CONSERVATION AND ECONOMIC LESSONS LEARNED FROM MANAGING THE NAMIBRAND NATURE RESERVE

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ABSTRACT—The NamibRand Nature Reserve, located in southern Namibia, is a private nature reserve established to protect and conserve the unique ecology and wildlife of the southwest Namib Desert. At 172,200 ha, NamibRand is one of the largest private conservation areas in southern Africa. The reserve consists of 13 former livestock farms rehabilitated into a continuous natural conservation area and shares a 100 km border with the Namib-Naukluft National Park. The reserve is a model for private conservation in southern Africa, as it demonstrates holistic biodiversity conservation balanced with financial sustainability. Innovative approaches to resource management ensure that this critical area bordering on the national park is effectively conserved. Research conducted on the reserve aims to directly benefit management of the reserve and to contribute to the national scientific knowledge base. The project is financially self-sustaining mainly through high-quality, low-impact tourism. Partnerships with local and regional neighbors, and government and other organizations, connect the reserve to a larger conservation landscape throughout Namibia, forming the foundation of the national tourism economy.

Key Words: biodiversity conservation, Namibia, NamibRand, nature reserve, sustainable ecotourism

INTRODUCTION

Namibia, located in southwestern Africa, covers an area of approximately 824,000 km² with a population of just over 2 million human inhabitants, making it one of the least densely populated countries on earth. The country gained its independence from South Africa in 1990 after an extended armed struggle. Although it is a developing nation, lawmakers took the opportunity to enshrine environmental protection into Namibia’s progressive new constitution.

Namibia’s landscape consists of five terrestrial biomes: the Namib Desert forms almost the entire west coast; Nama Karoo (an ecoregion situated in the northern Cape in South Africa and southern Namibia) covers the south and the eastern border of the Namib Desert; Succulent Karoo is restricted to the far southwest; Acacia Tree-and-shrub Savanna covers the north central regions; and Broadleaved Tree-and-shrub Savanna represents the northeast (Mendelsohn et al. 2002). The eastern border of the relatively narrow coastal Namib Desert belt is the transitional escarpment zone. The escarpment extends into a high central plateau covering the majority of Namibia. In the east, the plateau descends into the Kalahari basin. The country’s only perennial rivers are located on its northern, southern, and far northeastern borders, with only ephemeral rivers feeding the rest of the country.

Annual rainfall in Namibia ranges from 0 mm at the hyperarid desert coast to 700 mm in the subhumid northeastern woodlands (Mendelsohn et al. 2002). Rainfall is not only low but highly variable and is thus the limiting factor for agriculture and livestock activities throughout the country. Due to Namibia’s arid climate very little land is converted for arable agriculture. Extensive grazing by livestock and wildlife is provided by natural vegetation (Barnes et al. 2009).

Tourism, along with the mining, agriculture, and fishing industries, forms the basis of the Namibian national economy. Namibia’s rich wildlife and unique landscapes and geology are major attractions, bringing almost 240,000 overseas tourists and 690,000 regional tourists to the country in 2007 alone (MET 2007) Namibia’s climate, ranging from hyperarid to semi-arid with small pockets of subhumid areas in the northeast, supports
rich biodiversity, including numerous desert-adapted and endemic species. The Succulent Karoo is a transboundary biodiversity hotspot, extending from South Africa into Namibia’s recently proclaimed Sperrgebiet National Park.

CONSERVATION IN NAMIBIA

The Nature Conservation Ordinance of 1975 passed ownership of and responsibility for common plains game to individual freehold (private) landowners. This legislation saved wildlife in Namibia. Previously, when wildlife was state-owned, freehold farmers accrued no benefits from the wildlife on their land. This often led to resentment and hostility, as wildlife was seen to compete directly with livestock. Once farmers were able to benefit financially through the sustainable utilization of wildlife (i.e., game farming, trophy hunting, and tourism), the decline in wildlife populations was reversed (Barnes and De Jager 1995). In fact, on private land over the period 1970 to 2000, the main game species numbers increased by 100% while livestock numbers decreased by 45% (Barnes and Jones 2009). Freehold farmers can now enter into joint management initiatives, establishing freehold or commercial conservancies to create large open areas where wildlife can migrate freely and natural resources are cooperatively managed.

