 1995 to 5 billion in 2025 and that by the end of the 21st century more people will live in the urban areas of the developing world than are alive on the planet today. This scenario has significant implications for the global

ecosystem as each city has an ‘ecological footprint’ (based on its resource consumption and waste generation) that is many times larger than its physical area.

In South Africa this ‘ecological footprint’ has been significantly influenced by the environmental impacts of past governments’ policies which distributed the country’s resources along racial lines. The Land Act of 1913 began the process of racial segregation by restricting land ownership by black people to 7% of the country’s total land area. This was increased to 13% in 1936 as a ‘compensation’ for the loss of parliamentary voting rights. In 1948 the Nationalist government formally instituted the policy of apartheid, a cornerstone of which was the creation of ‘bantustans’ or self-governing ‘homelands’ for the black population. The political desire to separate the racial groups was, however, undermined by the need for a cheap and accessible labour force to support the country’s economy. This resulted in the promulgation of the Natives (Urban Areas) Act of 1923 (as amended in 1945) which enabled white local authorities to manage black townships within the so-called ‘white’ urban areas and which transformed urban blacks into temporary sojourners in ‘white South Africa’. This racial segregation was further reinforced by the Group Areas Act in 1950, under which Indians and coloureds were forcibly removed to special townships in the urban areas. These laws were supported in turn by the institution of pass laws and influx control.

The repeal of these influx controls and pass regulations in 1983 opened the floodgates of black urbanisation in South Africa. It was estimated at the time that 9 million people (i.e. 360,000 people a year or 1,000 people a day) from the ‘homelands’ would move into South Africa’s urban areas between 1985 and 2010. Almost all of the influx that has resulted has been to the poor black township areas in the previous ‘white cities’. This has produced extensive overcrowding and a mushrooming in the number of informal settlements. This rapid urbanisation has put significant pressure on the natural resource base in South Africa’s cities.

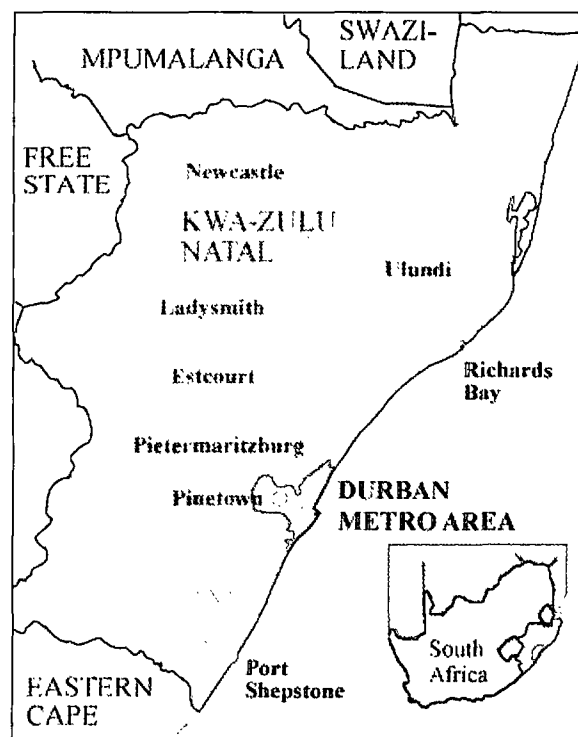
It is against this backdrop of global urbanisation and the emergence of post-apartheid cities that the mainstreaming of biodiversity issues in the South African city of Durban is examined.

The Durban case study

The eThekweni Municipality, formerly known as the Durban metropolitan area, is located on the eastern seaboard of Africa and occupies an area of 2,297km²—with a population of some 2.8 million people (Figure 8.1).

The city is a key industrial, commercial and transport centre in the southern African region, and is an important local, and emerging international, tourist destination. This development profile, combined with factors such as unemployment levels of 32%, high levels of poverty, a housing backlog estimated at 186,000 units, the development of dense, large scale informal settlements, urban sprawl and industrial pollution, have all placed high demands on the local ecosystems and impacted negatively on local and regional biodiversity. Three decades of open space planning in the city have, however, shown that it is possible to mainstream the concept of biodiversity protection by establishing clear, and understandable, links between ecosystem conservation and human needs, and by

Figure 8.1. Location of the Durban metropolitan area, now known as the eThekweni Municipality



incorporating this thinking—in an incremental and iterative fashion—into urban planning and decision-making processes.

Phase 1—Preparation of the Metropolitan Open Space System (MOSS) Plan

In Durban, attention was first focused on urban biodiversity issues during the early 1970s when an environmental NGO, now known as the Wildlife and Environment Society of South Africa (WESSA), expressed concern regarding the loss of important natural areas to *ad hoc* urban development. This prompted two key individuals within WESSA to propose the development of a metropolitan open space system (MOSS) to protect the conservation-worthy areas of the city. In 1979 the first MOSS plan was produced. This plan consolidated all viable conservation belts and potential trail routes within the metropolitan area into an open space network. The major shortfall of the plan was its focus on the preservation of rare and endangered species and communities, rather than the preservation of ecologically functional landscapes.

These same individuals (representing WESSA) approached the provincial planning authorities (i.e. the Natal Town and Regional Planning Commission: NTRPC) with concerns regarding the loss of important open spaces in Durban. An agreement was reached between the two institutions to develop a metropolitan open space system plan for the city as a joint project. The partnership hosted a seminar in February 1983 to promote the MOSS concept amongst the city's stakeholder groups. The resolutions passed at this seminar resulted in the NTRPC establishing a MOSS steering committee.

With support from NTRPC, a researcher was appointed in 1985 to produce a more detailed metropolitan open space plan. As with its predecessor, however, this second plan reinforced the idea that the ideal open space system consisted of large natural areas connected by river corridors. The scale of the plan was also too small to make it useful in the planning and decision-making of local municipalities. Thus, while the new plan focused increased attention on the need for appropriate open space design and protection, it lacked sufficient detail to assist with the implementation of the system.

Phase 2—Preparation of the Durban Metropolitan Open Space System (D'MOSS) Report for municipal Durban

At the same time as the provincial authorities and WESSA were working on a metropolitan open space system plan, authorities in municipal Durban (the largest local authority within the metropolitan area) were reviewing open space provision at a local level. Up until this point, the primary determinant of open space distribution in municipal Durban had been the town planning policy to reserve land for public open space at a ratio of 2 hectares per 1,000 of the estimated potential population. This approach was reviewed when amendments to the provincial Town Planning Ordinance (promulgated in September 1983) required local authorities to acquire privately owned land, reserved for open space purposes, within a 5–10 year period. A critical review of open space needs in the municipal area was necessary, especially as the privately-owned land, reserved for public open space in municipal Durban, had an estimated acquisition cost of approximately R20 million.

In a first attempt to rationalise and clarify acquisition priorities, an inventory of open spaces within the municipal area was developed. This did not, however, include ecological information on the listed open spaces. In 1983, a PhD candidate in the Biology Department of the local University of Natal approached the city's town planning department and motivated the need to undertake a detailed ecological evaluation of the open spaces within the municipal area, using a vegetation sampling methodology developed by the Department of Agriculture's National Botanical Institute. The resultant collaboration between the three institutions culminated in the production of the Durban Metropolitan Open Space System (D'MOSS) report in 1989. This report recommended the creation of an open space network for the municipal area which consisted of a grid of nine park systems. Plant communities were used to define the form and size of the system, and preliminary estimates of minimum critical area and corridor widths for the various plant communities were used to estimate the dimensions of corridors and conservation areas.

The real significance of the work undertaken during this second phase was that it focused on

the design of a system that was ecologically viable and self-sustaining, as opposed to being merely a collection of conservation-worthy sites. As such, the new system included many parcels of land that would not previously have been regarded as having conservation significance, including some disturbed areas and formal landscapes. The 1989 report was accepted by the Durban Council.

Phase 3—Preparation of the Durban Metropolitan Open Space System (D'MOSS) Framework Plan

The demise of apartheid and political changes in the early 1990s resulted in new political leadership emerging in Durban. These new decision-makers regarded the creation of an ecologically-viable open space system as a less urgent matter than addressing issues of poverty, economic development and meeting basic needs. This political about-face, combined with the demarcation of a new metropolitan boundary (significantly larger than that of the previous municipal boundary), ultimately provided the motivation for the design of a new open space system plan for Durban. This process was initiated in 1998 and led by the original PhD researcher who had now joined local government as Durban's first environmental manager.

The development of the metropolitan open space framework plan was influenced by two key factors i.e. the democratisation of South African society and the global prioritisation of sustainable development. As a result, the focus of open space planning in Durban shifted from conservation and ecological viability to the implementation and management of a socially, economically and environmentally sustainable urban open space system.

'Urban open space' was defined as any vegetated area (e.g. nature reserves, private and public gardens, golf courses, sports fields, road and rail verges, open water bodies etc.) or open hard-surfaced area (e.g. parking lots and other paved or concrete areas) within the urban environment. All of these areas were regarded as having some physical or economic value. Open space was seen as an urban 'asset' that was identifiable and quantifiable and that required protection, conservation and management in a manner similar to other urban resources. This approach differed substantially from previous town planning initiatives which had

treated open space as 'space left over after planning' or 'undeveloped land'.

Once the asset had been defined, experts from Durban contributed their knowledge to the identification and mapping of all open spaces considered important to the design of an ecologically functional open space system within the city. Data were mapped using a geographical information system (GIS). On completion of the data capture exercise, maps showing the open space asset were displayed in each local council area for public comment. The maps were also displayed at all stakeholder workshops held throughout the process. This allowed members of the public and various environmental organisations to refine the mapped open space asset using their local knowledge.

The open space asset thus identified represented approximately 33% of the total metropolitan area. Of this, approximately 52% was classified as undevelopable due to physical and legal constraints (including unstable land, steep topography, open water surfaces, road and rail reserves or land zoned as parks or conservation areas). The remaining 48% was, however, identified as being potentially developable and likely to come under pressure for urban development in the future.

Central to this new approach was the interrogation of the manner in which the open space system could contribute towards the broader development objectives of the city. Research was used to demonstrate how urban open spaces and their ecosystems provide 'goods' (e.g. water for consumption) and 'services' (e.g. waste treatment) that are important in meeting people's basic needs and improving quality of life. In Durban 17 different open space service types were identified, including: gas regulation, climate regulation, disturbance regulation, water regulation, water supply, erosion control, soil formation, nutrient cycling, waste treatment, pollination, biological control, refugia, food production, raw materials, genetic resources, recreation and cultural values.

Because not all open spaces supply the same kind of services, and because different urban land uses require different levels and types of open space services to remain sustainable, it was possible to prioritise open spaces. For example, in a catchment where residents in informal settlements collect water from local streams, the rivers and

wetlands that supply the water and improve its quality would be a priority for protection. This approach represented the first time that resource economics had been used as an open space planning tool in Durban, and possibly the world. The use of resource economics was also significant in that it allowed the value of open space to be communicated in terms that were meaningful to the vast majority of stakeholders within the city.

Prior to the preparation of the metropolitan framework plan, the value of open space was not well understood, especially when compared to the benefits of other land uses such as housing and industrial development. As a result the open space resource was undervalued during decision-making and resource allocation processes. By using internationally-recognised techniques it was possible to address this problem by calculating the replacement value of the open space services in Durban. This process resulted in a conservative estimate of R2.24 billion per annum, which excluded the value of Durban's tourism sector worth approximately R3.5 billion per annum (at the time approximately US\$1= R7). These figures can be compared with the 1998/1999 metropolitan council financial year operating expenditure for general services, airports, electricity, water, markets and transport of R3.5 billion.

Despite its initial attractiveness, the success of mainstreaming biodiversity and environmental management issues through the use of resource economics has had variable success. Although the 1999 Durban Metropolitan Open Space Framework Plan was accepted by Council, some politicians, line functions and stakeholders regard the implementation of the open space plan as a significant obstacle to development in the city. This is because the city's physical limitations (i.e. a coastal situation, numerous rivers and the deeply incised topography) mean that there are very few open areas that are not in some way impacted by the requirements of the plan. The result is that the D'MOSS framework plan is regarded as sterilising land suitable for development. Thus, while the principle of biodiversity conservation may be broadly acceptable to stakeholders at a conceptual level, it is clear that this position is subject to change when implementation of policy impacts on delivery.

Phase 4—The Unicity Open Space System Framework Plan

Although the debate regarding the implementation of the 1999 framework plan has not yet been resolved, the demarcation of a new metropolitan (Unicity) boundary in preparation for the 2000 local government elections provided the impetus for the design of a Unicity open space framework plan. This plan included only those areas considered critical to the sustainable provision of open space services whereas the 1999 plan had included all areas considered to contribute to the ecological viability of the system (i.e. the maximum potential open space system). This new approach was adopted in response to the growing conflict between conservation and development needs in the city. The result has been a significant reduction in the spatial footprint of the system. For example, the metropolitan plan included a total open space asset of 45,090 ha (33% of the metropolitan area). A similar design approach at the Unicity level would have produced a total open space asset of 123,000 ha (54% of the Unicity area). By designing a critical open space system, focused on the sustainable provision of open space services, the size has been reduced to 61,964 ha, of which only 15% (9,385 ha) is regarded as developable. This new plan is still to be presented to Council, but it is hoped that the significant reduction in system size will help to win greater political support for the implementation of the plan.

A review of progress to date

The mainstreaming of biodiversity concerns in Durban began with a highly motivated, environmental NGO concerned about the impact of *ad hoc* development on large, conservation-worthy areas. This resulted in urban biodiversity issues being moved from the periphery of the governmental planning debate to the point where they began to influence provincial policy development. Although the open space plans produced as a result of this process were flawed because of their focus on 'representative natural communities', they did serve to raise awareness amongst local government officials of the importance of urban open space conservation. Unfortunately this impact was reduced

by the fact that the plans were not at a scale that local level government could use in day-to-day planning and decision-making.

The production of a more detailed open space plan for the municipal area of Durban provided maps which could be used to inform land-use planning decisions almost at the lot level. The design of the system focused on the creation of an ecologically viable system. This approach highlighted the role of previously-overlooked areas (e.g. disturbed and formally managed landscapes) in securing ecological viability and biodiversity protection. It also helped to sensitise decision-makers to the fact that it was not only 'indigenous communities' that were of relevance to their planning and decision-making. This phase of open space planning mainstreamed the concept and importance of urban biodiversity to the extent that local government dedicated specific human and financial resources to the implementation of the system. As a result, between 1989–1993, the open space plan impacted significantly on planning decisions in the Durban municipal area and became an accepted yardstick for assessing the acceptability of development proposals. This was also a period when arguments centred on biodiversity conservation and/or ecological viability were regarded by politicians as acceptable motivations for the protection of open areas. This was also the only point in the open space planning process in Durban when acceptance of open space policy has been successfully translated into clear and focused implementation.

By comparison the development of the D'MOSS framework plan occurred in a period of rapid political transition, during which 'biodiversity conservation' was regarded as an interest of the minority, upper class. So, while ecological viability and biodiversity protection remained priorities amongst environmental planners, it was clear that these concepts had to be re-interpreted to make them acceptable to decision-makers focused on social upliftment and poverty alleviation. Resource economics provided a useful tool by which to achieve this re-alignment. Unfortunately, even this approach was challenged and implementation has been limited.

Based on these experiences, the Unicity open space framework plan focused on the design of a

system which prioritised sustainable service delivery rather than maximising ecological viability. By adopting this new approach it has been possible to reduce the spatial footprint of the open space plan dramatically. It is hoped that this will help reduce development/conservation conflicts in the city and in so doing secure political support for the implementation of the city's open space system.

CONCLUSIONS—MAINSTREAMING LESSONS LEARNED IN DURBAN

Incorporation of biodiversity considerations into sectoral policies

Since the early 1980s, open space planning in Durban has become an increasingly prominent element of land use policy and management. With the emergence of a sustainable development planning focus in the 1990s, the open space debate has begun to influence sectoral policy development and broad scale strategic planning in the city (e.g. the proposal to use river catchments in defining planning regions in the Unicity). Important lessons learned in this regard include:

- *the need for partnerships:* Although the initial concern for biodiversity conservation in Durban was articulated by an environmental NGO (WESSA), it was the partnership formed between WESSA and the provincial planning authorities that allowed this concern to move from the 'green fringe' to a point where it began to influence mainstream policy development. Similarly the partnership formed between the municipal authority, the local university and the National Botanical Institute allowed an academic concern for the conservation of local biodiversity to be translated into a detailed spatial plan, which was used to guide planning and decision-making by city authorities.
- *reinterpreting biodiversity:* The use of resource economics made it possible to convert the somewhat elusive value of biodiversity into something understandable to the majority of urban stakeholders (i.e. a monetary value). This approach helped in-

crease political support for biodiversity protection and has impacted on policy development within the city. Nevertheless, tensions still exist between the short-term time lines which govern most political decision-making and the longer term considerations which influence biodiversity planning. Political expediency continues to pose a potential threat to the effective mainstreaming of biodiversity concerns in urban areas.

- **need for data:** In Durban open space policy (and hence biodiversity conservation) has only led to action (e.g. acquisition and management of land) when policy has been translated into detailed spatial plans that can inform planning and approval processes. Without these detailed spatial plans, even the best policy has little or no impact on sectoral activities. Development of these detailed plans requires the development of ecological databases.

Win-win scenario between biodiversity conservation and economic gains

The mainstreaming of biodiversity issues in Durban is largely the result of open space design remaining responsive to changing development and political pressures. It is likely that the need to ensure an alignment between socio-economic and biodiversity priorities will be a continuing feature of open space planning in Durban for the foreseeable future. Important lessons learned in this regard include:

- **conceptual flexibility:** In the early stages of the open space planning process in Durban the focus of attention was on the protection of conservation worthy areas and subsequently the creation of an ecologically-viable open space system. This mirrored existing global environmental priorities (e.g. protection of rare and endangered species). A more holistic understanding of the role of biodiversity emerged in the 1990s as a result of the Rio Earth Summit, which highlighted the need for development that balanced ecological, social and economic concerns. This was supported in South Africa by a process of

democratisation and the increased priority placed on meeting people's basic needs. The shift from a 'conservation' to a 'sustainable development' focus has necessitated a change in the tools required for open space planning e.g. botanical surveys are now supplemented by the use of resource economics. This process highlights the need for biodiversity initiatives to remain responsive to changing political and ideological pressures.

- **need for education:** Although the use of resource economics helped provide a re-alignment between the ecological priorities of environmental planners and the human upliftment priorities of political decision-makers, this approach has not ensured an unchallenged implementation of Durban's open space framework plan. This suggests that the mainstreaming of biodiversity issues in cities must be supported by education programmes that help develop a deeper understanding of sustainability issues. In the long term this will avert situations where a lack of understanding of the inter-related nature of social, ecological and economic concerns, results in ecological (and hence biodiversity concerns) being marginalised when social and economic pressures are high.

Net biodiversity gain exceeds net biodiversity loss

Even though there is a growing realisation in Durban of the importance of open spaces, its effect on biodiversity loss *per se* has probably been minimal. It is anticipated that this will improve with a more coordinated and widespread implementation of the open space plan but this will require political support and the allocation of appropriate human and financial resources. Important lessons learned in this regard include:

- **the need to measure effectiveness:** While it is vital that biodiversity issues remain socially relevant, it is also critical that an emphasis on meeting basic needs does not overshadow biodiversity goals. In Durban the assumption is that protection of an ecologically-viable open space system will result in adequate biodiversity conservation. However, it is not

possible to say whether current approaches will protect 90% or 10% of the biodiversity of the pre-urban landscape.

- *the need for appropriate tools:* The use of resource economics in open space planning implies that the non-human world is only of value when it provides goods and services to the human world. Many of the services provided by open spaces are, however, intangible (e.g. aesthetic and cultural values) and are difficult to quantify in economic terms. Many people also consider these services to be irreplaceable or priceless. There is a danger, however, that where the value of open areas cannot be identified or where their economic value is not viewed as sufficiently substantial, areas will be treated as valueless. There is clearly a need to develop planning tools that ensure real sustainability and biodiversity protection.

Sectoral activity is based on/depends on sustainable use of biodiversity

The Durban experience has demonstrated that alignment of biodiversity concerns with other sectoral objectives is easier to achieve in sectors where delivery is linked directly to environmental quality issues (e.g. waste water management and storm water management). In cases where the link is not as direct (e.g. housing), open space concerns are often seen as a threat.

Role of champions

Finally, Durban's experience has demonstrated that committed individuals are important in ensuring the successful mainstreaming of biodiversity issues. Interested individuals with WESSA were the first to promote the concept of conservation-based open space planning. This championing role was subsequently taken over by individuals in local government and a researcher at the local university. The action of these individuals has influenced and directed institutional (governmental and non-governmental) policy development and decision-making. Champions are vital as they provide continuity when interest wanes amongst other stakeholders, they help

brand processes and they are often instrumental in unblocking stalled processes.

Sectoral mainstreaming is, therefore, in many cases the result of 'the right person being in the right place at the right time'. At the same time, there are potential pitfalls associated with too strong a reliance on champions. There is the danger that when a champion moves on (either geographically or in terms of interest) the programme will lose momentum or collapse entirely. This does not mean that champions are irreplaceable, but rather that each project needs more than one champion. The mainstreaming of biodiversity requires identification of a range of champions amongst all stakeholder groups and sectors to help build capacity and ensure the continuity and sustainability of the programme. Only in this way will the full range of sectoral activity effectively incorporate biodiversity concerns.

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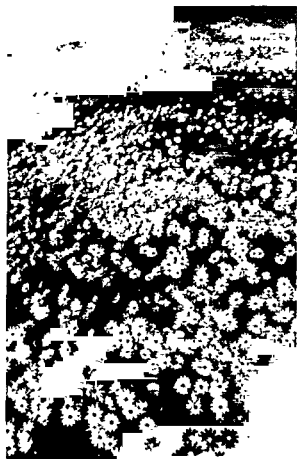
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Conserving an Embattled Flora: Mainstreaming Biodiversity Issues in Urban Cape Town

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SUMMARY

The urban sprawl of Cape Town has developed over an area that is home to extraordinary floral biodiversity. The low-lying habitat remnants, referred to here as the Cape Flats, support no less than 1,466 plant species, 76 of which are endemics. These species-rich fragments are threatened by further urbanisation and invasive alien shrubs. Under apartheid, the Flats were designated for disadvantaged ethnic groups with enforced removals from the more benign foothills of Cape Town. Although there had been a prolonged effort to conserve this flora, little progress was made until a NGO, the Botanical Society, identified core sites for conservation and presented a plan to the local government. A partnership was formed to implement the Cape Flats Flora Programme.

Conservation endeavours were made practicable through a process of prioritisation of 38 conservation-worthy sites. Biodiversity concerns were mainstreamed into the policies and practice of local government. Key factors in the success of the Cape Flats Flora Programme were: the receptiveness of key City of Cape Town officials; the formation of the new Environmental Management Department within the local government; partnerships between local government and the NGO; a people-centred conservation approach; the establishment of site-specific projects; and the commitment of working group members. By delivering both conserved habitats and net social gains (e.g. education, integration of recreational uses, and small-scale employment creation possibilities), the Cape Flats Flora Programme demonstrates the way for further conservation initiatives.