Communal-area residents were unable to benefit directly from wildlife until Namibia’s Communal Area Conservancy Act was passed by parliament in 1996. This legislation devolved rights to community members to use, manage, and benefit from wildlife on their land, further enhancing the protective landscape for biodiversity conservation in Namibia (DEA 1995). Today, Namibia’s Community-Based Natural Resource Management (CB-NRM) Program is internationally renowned not only as a successful conservation philosophy but as a tool to achieve rural development, poverty alleviation, and democracy (NACSO 2008).

A new, revised wildlife act is anticipated in 2010. This comprehensive legislation will enable private land in Namibia to be officially registered and proclaimed as protected areas. This will enhance the legal status of the private areas and further protect wildlife throughout the country (M. Paxton, head of the Strengthening the Protected Area Network [SPAN] Project, pers. comm. 2008).

Currently, Namibia’s conservation landscape is so effective that in 2009, just over 40% of land in Namibia is under intensive conservation status (SPAN 2009). As Figure 1 illustrates, this 40.5% is made up of communal areas, freehold conservancies, private protected areas such as the NamibRand Nature Reserve, community forests and tourism concessions, and state-protected areas (including national parks and game reserves). The remaining 59.5% represents land used for agriculture, mining, urban settlement, and all other land not under any kind of conservation status.

In Namibia, 88% of all common game occurs on private land, 8% on communal conservancies, and 4% in national protected areas (Mendelsohn 2006). These figures highlight the critical importance of private protected areas to the conservation of biodiversity in Namibia.

BACKGROUND AND DEVELOPMENT

The NamibRand Nature Reserve, located in southern Namibia, is a private not-for-profit nature reserve established to help protect and conserve the unique ecology and wildlife of the southwest Namib Desert (Fig. 2). Conserving the pro-Namib, the area along the eastern edge of the Namib Desert, is critically important in order to facilitate seasonal migratory wildlife routes and to protect biodiversity.

The NamibRand Nature Reserve is probably the largest private nature reserve in southern Africa, extending over an area of 172,200 ha. The reserve shares a 100 km border with the Namib-Naukluft National Park in the west and is bordered in the east by the Nubib Mountains.

The aims of the NamibRand Nature Reserve are (1) to conserve and protect, for the benefit of future generations, the sensitive and fragile environment and its rich biodiversity; (2) to create a nature reserve with a healthy and functioning ecosystem, providing a sanctuary for flora and fauna and to facilitate seasonal migratory routes in partnership with neighbors; (3) to promote sustainable
utilization through ecologically sustainable and high-quality tourism products and other projects; and (4) to achieve a commercially viable operation to ensure continuance and financial independence.

NamibRand originated as the dream of J.A. (Albi) Brückner to extend desert frontiers by integrating a large number of former livestock farms and developing a wildlife sanctuary. Mr. Brückner purchased the first farm, Gorassis, in 1984. Initial attempts at indigenous livestock farming soon proved unsustainable in the hyperarid climate—the area receives a mean annual rainfall of 70 mm.

The conservation context in which the NamibRand Nature Reserve developed began in 1979 when the Namib-Naukluft National Park was proclaimed as a single integrated reserve, comprised of an amalgamation of several large portions of existing national parks, unoccupied public land, diamond-mining areas, and purchased farmland. Heavy poaching of wildlife resulted in the fencing of the eastern boundary of the Namib-Naukluft National Park in the late 1970s and early 1980s. However, due to the vastness of the area and the distances involved, monitoring of the border fence by nature conservation authorities proved extremely challenging.