INTRODUCTION

The City of Cape Town is the largest metropolitan area within the Cape Floral Region (CFR). This region is also known as the Cape Floral Kingdom, the smallest of the world's six floral kingdoms. The Cape Metropolitan Area (CMA), sprawls across some 2,487 km² that includes a major centre of diversity and endemism (Figure 9.1). Indeed, this area has been described as a "jewel in the crown" of the CFR. Botanically and physiographically, the CMA can be divided into two regions: the Cape Peninsula mountain chain and the Cape Flats. The mountain chain (with 2,585 plant species in 471 km²) is an area of steep and rugged terrain, mainly untransformed by urbanisation. The CMA lowlands, the Cape Flats, cover a low and sandy isthmus between False and Table Bays, 70% of which has been urbanised (Figure 9.1). Here natural habitats are restricted to numerous isolated remnants, in undeveloped open spaces, parks and nature reserves, as well as in infrastructure servitudes, corridors, and road and freeway verges. Despite this, the region supports 1,466 plant species in 1,874 km² with 76 local endemics and 131 Red Data Book plants, a unique concentration of rare and endemic species in an urban setting.

Cape Town is a city of contrasts. The lower mountain slopes are home to the city's wealthier residents while 73% of the mountainous area falls within a statutory protected area, the Cape Peninsula National Park, which is the beneficiary of generous funding from international (GEF) as well as city and national sources (see Chapters 2 and 11). This ensures an excellent standard of management planning and implementation. In contrast, the windswept and bleak lowland area of the Cape Flats is home to Cape Town's impoverished majority forced to live there under apartheid, and joined by rural people with the weakening of laws in the early 1980s. Many residents live in impoverished and crime-ridden conditions, in uniform housing estates, serviced shacks and informal settlements. Quality of life in many of these suburbs is appallingly low, especially in comparison to the grand and leafy suburbs on the foothills of Table Mountain.

Seven of the Cape Flats' rare and endemic species have already gone extinct in the wild and the

remaining floral diversity is under extreme threat from ongoing urbanisation and peri-urban threats, such as inappropriate dumping of waste. These threats are escalating daily, as more people arrive from the impoverished Eastern Cape and establish themselves in informal settlements of shacks on the Cape Flats. This dire situation has led many conservationists to argue that the Cape Flats biota is a lost cause and that limited conservation resources would be better allocated to areas where opportunities are more favourable.

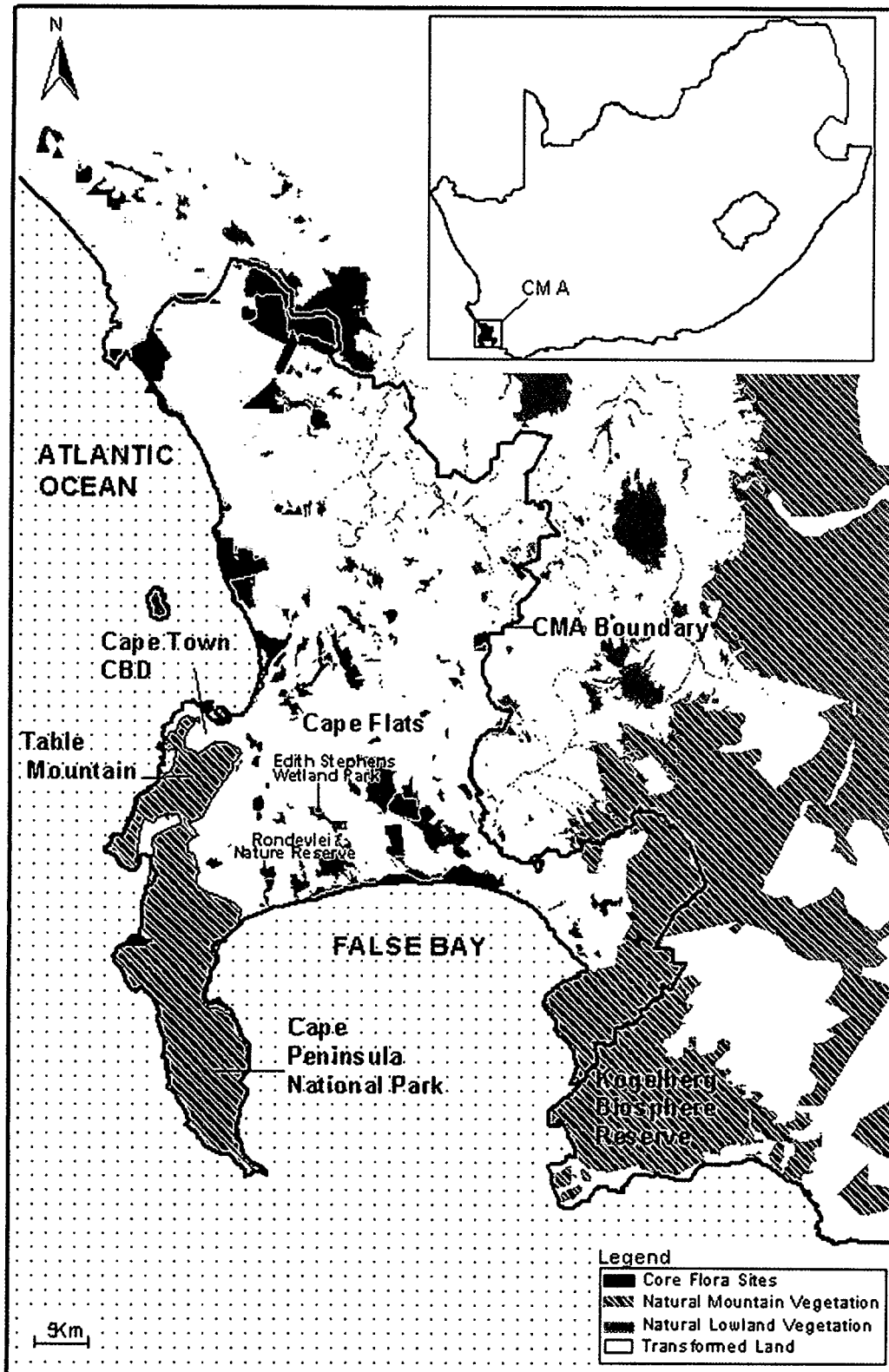
A committed minority of conservationists felt otherwise. Seizing opportunities provided by the emergence of new institutions, and the growing awareness that environmental health is a cornerstone of sustainable lifestyle, they have succeeded in mainstreaming biodiversity concerns into policies and practices in the city. This was achieved through a protracted campaign to create awareness of the plight of Cape Flats flora, through engagement of key stakeholders, and by identification of a list of priority sites which, together, will conserve the region's special species.

HISTORY OF CONSERVATION CONCERNS AND ACTIONS ON THE CAPE FLATS

Since the time of the early plant hunters, such as Thunberg who first visited the Cape in 1772, there has been a strong interest in the flora of the area now covered by the CMA. In comparison to the more spectacular Peninsula mountains, however, the Cape Flats were neglected. The first conservation initiative was the donation, in 1955, of three hectares of Cape Flats wetland by Edith Stephens, a lecturer in botany at the University of Cape Town. Later, in 1972, Hugh Taylor, a pioneer of plant community research in the CFR, published a paper where he raised concern about the conservation status of the Cape Flats vegetation and flora, largely in relation to threats from invasive alien plants.

Prior to 1982, small nature reserves were proclaimed such as Tygerberg Nature Reserve and the Rondevlei and Zandvlei bird sanctuaries (both now renamed as nature reserves). Most of these reserves were proclaimed on an *ad hoc* basis; i.e. sites were not identified in a systematic way that prioritised

Figure 9.1. The Cape Metropolitan Area (CMA) showing remaining natural vegetation, the Cape Flats, Cape Peninsula National Park and the 38 core flora conservation sites



areas on the basis of their contribution to pre-determined conservation targets. In 1982 the "Greening the City" report identified some areas as conservation priorities. The report was adopted by the then City of Cape Town's Council in 1984 and led to the proclamation of the Wolfgat Nature Reserve in 1986.

At the same time a project was funded by the Council for Scientific and Industrial Research (CSIR) to identify conservation priorities in lowland regions of the fynbos biome. Despite its value, this report never received political backing and none of its recommendations was implemented. Many of the identified priority sites were subsequently lost to the massive expansion of urban areas on the Cape Flats from the mid-1980s onwards. Political pressure, and urgency to accommodate a large number of migrants to the city, marginalised conservation concerns.

In the late 1980s and early 1990s, several floral surveys and vegetation mapping exercises were conducted to identify conservation-worthy areas. These studies, by botanists from the National Botanical Institute and the two local universities (University of Cape Town and the University of the Western Cape), were motivated in response to the rapid escalation of threats to the Cape Flats flora. In 1990 a report entitled "Conservation Priority Survey of the Cape Flats", identified and mapped important conservation areas. This study was funded by the Western Cape Regional Services Council (regional government), the City (local government), the University of Western Cape, and the Botanical Society of South Africa (NGO). This report was critical in raising awareness about the plight of the Cape Flats biota. It identified all sites with natural habitat and populations of Red Data Book species as important for conservation but did not prioritise them. One such site was Kenilworth Racecourse, a 50 ha remnant habitat within a horse-racing track which supports 18 Red Data Book species. In 1992, the city council accepted this study as a reference document to guide decision-making with respect to future development proposals and agreed, wherever possible, to retain natural areas identified as conservation-worthy.

Despite this council resolution, the report failed to mobilise significant action and the city adopted a passive role, particularly when dealing with ar-

reas threatened by development. This was due to a number of factors but mainly to a lack of political support for conservation issues. In addition there was no clear or organised strategy nor delegated body for implementation, and the findings of the report were not communicated to a sufficiently wide audience.

The conservation priority for both government and civil society at that time was the Peninsula mountain chain, where conservation was easier and more politically rewarding for a city council that was exclusively composed of representatives of the white minority. In contrast, the economically and politically marginalised Cape Flats received scant attention and fewer resources. Even proclaimed protected areas such as Wolfgat Nature Reserve did not receive any resources for management until after the first local government democratic elections of 1996 when the Parks and Forests Branch of the City began a community participation programme.

During the early to mid-1990s many of the larger remnants of land were lost to development while even those with some protection status (local and provincial nature reserves), gradually degraded, owing to lack of on-the-ground management (e.g. the Driftsands Nature Reserve). By 1997 there were nine formally proclaimed protected areas on the Cape Flats, but only three of these were effectively managed. Instead, between 1994 and 1997, the attention of government and civil society was focused elsewhere, on the consolidation of conservation areas and management on the Peninsula mountains, which culminated in the establishment of the Cape Peninsula National Park in 1998. Many conservationists had given up on the Cape Flats where fragmented landscapes, and escalating threats created a much greater conservation challenge, requiring the engagement of poor and marginalised communities.

During the 1990s the Botanical Society of South Africa (BotSoc), the most active NGO dealing with flora conservation issues in the CMA, commented on numerous development proposals which threatened conservation sites identified in the 1990 study. Given that there was no prioritisation of areas and that conservation resources were severely limited, it was difficult to defend some of these areas. Out of frustration, and an urgent need for clearly identified conservation priorities, BotSoc launched a study

to identify conservation priorities, based on the principles and practices of target-driven systematic conservation planning. With the establishment of the Cape Peninsula National Park well advanced, local and regional government were more willing to focus on other conservation responsibilities. The stage was set to engage CMA authorities in initiatives for effective conservation of the Cape Flats flora. The GEF-funded Cape Action Plan for the Environment (see Chapter 11) recognised the area as a priority for conservation action, opening the door for international funds to be allocated for conservation actions on the Cape Flats.

A STRATEGIC CONSERVATION PLAN FOR HABITAT REMNANTS ON THE CAPE FLATS

As threats to the remnant Cape Flats biodiversity continued to escalate from the mid-1990s, conservationists from BotSoc and the National Botanical Institute (a largely state-funded research institution) developed a planning process with the following attributes:

- priority sites should be identified using a systematic planning protocol that was explicitly target-driven and, hence, defensible;
- as far as possible, the plan should accommodate sites identified as part of the metropolitan open space system in the “Greening the City” Report;
- every effort should be made to use the planning outcomes as an opportunity to showcase the exceptional biodiversity of the CFR in an impoverished urban context, in particular emphasising the environmental education and recreation potential.

This planning process was conducted in two phases. Owing to limited funds, the first phase was based on existing information, mostly from the earlier report. After the first phase, funding was made available by the City to include previously unsurveyed sites.

Phase 1: Initial conservation plan

The first phase, conducted in 1997, identified a minimum set of 15 sites, out of 47 sites in the

western part of the Cape Flats, required to conserve at least one occurrence of the region’s special species. These sites, termed core conservation sites, included land parcels under a wide range of management, zoning, and ownership regimes, such as existing nature reserves, a freeway interchange or private land zoned as open space or agriculture. The report recommended:

- providing adequate protection status to 15 core conservation sites;
- promoting sound conservation management of the 15 core conservation sites;
- expansion of the study to less well-known eastern parts of the lowlands of the CMA.

The results of this study were submitted to the local, provincial and national government authorities. The former Cape Metropolitan Council found the report persuasive and officially adopted its recommendations in 1997. A working group of representatives from local and provincial government was established as the official body for liaison and implementation of the Cape Flats Flora Programme. At the same time the City provided funding for BotSoc to expand the study eastwards.

Phase 2: Expanded conservation plan

The second phase, which covered the entire lowland portion of the CMA (i.e. the eastern and western Cape Flats, as well as the agricultural land to the north) began in 1999. Although the technically-correct term for the expanded study area is the CMA lowlands, the area is referred to as the Cape Flats as this is a more accessible and marketable name. In this phase the overall conservation goal was expanded. The conservation target was set at two occurrences of each special species and the process included an evaluation of the extent to which existing protected areas in the planning domain achieved this target. Furthermore, the assessment also considered the vulnerability of sites to threatening processes.

A total of 1,466 indigenous plant species were recorded in 118 sites, 131 of which are threatened with extinction. This included 76 species endemic to the planning domain; these are the so-called special species. The nine protected areas in the

planning domain conserved less than one third of these special species. The reserve selection algorithm identified 23 sites, in addition to the 15 identified previously, as necessary to achieve the conservation target. This provided the new set of 38 core conservation sites. Owing to the extreme vulnerability of their populations, three endemic plants are expected to become extinct in the wild in the near future. The report recommended translocation and *ex situ* conservation actions for these species.

As with the first phase, the results of the study and recommendations were presented to all three tiers of government. The report included large format maps clearly showing the locality of the 38 sites and all the information pertaining to each site was captured on the City's geographical information system (GIS). The City adopted the recommendations of the Phase 2 report and agreed to continue coordination of the existing Working Group, whose responsibility had now been extended to the 38 core sites.

The role and achievements of the Working Group

The Working Group comprised representatives of the City's environmental and conservation management agencies for different areas of the CMA, the provincial nature conservation authority and BotSoc. The group was led by the City's Environmental Management Department and the Botanical Society of South Africa. Its official terms of reference included working towards improving the protection status of the 38 core conservation sites as well as their on-the-ground management. Bimonthly meetings provided a useful forum for solving problems and sharing experiences from site-specific projects. An important role of the Working Group was to communicate information on the core conservation sites to land use planners within the different geographic areas of the CMA. The group also provided guidance to the City on a land acquisition programme for conservation.

The Working Group placed great emphasis on creating awareness and raising the profile of important sites among politicians and the public at large. Even though significant political buy-in had been achieved, the group realised that this was an ongoing task to ensure that support was actively

maintained. One of the awareness activities included taking politicians from local government on guided spring tours of the core conservation sites to expose them to these unique areas, their associated management issues, opportunities and threats. In addition, awareness programmes were targeted at the general public and youth, including travelling exhibits, posters and brochures, environmental education materials (Box 9.1), and radio and television interviews.

Four years after the initiation of the Cape Flats Flora Programme, secure protection status had been achieved for three sites and substantial improvements to on-the-ground management had been made at 11 of the 38 core conservation sites. The Working Group highlighted the fact that many of the conservation sites are situated in some of the poorest quarters of the city, where open space requirements have often been overlooked. A 2001 survey among Cape Flats' households of awareness of environmental initiatives in the region ranked the Cape Flats Flora Programme higher than better resourced initiatives. This increased profile and political support paved the way for expanding the conservation estate and improving on-the-ground management.

Coordination and cooperation, provided through the Working Group, assisted in taking conservation beyond ecosystem management and integrating it

Box 9.1. Cape Flats floral treasures on your doorstep

In 2001 a program targeted specifically at school learners was initiated with the aim to encourage teachers and learners to explore the natural environments in the vicinity of school grounds through active learning. The theme "Cape Flats floral treasures on your doorstep" was promoted and the use of natural open spaces outdoor classrooms was encouraged. An active learning teachers guide, colour wall poster and map were commissioned and distributed free to all schools in the CMA, with funding from the City of Cape Town.

into the wider urban context among many different line functions and sectors e.g. catchment management, storm water control and spatial planning departments, (see also Chapter 8). Other local and provincial government departments such as spatial planning and development evaluation departments were made aware of the significance of the core conservation sites. Information on the 38 core conservation sites was integrated into land use decision-making. Spatial planning initiatives and specific site development plans for the CMA have incorporated these priority sites as no-go areas for development. NGOs, such as BotSoc, are engaged constructively with developers and planning authorities. Through the land-rezoning processes, such as at the Kenilworth Racecourse, it has been possible to negotiate trade-offs with developers. These ensure that conservation-worthy portions of a site are given increased protection status and that development funding is set aside for their management. In return permission is granted to develop those parts of the site with low conservation value. This approach is seen to be one of the key reasons for success of the programme so far.

The increased political support for conservation on the Cape Flats led to an increase in resources allocated to conservation. Through its conservation land-acquisition programme, the City committed R16.5 million over three years to land purchase at four of the core conservation sites (ca. 1000 ha), significantly increasing the amount of land and number of special species under secure conservation status. In addition to land purchase, money has been spent on infrastructure, management costs, environmental education and community involvement projects. Moreover a number of site-specific initiatives, including public-private partnerships and local community involvement, have led to the improvement of protection status and on-the-ground conservation management. The opportunity for partnerships to develop between funders, NGOs, local, provincial and national government facilitated access to funding and resources, both from the private and public sector.

The Working Group encouraged research at the core conservation sites by identifying projects for universities and making available the data used in the core sites study. Research projects covered top-

ics such as plant-pollinator mutualisms and the effects of city air pollutants on biodiversity. A new project aims to establish role models for community involvement in conservation at three pilot sites, situated in some of the poorest parts of the Cape Flats. Funding has been secured for this project for three years on a 50-50% basis from the Table Mountain Fund and the City (see Box 9.2).

Box 9.2. Conservation in the community: the Edith Stephens Wetland Park

The Edith Stephens Wetland Park was originally a three hectare wetland that needed to be connected to the two adjacent land parcels (one privately owned and the second owned by the City) to become ecologically viable. In June 2000 the City purchased the privately-owned land and amalgamated the three land parcels into the Edith Stephens Wetland Park. The steering committee for the park includes partners as diverse as the previously disadvantaged communities, the National Botanical Institute, the BotSoc, and the Table Mountain Fund. The project aims to establish a community park that creates jobs (through invasive alien plant removal), provide a recreational centre and a reserve that integrates the various communities. The Table Mountain Fund, with financing from the GEF, facilitated the first stakeholder workshop which led local community leaders to support the project.

To date, the City has spent more than R2 million on establishing this park. The National Botanical Institute has also enthusiastically sourced funding of over R400,000 from the *Working for Water* Programme for the removal of invasive alien vegetation in order to rehabilitate the park's natural wetlands, using labour sourced from local communities. The park's success demonstrates the linkages between poverty, environment and development. The Edith Stephens Wetland Park initiative demonstrates how core conservation sites can indeed work to deliver cross-sectoral benefits in urban settings.

KEY FACTORS IN THE SUCCESS OF MAINSTREAMING THE CAPE FLATS FLORA PROGRAMME

Clearly identified conservation priorities

The success of the Cape Flats Flora Programme hinged on the initial support gained from the City for the conservation plans that identified the core conservation sites. Several factors made these conservation plans acceptable to local government:

- The core conservation sites addressed a real biodiversity threat (urban development and conservation management neglect) and provided a solution to conservation challenges on the Cape Flats.
- The plan had a scientific basis and was based on a systematic approach with clear and explicit conservation targets that were cognisant of competing urban needs and threats.
- Decision-makers and politicians valued the process of identification of the core conservation sites as a pragmatic prioritisation and an effective way to deal with plant conservation challenges in the city, including allocation of limited conservation resources.

Securing political support

While the plan for the core conservation sites underpinned the Cape Flats Flora Programme, it was less than 5% of the job. One of the key tasks of the Working Group was to lobby the City to adopt the plan and to work to ensure ongoing support. The sound working relationships between project partners and politicians was facilitated through Working Group activities and spring tours, which enthused participants about site-specific projects. There was strong political support from the Councillor responsible for Planning and Environment, who championed the convergence between meeting inhabitants' needs and protecting the city's resource base.

Opportune timing

The release of the report on core conservation sites was particularly opportune in that the City's newly-

established Environmental Management Department was receptive to strategic and relevant planning projects. The early conservation awareness of some City officials and politicians and progressive "greening" of planning departments, paved the way for the establishment of the Environmental Management Department and willingness to take on the conservation challenge of the core conservation sites. This certainly was a major factor leading to local government's official adoption of recommendations for the core conservation sites. The increase in information and general public awareness about the environment assisted mainstreaming.

Committed conservationists

The commitment of participants of the Working Group, underpinned by the leadership of the City's Environmental Management Department and the Botanical Society of South Africa, was essential to the success of the Cape Flats Flora Programme. At times the challenge of conserving the core conservation sites seemed overwhelming but member commitment remained strong. The partnership between the City and BotSoc was a driving element in the Working Group and its activities and projects.

People-centred demonstration projects

Successful site-specific projects demonstrated how it is possible to achieve a net benefit across many sectors through the creation of jobs and providing a community asset (see Box 9.2). This helped secure support for further projects from local government and the private sector. Instead of focusing narrowly on ecological concerns alone, the Working Group investigated the challenge in the context of urban development, and socio-cultural issues. Thus, at the Edith Stephens Wetland Park jobs were created through ecological restoration projects and community facilities were provided. The group encouraged local involvement in developing solutions appropriate to particular situations.

Unique socio-ecological context

The uniqueness of conservation in this urban context with its distinct "Cape Flats" flavour was ap-

pealing to the media. In particular public attention was caught by the contrast between the urban, and often harsh, living environments of the Cape Flats and the conservation of fragile natural assets.

OBSTACLES TO MAINSTREAMING

Local government restructuring

The Working Group was established at a time when the City had just been restructured and significant institutional re-organisation and political change was taking place. Officials represented on the Working Group came from different parts of the City that were at different stages of restructuring. Frequently roles and responsibilities, powers and duties and lines of reporting were not clear. Officials faced tremendous obstacles, not least of which were budget constraints and staff shortages. Despite these constraints, group members were committed to participating, and played a large role in providing the required coordination.

Weak coordination

The lack of a coordinated approach to conservation management and initiatives across the City, as well as a varying degree of commitment from local government officials in charge of core conservation sites, was a huge challenge. Continued commitment by Working Group members was key to overcoming this constraint.