In the late 1980s, the then-Department of Nature Conservation encouraged the formation of the NamibRand Nature Reserve as an additional conservation area between the park and livestock farming areas, which would not only benefit wildlife directly by reestablishing
natural migration routes but also act as a buffer to keep poachers out. In 1991 a strategic plan was formulated to change the primary land use of NamibRand to conservation. While the Department of Nature Conservation did not provide any kind of federal financial support, it did grant political support for the project.

In 1993 NamibRand was declared a game reserve, a conservation warden was employed, and the primary form of sustainable resource utilization focused on trophy hunting. The first ecotourism concession was granted in 1994, and eventually pressure from the tourism operators prompted the decision to suspend trophy hunting in favor of ecotourism activities by the end of the 1990s. A tourism concession allows outside tourism operators to make use of land set aside for conservation for tourism purposes. This is usually in the form of a lease or rental agreement.

Between 1988 and 2000 several more farms were purchased by Mr. Brückner and resold as needed to philanthropists in order to inject capital into the project. The reserve currently consists of 13 former livestock farms rehabilitated into a single continuous natural habitat. Joint management initiatives and agreements with neighbors allowing for the opening of border fences were signed in 2008. These partnerships allow for the establishment of larger conservation areas critical to achieving healthy ecosystems throughout the region.

**INSTITUTIONAL STRUCTURES AND FINANCIAL MANAGEMENT**

In 2001 all landowners belonging to the reserve voluntarily signed the articles of association and adopted a constitution that sets aside the land for conservation. Landowners retain the title deed to their land but relinquish individual management. As there is currently no legal provision for private conservation areas (an omission that the proposed 2010 legislation is intended to remedy), the land is still zoned as agricultural and land tax is paid accordingly.

The articles of association make provision for landowners to serve as directors on the reserve’s managing board. The reserve employs a chief executive officer, a control warden, a research warden, a ranger, and five field staff to manage the reserve. Field guides employed by tourism concessions on the reserve also assist with monitoring and resource management, which is vital in order to control the vast area.

NamibRand Nature Reserve is a model for private conservation in southern Africa as it demonstrates holistic biodiversity conservation balanced with financial sustainability. Low-impact, high-quality ecotourism is a means toward sustaining conservation efforts through park fees. The reserve has awarded five tourism concessions, which pay a daily per-bed fee to the reserve. Currently the daily fee per person per day amounts to N$135 (about US$18; Namibian dollars converted at the rate of US$1 = N$7.5). Prior to the introduction of this revenue collection system, concessionaires were charged a percentage of turnover; however, in 2004 this was changed to a fixed fee at the request of some concessionaires in order to simplify accounting procedures.

Funds generated through park fees enable the reserve to be financially self-sustaining (Fig. 3). In 2007 the reserve collected N$1.9 million (US$245,000) in revenue. N$1 million (US$145,000) was used to cover operating expenses and N$500,000 (US$67,000) was used for capital expenditure, while the remaining N$400,000 (US$53,000) was posted as a surplus and allocated to dedicated reserve funds (i.e., game reintroduction, land acquisition, and satellite monitoring collars).

Although the daily management of the reserve is adequately funded through tourism, special projects require additional funding. To help fund such projects, the reserve established the NamibRand Conservation Foundation. This independent organization raises funds through several initiatives. The foundation already provided the NamibRand Research and Awareness Centre and the Namib Desert Environmental Education Trust (NaDEET) with significant funding and hopes to continue this support as well as identify new projects. Additional funds are also raised through the live sale of wildlife, although this serves primarily as a population management function and not as a steady source of income.

The reserve’s conservation efforts are an example of alternate land use, and NamibRand has created positive social impacts. Conservation and tourism are able to provide jobs for a greater number of people than could be employed if the land were strictly used for agriculture. When purchased, the 13 livestock farms comprising the NamibRand Nature Reserve had an average of three employees per farm. Currently more than 150 people are employed on the reserve, mainly by tourism concessionaires. As livelihoods improve and salaries increase, substantially more income is generated from this land use than any other economic activity in the surrounding area. In addition, the Namibian government benefits from income and value-added taxes. Important to note are the third-party industries, which are supported as a result of conservation and tourism land uses. Examples include

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contracts with local businesses to offer services such as laundry, vehicle maintenance, provision of supplies, and construction.