Lack of resources

The lack of capacity and resources hampered the implementation of action plans at each of the core sites. The Working Group provided a forum to address these problems and in some cases creative solutions were developed (e.g. sourcing funding for restoration and community tourism projects from the national government's Poverty Relief Fund).

Raising interest in the programme

Initially it was difficult to raise interest in the Cape Flats flora even among some conservationists. The highly fragmented nature of the remaining habitat, and the extreme nature of the threats, discouraged

many from accepting the conservation challenge. Further, there was little experience in conservation through public participation, particularly in engaging with disadvantaged communities. The need to engage with poor and marginalised neighbouring communities was a paradigm shift requiring much effort from already over-stretched conservationists. Once pilot community-based conservation and environmental education initiatives started showing promise, more support was forthcoming.

Resistance to systematic approach

Initially there was some resistance to the prioritisation of sites for conservation. It took a few years to convince sceptics that prioritisation was necessary in order to profile biodiversity conservation, secure the necessary political buy-in and to focus limited conservation resources.

Plant-focused plan

Some non-botanists viewed the conservation plan as too plant-centric but data were lacking for other organisms. Fortunately most scientists accepted that plants were a good surrogate for other life forms in planning at this scale.

FUTURE CHALLENGES

Maintaining momentum

Maintaining momentum to effect implementation is a huge challenge and a long-term task that requires constant encouragement and optimism from the members of the Working Group as well as funders. Ongoing political support and commitment can be achieved through targeted awareness campaigns, based on success stories at grass roots level, and by demonstrating integration and streamlining with the City's priorities and objectives.

Securing resources

A significant lack of capacity and resources hampers implementation of plans at all core sites. It is hoped that the success of demonstration projects, increased public support and a comprehensive biodiversity strategy for the City, will leverage

increased resources for biodiversity conservation from local government. Much of the future success of conservation on the Cape Flats depends on creative conservation initiatives providing multiple benefits and contributing to improved urban environments. This must start with increasing the awareness, appreciation and stewardship of biodiversity by local communities, followed by sustainable financial mechanisms and conservation management arrangements.

Ongoing local government transformation

The renewed re-organisation and social transformation of local government and the potential loss of environmental management as a distinct recognisable unit pose threats and challenges. Although the role of environment and its advocacy role within local government is currently seen as critical, environmental management may become a subordinate function of urbanisation and planning.

Improved management

Institutional capacity for conservation at local government level must be improved to ensure sound and integrated conservation management at each site. Securing the support of the private sector is a key challenge.

Research

There is a great need to improve our ecological understanding of urban conservation. Particular areas for study include: important ecological processes such as the role of fire in the isolated, remnant fynbos sites; the effects of population isolation and the role of corridors; and the control of invasive alien shrubs, herbs and grasses. As research improves, the Working Group needs to channel the information through to managers in order to fine-tune the on-the-ground conservation management requirements of each site.

CONCLUSIONS

The state of biodiversity conservation on the Cape Flats has improved through the Cape Flats Flora Programme. Communities have developed a greater appreciation and awareness of the value of

natural habitats in the city through open space and outdoor classrooms. Efforts to develop a viable conservation strategy for the Cape Flats flora show promise of success where it has been possible to integrate the conservation of habitat remnants with development needs and poverty alleviation.

Biodiversity considerations have been effectively mainstreamed in the City's environmental plans and policies which, in turn, guide land use planning and development. The core sites project demonstrates that biodiversity conservation and economic gains can go hand-in-hand through informed land use decision-making. By approaching conservation in a manner that delivers not only conserved habitats, but a net gain across sectors (e.g. education, integration of recreational uses, and small-scale employment creation possibilities through the rehabilitation of these pocket reserves), the Cape Flats Flora Programme demonstrates the way for furthering biodiversity conservation and social progress within the Cape Floral Kingdom as a whole. The uniqueness of Cape Town's biodiversity, clearly defined conservation priorities, committed conservationists and a people-centred approach were the key ingredients that led to the successful mainstreaming of biodiversity on the Cape Flats.

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Putting Biodiversity to Business on the Agulhas Plain

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SUMMARY

The Agulhas Plain encompasses the major issues and challenges facing conservation authorities in the Cape, especially in the lowlands. It has a high number of rare, endangered and endemic plant species, but this biodiversity is threatened by various activities including agriculture, urbanisation and invasive alien plants. Scientists and conservationists have long been aware of the area's exceptional diversity and its threats, and have recently used systematic conservation planning tools in order to define conservation priorities. At present, only 4% of the Plain is formally conserved in provincial and national reserves and, owing to financial constraints, this area is unlikely to be expanded significantly. Of the unconserved land, 95% is in the hands of rural private landowners, who also own the majority of conservation-worthy landscapes. As a result of the apartheid legacy, virtually all these landowners are white and there is high unemployment and poverty amongst the other, marginalised communities.

To successfully conserve the globally significant ecological patterns and processes of the Agulhas Plain requires innovative methods of integrating the private sector and local communities into the conservation network. This paper explores two recent conservation interventions that do exactly that. One is a strategically devised programme of land purchase and of contracting private land into a national park that will safeguard much of the region's priority conservation sites. The other is a collaborative conservation project between the government, private and NGO sectors that is using innovative methods to integrate biodiversity into business practices and bring private landowners into the conservation network. These provide examples of the mainstreaming of biodiversity

into various sectors including tourism, agriculture and education. Key driving factors were the perceived threats to the regions' biodiversity; the role of key individuals and organisations; institutional support; government will; inter-departmental cooperation and collaboration; and trust between parties.

INTRODUCTION

The Agulhas Plain, comprising 153,917 ha at the southern tip of Africa (Figure 10.1) is an example of a high priority lowland area in the Cape Floristic Region (CFR). It is a microcosm of the issues facing conservation authorities throughout the Cape, especially in lowland regions. The biodiversity of the region is spectacular, including many locally endemic plants. However, this biodiversity is extremely threatened by human activities. Some 23% of the Plain has been lost to cultivation, while approximately 15% of the remnant natural habitat has been transformed by dense stands of invasive alien trees. The region contains 112 Red Data Book plant species, many of which are on the verge of extinction.

Threats to the region's biodiversity are compounded by the fact that only 4% of the Plain enjoys formal conservation status and 95% of the unconserved land is in the hands of rural private landowners. The majority of these private landowners (70%) are involved in commercial farming activities that have a negative impact on the conservation status of their properties. As a result of South Africa's apartheid legacy, virtually all the privately-owned land on the Agulhas Plain is in white ownership. The rural settlements and small towns of the plain are mostly inhabited by those communities disadvantaged by apartheid—mostly descended from the aboriginal Khoen-Khoen or Khoi inhabitants of the region. Over the last decade there has also been a large influx into the region's towns of Xhosa people from the former homelands of the Eastern Cape. Unemployment is rife, in some cases exceeding 50% of the economically active population. While the ideal scenario would be to ensure that all unspoiled land on the plain, irrespective of size of remnant, enjoys some form of conservation action, funds for the purchase of land and conser-

vation management are very limited and need to be strategically spent.

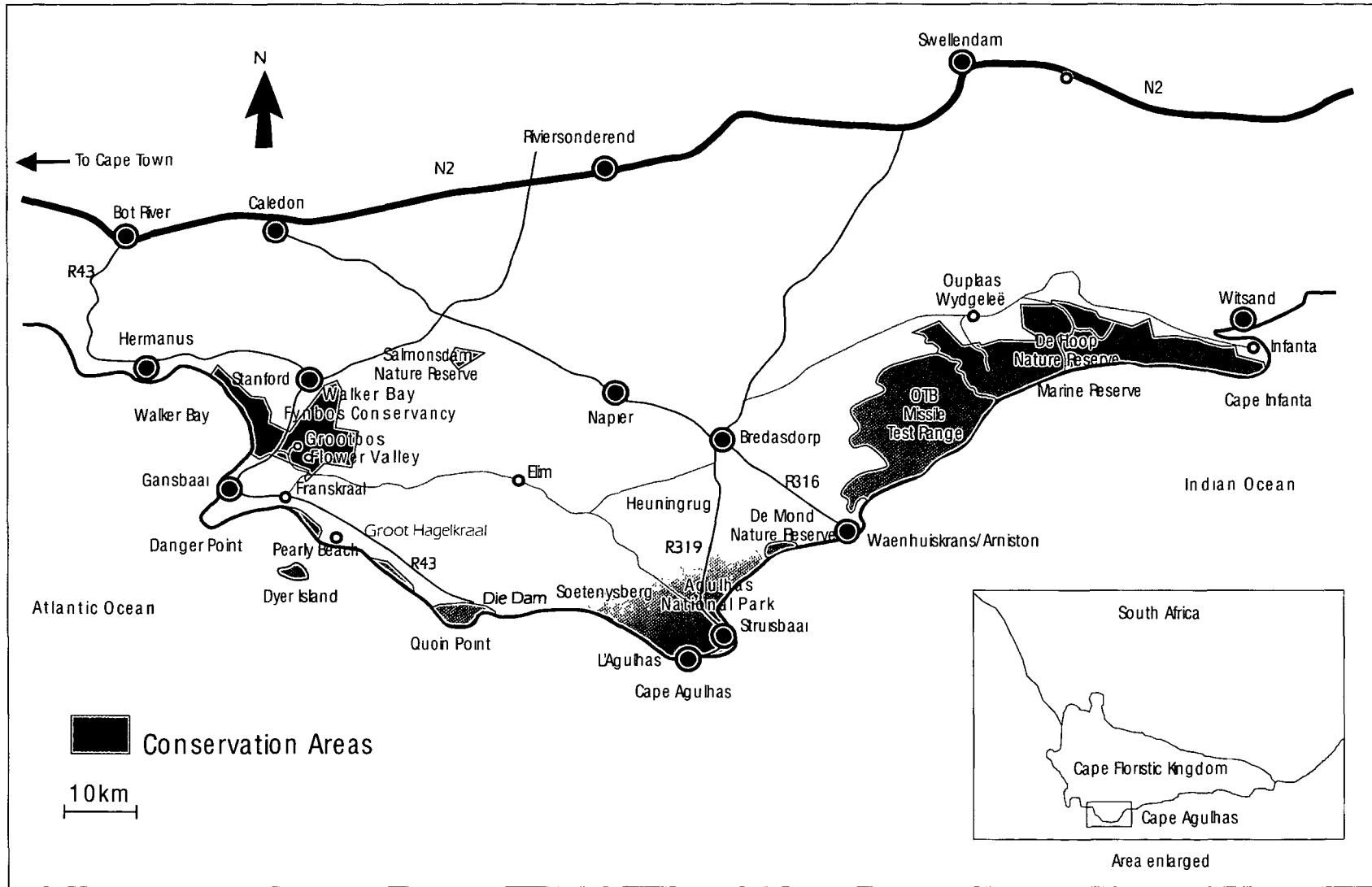
Thus, the scenario facing conservation planners on the Agulhas Plain includes a minefield of social, political and economic issues. Critically, for conservation to succeed they will need to involve private landowners as well as the formerly disenfranchised local communities. Creative approaches are required to ensure the management and expansion of the conservation network through biodiversity-based opportunities for local landowners and communities.

This chapter explores two initiatives on the Agulhas Plain that have developed over the last decade. Both are models of state-private sector partnerships. One is a strategic conservation intervention driven by the South African National Parks and based on a solid scientific grounding. The other is a collaborative partnership between the Western Cape Nature Conservation Board, private sector and an international non-government organisation (Fauna & Flora International), that has developed largely as a result of serendipitous events. Both are characterised by new and innovative approaches to biodiversity conservation. This is a good news story, albeit fraught with challenges.

THE STATUS OF THE PLAIN A DECADE AGO

In the late 1980s, prospects for biodiversity conservation on the Agulhas Plain were bleak. The region had long been identified as a top priority for conservation in the Cape Floristic Region. A number of scientific surveys had emphasised the extraordinary richness and value of the floral and faunal biodiversity. However, little was being done to ensure the conservation status of rare and threatened habitats and taxa. Conservation was largely espoused as a formal land use restricted to state-owned properties. The original proclamation of these reserves had very little to do with conservation priorities. The De Mond State Forest, (named according to legal status, not vegetation type), had been proclaimed for state security (the landing of seaplanes during World War II) in 1941. This was followed in 1960 by the Walker Bay State Forest network (again named according to legal status not vegetation type), which was proclaimed in order to stabilise coastal sand dunes. The shifting sand

Figure 10.1. The Agulhas Plain showing the location of the Agulhas National Park, Grootbos Private Nature Reserve, Flower Valley and the Walker Bay Fynbos Conservancy, as well as existing nature reserves and priority areas for conservation intervention



dunes in these coastal areas were considered a threat to agriculture and an intensive planting programme was initiated. Today, the biggest management cost in these state forests, and many of the surrounding private properties, is the removal of these alien trees that were planted there only a few decades previously by the state.

The recently-formed provincial statutory board, the Western Cape Nature Conservation Board (WCNCB), now administers these reserves. When the management of these state assets was devolved from national government to the provincial government in the mid-1980's, there was a concomitant loss of the cross subsidisation from forestry permits which had previously financed their management. Further cuts in conservation budgets over the last decade have resulted in a situation where there is virtually no funding available for conservation management on these reserves. They house no facilities for tourism, generate virtually no income and are beset with management problems, including poor access control and dense alien vegetation cover.

Consequently, by 1990, only about 4% of the area of the Agulhas Plain was formally conserved. This reserve network had been haphazardly established and there were insufficient funds available for its management. On private properties, agricultural activities, which had begun in the 18th century, have continued unabated until the present. Cultivation for cereals and pastures resulted in the loss of 35,000 hectares of lowland vegetation on the more fertile, shale-derived soils. Many of the habitats previously thought to be marginal for commercial cultivation had come under threat from new forms of land use, including the cultivation of wild flowers and viticulture. The fynbos wild flower industry, which is based on the area's biodiversity, is by far the largest industry on the Agulhas Plain. Traditionally, flowers were harvested from the wild by landowners for the fresh and dried flower markets. However, a growing trend over the last 20 years has been the cultivation of a number of indigenous fynbos species for the export market. The net result was habitat conversion and an overall loss of biodiversity. The lack of formal control in this region is highlighted by the fact that the 4,600 ha of fynbos under cultivation represents almost 10 times the area for which approval to

cultivate virgin land has been granted by the state. Furthermore, the majority of private properties were infested with alien vegetation and very little was being done to curb their spread.

THE TURNING POINT

In 1994, something happened that was to change the future of the Agulhas Plain—plans to develop a nuclear power station. Environmentalists normally regard nuclear plants as threats. In this case the development was the catalyst to promote biodiversity conservation.

Scientists from the Institute for Plant Conservation (IPC) had been researching various aspects of the Agulhas Plain's flora and vegetation, working with conservation-minded landowners. They were approached by the consultants appointed by the nuclear agency (Electrical Supply Commission—ESKOM) to carry out the biological component of a structure plan for the plain. Incidentally, the site (5km²) chosen for the nuclear facility is probably the most biologically valuable on the Plain, being home to four unique species and 45 Agulhas Plain endemics. The structure plan enabled IPC scientists to incorporate their research findings into a document that would guide economic development on the Agulhas Plain for decades to come. Understandably, conservation issues emerged as major concerns. A preliminary configuration of priority sites for conservation action was included in the plan. The threat of a nuclear power station thus gave rise to the first major conservation planning exercise on the Agulhas Plain.

ESKOM had paid for the plan but who was going to ensure that these biodiversity issues were translated into action and therefore implemented? The ESKOM structure plan was not legally binding, at least for its conservation aspects. Besides, the capacity to implement its recommendations was lacking at all tiers of government. For this reason, the IPC and the Botanical Society, using funds from the Pew Foundation (USA), and WWF-South Africa, appointed a conservation officer for the Agulhas Plain. His job was essentially to investigate opportunities for implementing the conservation recommendations of the structure plan. He would do this by seeking to understand the socio-economic drivers of habitat loss and the opportu-

nity costs and potential and actual benefits of conservation. Most importantly, he was encouraged to develop good relationships with the local inhabitants. The creation of this full time post provided the initial momentum to ensure that biodiversity issues became mainstreamed on the Agulhas Plain.

STRATEGIC CONSERVATION INTERVENTION BY SOUTH AFRICAN NATIONAL PARKS

Planning for a park

In the early 1990s, South African National Parks (SANP) investigated the establishment of a coastal park along the Agulhas Plain. Following a feasibility study in 1995, which included vital input from the ESKOM structure plan and key scientists from the University of Cape Town, SANP shifted their focus away from the coast and highlighted the Agulhas Plain's fynbos vegetation and unique wetland systems as conservation priorities. Concomitant with the SANP study, the Institute of Plant Conservation (IPC) at the University of Cape Town initiated a systematic conservation plan. Four priority nodes were identified, all of which coincided with areas previously emphasised as conservation priorities in other studies. These were the Heuningrug limestone complex in the northeast, the Elim area in the centre, Groot Hagelkraal in the southwest and the Soetanyberg in the southeast (Figure 10.1). As a result, SANP amended their goal for the Agulhas National Park to incorporate the four nodes, two of which coincided with their own priority areas. Altogether SANP identified an area of approximately 20,000 ha for the Agulhas National Park. In early 1996, the Board of SANP approved the establishment of a national park on the Agulhas Plain.

Serendipity, and the need for academic institutions to actively market their products, was a turning point in the development of the Agulhas National Park. Without the intervention by the IPC, resources may well have been directed towards a coastal park (which would have been politically difficult given the high usage of the area by local people) and the fynbos and wetland systems would have been left to degrade.

Box 10.1. Conservation mechanisms of South African National Parks

South African National Parks (SANP) has two types of conservation mechanisms. Schedule 1 national parks are the traditional national parks owned and managed by the state. Alternatively, contractual national parks allow for the proclamation of private land (or state land under the control of a parastatal organisation or community) to become part of a national park. In these parks, the land remains the property of the landowner and is managed according to an agreement between SANP and the landowner. The agreement is flexible and may allow for some (sustainable) resource use. The agreement requires a formal contract with SANP for a period of more than 30 years (preferably 99 years). The Agulhas National Park is a combination of the schedule 1 and contractual national park mechanisms.

The appointment of a coordinator

By early 1997, the Botanical Society's conservation manager (discussed above) had been working in the area for 18 months and had gained local knowledge and standing in the community. He was then appointed by SANP as the locally based coordinator to oversee the implementation of the park. The new park coordinator produced a newsletter, disseminated information and organised a series of meetings with the public and sectoral groups during 1997 and 1998. This post was vitally important in developing trust between SANP, NGOs, private landowners and local communities on the Plain, an essential ingredient for success in a project of this nature.

The first funds for invasive alien plant clearing

In early 1998, a large-scale project, funded by the Norwegian government, to clear invasive alien plants on the Elim communal lands was initiated by SANP. Although the national park had not been proclaimed at that stage, SANP recognised the

Box 10.2. The Elim Community

Although most of the land on the Agulhas Plain is freehold, there is one area of communally owned land. The Elim community, many of whom are descendants of the original Khoen-Khoen inhabitants, are the custodians of approximately 7,000 ha of land, including one of the largest and best-preserved tracts of rare Elim fynbos. Preliminary discussions between SANP and the Elim community suggested that the community would be willing to investigate the inclusion of the Geelkop node (home to many endemic plants) into the Agulhas National Park on a contractual basis. The Elim community, however, is currently busy with internal negotiations to transfer the title deeds of the land from the Moravian church to the local community. This process will need to run its course before further discussions regarding the national park.

social and economic benefits in providing more than 70 jobs to people in the community adjacent to the future park. Moreover, clearing the catchment of the Elim lands of invasive trees would benefit the wetland systems of the downstream areas earmarked for park inclusion. The success of the Elim *Working for Water* project was a result of a number of initiatives and serendipitous events. These included a pilot project funded by the IPC from monies leveraged from a top-tier ecotourism venture, a chance in-flight meeting and decision to fund the project by two top government officials, and a partnership between a number of government departments to secure bridging finance and co-financing to complement the foreign funding.

At the same time SANP initiated a second alien-clearing project, again as a result of a joint partnership between SANP and the Department of Water Affairs. This project provided the impetus for the development of an ecological and socio-economic development project that trained locally-based contractors and provided the capacity to

undertake works in the area of the developing Agulhas National Park. This successful partnership enabled SANP to undertake important management work, utilising central government funds and without putting a strain on its own funding mechanisms. Instead SANP funds were used primarily for the purchase of land for the park. Furthermore these two initiatives provided local communities with a direct buy-in to the park through employment opportunities.

The first land acquisitions

In a conservation environment where dwindling funds are the norm, innovative strategies are needed to create the financial, economic and social basis for a major intervention like a new national park. Only once the national park enjoys a measure of economic sustainability, will its biodiversity be effectively safeguarded. In the interim, and as the national park develops, commercial opportunities need to be exploited by SANP. Thus, a decision was made to establish a gateway to the national park at Cape Agulhas, the southernmost tip of Africa. Although the Cape Agulhas area was not one of the priority areas for biodiversity identified by the systematic conservation plan, the site's incorporation was vital for capitalising on the area's substantial tourism potential.

The first property to be proclaimed as part of the Agulhas National Park was the land managed by the quasi-government Portnet Lighthouse Services. This organisation was looking for management assistance and a vision for the future of Cape Agulhas at the same time as SANP was putting its plans into action. Through good relationships between key individuals and trust built up over a few years, not only the land, but also two money-making enterprises, a museum and a restaurant, were handed over for SANP to run. The Agulhas National Park was officially launched by the Minister of Environment Affairs and Tourism on 1st March 1999 and the first areas proclaimed in September 1999. What makes this process of park establishment unique is that it was the first example in South Africa where a flexible, strategic and systematic conservation planning approach was applied in planning and initiating a system of conservation areas.

Economic benefits of a national park

A recent survey of businesses on the Agulhas Plain indicated that, owing to increased economic opportunities, the majority favoured the establishment of the Agulhas National Park. Indeed, the economic impacts of protected areas extend well beyond their boundaries. In South Africa, the Kruger National Park is estimated to have a value of between R3 billion and R5 billion per year after the economic multipliers have been taken into account. Similarly, the Addo Elephant National Park generates some R 360 million annually (Chapter 6). The value of these protected areas, which exceeds the individual park budget by orders of magnitude, provides evidence to decision-makers of their true contribution to the economy.

State-private sector partnerships

SANP realised that it was not realistic to depend on the state for the provision of all of the requirements for the establishment of new protected areas. An estimated US\$4 million is required for purchasing 12,000 ha of privately-owned land in order to consolidate the high priority areas for the effective conservation of the park's biodiversity. The remaining 8,000 ha would be included into the park on a contractual basis. SANP's internal development fund for land purchase will not be sufficient for consolidating all important conservation areas. Other sources of funding, including those administered by WWF-South Africa and Fauna & Flora International (FFI) have been used to supplement SANP's internal land purchase funds.

The prospect of SANP incorporating sufficient land for the effective consolidation of the Agulhas National Park without the cooperation of private landowners and other conservation agencies (especially the Western Cape Nature Conservation Board) would be unrealistic. Indeed, this cooperative approach has paved the way for the development of the Agulhas Biodiversity Initiative (ABI), which should provide the mechanism for the effective implementation of the Agulhas National Park and further consolidation of conservation-worthy areas on the Agulhas Plain. ABI is considered an important pilot for implementation of the

Cape Action Plan for the Environment (CAPE) (see Chapter 11) as it takes high level planning to a local level. ABI is designed to address the main threats to the region's biodiversity and to improve the livelihoods of the local communities through a multiplicity of inter-linked conservation, development and socio-economic activities. A GEF project is under preparation to include biodiversity conservation, sustainable harvesting and ecotourism components. It is estimated that the full project will access US\$3.5 million from GEF funds and co-financing to the value of US\$7 million from SANP, FFI and the Western Cape Nature Conservation Board (WCNCB).

Box 10.3. South African National Parks—private sector partnerships

There are three ways in which the private sector can invest in SANP's establishment of a formal conservation system for the region: i) by donating land for the system, with or without commercial opportunities; ii) under an agreement or formal contract whereby land is included in the long-term interests of conservation in exchange for various benefits (which are not necessarily financial) e.g. contractual national parks, and iii) by landowners undertaking conservation and sustainable farming practices of their own free will.

Contractual national parks are bound by a formal contract between the landowner and SANP but they do not always ensure equitable benefits to both parties. Experience thus far suggests that accrual of benefits from contractual national parks often favours the private sector more than conservation, with landowners sometimes perceiving the arrangement solely as an incentive for a land improvement service (e.g. alien plant control) or for economic opportunities (e.g. ecotourism). It is important, therefore, to ensure that the contractual national park strives to incorporate explicit conservation goals over the long term.

A COLLABORATIVE CONSERVATION INITIATIVE ON THE WESTERN RIM OF THE AGULHAS PLAIN

The coastal region between Hermanus and Gansbaai on the western rim of the Agulhas Plain (Figure 10.1) is characterised by uncultivated, agriculturally marginal and scenically spectacular landscapes. Up until the late 1980s, farms in the area were utilised for cattle grazing and wild flower harvesting. Fortunately, owing to the low productivity of the soils virtually no cultivation had taken place. According to the reserve selection procedure used to determine the area of the Agulhas National Park, this region was not a priority for inclusion in the park. However, a conservation initiative, born out of a dynamic private sector tourism project, was to have a significant influence on the future conservation management of the area.

The private sector—Grootbos Nature Reserve

In 1991, an entrepreneurial businessman from Cape Town purchased a 127 hectare farm near Gansbaai. His decision to buy the farm was based on its spectacular view over the Atlantic Ocean rather than its biodiversity value. The owners recognised the potential economic benefits of catering for the foreign nature-based tourism market. Their decision to invest in an up-market lodge was influenced by political stability and the inflow of foreign visitors following South Africa's first democratic elections of 1994. The property had previously been poorly managed as a cattle and flower harvesting farm to the detriment of the site's biodiversity; at that time it employed only four staff. The farm was converted into an ecolodge employing 50 full-time staff, more than half of whom come from the surrounding impoverished communities. These local unskilled staff were trained to fulfil the many requirements of a fully functioning tourist lodge.

From the beginning, the owners realised the importance of basing the business on the region's spectacular natural beauty and diverse flora and fauna. The lodge was carefully integrated into the natural environment, and only local artisans and craftsmen were employed. The farm was registered as a private nature reserve and opened to its first guests in 1995. Three neighbouring farms were

added in 1996 and 1997 increasing the reserve to 1,050 ha.

Grootbos employs qualified biologists and conservationists to run guided tours and to develop the conservation projects. Funds generated by the tourism business have been re-invested into a variety of conservation projects. These have included fauna and flora surveys, clearing of invasive alien vegetation, fynbos and forest restoration projects, fire management and radio tracking of endangered mammals. This information has been integrated into a comprehensive conservation management plan for Grootbos. While the establishment of this reserve was not based on a rigorous scientific selection analysis, subsequent research has shown

Box 10.4. Private Nature Reserves (PNR) on the Agulhas Plain

Private nature reserves are administered by the Western Cape Nature Conservation Board (WCNCB) and are established with the objective of protecting and conserving the natural environment. The owner undertakes not to pursue any activity that will degrade the natural environment, and all activities should be based on sound ecological principles. PNRs are registered and published in the Government Gazette. No financial support is provided by the WCNCB, but expertise on managing natural systems is made available to the landowner on request. There is no legal commitment binding the landowner to conservation activities and registration of private nature reserves can be cancelled at any stage on receipt of a written request from the landowner. A PNR, therefore, provides no long-term security for threatened populations, pristine landscapes or ecological processes. The conservation status depends largely on the commitment and financial position of the owner. The Albertyn family initiated the first PNR on the Agulhas Plain in 1969. Today there are 24 PNRs on the Plain, covering a total area of approximately 8,000 ha. This is nearly the same area as that administered by the WCNCB in formal provincial reserves in the region (9,277 ha).

Box 10.5. Some marketing lessons from Grootbos Nature Reserve

The vast majority of international guests visit Africa to view big game. It is more difficult to market floral biodiversity as an attraction for foreign visitors. The problem is compounded by a lack of coordinated efforts to market the Cape's unique floral wealth. Grootbos was forced to develop a marketing strategy around luxury and service, to which was added a package of natural attractions, emphasising marine fauna, especially whales, penguins and seals. The botanical tours of the fynbos proved very popular once the guests had arrived at Grootbos, and increasingly guests are visiting the reserve specifically to view the flora.

Grootbos invested a large amount of capital into developing their sound environmental practices, conservation commitment and involvement of the local communities. From a business perspective, these funds might have been better spent on infrastructure development, marketing or dividends to shareholders. However, this investment into the environment is now paying its own dividends through positive marketing from environmentally-based magazine and newspaper articles, conservation and ecotourism awards, increased interest from specialist nature-travel operators, and support from local and international conservation agencies.

that the site has considerable conservation value (604 plant species, including 44 Red Data species and two species new to science). A nature reserve established by chance because of its spectacular views, and expanded in order to cater for tourism requirements, has turned out to be of regional conservation value.

The guiding philosophy at Grootbos aims to convert science into stories in such a way that nature comes to life for the guests. On all tours, guides emphasise the threats posed to the conservation of the natural environment and the role that Grootbos and its conservation partners are playing in countering these threats. As a result, each year, over

5,000 foreign and local visitors are exposed to the uniqueness of the Agulhas Plain's biodiversity and the need for conservation intervention.

Primarily, Grootbos is a tourism lodge generating its income through nature-based activities. Funds generated by the tourism business have been re-invested into conservation and social projects. Mainstreaming has taken place through the shift in land use from agriculture to nature-based tourism activities. As a result, there has been a net gain in biodiversity conservation and tourism in the region. A hurdle for ecotourism world-wide is that almost all nature tourism is advertised as ecotourism, whether or not the business contributes to biodiversity conservation. The Grootbos tourism initiative has secured the conservation of 1,050 ha of previously threatened habitat, significantly increasing its conservation profile and influencing conservation in the surrounding area. It has created employment and training opportunities, increased environmental awareness amongst local and foreign visitors, marketed the region's natural diversity, increased visitation to the area and created business opportunities for a variety of secondary businesses and other nature-based tourism operators.

NGO involvement—Fauna & Flora International and Flower Valley

The development of collaborative conservation in the area was accelerated by the acquisition of a 578 ha portion of land adjacent to Grootbos by Fauna & Flora International (FFI) in 1999. FFI's involvement arose out of the imminent threat of conversion of the Flower Valley property from natural vegetation to viticulture. A neighbouring private landowner provided the catalyst and key driving force to initiate what has subsequently become a major conservation project. She privately funded a deposit on the property and negotiated a one-year period to secure the remaining finance. Having failed to obtain financial support in South Africa, she went to the United Kingdom, where she successfully mobilised the necessary funds with the aid of Fauna & Flora International (FFI). The decision by FFI to support the project was influenced by crucial input from local scientists and conservationists from the major stakeholders,

WCNCB, SANP, Botanical Society, IPC and Grootbos. They were also swayed by the conservation value of the farm, the unified support by local conservation agencies and the existing momentum of other conservation initiatives in the region.

At least in terms of flora, Flower Valley was not a priority conservation site. It did, however, form one of the few links between the western hills of the Agulhas Plain and the Elim hotspot. In this instance threats were used to galvanise support. The threat to Flower Valley provided the opening for an international NGO to become involved in conservation on the Agulhas Plain. FFI has subsequently been involved in financing the acquisition of priority land for the Agulhas National Park in a core conservation area. The NGO has also become intricately involved in conservation planning and the Agulhas Biodiversity Initiative. With Flower Valley as its flagship project, FFI will continue to have an influential role in fynbos conservation in the future.

Flower Valley is now owned and run by the Flower Valley Conservation Trust (FVCT), which aims to promote the sustainable utilisation of fynbos resources for the conservation of biodiversity and the upliftment of local communities on the Agulhas Plain. The FVCT has set about developing an ambitious biodiversity-based business with economic, environmental and social components. The core business remains the export of fynbos flowers to European flower markets. The business buys wild flowers from farms covering 20,000 ha of the Agulhas Plain, thereby influencing land management practices over a large area using economic incentives. The Trust is in the process of developing a niche market overseas through an internationally-recognised certification or “green labeling” system.

Establishing eco- and/or fair trade labels may be the best way to establish the credentials of a biodiversity business product. The establishment of this certification process is being carried out in close collaboration with a number of organisations including WCNCB, SANP, Botanical Society and the South African Protea Producers and Exporters (SAPPEX). The primary objective is to maintain the use of wild harvested products as against the cultivation of fynbos crops. Key requirements for

Box 10.6. Fynbos cultivation

The ploughing of natural fynbos and replacement with cultivated fynbos species for the export of flowers is a common, and growing, agricultural activity on the Agulhas Plain and elsewhere in the Cape Floristic Region. Quality control, in terms of stem length, flower shape and colour, as well as stringent phyto-sanitary requirements have pressurised the fresh flower industry into expanding areas under cultivation. Income derived from cultivars can be far higher than flowers harvested in the wild. One hectare cultivated generates the same revenue as 50 to 100 ha of natural vegetation. However, cultivation is negatively impacting the biodiversity of the region. Most cultivation replaces pristine fynbos, pesticides are commonly used and there are concerns of genetic contamination of wild stocks as the genetic material used comes from a variety of sources. The production of cultivated species is also less labour intensive than wild flower harvesting, an important consideration in a region with unemployment of over 50%.

certification will include strict harvesting techniques, road and fire management, alien plant control, payment of correct wages and provision of proper working conditions and housing. It is hoped that Flower Valley’s innovative biodiversity-based business strategy will successfully develop a niche market that will increase the demand for sustainably harvested, as against cultivated, fynbos products.

Seasonality in the flower export business results in workers being laid off during the quiet months. Flower Valley employs 55 workers with 165 dependants. Under previous management, approximately half of the work force was laid off for six months each year. Through the development of a paper-making micro-enterprise, the FVCT has created full time employment on the farm for all staff. An important element in the marketing success of the paper products is the story of conservation and

social commitment that is explained on the packaging. The purchaser is not only buying a professional looking product, but one that carries a powerful message of employment creation and conservation.

A biodiversity business as a sustainable entity will fail without ongoing support from the local community. The success of the project has been built on gaining the community's support through sincere efforts to address their needs. The Trust has set about improving standards of living and enhancing capacity, especially amongst the women and children. Within its first six months of operation, the Trust established an Early Learning Centre (ELC) for local children. The ELC provides pre-primary education and day-care educational support for 24 children. The facility also provides day-learning programmes in environmental/outdoor education for teachers and children from other schools in the area. The ELC has significantly improved the children's readiness for primary school and was important in gaining the community's support by addressing a fundamental need at an early stage of the project. In the longer term, the Trust plans to develop further environmental education centres on the Agulhas Plain.

The FVCT is working towards independence of donor assistance. After 36 months, the flower and paper businesses are not yet covering the conservation and community costs and the trust is still dependent on financial support from FFI. Obtaining financing for a biodiversity business in South Africa is difficult, as it is a relatively new concept for finance institutions. It is imperative to secure bridging capital/loans while developing the business model and identifying potential financiers. Ultimately it is hoped that the business will generate sufficient income to fund the Trust's conservation and community objectives. Once the business can fully support the conservation and community costs, the Flower Valley model will provide a net gain in biodiversity conservation, skills development, job creation and education.

The Walker Bay Fynbos Conservancy

Over the last decade almost all of the traditional, agriculturally active landowners on the western rim of the Agulhas Plain have sold their properties to more affluent, conservation-minded South

Box 10.7. What is a conservancy?

Conservancies, implemented by the Western Cape Nature Conservation Board (WCNCB), encourage off-reserve conservation through co-operative management. They create a mechanism whereby groups of landowners can pool their resources for the purpose of conserving fauna and flora and the development of environmentally friendly business opportunities. The WCNCB provides landowners with guidance and expertise in conservation management. Currently conservancies are based on a voluntary agreement but legislation is being investigated to strengthen their status.

Africans and foreigners. These new landowners placed a greater value on preserving the natural landscapes. By 1999 their concern over issues such as alien vegetation invasion and repeated, uncontrolled wild fires resulted in the formation of the Walker Bay Fynbos Conservancy (WBFC). Grootbos Nature Reserve provided the catalyst to initiate this project. Their conservation staff established communication channels and played a crucial role in developing trust between the various parties. The success of this form of collaborative conservation management is built on strong personal relationships.

The conservancy incorporates 17 landowners covering an area of 12,160 ha and includes Grootbos, Flower Valley and the Walker Bay Nature Reserve managed by the WCNCB. In order to achieve its objectives concerning conservation management and social upliftment, the conservancy is actively pursuing biodiversity-based business opportunities. The conservancy used funds acquired, with the assistance of FFI, from the Whitley Awards Foundation in the United Kingdom, to employ a permanent conservation management team. In close collaboration with all landowners they have developed a set of priorities for conservation management and biodiversity-based business opportunities. A conservation management plan was drawn up for all the properties and alien vegetation removal and fire management

programmes implemented. On the Agulhas Plain, the only major channel for state-funded clearing is via the *Working for Water* projects administered by South African National Parks and WCNCB (local implementing agencies). The SANP-administered funds are only available to a limited number of landowners whose properties are earmarked for inclusion in the park on a contractual basis. The WCNCB has a difficult task in selecting which landowners should receive funds and are using conservancy membership as a prerequisite for funding. The conservancy has thus far received over R200,000 for alien clearing that would not have been made available to the individual landowners.

The 17 landowners making up the conservancy jointly own a very valuable area of the Plain, both from a biodiversity and ecotourism perspective. It is essential to develop economic incentives for these landowners to conserve their properties in the long term. The challenge lies in creating biodiversity-based economic activities for landowners and employment opportunities for the local communities. The conservancy has developed a strategy for nature-based tourism development in the area and is currently exploring options for the development of multi-day hiking and horse riding trails that will traverse various properties. Through a “slowly-slowly” approach, landowners have gained enough confidence in the conservancy structure to endorse a notarised agreement securing right of access across their properties for the hiking trail in favour of the conservancy. These trails will provide income for landowners and also significant opportunities for training and employment of the local communities. The success of the WBFC can be attributed to certain key factors: firstly the desire by landowners to conserve their properties; secondly, perceived threats in the form of wild fires, alien plants and new land use practices in the area; thirdly, a private sector driving force in Grootbos Nature Reserve with its qualified staff, committed owners and financial subsidisation of the project; fourthly, support from an international donor (FFI) and, finally, the key driving forces provided by energetic individuals from within the group.

While the conservancy concept suffers from various inadequacies, it is presently the most ef-

fective vehicle in South Africa for cooperative management by landowners affected by common resource issues. The need for off-reserve mechanisms for effective conservation was emphasised by the Cape Action Plan for the Environment (CAPE) and the WCNCB has made a strategic decision to promote and encourage the establishment of conservancies. Since the establishment of the WBFC in 1999, a further four conservancies have been launched on the Agulhas Plain. The total area registered within conservancies on the Agulhas Plain now exceeds 35,000 ha, an area nearly four times that administered by the WCNCB in the region’s formal reserves. If properly nurtured, the conservancy concept will provide the most cost-effective means of conserving large tracts of private land in the CFR.

LESSONS FOR MAINSTREAMING

Turning points and enabling factors

Decades of scientific research had shown that the Agulhas Plain was a region of exceptional biodiversity. There was something worth conserving. This focused the attention of key scientists and conservationists on the plight of the region and proved important later in conservation planning and fund raising. An immediate threat to the region’s biodiversity, the development of a nuclear power station, gave the impetus for a structure plan, which played a major role in the development of the Agulhas National Park. Similarly, the threat of viticulture galvanised support for conserving Flower Valley that led to the involvement of Fauna & Flora International. The threats of fire and alien plant invasions were important arguments used in the establishment of the conservancy. Solutions have been found by treating each threat as an opportunity, rather than reacting against it. In the Agulhas National Park, Grootbos, Flower Valley and the Walker Bay Fynbos Conservancy, key individuals drove the projects. Ex-students from the Institute of Plant Conservation (University of Cape Town) played important roles in developing both the Agulhas National Park and the conservancy.

Individuals could not function on their own and institutional support in the form of South African National Parks (SANP), the Western Cape Nature Conservation Board (WCNCB), Fauna & Flora International (FFI) and Grootbos, as well as collaboration between these institutions, was essential in the mainstreaming process. FFI provided funding for land purchase and support of Flower Valley as well as land purchase for the Agulhas National Park, while Grootbos provided administrative and financial support to the conservancy. The establishment of the Agulhas National Park has been dependent on governmental will and inter-departmental cooperation, while the Walker Bay Fynbos Conservancy was built on organisational support from Grootbos and FFI. Both the individual and organisational support often require a degree of risk taking. High risks in conservation often require brave action and if individuals and/or organisations are prepared to take the risks, threats can be turned into opportunities.

The success of collaborative initiatives such as contractual national parks and conservancies are dependent on trust between key individuals and landowners that may take several years to build. These are often one-on-one relationships that may break down if key individuals leave the project. One drawback with the development of the Agulhas National Park, was that only one or two individuals, rather than a team, have been responsible for the majority of the development and planning work. It is important that mechanisms are in place to ensure that projects are sustainable, independent of any one individual.

A rigorous scientific basis and strategic conservation planning are important for achieving conservation goals. However, in some instances, such as the Grootbos and Flower Valley projects, conservation initiatives develop independently and should be supported despite the lack of strategic prioritisation. It is important to look for key enabling factors and to support these initiatives.

Results of mainstreaming

Although the collaborative conservation projects on the Agulhas Plain are still at an early stage, they have already contributed in a number of ways

to regional development. They have resulted in a significant improvement in the standards of conservation management of certain areas on the Plain (e.g. alien clearing in the Agulhas National Park, Elim and the WBFC). They have created increased environmental awareness amongst landowners (e.g. the coordinator of the Agulhas National Park visited most landowners on the plain) and local communities (e.g. the Flower Valley Early Learning Centre). They have significantly increased employment and training opportunities (e.g. Grootbos Nature Reserve). They have resulted in positive business spin-offs through direct marketing opportunities (e.g. tourism opportunities for contracted landowners and neighbours of the Agulhas National Park), partnerships (e.g. joint marketing of conservancy accommodation, establishment of a joint hiking trail) and the support of outside businesses (e.g. Grootbos support for boat-based nature tours).

Constraints on progress

The Agulhas National Park is still developing slowly as a result of central funding cutbacks within SANP. This “slowly-slowly” approach may have advantages, however, in that it allows SANP to gain acceptance with the local community. Credibility with the local community is crucial to the success of a project of this nature. Sensitive negotiations to include large tracts of private land into the park are ongoing and require continuity and trust on the part of both SANP and landowners. The ability to lever funds from a variety of sectors, private and public, domestic and international are crucial to the future success of the development of the Agulhas National Park. The Agulhas Biodiversity Initiative should provide the financial and technical assistance to do this.

Outside of the planned area of the Agulhas National Park, land purchase is not a realistic option for expanding the conservation network. Less restrictive conservation models offered by the Western Cape Nature Conservation Board, (namely private nature reserves and conservancies) are likely to be more attractive to most landowners. Unfortunately, these conservation models provide very low levels of security for biodiversity, with landowners being able to withdraw at any stage, even

after substantial investment of resources from conservation agencies. Legislation to strengthen the status of private conservation initiatives and provide economic incentives for private conservation is, therefore, urgently required. A key lesson is the need to approach on-farm conservation in a building-block manner, allowing landowners to retain rights over land and gradually working towards greater conservation security for those who wish to receive greater rewards. South Africa needs to develop a classification system to assist this, as most people are reluctant to sacrifice any rights immediately, even for the noble cause of conservation.

CONCLUSIONS

The status of biodiversity conservation on the Agulhas Plain has steadily improved over the last decade. This improvement has coincided with a change in the approach of government conservation agencies towards conservation management on the Plain. Not only have conservation interventions been strategically planned, but also a far greater effort has been made to involve private landowners, NGOs and local communities in order to reach conservation goals. It has been realised that the region's unique biodiversity cannot be saved by the traditional approach of enlarging the formal conservation network. Instead, a far more progressive collaborative approach has been adopted. This has included developing partnerships with private landowners (e.g. contractual national parks and conservancies) and NGOs (e.g. land purchase and support by FFI for SANP), and creating biodiversity-based employment opportunities both on and off reserves with the assistance of other government agencies (e.g. accessing *Working for Water* project funds for alien clearing), and in collaboration with private landowners (e.g. developing trails that traverse state and private properties).

Already sectors such as tourism, education and agriculture have benefited through the mainstreaming of biodiversity on the Plain. The businesses described above are dependent on the region's biodiversity for their success. Yet, at the same time, by putting biodiversity to business in a sustainable manner, there has been a concomitant improvement in the status of biodiversity on those

properties. The challenge ahead is how to roll these success stories out to other conservation-worthy areas on the Plain. This will require further strengthening of the collaborative partnerships established over the last decade and an even greater effort by conservation agencies to integrate private landowners, NGOs and communities into their conservation network. Ultimately, the biodiversity of the Agulhas Plain will only be safeguarded once all the owners of conservation-worthy land are on board and have an incentive to conserve.

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Incorporating Conservation Priorities into Planning Guidelines for the Western Cape

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SUMMARY

The south-western region of South Africa has an attractive environment and a relatively strong economy. This is the province of the Western Cape, an area of exceptional biodiversity which encompasses almost all of the Cape Floristic Region. The region's economy and beauty attract people into the area, with resultant development needs that exert immense pressure on the region's natural resources. As a consequence, there has been a history of time-consuming and costly conflict between conservation and development, which has contributed to an ongoing loss of biodiversity. Recently, the independent, but coincidental, initiation of systematic planning initiatives by both the conservation community and the development planning authorities has resulted in an environment conducive to collaboration. This has been a turning point, marking the beginning of biodiversity considerations being mainstreamed into decision-making processes in land use planning and implementation.

Advances in systematic conservation planning have resulted in a rigorous and defensible identification of priority areas for conservation in the Western Cape. The identification of these priority areas coincided with the launch of a new strategic bioregional planning initiative being implemented by the provincial planning authorities. There are two major benefits. Firstly, formally established protected areas are legally protected as zones within land use plans, and the bioregional approach to planning facilitates the maintenance of landscape linkages

necessary for long-term ecosystem functioning and biodiversity maintenance. Secondly, there are benefits for efficient land use planning and development control, since a proactive statement of conservation priorities can steer development towards less sensitive sites, and result in less costly decision-making procedures.