**RESOURCE MANAGEMENT**

Innovative approaches to resource management on NamibRand ensure that this critical area bordering on the Namib-Naukluft National Park is effectively conserved. The reserve maintains a conservation policy of minimal interference with constant monitoring, implemented through an environmental management plan. A monitoring system has been introduced that includes population census methods. A road count is conducted annually to monitor game populations. This method has been specially adapted for use on the NamibRand Nature Reserve from the well-known census technique as developed by the Natural Resource Working Group, a joint venture between the Namibian Ministry of Environment and Tourism, the World Wildlife Fund, and the Namibia Nature Foundation. This method is used throughout Namibia and allows for standardized population comparisons.

Wildlife populations on NamibRand appeared to have now stabilized, recovering significantly from numbers recorded when intensive conservation efforts began (Table 1). Early monitoring indicates that population figures on the reserve in 1989 were 1,250 oryx (*Oryx gazella*), 840 springbok (*Antidorcas marsupialis*), and 83 ostrich (*Struthio camelus*) (Odendaal and Shaw 2004). Twenty years later, the 2009 game census indicated that the reserve contained 4,376 oryx, 11,150 springbok, and 300 ostrich (Odendaal et al. 2009). The reserve also reintroduced species that had historically occurred in the area but were hunted to local extinction while the land was used as freehold farmland. Key species such as red hartebeest (*Alcelaphus caama*), cheetah (*Acinonyx jubatus*), giraffe (*Giraffa camelopardalis*), and plains zebra (*Equus quagga*) were reintroduced to restore ecological balance. By 2009 a total of 140 red hartebeests, seven cheetahs, nine giraffes, and 600 plains zebras were successfully reestablished on the reserve.

Additional management work centers around maintenance and improvement of infrastructure, focusing on water provision. The reserve also contributes to a southern African avifaunal atlas project as well as a national large carnivore atlas. Other projects focus on keystone species conservation, such as the monitoring of the critically endangered Lappet-faced vultures (*Torgos tracheliotus*) and the reintroduction of cheetahs. Outreach efforts focus on predator-livestock management on neighboring freehold farms.

Recently a detailed Tourism and Economic Development Plan (TEDP) was developed. The aim of this plan is to assist in the diversification and expansion of the NamibRand Nature Reserve’s income sources and to ensure that any future tourism development is in line with existing conservation objectives. Tied to the TEDP and included in the reserve’s environmental management plan is a land-use zonation plan. This zonation plan is essential for planning and management, but it also protects sensitive
areas. Recognizing the importance of wilderness areas, the NamibRand Nature Reserve has exclusively set aside more than 15% of its total area for wilderness.

**RESEARCH**

Research conducted on the reserve aims to directly benefit management of the reserve and to contribute to the national scientific knowledge base. Established in 2006, the NamibRand Desert Research and Awareness Centre has hosted numerous researchers. During this time, researchers have conducted both short-term and longer-term studies on fairy circles (mysterious bare circles in the sand that dot the landscape but for which no scientist has yet been able to determine their cause or purpose), Grant’s golden mole (*Eremitalpa granti*), the Cape ground squirrel (*Xerus inauris*), the wedge-snouted lizard (*Meroles cuneirostris*), elephant shrews, and other desert-adapted species. Species inventories and monitoring of endangered plant species have increased knowledge of NamibRand’s local environment. The reserve’s ongoing work with the Cheetah Conservation Fund and the Na’an ku sê Wildlife Experience has resulted in the successful reintroduction of the cheetah. Several social-impact studies have investigated the impacts and benefits of alternative land-use practices. Archeological studies and excavations conducted as part of a long-term regional study have yielded important artifacts and may eventually assist in further protection of the reserve.