Although these concurrent moves towards a more strategic approach created an environment conducive to collaboration, actual transformation within the relevant authorities required the establishment of a cross-sectoral partnership between the conservation and planning communities. A key step in this process was the development of the Cape Action Plan for the Environment (CAPE), funded through the GEF, which facilitated interaction among key individuals and led to formalised inter-agency cooperation agreements. This resulted in a highly supportive policy mandate but there still remains a need to improve appropriate inter-disciplinary capacity for local implementation.

BACKGROUND

The Western Cape is situated in the southern-most part of the African continent. It covers 129,406 km². Almost four million people live, work and relax in this area, and the population is increasing at an average rate of 2.8% per year, partly as a result of intrinsic growth but also because people are drawn there, mainly from other parts of the country, by its relatively strong economy and natural beauty. This region, and the adjoining marine areas, have spectacularly high levels of plant and animal diversity and endemism (Box 11.1). The combination of pressure for development and high diversity make it one of the hottest hotspots of global biodiversity.

The principles and practices of systematic conservation planning have only recently been applied at a scale appropriate for region-wide assessment and now offer opportunities for improving decision-making regarding land use in the CFR. In the past, without the regional perspective, the impacts of proposed developments have been evaluated on an individual basis. Opposition to development was often based on advocacy rather than on actual conservation value. Many proposed developments in non-critical areas experienced strong opposition

from environmental lobbyists while development proceeded in areas with unique conservation value. This approach was very inefficient for both conservationists and developers.

This chapter describes how the deadlock was broken by the concomitant development of systematic planning initiatives within both the land use planning and conservation sectors. It explains how these systematic approaches complemented each other and led to the incorporation of conservation priorities in development planning processes. It outlines both the early successes that have been derived from collaboration, and the challenges which lie ahead. In particular, it focuses on the development of a strong partnership between the conservation and land use planning sectors and how this needs to be supported by sound legal frameworks and the capacity to deliver.

TWO PARALLEL INITIATIVES ADOPT A STRATEGIC APPROACH

The individual development of two complementary strategic planning initiatives facilitated cross-sectoral collaboration. These initiatives were: the adoption of a bioregional approach to land use planning, and the development of a strategic conservation plan which systematically identified priority areas for conservation.

Bioregional planning: a facilitatory framework

In the past, poorly integrated planning frequently fragmented the landscape and disrupted ecological and evolutionary processes necessary for maintaining biodiversity. For example, conservation areas could be inadvertently juxtaposed with areas of intense development, leading to spill-over edge effects. In response to the growing pressure for a more sustainable approach to development, bioregional planning emerged as an integrative concept that amalgamates ecosystem management and development planning into a single framework. A significant departure from the former approach to land use planning, it aims to accommodate both the conservation of biodiversity and the need for development within the landscape. One of the tools for implementing bioregional planning in practice is the development of biosphere reserves (see Box

Box 11.1. Biodiversity and conservation in the Cape Floristic Region

The Cape Floristic Region (CFR) comprises an area of 87,892 km² at the south-western tip of Africa, almost all of which lies in South Africa's Western Cape Province. This region has long been recognised as a global priority for conservation action, owing to its high concentration of endemic taxa, especially of plants and invertebrates, and its vulnerability to processes that threaten this unique biodiversity. The CFR is recognised as a Centre of Plant Diversity, an Endemic Bird Area and a WWF Global 200 Ecoregion.

The biodiversity tally for the CFR is impressive. The region supports 8,200 plant species (5,682 endemic), 127 mammals (9 endemic), 288 birds (6 endemic), 109 reptiles (19 endemic), 38 amphibians (19 endemic) and an unrecorded, but undoubtedly large, number of endemic invertebrates. In addition, the area is home to 1,406 Red Data Book plant species, the third highest known concentration of such threatened species in the world. Cultivation for agriculture has transformed 25.9% of the CFR and dense stands of woody alien plants and urban areas each cover 1.6%. Although invasive alien plants are a problem in the mountains, most transformation has occurred on the more productive, and accessible, lowlands where more than 95% of some habitats have been lost.

As of 1999, about 20% of the CFR is included in 50 protected areas supported by provincial or national legislation. Given the global aspiration of protecting at least 10% of each country or region, this situation appears quite healthy. On closer scrutiny, however, the alarm bells start ringing. While some 50% of the fynbos-clad mountains are protected, only 9% of the lowlands are reserved. Moreover, many of the lowland habitats have no protected areas whatsoever, and they have been so extensively transformed by the human footprint that it is no longer possible to achieve even a modest 10% conservation target. Finally, the existing protected area network does a very poor job in incorporating the ecological and evolutionary processes that will sustain the CFR flora and fauna indefinitely. These processes include the migration of plants and animals along gradients of climate and soil, the ongoing evolution of species, and the tolerance of naturally-ignited fires that have influenced so profoundly the evolution of the CFR biota.

11.2). This involves the proactive identification of priority areas for conservation and their placement within a supportive planning framework of buffers and transition areas.

Application of bioregional planning in the Western Cape

Although there has long been awareness in South Africa of the importance of balancing development and environmental protection, there were few practical tools to achieve this goal. In 1996, however, the provincial government formally adopted bioregional planning as a basis for land use planning in the Western Cape, with agreement that a network of biosphere reserves would be established to integrate protected areas into the surrounding landscape. The definitions of both bioregional planning and biosphere reserves were opportunistically,

and flexibly, applied to the realities of modern South Africa.

Coincidentally, as part of the post-apartheid policy reform in South Africa, all municipalities were given a directive (in terms of the Municipal Systems Act No 32 of 2000) to draft integrated development plans (IDPs) for their areas of jurisdiction. This provided the opportunity for a complete revision of all plans. Most importantly, for the first time, spatial development frameworks (SDF) whose role is to guide land use, were extended beyond their previous limitation within urban areas to include the entire landscape, giving them much wider relevance. In addition, provision was made for these frameworks to have statutory status. Consequently, protected areas and other conservation zones identified in these spatial frameworks would have legal protection from development. The opportunity to incorporate the

Box 11.2. Biosphere reserves in the Western Cape

In the Western Cape, there has been formal recognition by UNESCO of the Kogelberg Biosphere Reserve and the Cape West Coast Biosphere Reserve. These biosphere reserves link protected areas and surrounding privately-owned land in an association which is governed by a not-for-profit company structure. The Kogelberg Biosphere Reserve lies approximately 60 km south east of Cape Town. It encompasses both mountain and coastal/marine components, and a core protected area which is home to 1,600 different plant species. This makes it one of the world's richest sites of plant diversity. Private and municipal nature reserves, the Harold Porter Botanical Garden, the Palmiet River estuary, sections of the coast and marine areas comprise the buffer zone. Plantations, farms, local towns and industrial developments make up the transition zone.

The Cape West Coast Biosphere Reserve on the other hand protects the highly threatened remnants of coastal lowland fynbos on the west coast north of Cape Town. The core area consists of the West Coast National Park comprising dune thicket and transitional scrub. The biosphere reserve includes some of the most poorly conserved renosterveld and sand plain fynbos where less than 5% and 1% respectively are formally protected. The Cape West Coast Biosphere Reserve is a focus of efforts to link conservation and socio-economic development in an area of high unemployment and poor levels of education, but where prospects of sustainable nature-based tourism are high.

bioregional planning approach in SDFs and IDPs throughout the Western Cape permitted the incorporation of the most up-to-date information on conservation priorities.

The Cape Action Plan for the Environment (CAPE)

In 1997, South Africa received GEF funding through the Cape Peninsula Biodiversity Conservation Project to assist with establishment of the Cape Peninsula National Park, to protect the most threatened part of the CFR, and for the development of the Cape Action Plan for the Environment (CAPE). The objective of CAPE was the establishment of a common vision and strategy for the conservation of the unique diversity of this region, together with an action plan for its implementation through cross-sectoral partnerships.

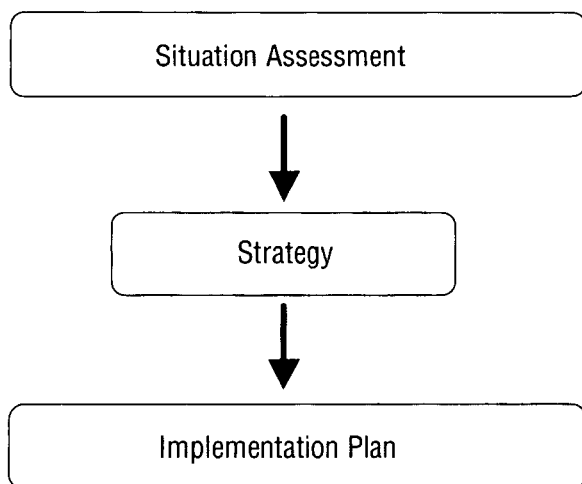
The first step was to gain a good understanding of the current situation by undertaking a rigorous situation assessment (Figure 11.1). A thorough consultative process then guided the development of a strategy for the conservation of the biodiversity of the region, which was fleshed out into a 20-year implementation plan. The long-term imple-

mentation plan was supported by detailed plans for the first five years of implementation.

The situation assessment addressed both the biophysical and the human environment. The biophysical analysis included an evaluation of the terrestrial, freshwater and marine systems. The outcome was the development of a spatially-explicit conservation plan that, for the first time, systematically identified priority areas for conservation. The rigorous and transparent nature of the process used to identify these priorities was critical in gaining acceptance for the resulting spatial conservation plan (see Box 11.3). The participatory nature of both the development of the strategy and the establishment of a supportive implementation plan was critical in establishing local buy-in. Strong participation by those who would be responsible for implementation also ensured that the plan was practical and supportive of existing initiatives (see Box 11.4).

Successful implementation of CAPE is dependent on the development of support from a diverse group of stakeholders. For this reason, an intensive public involvement programme was conducted, which ensured that those who would inherit

Figure 11.1. Process used to develop the Cape Action Plan for the Environment (CAPE)



the plans were intimately involved in their development. This process of involvement culminated in the establishment of a coordinating committee, which included all the key institutions involved in implementation, and a full-time coordination unit to facilitate collaboration between this inclusive grouping of stakeholders. Involvement of these diverse stakeholders brought biodiversity onto the agenda of institutions not normally concerned with biodiversity management. This provided an opportunity to mainstream biodiversity into the policies of multiple sectors as well as the establishment of the cross-sectoral partnerships necessary for implementation of collaborative projects.

Cross-Sectoral Partnerships Facilitate the Mainstreaming of Biodiversity into the Land Use Planning Sector

For the conservation priorities identified by the CAPE strategy to have an impact in practice, they needed to be recognised and implemented in partnership by the planning and conservation communities.

Formalising cross-sectoral partnerships

Many of the collaborative cross-sectoral partnerships established under the initial stages of CAPE were driven by the personal collaboration of dynamic individuals who built invaluable bridges

Box 11.3. Systematic identification of priority areas

Eight stages in the development of a systematic conservation planning process

1. Identifying and consulting key stakeholders
2. Identifying broad goals for conservation planning
3. Gathering and evaluating data on biodiversity features and threats to their persistence
4. Formulating targets for biodiversity features
5. Reviewing the effectiveness of existing conservation areas
6. Selecting additional conservation areas
7. Implementing conservation action in selected areas
8. Maintaining and monitoring established conservation areas

between sectors. Since such informal partnerships are vulnerable to the loss of key individuals, it is necessary to strengthen some of them through the establishment of formal institutional linkages. This process has already been initiated with the signing of memoranda of understanding at two levels. Firstly, political agreement was reached, committing both national and provincial government to the implementation of the CAPE strategy, and secondly, all of the implementation agencies (the CAPE implementation committee) have agreed to undertake specific roles and responsibilities in their respective sectors. It is, however, critical that this process of institutionalising collaboration does not result in the loss of ownership and drive that lay behind the initial successes.

Incorporation of conservation priorities into spatial planning processes

Although planning initiatives are being undertaken in other provinces of South Africa, the bioregional planning approach being used in the Western Cape is particularly well suited to support the inclusion of conservation priorities. The

Box 11.4. Interventions proposed by CAPE

The CAPE conservation programme has followed the international trend in conservation of moving away from top-down control of conservation areas and resource use, towards a more collaborative mechanism. In this model, sound scientific understanding and appropriate institutional structures support cooperative governance and community participation. A strong emphasis was placed on including local role players, and especially the institutions that are responsible for implementing the outcomes of CAPE, in the planning and decision-making phase.

The implementation programme was structured into three integrated themes: protecting biodiversity in priority areas, promoting sustainable use of biodiversity, and strengthening institutions and governance. Specific objectives of these themes include:

To establish an effective reserve network, enhance off-reserve conservation and protect threatened species. The conservation of small fragmented priority areas, as well as the large areas required to conserve landscape scale processes, must be secured through the use of private land in conjunction with state protected areas. It is therefore essential to have effective off-reserve conservation that encourages conservation on private land through supportive bioregional planning, incentives for appropriate land uses, and good extension aimed at motivating landowners to participate in conservation initiatives.

To develop methods of integrating biodiversity concerns into catchment management programmes, support sustainable harvesting, and encourage sustainable nature-based tourism. Sustainable use of freshwater systems can be addressed by integrated catchment management, which includes management of water resources, as well as all other processes impacting negatively on biodiversity, such as the control of invasive alien species. Sustainable harvesting must be supported by measures that promote compliance through education and the development of incentives such as ownership of communal resources. For terrestrial species this implies the establishment of sustainable levels of harvesting. In the case of marine resources, the establishment of protected areas to protect the resource base is critical. The potential of tourism to drive the conservation of biodiversity also needs to be harnessed by mechanisms that encourage reinvestment of revenues and guide development.

To strengthen institutions, policies and laws, enhance cooperative governance and community participation, and support continued research. The most important activities include the establishment of effective coordinating mechanisms, supported by an integrated legal framework that explicitly targets the conservation of biodiversity. This will enable resources to be focused on conserving priority areas, and supportive training, extension, research and awareness programmes.

Above all, the CAPE implementation programme recognises the need to mobilise civil society as a partner in conservation through enhanced institutional frameworks as well as capacity building. Successful implementation is dependent on realignment of resources around agreed priorities and collaboration between agencies to ensure that the most important projects are initiated and that resources are used efficiently. In order to get the projects implemented quickly enough it is also critical that additional resources are secured from national budgets and/or the international community or national budgets.

bioregional planning approach involves the identification of core areas for conservation and their support through the use of buffer and transition areas. The conservation priorities identified by CAPE will contribute towards the process of lo-

cating core conservation areas for the proposed biosphere reserves. There is, therefore, good potential for securing their long-term viability, by removing direct conflict with other types of land use. In addition, since bioregional planning re-

gards the entire landscape as one functional unit, the buffer zones can be used for the maintenance of large-scale ecological processes such as migration which contribute towards maintaining diversity in the long term. As these spatial frameworks have formal legal status and can form the basis for development control, they are potentially the most important implementation mechanism of the spatial conservation plan developed by CAPE—see Box 11.5.

Conservation on the ground: biosphere reserves

Once the planning frameworks are in place the next step is to put into place institutional frameworks for implementation. Biosphere reserves have been recognised internationally as a powerful means of implementing bioregional planning and this is strongly supported locally by both the conservation agencies and provincial government. Two bio-

sphere reserves have already been approved by UNESCO's Man and Biosphere (MAB) programme in the Western Cape. These are the Kogelberg Biosphere Reserve and the Cape West Coast Biosphere Reserve (see Box 11.2). The adoption of bioregional planning as a provincial policy and the support of both planning and nature conservation authorities for the implementation of the programme offers enormous scope for extending the network of biosphere reserves across the CFR. This could result in a network of biosphere reserves across the whole province (see Figure 11.2). The establishment of biosphere reserves is an effective mechanism for integration of environmental management at a local level. Both existing biosphere reserves are driven by independent bodies in which both local stakeholders and government partners are represented.

The role of conservation agencies within and beyond protected areas

The conservation agencies and non-governmental organisations (NGOs) most closely involved in the development of CAPE have taken a lead role in its implementation. Interventions range from creating new protected areas to focusing off-reserve conservation measures in identified priority areas. The development of incentives to encourage conservation on privately-owned land and the establishment of a strong conservation extension arm are well suited to integration with a bioregional planning approach. Collaboration between agencies, and integration with other relevant sectors, has provided an effective institutional framework, and much greater capacity, to implement conservation measures than previously when the nature conservation agency worked in isolation. There has been encouraging progress as the conservation authorities and the development planning authorities have begun to cooperate to share decision-making processes around land use and provide a better service to the public.

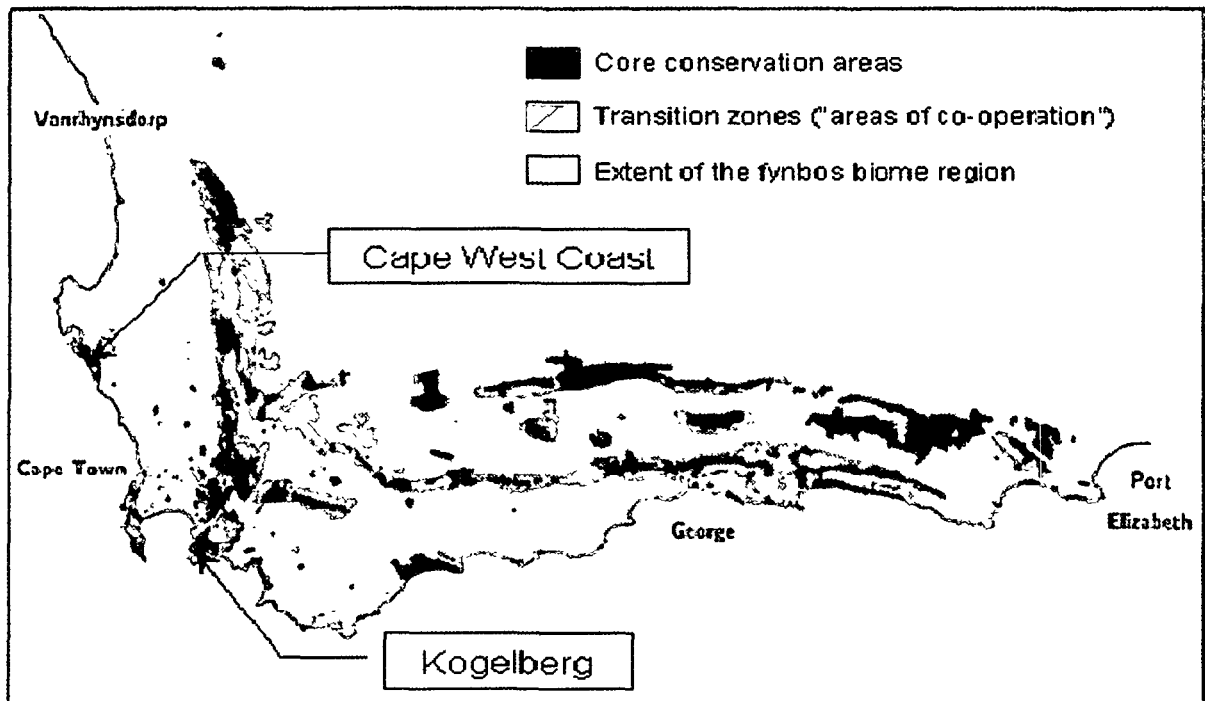
Box 11.5. Use of CAPE to support the development of a coastal zone policy for the Western Cape

The potential for using the conservation priorities identified by CAPE to inform the planning process has already been successfully demonstrated in the development of a coastal zone policy for the Western Cape. The Western Cape Department of Planning is responsible for developing a policy to prevent linear development along the coastline. Such development would not only destroy the sensitive natural areas but would also affect the attractiveness of the coastline and the potential role it can play in the tourism industry. Although the spatial frameworks for this policy were already in an advanced state, the planning department decided to delay their finalisation of the policy in order to ensure that the conservation priorities identified in CAPE were protected as core conservation areas. Although still in draft form, these revised frameworks are already being widely used by authorities and town planners involved in development applications along the coastline.

CHALLENGES TO SUCCESSFUL IMPLEMENTATION

Key challenges still lie ahead in order to successfully mainstream biodiversity considerations into

Figure 11.2. Proposed clustered system of biosphere reserves



land use planning. These include maintaining a good flow of information to decision-makers and developing appropriate capacity for implementation.

Providing information to decision-makers

It is critical that regional and local decision-makers are aware of conservation priorities that fall under their jurisdiction. In order to achieve this, the conservation authorities responsible for the curation of the CAPE conservation plans must establish strong relationships with both decision-makers, and the planners who support them, to provide updated information on conservation priorities in an easily accessible and appropriate format. The CAPE implementation committee provides an ideal vehicle to facilitate managerial level interaction. It is supported by a specialist working group which addresses the specifics of information management. The programme aims to ensure that decision-making processes for land use planning, development control and conservation planning can be made on the basis of the most comprehensive and up-to-date information. Capac-

ity is being strengthened in the agencies concerned to improve management of this information as a strategic resource.

Information collected in the course of planning and environmental assessment exercises continues to update and supplement the original data. This is particularly important in view of the fact that the CAPE conservation plans were completed at a 1:250000 scale, suitable for regional planning processes. Only in one pilot area—the Agulhas Plain (see Chapter 10)—was more detailed planning done at a scale (1:10000) able to support local planning processes. Local planning and assessment processes, therefore, have an important role to play in gathering additional finer scale data which can be fed back to conservation agencies holding the master conservation plan. This more detailed information could then be used to further refine conservation priorities to ensure that they are at a scale suitable for local implementation. Web-based information servers are being installed to provide the most efficient and effective access to data. Collaborative workshops with user groups across all sectors have defined essential data requirements

and the management protocols necessary to enhance their use.

Development of appropriate capacity

To ensure that information from CAPE is used to guide the development of spatial frameworks, the CAPE strategy identifies a suite of projects that support bioregional planning through the development of appropriate guidelines and capacity. More detailed information on the incorporation of conservation principles into the bioregional planning process, with a focus specifically on the prioritisation of areas for conservation, will be integrated in training manuals and workshops used to train local government officials and consultants.

Ensuring that information on conservation priorities is used correctly in both planning and evaluation processes is not a trivial task. There are very few people available with the cross-disciplinary expertise necessary to effectively integrate sound conservation principles and priorities into bioregional planning processes. The need for developing this capacity has been made even more acute by the recent devolution of responsibility for compiling these plans from provincial to local government (municipalities), where capacity to undertake even the most basic planning is severely limited.

The conservation priorities identified by the CAPE strategy are underpinned by decision-support software that can be used to assist a participatory decision-making process. This is very important in South Africa where there has been a strong move away from top-down planning towards more participatory approaches and has considerable potential to aid local implementation.

Realignment of resources to use a window of opportunity

The redrafting of all spatial frameworks has created a window of opportunity to mainstream biodiversity, particularly when clearly articulated inputs in terms of agreed conservation priorities are available. Internal resources have been realigned to support this process but there is limited capacity and budgets particularly within the conservation agencies. In recognition of the urgency

of the situation, other donors have provided bridging funds to ensure that the information management system is developed further.