The NamibRand Desert Research and Awareness Centre provides support and guidance for local and international researchers and assists research focusing on management issues. Currently, the centre functions as a field base, providing comfortable but simple accommodation for researchers. However, the long-term vision is to extend the scope of the centre to include interpretive and awareness-raising programs. The awareness program would target decision and policy makers and other audiences to highlight the importance of conservation and sustainable utilization of natural resources. The interpretive component could develop into an income-generating centre open to the public, highlighting the unique desert ecology of the area.

The reserve has determined priority research goals, consisting of research topics that would immediately provide better understanding of NamibRand’s biodiversity and assist with management practices. These topics include carrying-capacity studies, vegetation surveys, and reptile and amphibian inventories. While all research is encouraged, research focused on these topics receives

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**TABLE 1**

**GROWTH OF WILDLIFE POPULATIONS AT NAMIBRAND NATURE RESERVE, 1987 TO 2009**

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</thead>
<tbody>
<tr>
<td>Oryx</td>
<td>1,250</td>
<td>1,016</td>
<td>1,497</td>
<td>3,621</td>
<td>3,513</td>
<td>3,741</td>
<td>3,258</td>
<td>4,376</td>
</tr>
<tr>
<td>Springbok</td>
<td>12</td>
<td>840</td>
<td>344</td>
<td>661</td>
<td>4,549</td>
<td>7,700</td>
<td>12,451</td>
<td>11,150</td>
</tr>
<tr>
<td>Plains zebra</td>
<td>14</td>
<td>45</td>
<td>181</td>
<td>414</td>
<td>487</td>
<td>668</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Ostrich</td>
<td>18</td>
<td>83</td>
<td>80</td>
<td>135</td>
<td>385</td>
<td>421</td>
<td>262</td>
<td>300</td>
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<tr>
<td>Kudu</td>
<td>2</td>
<td></td>
<td></td>
<td>10</td>
<td>118</td>
<td>256</td>
<td>375</td>
<td>300</td>
</tr>
<tr>
<td>Steenbok</td>
<td></td>
<td>7</td>
<td></td>
<td>110</td>
<td>174</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mountain zebra</td>
<td></td>
<td>14</td>
<td>16</td>
<td>30</td>
<td>50</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red hartebeest</td>
<td></td>
<td>24</td>
<td></td>
<td>50</td>
<td>90</td>
<td>150</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Giraffe</td>
<td></td>
<td>3</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cheetah</td>
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<td>7</td>
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</table>

Note: The population counts for the four species in the upper panel are regarded as highly reliable. The population counts for the six species in the lower panel are less reliable but indicative: (1) steenbok and mountain zebra have always existed on the reserve, but no reliable counts were made for the earlier years; (2) red hartebeest, giraffe, plains zebra, and cheetah were apparently extirpated, but the reserve staff has now reintroduced these species. The full data set is available online at http://www.unl.edu/plains/publications/GPR/gprdatarep.shtml.
priority attention, as well as some support through the centre. At this stage, the centre is unable to provide direct financial assistance but is able to provide assistance in kind (i.e., accommodation, services, and other support). The centre seeks strategic partnerships with local and international institutions. An agreement has been finalized between the centre and the Gobabeb Training and Research Centre that is mutually beneficial, providing alternate or comparative research opportunities for researchers from Gobabeb and ensuring access to any needed technical support not available directly on NamibRand. It is anticipated that linkages with overseas universities and other institutions will develop and provide a more comprehensive understanding of NamibRand’s natural and social environment.

LESSONS LEARNED AND APPLICATIONS TO THE GREAT PLAINS

The NamibRand Nature Reserve is model of private land conservation. It has achieved a financially self-sustaining private conservation area. Funds for conservation are earned by charging tourism operations that use the environment as the basis for their products. However, this approach is not without risk. Developing a fledgling ecotourism industry or indigenous biodiversity production systems in the Great Plains will require time, perseverance, and careful marketing, just as it did on NamibRand.