Strategic environmental assessment (SEA)

Strategic environmental assessment (SEA) has the potential to further assist in integrating the conservation of biodiversity into mainstream decision-making (see also Chapter 4). The purpose of SEA is to integrate environmental issues into policy, plan and programme formulation at an early stage. A key difference between environmental impact assessment (EIA) and SEA is that EIA focuses on the impact of development on the environment; whereas the focus of an SEA is on the opportunities and constraints that the environment places on development (Box 11.6). A SEA is required as part of spatial development frameworks although the detailed methodological approach has not yet been finalised. It is important that the conservation community becomes engaged in the SEA process to ensure that conservation priorities are included in spatial development frameworks.

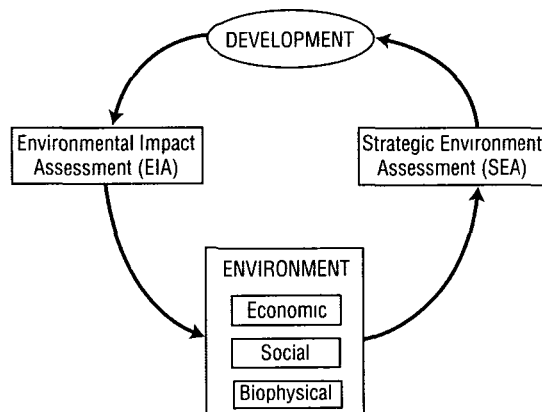
CONCLUSIONS

The incorporation of conservation priorities into planning guidelines allows for the wise and biodiversity-friendly selection of sites for development. In this way landowners, developers, town planners, environmentalists and others are clearly informed of development options and development can be diverted away from key conservation areas and is directed towards areas that have lower conservation priority. The South African movement towards strategic environmental assessment offers considerable potential to mainstream biodiversity conservation into development planning.

This move to systematically incorporate the conservation of priority areas into the planning guidelines for the region is a large step forward from past *ad hoc* approaches which were ineffective for both developers and conservationists. From the developers' perspective, the previous lack of clarity on where conservation priorities were located led to expensive plans being made for areas

Box 11.6. Strategic environmental assessment (SEA)

Figure 11.3. Difference in focus between EIA and SEA: Environmental impact assessment (EIA) addresses the impact of development on the environment, whilst SEA focuses on the effect of the environment on development.



Main benefits of SEA

The main benefits of SEA are that it:

- proactively informs the development of plans and programmes;
- identifies the opportunities and constraints which the environment places on development;
- provides guidelines to ensure that development is within sustainable limits;
- has the ability to integrate across areas, regions or sectors;
- improves the way in which cumulative effects are dealt with in environmental assessment, for example, through the use of thresholds and limits of acceptable change; and
- focuses on the maintenance and enhancement of a chosen level of environmental quality, rather than on minimising individual impacts.

For example an important task within a SEA is to identify the environmental limits or limits of acceptable change of the environment (e.g. limits to water extraction) within which development can occur. Information on biodiversity and conservation priorities can play a critical role in informing the definition of these environmental limits.

where development was likely to be opposed because of their conservation values. From a conservationist's perspective, the consequence was time-consuming advocacy against development, which in some cases was not actually going to impact on true conservation priorities. By clearly identifying conservation priorities, the new approach allows development to be proactively guided away from priority areas, and is therefore clearly a more efficient solution for all parties.

The clear identification of conservation priorities provides an opportunity to ensure that core conservation areas are identified in regional planning processes according to the location of underlying biodiversity value rather than located in areas where there are low opportunity costs because of low potential for development. Furthermore, as an integrative bioregional planning approach is now used, these core conservation areas can be supported by buffer and transition zones to prevent

fragmentation of the landscape and facilitate the maintenance of large-scale ecological processes such as migration.

The key factor that facilitated the mainstreaming of biodiversity into development planning processes was the development of a cross-sectoral partnership between the conservation and planning authorities. The establishment of this partnership was supported in two ways: firstly, by simultaneous moves towards a more strategic approach and secondly, through the framework of collaboration established under the GEF-sponsored CAPE project. CAPE is promoting further collaboration and cross-sectoral implementation through a multi-stakeholder committee supported by an independent coordinator. Successful implementation of the CAPE project will ultimately depend on the development of strong partnerships with sectors not usually associated with conservation, e.g. mining and health, and facilitating the mainstreaming of biodiversity into their policies and plans.

Real benefits have already been experienced in addressing biodiversity conservation concerns within the development process. This has enabled conservation agencies and civil society advocates to focus their interventions on critical sites. The explicit statement of conservation priorities and their incorporation into statutory frameworks has facilitated orderly development, and removed the confusion and conflict, which frequently results when the impacts of development proposals are addressed in an *ad hoc* manner. The full potential of this partnership is still to be realised. However, early indications are that the mainstreaming of priorities for biodiversity conservation into land use planning will mean development with lower impact on biodiversity. It will also lead to the promotion of those opportunities, such as ecotourism, which biodiversity holds for development.

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Maloti-Drakensberg: Transfrontier Conservation and Development

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SUMMARY

The Maloti-Drakensberg Transfrontier Conservation and Development Programme (MDTP) between South Africa and Lesotho seeks to conserve globally significant biodiversity while contributing to economic and community development. Over the past 20 years, a process has been underway to forge cooperative action between the two countries and to develop an overall management and development strategy for the shared mountain ecosystem. This resulted in the mainstreaming of biodiversity-friendly key policies and programmes into sectoral development. In particular, the services that the ecosystem provides, such as high quality water, are recognised as fundamental to economic development in the region and are dependent on sound management of the biodiversity resource. This has led to a bilateral agreement between the two countries to work cooperatively in pursuit of the programme goals and the adoption of compatible land use planning to ensure orderly development. This chapter also examines this process operating in the Mnweni component of the larger programme area, and contrasts the global and local scales of the initiative. It is concluded that mainstreaming has indeed occurred, but needs continued high-level support to be effective. Local stakeholders must also be involved if its potential benefits are to be achieved.

INTRODUCTION

Heritage values and historical background

The Maloti-Drakensberg ecoregion is an extensive mountainous area on Lesotho's eastern border with South Africa. Covering 5,000 km², the mountain range straddles the international boundary and encompasses a diverse natural and cultural landscape, which has been accorded World Heritage status (Figure 12.1). It is an Important Bird Area (IBA) and includes Ramsar wetlands of international importance, is species rich, and has high levels of endemism. It also contains a unique assemblage of San rock art (see Box 12.1).

The Maloti-Drakensberg mountains were the home of San hunter-gatherers, who found their last refuge in these mountains as they were displaced, and eventually eliminated, by pastoralists and colonial settlers in the second half of the 19th century. From as early as 1848, the government relocated black communities to "locations" in the foothills, onto land held in trust for these communities. The purpose of these schemes was to create a buffer between farmers and the San people and to create separate areas for different population groups. This was the Victorian forerunner of the former South African government's apartheid policies. Little thought or planning went into the prospects for sustainable livelihoods under these circumstances, either then or in the subsequent century. The current patterns of settlement and land use in the mountains are a consequence of these early actions.

Converging streams of resource conservation

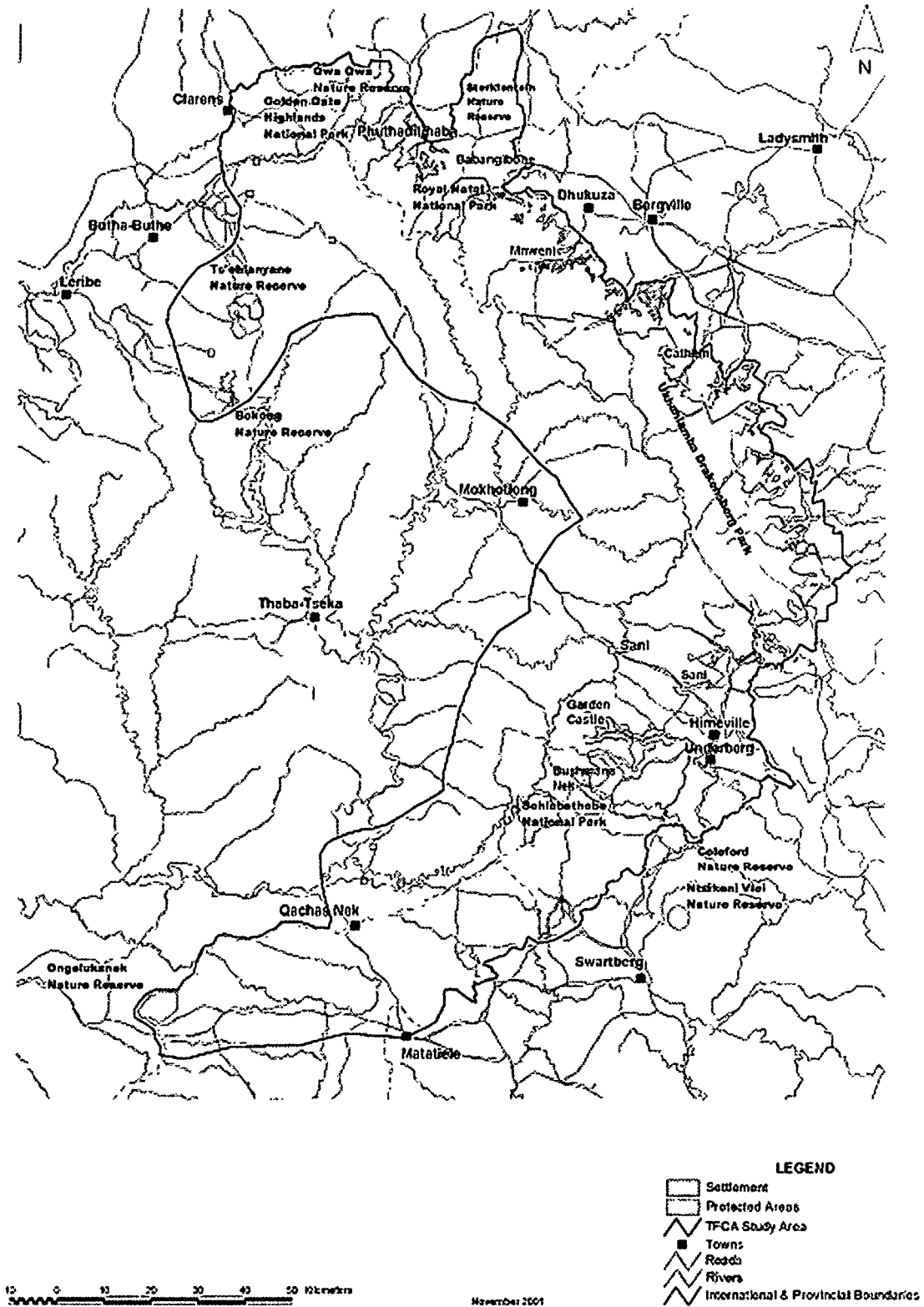
The Maloti-Drakensberg region is a resource of great strategic value to Lesotho and South Africa, primarily because of its role as the most important water catchment area in the sub-continent. This prompted discussions in the 1960s between the countries regarding the exploitation of these resources, and also resulted in the initiation of a range of important protection measures. Development of resource protection in the mountains has been effective for both catchment management and biodiversity conservation, but with marked differences in effectiveness across the international boundary.

South Africa

In South Africa, the earliest protection measures were the proclamation of forests in the 1890s and the establishment of protected areas for scenic and species conservation purposes. For example, the Giants Castle Game Reserve, proclaimed in 1907, protected the last extensive population of the eland (*Taurotragus oryx*), in the Colony of Natal. The South African government supported the inclusion of the major catchment areas of the Drakensberg in a series of state forests in the 1960s and 1970s. These were managed primarily for their role in generating water run-off of a sufficient quantity and quality. Hydrological research conducted in these catchments quantified rates and patterns of run-off but also experimented with the effects of different land management and agricultural practices. These rivers currently supply the bulk of the water to the industrial development areas of South Africa through diverse inter-basin water transfer schemes, including the Thukela-Vaal pumped storage scheme and the Lesotho Highlands Water Scheme, and involve some of the largest and most complex engineering developments in Africa. Less attention was paid to biodiversity, including the devastating effects of plantation forestry in this fragile environment, beyond estimating the role of different fire management treatments on vegetation communities, which was always linked to the implications for run-off.

Ultimately, it was recognised that agricultural land uses were inappropriate on the fragile soils above a contour that became known as the Natural Physiographic Catchment Boundary. A systematic attempt was made in the 1970s and 1980s to acquire this land for the state and to protect it. A significant advance for conservation of biodiversity took place in 1989 when the relevant authorities assigned responsibility for the state forests, including the wilderness areas and nature reserves, to the provincial nature conservation authorities, to be managed as though they were nature reserves. This provided the opportunity for virtually the entire extent of the Drakensberg on the South African side of the border to be consolidated under a single state-controlled management regime. The only exclusion was the area of communal land, known as the

Figure 12.1. The Maloti-Drakensberg Transfrontier Conservation and Development Area



Box 12.1. Heritage value of the Maloti-Drakensberg mountains

- Species rich (2,153 plants, 299 birds, 48 mammals, 48 reptiles and 26 frogs)
- Exceptional diversity of palaeo-invertebrates
- 119 threatened Red Data species including the Drakensberg cycad (*Encephalartos ghellinkii*), bearded vulture (*Gypaetus barbatus*), oribi (*Ourebi ourebi*)
- High levels of endemism (30% for plants)
- One of seven recognised biodiversity hotspots in Southern Africa
- Unique high altitude wetlands
- Montane and alpine grasslands and shrublands
- Richest occurrence of rock art in the world
- Over 40,000 images in 600 painted sites

Mnweni, which has remained under communal land tenure.

Lesotho

A strikingly different situation prevails in Lesotho, where virtually the entire high altitude region is a communal rangeland area under the control of traditional authorities. Extensive development assistance has been directed at determining the conditions for sustainable rangeland management in the highland areas, with partial success in the implementation of improved management programmes. There is a single national park, Sehlabathebe National Park, which lies in the mountain region adjacent to the international boundary and the Ukhahlamba-Drakensberg Park. The analysis of biodiversity priorities through the development of a national biodiversity strategy for Lesotho identified the need to protect a range of landscapes, including better representation of the eastern mountains, and the transitions from lowland to highland areas. This coincided with proposals for new protected areas to protect the watersheds and mitigate the impacts of the major dams in the Lesotho Highlands Water Scheme. There is, as yet, no formal nature conservation

authority in Lesotho, although there is an advanced understanding of the relationship between natural resource conservation and sectoral development, particularly with respect to water production, agriculture, and more recently, tourism development.

The seeds of mainstreaming

By the 1990s, therefore, there was a growing recognition in both countries of the integrated nature of biodiversity conservation and the ecosystem services that natural landscapes provide, as well as an understanding that the future prospects for sustainable development hinge on effective resource conservation. It is in this recognition that the seeds of mainstreaming are to be found. In both Lesotho and South Africa, the processes began as two separate streams, brought together by the juxtaposition of politics, resource demands and economic development. This process was strengthened and supported, both nationally and through a high-level engagement between the countries.

GROWTH OF THE MAINSTREAMING PROCESS

A vision for transfrontier cooperation

For many years, there has been a vision for the mountain range to be developed into a transboundary conservation area, mainly to extend and protect its wilderness value. In the early 1980s, the South African and Lesotho authorities, as a component of broader political cooperation, sought to evaluate the potential for transboundary conservation programmes. The programme continued until 1992, amidst varying levels of political accord between the two countries. The changing political landscape after 1994, with the advent of South Africa's first democratically-elected government, provided fresh impetus as South Africa and its neighbours sought to build greater regional cooperation and stimulate rural economies. At the request of Lesotho, the then Natal Parks Board (see Chapter 7) supported further interaction and renewed efforts to obtain significant programmatic funding. With a preparatory grant from the GEF, through the World Bank, it was possible to investigate the priority actions required to address threats to globally significant biodiversity and to

design a transboundary programme of active intervention to be implemented by the two countries from 2002–2006.

Mainstreaming biodiversity into regional land use plans

The transition to democracy in South Africa also initiated a complete review of sectoral policies and practices, and created new provinces. One consequence was the need for a uniform policy for land use planning and development control in the Drakensberg region of the new province of KwaZulu-Natal. Known as the Drakensberg Special Case Area Plan, the process envisaged a single plan and authority to guide future decision making and ensure orderly development. During the preparation of the Maloti-Drakensberg Transfrontier Programme (MDTP) proposals, this same concept of a uniform and complementary land use planning and zonation scheme for the whole area gained greater currency and is now one of the major goals of the programme. This notion of greater uniformity of control and management has elevated the status of the area in terms of provincial and national priorities, and has ensured that biodiversity resources are recognised in the spatial plans for development. Similarly in Lesotho, the recognition of a nationally important resource has led the government to impose statutory special develop-

ment areas on formerly open access rangelands. This has had the important consequence of enhancing the prospects of private sector investment in key tourism sites in the mountains.

Mainstreaming biodiversity through political commitment

On the 11th June 2001, the governments of South Africa and Lesotho entered into a memorandum of understanding (MOU) that seeks to develop and implement a cooperative biodiversity management and socio-economic development strategy based on the rich biodiversity and cultural heritage in the Maloti-Drakensberg Transfrontier Conservation and Development Area. (see Box 12.2). This resulted in the establishment of a bilateral MDTP steering committee and preparatory activities, which have evaluated the potential for nature-based tourism to support community development and biodiversity conservation in the transfrontier area. A US\$16 million grant from the GEF will support the MDTP programme in both countries.

The MOU captures an important shift in thinking in the sub-region, where the goals of biodiversity conservation and addressing the root causes of poverty and environmental degradation have become inter-dependent. A focus on the international value of the resource base, and the shared responsibility to protect it has also provided

Box 12.2. Extract from the Maloti-Drakensberg bilateral memorandum of understanding (MOU) between South Africa and Lesotho

“Recognising:

- the sovereign right of each country to exploit its own resources;
- the need for cooperation to discourage or prevent transboundary environmental impacts;
- that peace, economic development and environmental protection are inter-dependent and indivisible;
- that poverty is both a cause and consequence of environmental degradation;
- the global environmental importance of the Maloti-Drakensberg Transfrontier Conservation and Development Area;

The parties unanimously declare their commitment to establish a framework for cooperation between the countries for the purpose of conserving biological diversity and promoting sustainable development of the Maloti-Drakensberg Transfrontier Conservation and Development Area.”

the most important means for securing sustainability in this landscape. It is also clear that mainstreaming biodiversity into the regional development agenda, and at greater spatial and jurisdictional scales, presents unique challenges.

TRIGGERS AND TURNING POINTS

It is useful to consider the elements of the MDTP case study as a means of understanding what triggered mainstreaming and how this trend can be nurtured and supported. This experience may contribute to a more general perspective on processes of mainstreaming, and in particular on how this takes place in the context of cooperation across national boundaries. The development of the MDTP illustrates the manner in which the mainstreaming of biodiversity can emerge as a consequence of apparently independent programmes. Two major turning points have been the recognition of water production as a fundamental biodiversity process, and the economic exploitation of globally significant resources through tourism.

Biodiversity and water resources

There has long been recognition of the beauty and recreational opportunity presented by the Maloti-Drakensberg mountains and, especially in South Africa, infrastructure has been developed to enable people to access this area. During the 1970s and 1980s, the fragility of the mountain ecosystem and the deleterious effects of poor policies and management became apparent with advancing populations of alien plants, soil erosion and poor agricultural productivity. Mountaineers and other wilderness adherents lobbied for action. The Natal Town and Regional Planning Commission and the then South African Department of Environmental Affairs and Forestry took steps to address these problems by including all land with high fragility and poor agricultural potential into zones which merited greater protection. Similarly in Lesotho, the economic benefits of sustained water yields focused a multi-sectoral (agriculture, natural resources, tourism, planning and local government) response to manage the highlands appropriately.

A primary motivation of these agencies, and the primary argument used to convince decision-makers,

was that the ecosystem service of water production could be detrimentally affected by poor land use practices (see also Chapter 2). The only guarantee of continuing supplies of quality water would be measures to address the negative impacts and maintain the structure and integrity of the fragile resource base. The juxtaposition of these concerns meant that biodiversity in this system became a direct concern of government.

Tourism as a lead economic sector

In both South Africa and Lesotho, tourism is advanced as a potential source of economic growth and human development, particularly in rural areas. During the 20th century, tourism in Africa and in the sub-region focused largely on the “Big Five” (lion, leopard, elephant, rhino, buffalo) destinations. Political conflict and instability in eastern and central Africa has increased the numbers of visitors traveling to southern Africa, and this expansion of tourism arrivals has coincided with an international trend of increased demand for greater quality in niche destinations, e.g. adventure tourism in unique places. This has been recognised by South Africa and Lesotho, who commissioned investigations and initiated processes in 1997 to create strategic development initiatives, including the Maloti-Drakensberg. A key trigger in the MDTP has been the recognition in 2000 of the Ukhahlamba-Drakensberg as a mixed natural and cultural World Heritage Site, one of only 23 such areas in the world and, therefore, a highly attractive international tourism destination. This has immediately generated a marked change in the area’s market profile and an increased opportunity for many associated private sector enterprises to develop. In a short space of time, the Maloti-Drakensberg transboundary area, and its globally significant biodiversity, has become a significant vehicle for promoting and sustaining human development. Several new tourism developments, including private as well as public/private partnerships, are being built as a result.

FACTORS CONTRIBUTING TO MAINSTREAMING IN THE MDTP

In addition to the regional cooperation mechanisms which have stimulated transboundary conservation

and development programmes throughout the sub-region, there have been a number of other factors which have contributed to its emergent profile.

Biodiversity science

There has been a growing recognition of the importance of the biodiversity of the Maloti-Drakensberg mountains, with taxonomic studies describing a distinct fauna and flora. This steady growth of scientific knowledge of the area, and its international significance, has compelled authorities and the public at large to take notice of the area as having a value beyond its obvious watershed/catchment and recreational values. A particular aspect, often ignored in South Africa, is the complexity and importance of the high altitude grassland ecosystems. Grasslands have generally been exploited extensively for grazing, cultivation and for plantation forestry. It is only recently that the biological significance and diversity of grasslands, their economic importance, and poor conservation status, have been more widely appreciated.

New perspectives on cultural resources

The rock art of the Maloti-Drakensberg is widely known, but only recently has there been a greater appreciation of the San culture and the long-term continuity of occupation and use of these landscapes. Although there are widely differing views on the symbolic interpretation of some of the images and rituals depicted, these are the only glimpses that we have of the culture and lifestyles of the San people, as they were almost completely disrupted by waves of settlement and conflict during the 19th century. This rock art heritage is of particular interest today, as both the art, and the environment it depicts and in which it was created, are protected and managed together. The intermeshing of culture and nature in the Maloti-Drakensberg area has implications for resource management, and raises awareness of the cultural context in which nature conservation and land use activities are conducted today. In the southern African context, there is also a heightened awareness of the manner in which colonial powers dealt with the people of the region, and a need for reconciliation for past injustices.