Given the strong history of agriculture and the urgent need in Namibia for land reform, understanding and support for conservation land use from livestock farmers and non-conservation-oriented government ministries is often hesitant. NamibRand still struggles with hostile neighbors and the threat of expropriation (forcible redistribution of land), although as tourism is now recognized as Namibia’s second-largest income generator, this may change. In Namibia, tourism cannot exist without appropriate conservation efforts.

A critical aspect of the establishment of the NamibRand Nature Reserve was the voluntary dedication of private land to conservation. Although NamibRand developed from one man’s personal commitment to preserving his land for the future, as other landowners and new generations become involved, motivations are changing. Landowners have now requested a direct financial benefit to decrease personal expenses accrued through ownership of the land. This is currently being achieved through the payment of a minimal land usage fee as well as the reserve’s acceptance of financial responsibility for water installations and other infrastructure used directly for the benefit of NamibRand. In the long term, private landowners in the Great Plains should accrue financial or other substantial benefits to ensure the sustainability of conservation efforts.

Policies and legislation that grant various types of rights over wildlife are key to conservation of private protected areas, because they provide benefits to landowners and incentives to conserve land and its biodiversity. While federal policy and laws regarding rights to wildlife in the Great Plains may not be changed easily, there are opportunities to enhance conservation efforts in the region. Perhaps stronger conservation could be achieved by obtaining more rights over wildlife through public-private partnerships or other innovative methods that might succeed within existing policy frameworks.

Compared to other models, NamibRand’s strong point is its commitment to conservation. It is not a tourism enterprise seeking to promote itself by practicing conservation as a secondary activity. Other private reserves often integrate tourism with conservation, limiting funding for conservation to a line item in their budget. NamibRand’s reputation both nationally and internationally is based on the practice of conservation, leaving tourism to experts.

In Namibia in 2005, indigenous natural resource production systems, which include wildlife viewing, trophy hunting, live game sales, firewood and charcoal sales, and indigenous plant production, earned N$3.2 billion (US$425 million). During the same period, the output of the entire agricultural sector amounted to N$1.8 billion (US$240 million) (Mendelsohn 2006). Considering the historic and political importance of agriculture to Namibia, these figures indicate that priorities are shifting toward an indigenous natural resource-based economy.

The Great Plains has additional conservation-related income-earning opportunities other than tourism that could fund conservation efforts. These might include options such as trading carbon credits, upstream water conservation for urban centers, bison ranching, and indigenous horticultural or medicinal products, to name a few. The ultimate and perhaps highly idealistic goal should be that indigenous biodiversity production systems outperform traditional agriculture and livestock systems, making conservation the best option in the region.

THE FUTURE FOR NAMIBRAND

Today the majority of land bordering the Namib-Naukluft National Park is now under some form of conservation. Not only have conservancies been established,
but other land belongs to tourism operators who have completely stopped or minimized unsustainable and incompatible livestock farming in favor of nature conservation. It is encouraging to see that the original vision of creating a vast conservation area, including seasonal wildlife migration routes and enough land to protect these migrating animals, has become a reality through public-private partnerships. Plans are now underway to establish the Namib Private Protected Area Working Group under the umbrella of the soon-to-be legally constituted National Private Protected Area Association. The main focus of this organization will be to open the conservation area next to the Namib-Naukluft National Park for conservation and to take down all internal fences with the aim of creating a “fence-free Namib.”

It is hoped that the new wildlife act currently under review by the Ministry of Environment and Tourism will be passed by parliament in 2010. This act will permit the proclamation of various types of private protected areas and ensure that NamibRand’s land is conserved and no longer under threat from expropriation. It also permits more concrete partnerships between public and private protected areas. It could facilitate the removal of fences and the establishment of joint management efforts between the Namib-Naukluft National Park and the NamibRand Nature Reserve.

The success of conservation in the pro-Namib area has proven that conservation-focused land use can far outweigh the benefits of livestock farming and can significantly contribute more social, economic, and environmental benefits.

REFERENCES