Land restitution

In South Africa, the government has embarked on a wide-reaching programme for the restitution of land rights lost through racially discriminatory laws of the past. In many cases, claims over land within the present system of protected areas have been resolved by providing benefits that are derived from these protected areas. Examples include agreements for the flow of benefits from community levies on tourism, and for equity share-holdings by communities in tourism developments (see Chapter 7). Despite the conflict which can be engendered through the restitution process, it creates the opportunity and highlights the significant role that achieving equitable benefits from biodiversity plays in initiating and sustaining mainstreaming.

Illegal trade

Illegal activities in the Maloti-Drakensberg area include cross-border cattle and other stock theft as well as the cultivation and transboundary transport of dagga (*Cannabis sativa*) in both directions. The conflict and impact on communities resulting from these activities have prompted high level concern and intervention. This has raised the profile of the region at a political level, and also the realisation that poverty is a root cause of illegal activities and environmental degradation.

Politics and regional cooperation

South Africa and Lesotho have maintained a cordial but constrained relationship, with tensions having their origin in the apartheid era, but extending to the present. The involvement of a Southern African Development Community (SADC), and largely South African, peace-keeping force in 1999 in Lesotho's internal political problems precipitated a period of tension, which is slowly being resolved. There has always been a concern in Lesotho that South Africa is an overwhelmingly powerful neighbour. Consequently, there is a need to establish a basis for enhanced cooperation as well as reconciliation.

Local democratic structures

The introduction of elected local government in South Africa has expanded the direct involvement

of communities in local government affairs. In addition, there has been a policy trend in both Lesotho and South Africa to increase cooperative governance in many sectors, e.g. community forestry agreements. In the nature conservation sector, there have also been efforts to create local governance structures. The programme of developing new protected areas in Lesotho has resulted in the formation of community conservation forums, representing authorities and community interests. In KwaZulu-Natal in South Africa, statutory local boards have been developed to ensure greater integration of the activities in protected areas with the livelihoods of the people living in and around them (also see Chapter 7). This form of co-management contributes significantly to the alignment of conservation and development priorities and actions.

Tourism potential

During the development of the MDTP, nature-based tourism was identified as an industry that could potentially provide significant economic development and biodiversity protection. A major constraint is the significant infrastructure requirement to support private sector investment and ensure an acceptable return on investment. This means that a partnership has to be developed between government, the private sector and communities to improve infrastructure to the point where a viable nature-based tourism industry can be developed. Even modest levels of tourism development, especially in Lesotho, would enable a switch in land use from grazing, and other forms of non-sustainable use, to nature-based tourism. A greater number and diversity of employment and income opportunities will be created. Careful planning and execution of these developments will avoid introducing new negative impacts.

In summary, the strong support for mainstreaming biodiversity in the MDTP is the result of both political and economic factors in the southern African sub-region, linked to enhanced opportunities for cooperation in the transboundary context of the Maloti-Drakensberg. Agreement was reached among the wide range of stakeholders at all levels that urgent intervention was required in eight critical but inter-related areas. The components of the MDTP are listed in Box 12.3.

THE MNWENI PROJECT: CONSERVATION AND DEVELOPMENT OF THE AMANGWANE TRIBAL AREA OF THE MALOTI-DRAKENSBERG MOUNTAINS

A particular focus of the MDTP has been on determining how to act locally to make a significant contribution at the level of the programme goals. The preparation of the programme, the identification of priority interventions, and the *modus operandi* were derived from existing and ongoing initiatives at a local level in the mountains. An example of a local level programme which is consistent with MDTP goals, but also challenges and informs the overall programme, is the Mnweni Project.

The amaNgwane Tribal area (AT)—the location of the Mnweni Project—stretches from the lower valleys in KwaZulu-Natal right up to the international boundary with Lesotho, along the Drakensberg escarpment (Figure 12.1). It is occupied by about 10,000 people, who are some of the poorest and most marginalised in South Africa. Because of its remoteness and history, it is regarded as one of the few remnant areas in South Africa which could be described as a “living cultural landscape” where traditional communities and forms of land use persist. Land use practices include traditional agricultural options, involving extensive cattle grazing, juxtaposed with the more recent illegal cultivation and exploitation of dagga (*Cannabis*). The already complex dynamics of social interaction in this traditional society are further complicated by the challenges of the power relations and economy resulting from the illegal activities and the interaction of the communities with outsiders. Since 1995, Bergwatch, an informal association of conservation organisations led by the Wildlife and Environmental Society of Southern Africa (WESSA), has been working with communities in the AT.

Conservation action in this community has had to begin with seeking common ground between communities and conservationists, and the establishment of trust and long-term commitment to cooperate. The livelihoods of the communities are inextricably linked to the biodiversity resource base, and there is a ready acknowledgement of this dependence and also of the factors which threaten

Box 12.3. Components of the Maloti-Drakensberg Transboundary Conservation and Development Programme

1. **Programme management and transboundary cooperation.** A complex programme operating across national and sub-national jurisdictional boundaries demands a stable institutional framework. In the MDTP, this has been secured through a bilateral MOU and steering committee, as well as sub-national coordination committees and coordination units.
2. **Strategic conservation planning.** A programme objective and major component is the establishment of an agreed overall strategic vision and framework, which integrates biodiversity, socio-cultural and economic dimensions. This will require further development and consultation, over many years, before adoption by the two countries.
3. **Protected area planning.** Plans for existing protected areas and zones within protected areas require harmonisation, both spatially and with the overall transboundary vision. In addition, compatible and sustainable business plans must be developed to ensure that the future management and development of protected areas is secure.
4. **Protected area management.** Existing threats caused by alien plant invasions, erosion, poor fire management and visitor use must be mitigated. Programmes focus on developing local skills and capacity for conservation management.
5. **Conservation management in priority areas.** The vast majority of the landscape is not formally protected. Through a prioritisation process, key conservation areas have been identified and effective management for these areas must be secured, especially the high altitude wetlands and the transitional zones along the escarpment edge.
6. **Community involvement.** A cross-cutting theme of the programme is the involvement of communities throughout the research, planning and management phases. A particular focus is on enabling community members, under professional guidance, to develop and implement the core community conservation programmes.
7. **Nature-based tourism planning.** Echoing and supporting the conservation vision, the analysis and planning of a major tourism investment programme is a key approach to developing vibrant alternatives to subsistence agriculture and to ensuring the economic benefits positively impact local communities.
8. **Institutional development.** In many parts of the programme area, nature conservation agencies and local community conservation structures are transitional. The programme supports the strengthening of existing conservation agencies and formalised incipient institutions, especially at the local level.

it. On the other hand, there has been a deterioration in natural productivity and, while community members have noticed this, they are not agreed on how best to meet this challenge. The amaNgwane Tribal Council and the Mnweni Valley Development Committee mandated Bergwatch to raise funds for projects compatible with conservation and development and to discuss these opportunities with the communities concerned.

The approach adopted was to identify conservation and development activities that would di-

rectly create sustainable employment in the amaNgwane Tribal area (AT). The bottom line was that the community would have to be convinced that alternative activities would generate greater benefits than the existing land use practices and illegal activities. A real challenge was to resource these efforts for long enough to ensure that they would become self-sustaining, as short-term project interventions usually do not achieve this threshold of success. The remoteness, suspicion by communities of outsiders and the difficulties of working

in such an area compounded the problems usually experienced in working in this kind of project context. Nevertheless, significant progress has been achieved.

A community-managed trust was established as an independent legal entity, endowed with capital provided by Rand Water, a parastatal service provider drawing water resources from dams fed by the major rivers in the AT. The trustees include a majority of community representatives as well as Rand Water, WESSA and Bergwatch. Interest from the capital fund sustains financial support for specific conservation activities, and there is also a fund-raising component which seeks further funds to supplement the capital fund or to facilitate the initiation of complementary projects.

Activities

Development of a community conservation area

Biodiversity data were compiled at the request of the Manzana ward, one of three sub-structures of the amaNgwane Tribal Council as the basis for designating a portion of the area for conservation purposes. No firm decisions have yet been taken over formal designation of the area.

A community-managed multi-functional cultural and community centre

A proposal to develop a centre was prepared, and the necessary authority sought. Funds were sourced from local government structures. Supporting activities preparing the communities for the operation of the centre have been intensive training for wilderness and cultural guiding, craft development, environmental education, business management, nature-based tourism and literacy in English. These activities were made possible through funding from the state poverty relief programmes.

Erosion reclamation

A labour-intensive reclamation project was initiated at an early stage to address some of the more serious soil erosion problems in the area. It has created jobs, trained workers in rehabilitation techniques and made skills available to local private

farmers for a community-run, small business, erosion-reclamation enterprise.

Exchange visits

Exchanges among the different wards and neighbouring community areas has led to a wider awareness and understanding of the common problems of these communities. It has played a role in defusing long-standing conflicts between communities, and between communities and conservation managers regarding fire management and grazing practices.

Progress

These programmes have been gradual and cumulative in their impact. As communities have learned more about the uniqueness of the biodiversity resource base, and how this can be coupled to existing and future development opportunities, it has been possible to introduce new ideas and move forward with greater confidence.

It was previously impossible to contemplate actions regarding controlled grazing and fire management, as these were linked to the illegal trade in dagga (*Cannabis*). Similarly, the need for environmental education had to be recognised from within the community structure, as it would not have been possible to impose this from the outside. Since embarking on this programme, facilitators have been able to respond to the communities' own regard for sacred sites and natural features as the basis from which to consider broader conservation measures. It took two years for the various community structures to reach a common understanding of the problems they face and the opportunities to address them, as well as to develop the commitment and will to act. Communities have begun to introduce new and innovative techniques in their rehabilitation work, and there have been enquiries from neighbouring communities for assistance with developing their own programmes.

Challenges and constraints

The communities and project facilitators have encountered short-term political agendas that threaten the longer-term framework essential for a sustain-

able programme, particularly since the introduction in 2000 of elected local government contested on party-political grounds. Common to similar programmes everywhere, the timing of funding often does not coincide with the programme development, risking failure, either when funding is made available before communities are ready for it, or when expectations of funding are not realised. This is coupled with the requirement for a slow process of communication and relationship-building, expressed by one of the community members as “We see you for a year, and then we begin to hear you”. There are also other pressing issues that intervene and retard progress with programme goals, for example, poor nutrition, HIV/Aids-related mortality, inadequate infrastructure (such as safe river crossings) and the costs of sending children to school.

Although the conservation activities undertaken in the Mnweni Project have shown positive results in clearing alien plants, repairing erosion, training guides and showing people how to work together, it is not certain whether this work or the positive impacts will be sustained. It has value as a pilot project for demonstrating conservation that promotes sustainable development and involves communities. However, the impact of this initiative needs to be monitored over time, so that the lessons learned can be applied more widely, and defensible choices made regarding the use of scarce management resources. The Mnweni Project is, nevertheless, an example of mainstreaming biodiversity and culture at the grassroots level. It will inform future efforts to expand such programmes to achieve landscape level impact on sustainable natural resource management and regional economic development.

CONCLUSIONS: THE MDTP AS AN EXAMPLE OF MAINSTREAMING

Mainstreaming occurs when biodiversity becomes an essential purpose and consideration in sectoral policies, plans and programmes; when there is a simultaneous and sustainable achievement of biodiversity and economic objectives; where economic activity ultimately depends on the persistence of biodiversity; and, most importantly, when there

is a net improvement in the status of biodiversity. The MDTP is an example of a programme where biodiversity at the sub-regional landscape scale, as well as at the local scale, has become the rationale for, and stands to benefit from, appropriately designed development programmes. Since mainstreaming is a process and its impacts are not necessarily immediately obvious, it is useful to consider how the programme conforms to this notion of mainstreaming and how this process can be guided and supported.

Incorporation of biodiversity considerations into sectoral policies

The MDTP provides a rich example of how biodiversity can become explicitly recognised at the policy and programme level. This process began decades prior to the coining of the term biodiversity, and is in many ways a consequence of other factors operating rather than a direct recognition of the intrinsic value of biodiversity. Nevertheless, the result has been that the natural resource base of the Maloti-Drakensberg mountains has been recognised, at the highest levels of government in two adjacent countries, as the foundation for appropriate future development in the sub-region. A major contributing factor has been the demand for water for the economic hub of southern Africa, and the ability of the mountains to supply it sustainably under an appropriate management regime. At a more local scale, there are communities in both countries who are directly dependent on the natural resources of the area, and whose livelihoods will be either secured or threatened by future developments. Decision-makers are taking account of both global and local issues regarding sustainability, and biodiversity is a key component of these decisions.

The advent of democracy in South Africa in 1994 has resulted in a questioning of previous policies, including those affecting conservation of biodiversity, and the adoption of a new vision where human development is a primary concern. This provides a context for the process unfolding in the MDTP. Firstly, the area provides one of the few examples where the natural and cultural attributes of the landscape can be integrated to inform a way of life in which people and nature

can co-exist. The development of livelihoods and the lifestyle in the Mnweni area will therefore be fundamentally based on biodiversity and cultural resources. Secondly, there will be further innovation as stakeholders grapple with the real questions of achieving positive socio-economic and biophysical impact, and of involving the entire community. It could be concluded that the role of biodiversity has become a central concern.

At a more practical level, the implementation of these policies has elicited new challenges. There is a high level of institutional and community acceptance required for an integrative programme, and major difficulties in reaching people on the ground in an extensive and difficult region. There is also a need to sustain the process with an elaborate set of institutions and coordination mechanisms, as the programme cuts across political and jurisdictional barriers. The real test of whether mainstreaming has occurred will be when this “institutional” subsidy can be withdrawn and the programme will have achieved its own momentum.

Win-win scenario: biodiversity conservation and economic gains

Achieving economic results through nature-based tourism is a long-term challenge as there are many factors which contribute to the establishment of an area as a tourism destination, and it takes time to finance, develop and market new tourism products. The success of the MDTP has been to capture the attention of government and private sector alike, with commitments and new action to upgrade infrastructure, to remove legal and institutional barriers to development and to invest in new tourism facilities. There has already been upgrading of access roads, the refurbishment of tourism facilities and the entry of community tourism and guiding projects. It is perhaps too early to say whether this has been a win-win situation, but the trend is clear. The focus of new development has been to build on and reinforce the biodiversity heritage values recognised by the World Heritage Council, and to build a more vibrant nature-based tourism economy.

Biodiversity gains exceed biodiversity loss

In the absence of direct monitoring and evaluation,

it is too early to state with certainty that there has been a net benefit for biodiversity, but there are positive signs. There has been increasing support from national government in South Africa for measures to address threats to biodiversity (e.g. from removing alien plants) and to create jobs in the process (see Chapter 2). In the agricultural sector, likewise, poverty-relief funding has been deployed to build capacity among disadvantaged communities while addressing the threat of soil erosion. The greater emphasis of the MDTP at the regional landscape scale has generated government commitment to consolidate and even expand protected areas, and to ensure that they are effectively managed. In Lesotho, too, there has been a recognition by government that highland wetlands must be protected and new protected areas are being created. All of these biodiversity protection measures have been stimulated by the increased attention being paid to the region as a result of the MDTP process.

Sectoral activity is based on/ depends on sustainable use of biodiversity

The MDTP illustrates how many development sectors have become either positively aligned with or based on an appreciation of biodiversity. In particular, there has been a gradual shift away from exploitative agricultural activity in the MDTP area and a move towards those land use activities that are more compatible with the natural resource base, e.g. nature-based tourism and recreation. Lesotho has long recognized the need to address environmental degradation caused by overgrazing and inappropriate agricultural activities, but the planning and development process now emphasises special development areas where a new economy based on nature-based tourism can be developed. The incorporation of the MDTP vision and goals into a spatial development framework that straddles the international border and sub-national jurisdictions will further support the mainstreaming process.

A resonance of scales

An overall and concluding perspective is that there has to be an alignment of the overall vision and goals of the MDTP with demonstrated results at a local level. One view of mainstreaming is that it

occurs when a multiplicity of small and successful initiatives come together to provide an overall coherence of purpose at a much larger scale. For this to happen, there has to be a critical mass generated by collective action, and a convergence of biological, social, economic, institutional and, most importantly, political realities. For the MDTP, there are a great many pieces of this puzzle in place, and an understanding that mainstreaming biodiversity is the only significant opportunity for human development in the mountains. However, this mainstreaming process will need to be guided by the constraints imposed by the needs of the people who live there.

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Conclusions: The Fundamentals of Mainstreaming Biodiversity

R. M. Cowling, S. M. Pierce and T. Sandwith

SUMMARY

In this concluding chapter we assess the extent to which individual case studies have incorporated biodiversity priorities into mainstream development. Firstly we devised a framework for biodiversity mainstreaming with three interdependent components: prerequisites, stimuli and mechanisms. Then we classified these components and ranked them according to their frequency in the 11 case studies. Finally, we assessed the extent to which the case studies have achieved four outcomes of mainstreaming biodiversity, namely the incorporation of biodiversity conservation into policy; gains in both biodiversity and the sector; net biodiversity gains being greater than biodiversity losses; and sustainable management.

The most frequently cited prerequisites for mainstreaming were: 1) scientific knowledge and understanding; 2) adequate institutional capacity; 3) effective NGO involvement; and 4) commitment of stakeholders. All of these capacities need to be in place before positive mainstreaming outcomes can be achieved.

Commonly cited stimuli for mainstreaming activities included: 1) the post-1994 change in governance; 2) an appreciation of the threats to biodiversity/ecosystem services; and 3) linkages to socio-economic delivery. Of paramount importance was the stimulation of stakeholders to identify innovative mainstreaming mechanisms that would satisfy the desire of the new government to provide socio-economic services to marginalised communities.

Mainstreaming mechanisms identified in most case studies included: 1) effective communication to stakeholders; 2) synergistic partnerships between government, private sector and NGOs; 3) enabling legislation and policy; and 4) the creation of new institutions or institutional arrangements. The effect to which

these mechanisms affected mainstreaming outcomes varied across case studies. Most case studies had achieved mainstreaming outcomes through the incorporation of biodiversity issues into sector policies, and the achievement of simultaneous biodiversity and sector gains. However, in fewer than half, net biodiversity gains exceeded biodiversity loss by sector activities, and sector activity was based on sustainable use of biodiversity. This is understandable since some of the activities analysed (e.g. plantation forestry, agriculture) are wholly or partially based on the transformation of biodiversity and habitats.

We conclude by pointing out that South Africa has made remarkable progress in mainstreaming biodiversity and that this is due, in part, to a long history of concern and action regarding biodiversity issues. Nevertheless there are many factors that challenge the gains made thus far. Foremost amongst these are a dwindling institutional capacity, a declining corps of biodiversity professionals, and the need to demonstrate that biodiversity-friendly policies do indeed provide socio-economic opportunities for the poor.

INTRODUCTION

As a party to the Convention on Biological Diversity, the government of South Africa is obliged to mainstream biodiversity issues into relevant sectoral and cross-sectoral plans, programmes and policies. Simply stated, this means that biodiversity must be integrated into sectors. In the ideal situation, biodiversity gains exceed losses, without compromising sectoral activities. In rare cases, this can mean that sectors lose assets to biodiversity, such as where land is transferred from agriculture to conservation. Most often this can mean mitigation of impacts, as in plantation forestry. Essentially, integration of biodiversity is achieved when the sectoral activity becomes dependent on the sustainable use, or preservation of biodiversity.

This is easier said than done. As pointed out by Sandwith (Chapter 1), effective mainstreaming requires more than supportive policy. Indeed, the process of mainstreaming requires three inter-dependent components, namely prerequisites, stimuli and mechanisms (Figure. 13.1).

South Africa has a long history of biodiversity research, awareness and conservation action. This volume has brought together 11 case studies from three main sectors, natural resource use, conservation, and urban and regional planning (see Figure 13.1), and presented them as narratives.

We attempt here to derive generalisations from these specific cases that might have relevance in other parts of the world. The case studies include the following components for mainstreaming:

- prerequisites (knowledge, capacity, need and commitment without which mainstreaming cannot happen);
- stimuli (factors external and internal to the sector that catalyse awareness of the need for mainstreaming actions); and
- mechanisms (the actual activities that seek to effect mainstreaming)

Our framework is very simple. Given that certain prerequisites are in place, a set of specific stimuli can catalyse activities which then lead to the identification of appropriate mechanisms, with the net result that effective mainstreaming, as measured by outcomes, will happen. In this chapter, we identify the general components of this framework and discuss these with regard to the case studies. We conclude with an evaluation of mainstreaming outcomes and challenges in South Africa.

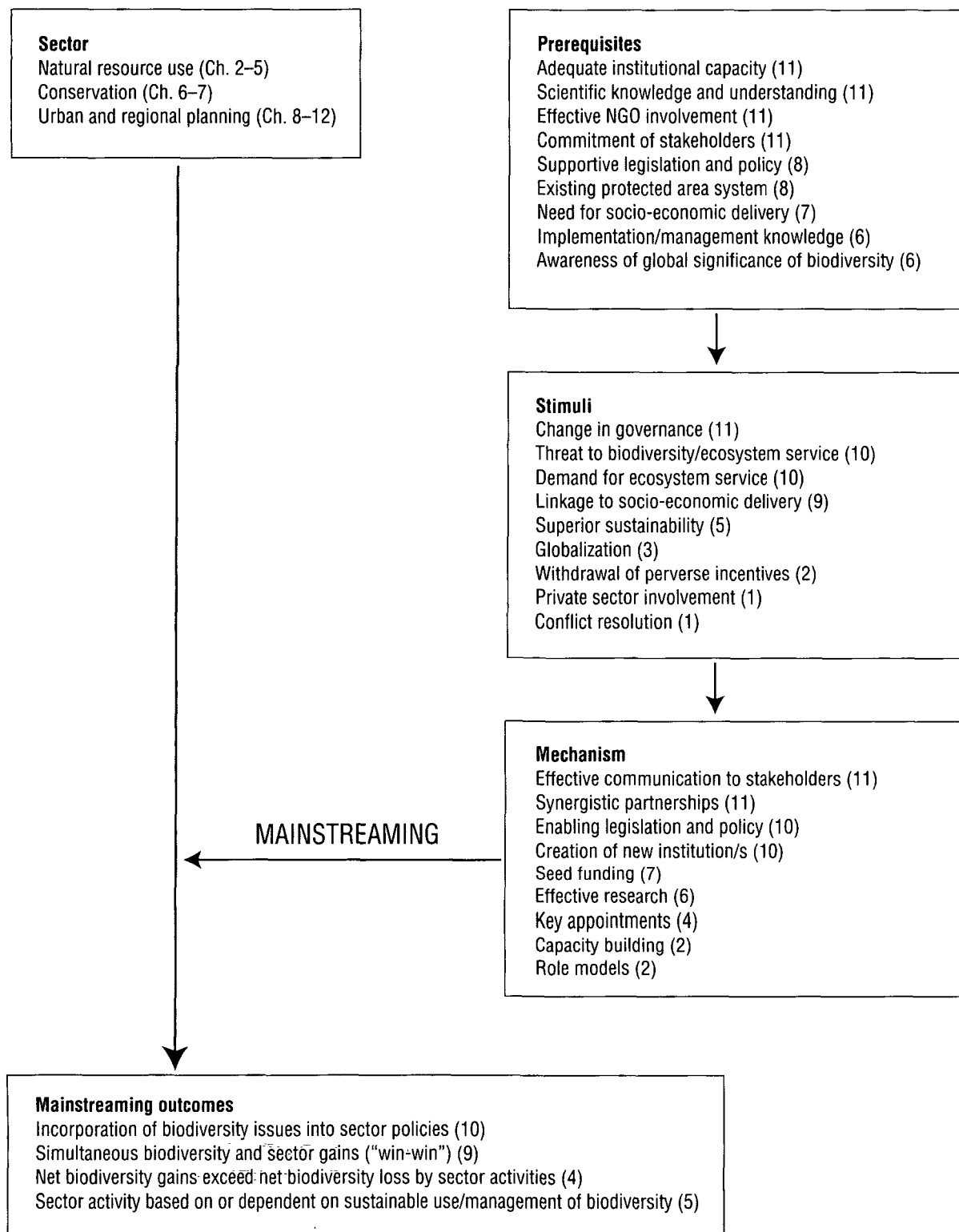
SECTORS

Three very broad sectors were considered in this volume. These are:

- Natural resource use (sustainable water production, wildlife utilisation, plantation forestry, commercial agriculture, nature-based tourism);
- Conservation (protected area expansion, institutional transformation);
- Urban and regional planning (metropolitan-scale, regional-scale, provincial-scale, trans-frontier-scale).

The fact that we have included conservation as a sector here requires some explanation. Because biodiversity is the core concern of the conservation sector, it should follow that biodiversity has been

Figure 13.1. The process of mainstreaming biodiversity



Note: The numbers in brackets refer to frequency of issue/action in the 11 case studies described in this volume.

effectively mainstreamed in this sector. However, this has not always been the case. In many situations, the establishment and expansion of protected areas has not been driven by biodiversity considerations. Historically, reserves were set up for any number of reasons—for single species preservation, on land marginal for agriculture, on former royal hunting grounds etc. Often conservation agencies avoid those areas where the opportunity costs of conservation are high. With the growth in understanding of biodiversity patterns and processes, and the identification and use of explicit conservation targets, it is now widely appreciated that many protected area systems are not representative of biodiversity or are inappropriately managed for biodiversity maintenance. In order to effectively conserve biodiversity in many parts of the world, novel approaches are required. For example, protection of under-represented biodiversity might require the integration of conservation in production landscapes, with due consideration of socio-economic issues, especially incentives and alternative employment opportunities (see Chapter 6). Hence, biodiversity mainstreaming into the conservation sector may require a number of mechanisms identified in this volume.

Furthermore, many conservation agencies may require far-reaching structural transformation in order to conserve biodiversity effectively on, and off, protected areas (see Chapter 7). More specifically, these agencies may require democratisation of their decision-making structures and sensitisation to social delivery in order to achieve their conservation goals.

A shortcoming of this volume is that it did not consider those sectors where links to biodiversity are tenuous, namely mining, manufacturing, transport and construction. Also not considered to any great extent were agriculture and wildlife utilisation (including medicinal use of plants) on South Africa's communal lands (but see Chapter 7, 10 and 12). These sectors provide a major challenge for mainstreaming biodiversity, and must be considered in the future.

PREREQUISITES

No doubt there are many prerequisites which can create an enabling environment for mainstreaming

biodiversity, but the case studies in this volume identified only nine of these (Figure 13.1). They are discussed in more detail below.

Sound scientific knowledge and understanding

South Africa has a long history of excellent biodiversity recording and research, dating back to the 18th century. All of the case studies identified sound scientific knowledge and understanding as prerequisites for effective mainstreaming in their sectors. Much of this understanding has its origins in collaborative and trans-disciplinary research that was fostered by the Cooperative Scientific Programmes (CSP) of the Council for Scientific and Industrial Research (CSIR), which ran from the mid-1970s to the mid-1980s. The country is reaping the benefits of this legacy.

Adequate institutional capacity

In all of the case studies, adequate institutional capacity was identified as a prerequisite. These institutions include national, and provincial, level resource management and conservation agencies, academic institutions, and non-governmental organisations (NGOs). There is an important lesson here. The mainstreaming of biodiversity will not occur without an adequate level of capacity—human and financial—in institutions responsible for policy development, implementation, research, monitoring and lobbying.

Effective NGO involvement

All of the case studies cited effective NGO involvement as a prerequisite for mainstreaming biodiversity. South Africa has a particularly vibrant conservation NGO sector, which has provided seed funding, conducted essential research and lobbied for mainstreaming actions. Two organisations stand out, both of which have been in existence since the early decades of the 20th century: the Wildlife and Environment Society of Southern Africa (WESSA) and the Botanical Society of South Africa (BotSoc). WWF-South Africa has provided seed funding for both the *Working for Water* programme and the Agulhas Plain initiative. The National Veld Trust, a now defunct NGO, played a crucial role in drafting

soil conservation legislation promulgated in 1946. The role of NGOs is a *sine qua non* for effective biodiversity mainstreaming.

Commitment of stakeholders/champions

Committed stakeholders are an essential component of the mainstreaming process. All case studies identified individuals and institutions whose commitment and enthusiasm were regarded as a key prerequisite for mainstreaming. These stakeholders ranged from non-affiliated individuals, academics, government agency personnel, entire institutions (including NGOs), private landowners, local communities and even cabinet ministers. The contribution to mainstreaming by these stakeholders, especially that made by individuals who go far beyond the normal call of duty, cannot be overestimated.

Existing protected area system

The existence of a well-managed protected area system was cited as a prerequisite for mainstreaming in eight case studies. These protected areas were important in a number of respects. For example, they supply excess wildlife for restocking privately-owned ranches, essential for the growth of the wildlife industry; they are the building blocks for park expansion and the growth of nature-based tourism; and they provide an array of ecosystem services to city and rural communities. All of these attributes serve to demonstrate the value of biodiversity to society, an extremely important part of the mainstreaming process.

Need for socio-economic delivery

In developing countries such as South Africa, where there is a need for all sectors to deliver socio-economic benefits, the mainstreaming of biodiversity cannot be sustained unless it is linked to these benefits. This may be in the form of employment opportunities or cost-effective delivery of ecosystem services. This link emerged as a prerequisite for mainstreaming in seven case studies here. Examples include the alien plant eradication for the cost-effective supply of water from mountain catchments, nature-based tourism as an engine for

socio-economic development, and the economic value of urban biodiversity to city dwellers. These links, if effectively communicated, are important for obtaining support for biodiversity mainstreaming from key stakeholders, especially politicians.

Implementation/management knowledge

Knowledge on how to implement and manage projects and programmes associated with the mainstreaming of biodiversity is an essential ingredient for this process in many sectors. Although often linked to institutional capacity, this knowledge sometimes resides in the private sector or academia. The ability of South Africa to launch the massive *Working for Water* programme was due, in part, to the fact that individuals and agencies had excellent experience in implementing and managing large-scale alien plant removal projects. Similarly, the substantial experience in wildlife management enabled the rapid development of the private wildlife industry. Likewise, the capacity among some academic institutions to manage large conservation planning projects formed the basis for effective mainstreaming of biodiversity into the rural planning sector.

Awareness of the global significance of biodiversity

In some respects, this is a special case of “scientific knowledge and understanding”. However, six of the case studies emphasised the importance of awareness of the global significance of biodiversity for the mainstreaming process. These included sectors with activities in the globally important Cape Floristic Region and montane grasslands, as well as the ecosystem-rich Eastern Cape. The fact that South Africa is recognised as a “megadiversity country” and includes three internationally-recognised biodiversity hotspots, is important for engendering a sense of national pride regarding these assets and for persuading decision makers to acknowledge and act on the country’s international obligations to conserve them.

STIMULI

The stimuli for mainstreaming biodiversity appear to be specific to each sector. These can be internal

or external factors that catalyse actions which lead to the mainstreaming of biodiversity. These stimuli are invariably threats to biodiversity, as well as events or processes that offer opportunities for mainstreaming. In this section we discuss some of the stimuli identified by the case studies described in this volume.

Change in governance

South Africa has undergone fundamental political restructuring at all tiers of government since 1994 when the first democratic elections were held. This change in governance introduced new and significant opportunities for mainstreaming biodiversity. All case studies cited change in governance as a catalyst for mainstreaming. This change to a democracy also led to the lifting of sanctions (economic, trade, academic, tourism etc.), which also impacted on the mainstreaming of biodiversity. Points raised in these studies included:

- enthusiasm of the new corps of politicians and civil servants for ideas that linked biodiversity preservation and sustainable use to socio-economic delivery for the poor;
- global acceptance of post-apartheid South Africa with opportunities to develop and exploit hitherto inaccessible global markets in biodiversity resources such as nature-based tourism and wildlife products;
- identification of nature-based tourism as an engine for economic growth;
- democratisation of institutions that enabled participation by communities, NGOs and individuals in identifying policies and actions that are biodiversity friendly.
- the national government's adoption of international conventions that bind it to supporting biodiversity-friendly policies;
- accessibility to international funding sources for biodiversity-related research and implementation of projects;

More recently, there have been changes at the local government level, with a resultant devolution of powers of land use planning to the municipal level. This also provides a stimulus and challenge for mainstreaming biodiversity.

Decentralised and participatory planning has permitted the incorporation of biodiversity issues into mandatory regional and local structure planning processes that are implemented by the government structures that make the actual decisions about land use.

Government restructuring, however, does not come without its problems for biodiversity. The identification of new regional (provincial tier) structures has left some institutions severely incapacitated. Most of the newly identified municipalities lack the capacity to incorporate biodiversity concerns effectively into land use planning. Furthermore, while some of the better capacitated new municipal structures have been enthusiastic about biodiversity preservation, others, especially in the poorer parts of the country, have not.

Threat to biodiversity/ecosystem services

Almost all case studies identified threats, or appreciation of threats, as a stimulus. Loss of biodiversity and the unsustainable use of natural resources and ecosystem services provided the catalyst for stakeholders to seek effective ways of countering these. Examples include the urgency to effectively manage the country's hard-stretched water resources in order to stimulate economic growth, and the threat to the ecotourism industry of habitat degradation and biodiversity loss.

Demand for ecosystem service

A demand for the services provided by biodiversity—articulated by private as well as public sector institutions—provided a catalyst for mainstreaming in ten of the case studies. These services included water resources, wildlife products, nature-based tourism opportunities, agricultural produce, and public open space.

Linkage to socio-economic delivery

The identification of links between biodiversity and the delivery of socio-economic services to South Africa's massive population of poor and socially marginalised people was cited as a stimulus for mainstreaming in nine case studies. Imaginative “win-win” approaches to biodiversity mainstream-

ing are found throughout this volume. A good example is the link between biodiversity conservation, cost-effective delivery of water for socio-economic development and human resource development in the *Working for Water* programme. Others include the job creation and training potential of nature-based tourism, and the ecosystem services provided by biodiversity in urban settings. A prerequisite for socio-economic delivery as a stimulus for mainstreaming was the identification of this linkage by committed, and socially responsible, biodiversity professionals.

Superior sustainability

Superior economic and ecological sustainability of biodiversity-friendly activities as the stimulus for mainstreaming was included in five of the case studies. Removal of water-hungry alien plants is a more sustainable practice for delivering water from catchments than is the building of additional dams. Wildlife utilisation and conservation farming are more sustainable than conventional livestock rearing and agriculture. Nature-based tourism is more sustainable than alternative forms of land use in certain ecosystems.

Globalisation

The globalisation of markets is often associated with the unsustainable use and loss of biodiversity. However, globalisation was identified as a stimulus for mainstreaming in three case studies. Two of these listed “green branding” of products—niche markets linked to ecologically sustainable production methods—as a catalyst, while one argued that the “global prioritisation of sustainable development” provided an important stimulus (Chapter 8).

Withdrawal of perverse incentives

The post-1994 withdrawal of state-sponsored subsidies for unsustainable agricultural practices, was cited as a stimulus for the adoption of more biodiversity-friendly land use practices in two case studies. However, as pointed out below, these subsidies included support for conservation farming practices, for example the stock reduction scheme

of the 1970s and 1980s. The implementation of this scheme has probably saved the country untold millions of rands in reduced erosion (and siltation of dams), range improvement and biodiversity conservation. The impacts of this subsidy withdrawal remains to be documented.

Private sector involvement

Only two case studies suggested that private sector involvement provided the stimulus for mainstreaming. We suspect, however, that private sector involvement has been a more widespread stimulus. The initiative of the private sector in developing the wildlife utilisation and nature-based tourism industries is a good example of how this sector stimulated biodiversity-friendly policy and practice.

A more unusual example is the mainstreaming of biodiversity as the result of a proposal for a nuclear power station (energy sector). An electricity supply company arranged for a structure plan to assess the impacts of a proposed nuclear facility, and this action led to a host of conservation initiatives on the Agulhas Plain.

Conflict resolution

The ongoing conflict between development and conservation was listed by two case studies as the stimulus for integrating the outcomes of systematic conservation plans into policy regarding land use decisions.

MECHANISMS

Effective communication to stakeholders

All case studies demonstrated that effective communication of biodiversity issues, potential social and economic linkages, and legal and moral responsibilities for policy implementation, was central to the mainstreaming process. Communication successes ranged from a one-off delivery of a “road show” that convinced the Minister of Water Affairs and Forestry to initiate the *Working for Water* programme; advocacy programmes that targeted key officials and politicians; awareness campaigns that gained public support for biodiversity projects;

to the cumulative impacts of sustained extension services in the conservation and agriculture sectors. Communication was especially effective when conservation of biodiversity was simplified into “do-able” projects, such as the clearing of invasive shrubs, or when urban planners were given a prioritised list of sites to conserve.

Synergistic partnerships

Partnerships that were complementary in terms of capacity, skills and political leverage were cited in all case studies as effective mechanisms for mainstreaming. These partnerships ranged from those involving politicians from neighbouring countries to those between different state institutions, between state institutions and NGOs; between state institutions and the private sector; between state institutions, NGOs and academia; and between state institutions, NGOs and traditional communities.

Enabling legislation and policy

Enabling legislation and policy was regarded by most case studies as an effective mechanism for mainstreaming biodiversity. Some of these legal frameworks pre-dated the Convention on Biological Diversity and, hence, South Africa’s obligation to mainstream biodiversity. Examples include policies that enabled private ownership and subsidised the provision of wildlife resources to ranchers; the establishment of private nature reserves, contractual national parks and conservancies; the incorporation of “green” issues into urban and regional planning; legislation that restricted the extent of afforestation in water catchments, and conservation farming legislation and subsidies. Other legislation is more recent and has been guided in its development by South Africa’s international obligations regarding biodiversity. Included here is the requirement for environmental impact assessment (EIA) and strategic environmental assessment (SEA) in terms of the National Water Act of 1998 and the National Environmental Management Act of 1998, both of which have had extremely positive outcomes for biodiversity in the forestry, agriculture and land use planning sectors.

Creation of new institutions

The creation of new institutions, established specifically to ensure mainstreaming outcomes, was listed as an effective mechanism in ten case studies. While some of these were statutory institutions or formally linked to government structures, many had their origins in the private sector, or were new NGOs. The establishment of appropriate, independent institutions such as *Working for Water*, ranchers and farmers associations, forestry working groups, conservancies, advisory boards, and so on, ensure that the mainstreaming process maintains its momentum in the face of personnel turnover and institutional restructuring.

Seed funding

In seven case studies, seed funding proved to be a highly effective means of kick-starting mainstreaming activities. Funding sources ranged from local and international NGOs to international funding agencies such as the GEF, the private sector, and state institutions.

Effective research

Research that guided the mainstreaming process and demonstrated its benefits was regarded as an effective mechanism in six case studies. Thus, research that highlighted the economic advantages of alien plant eradication for sustainable water production has reinforced the value to society of the *Working for Water* programme. Systematic conservation planning studies have provided a transparent and defensible means of identifying land use options, thereby winning the support of stakeholders and providing implementing agencies with very effective guidelines for land use decisions.

Key appointments

Four case studies identified key appointments as an effective mechanism for mainstreaming. Capable and committed individuals can guide the process through the difficult period between the identification of the mainstreaming opportunity and the policy development and implementation phases. They are also important in starting the pro-

cess of mainstreaming. However, it emerged from the case studies that it is vital that mainstreaming does not rely too heavily on single individuals, but rather on small teams of individuals, or institutional-level responsibility.

Capacity building

The development of new capacity to ensure mainstreaming outcomes was identified in only two case studies. This probably reflects the fact that all case studies indicated that there was adequate institutional capacity and knowledge for the mainstreaming process to occur. However, this should not be seen as a reflection of the situation across all regions and sectors of South Africa. In those cases where mainstreaming has not occurred, we propose that inadequate capacity is one of the key factors.

Role models

The example of role models as a mechanism for mainstreaming was cited by only two studies. These were the significance of progressive farmers in helping to mainstream biodiversity in the agriculture sector and the key role played by a successful nature-based tourism enterprise on the Agulhas Plain. We believe that the positive example of role models plays a more important role as a mechanism for mainstreaming than is evident from the case studies in this volume.

MAINSTREAMING OUTCOMES

The success of the mainstreaming of biodiversity was assessed according to the following criteria:

- incorporation of biodiversity issues into sector policies
- simultaneous biodiversity and sector gains (“win-win”)
- net biodiversity gains exceed net biodiversity loss by sector activities
- sector activity based on or dependent on sustainable use /management of biodiversity

To what extent have the case studies described in this volume achieved these outcomes? It would

appear that all outcomes have been achieved for the case studies described in Chapters 2, 3, 5, 6 and 7 (see Figure 13.1). In the case of the urban and regional planning sector, the first two outcomes (incorporation into policy and a “win-win” situation) generally apply, although it remains to be seen whether net biodiversity gains will exceed losses, and the extent to which this sector will become biodiversity-based. This will depend very much on the way in which these planning processes are implemented and the extent to which development issues will override conservation in contentious areas (see, for example, Chapter 8). The forestry and commercial agricultural sectors (Chapters 4 and 5) have been remarkably successful in incorporating biodiversity issues into policy, but nevertheless both of these sectors are dependent to varying degrees, on the transformation of natural habitat. Furthermore, biodiversity-friendly policies, even in the context of transformed landscapes, are not universally applied across all activities and regions in these sectors. It is still too early to assess whether the ambitious policies being formulated for the Maloti-Drakensberg Conservation and Development Programme (Chapter 12) will result in effective mainstreaming outcomes.

DISCUSSION AND CONCLUSIONS

The Convention on Biological Diversity (CBD), which South Africa has ratified, promotes the principles for sustainable development and mainstreaming biodiversity as a platform for conservation, sustainable use and equitable sharing of benefits. Funders of reconstruction and development programmes have shown interest in the concept and have proposed policies for the mainstreaming of biodiversity.

South Africa has a long history of concern and action regarding biodiversity issues. The combination of adequate institutional capacity, scientific knowledge and management skills, effective NGO involvement and a high level of commitment have enabled the development of a biodiversity mainstreaming process in many sectors. Escalating threats to the country’s extraordinary biodiversity resources, at a time when a new government was keen to provide socio-economic services to the

Box 13.1. Discussions at the Giant's Castle Workshop, June 2001

Discussion during the workshop elicited comments which do not readily fit into the framework of mainstreaming biodiversity presented in this chapter. Some factors which might well be unique to South Africa were highlighted. The cruel injustices of apartheid are notorious worldwide. Less well known may be the effects of sanctions, including the academic boycotts. The international isolation had the effect of pushing many professionals to be more innovative in dealing with problems. As a result of the inequitable education system, the biodiversity professionals were almost exclusively white, and formed a very small community. This undersized group had to develop broader perspectives, and be less specialised than in most First World situations. Encouraged by the innovative Cooperative Scientific Programmes of the former Council for Scientific and Industrial Research (CSIR), professionals with different skills were brought together to solve complex problems. This small scientific community also meant closer networking, and a trans-disciplinary awareness not normally evident amongst biodiversity professionals.

The juxtaposition of developed and developing worlds in South Africa led to an intense awareness in the biodiversity community of social injustices. With the collapse of apartheid after 1990, and the democratic elections of 1994, came an urgency to find socially equitable solutions to environmental problems. Scientists responded by rapidly and effectively disseminating information on biodiversity, demystifying and simplifying biodiversity issues, and making these manageable, accessible and tractable. The mix of developed and developing worlds enabled the recognition of biodiversity as a contributor to, and source of, socio-economic development.

marginalised majority, stimulated stakeholders to identify many innovative and effective mainstreaming mechanisms. The result has been the incorporation of the outcomes of the mainstreaming of biodiversity in several sectors, with concomitant benefits for the long-term persistence of biodiversity. This has been a remarkable achievement.

However, the situation is not as rosy as it would appear. There are many factors that challenge the gains made thus far. One such factor is dwindling institutional capacity. This volume has demonstrated that adequate institutional capacity is an essential condition for mainstreaming. The recent decline in institutional capacity across South Africa is great cause for concern regarding sustainability of mainstreaming outcomes. We urge that appropriate institutional capacity in biodiversity research and management be built and maintained.

Linked to this challenge is the declining and ageing corps of biodiversity professionals and as yet no up-and-coming team to replace it. Owing to political insecurity, crime, institutional decline

and the progressive decline in research funds, many of the older, experienced researchers, as well as those young and newly trained, have emigrated. Furthermore, attempts to train a corps of black researchers in biodiversity science have not been particularly successful. Very few are attracted to, and recruited into, the discipline. Those few who emerge as post-graduates are often head-hunted by government and the corporate world for managerial positions. Much more effort should be devoted to retaining and funding the skilled researchers who are required to inspire and train black biodiversity scientists. The conservation baton, which has been held by white South Africans through the apartheid period, must be passed on to an emerging community, representative of the country's population.

A third challenge is the need to demonstrate in an honest and transparent way that biodiversity-friendly policies do indeed provide socio-economic opportunities for poor people. This is not a trivial task. Care must be taken not to raise expectations about potential socio-economic delivery when there are limited opportunities for this. Furthermore,

greater effort is required to convince all sections of South African society of the intrinsic value of biodiversity

Given South Africa's achievements in mainstreaming biodiversity, and the fact that these may have widespread value elsewhere on the continent and the world, every effort should be made to safeguard them.

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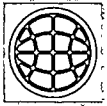
Carol Scheepers of KwaZulu-Natal Wildlife provided invaluable support. Finally, we owe a great debt to all of those committed and passionate people who, while not always knowing it, have played an indispensable role in mainstreaming biodiversity in South Africa. These roles extend from simple membership of a NGO through the full spectrum of activities, to the actions of government ministers. Thank you for your efforts; they have not been wasted.

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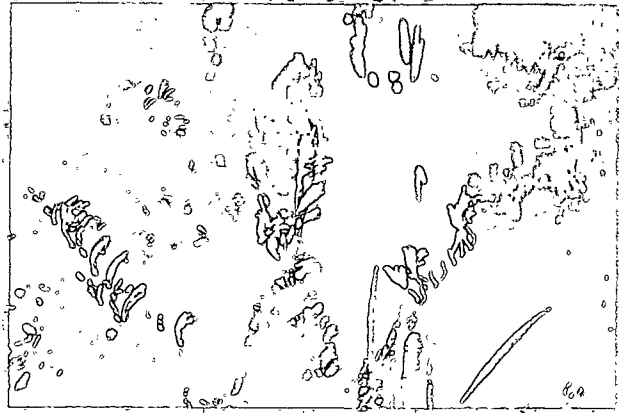
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