

Black Rhino Translocations within Africa

The responsibility for the conservation of the critically endangered Black Rhinoceros,

Diceros bicornis, lies within Africa. This species is managed at the subspecies level and we document nine international translocation case studies involving South Africa since 1962 aimed at re-establishing or boosting populations throughout its former range. These translocations have been the focus of bi- or trilateral international arrangements. We argue that the international management of this species within Africa serves as a model for international collaboration over conservation and conservation best practice. As environmental issues are generally considered politically neutral grounds, international collaboration in this field may in turn promote higher level international engagement within Africa.

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Introduction

The Black Rhinoceros (*Diceros bicornis*) was historically found throughout sub-Saharan Africa, with the exception of the moist Congo Basin.¹ This browsing mega herbivore normally occurred in relatively small densities throughout its range. However, primarily as a result of heavy commercial poaching of the animal for its horn, the (crudely) estimated continental population of 100 000 animals in the 1960s has reduced in number to 2 400 in 1995. Through strict conservation programmes, the numbers in Africa have slowly increased, reaching 4,200 by 2007.² This radical decline in numbers led to the Black Rhino being rated as critically endangered on the International Union for the Conservation of Nature's (IUCN) Red List of Threatened Species,³ thus granting the species the highest international conservation status.

South Africa's role in black rhino conservation was initially relatively small. The national population was reduced to about 110 animals in 1935, or less than 0.1% of the continent's population. By 1980 the South African population had increased to 630 animals (4% of the African estimate), and up to 1 488 Black Rhino by 2007 (35% of the continental total).⁴ This radical increase

Table 1 African countries in which black rhinos have gone extinct, persisted and been reintroduced.

Countries (number & name)		
Persisted in	Extinct in	*Reintroduced to
5: Namibia, South Africa, Zimbabwe, Kenya, Tanzania	20: Angola, Cameroon, Central African Republic, Democratic Republic of Congo, Nigeria, Benin, Togo, Burkina Faso, Ghana, Mali, Côte d'Ivoire, Guinea, Chad, Ethiopia, Mozambique, Rwanda, Burundi, Somalia, Sudan, Uganda	4: Malawi, Swaziland, Zambia, Botswana

* Only countries from which black rhino went extinct.

Source: Author

in the South African contribution was a result of proactive conservation measures, and the declining populations in many other African range states. Thus, the world importance of South Africa to black rhino conservation has increased dramatically over the last 70 years.

Four nominal 'subspecies' or conservation units are recognised by the IUCN Species Survival Commission (SSC) called the African Rhino Specialist Group (AfRSG). These subspecies are geographically and ecologically distinct, namely: *D.b. minor* (or the Southern Central subspecies: originally found in South Africa, Botswana, Zimbabwe, Zambia, Mozambique & southern Tanzania); *D.b. bicornis* (the South Western subspecies: Namibia, Angola & South Africa); *D.b. michaeli* (the Eastern subspecies: Tanzania & Kenya); and *D.b. longipes* (the Western subspecies: West Africa to Cameroon).⁵ Genetic studies⁶ noted discernible genetic variation and support for the proposed subspecies. The *D.b. longipes* subspecies is now considered to be extinct, leaving only three subspecies for the continent.⁷ Although once geographically widespread (in 28 African countries), Black Rhinos are now restricted to a handful of countries, namely South Africa, Namibia, Zimbabwe, Tanzania and Kenya, while Zambia, Botswana, and Malawi support small recently re-established fledging populations (Table 1). The species is still extinct in the vast majority of

countries, which in itself provides opportunities for the now growing Black Rhino population. Establishing new populations within former range states remains a priority of conservation plans⁸ to reduce the environmental risk and also provide conservation flagships.

This article will focus on the role played by the international translocation of Black Rhino as a model for promoting international cooperation and conservation best practice of this endangered species. It will largely focus on Black Rhino translocations from or to South Africa and the rest of Africa. Given that black rhinos are endemic to Africa, the issues around their conservation remain an African responsibility, and by extension, a uniquely African opportunity to benefit and learn from this process.

What is considered to be international best practice?

Since the formation of the Rhino Management Group (RMG) (now Southern African Development Community (SADC) RMG in 1989⁹ which is an international multi-conservation advisory body, the basic principles of Black Rhino conservation/biological management have been largely developed and refined.¹⁰ These principles are grounded in the scientific understanding of Black Rhino ecology and management,

and also reflect general best practice principles for biodiversity conservation.¹¹

The principles specifically associated with the establishment of new populations in other range states are:

- **International & regional conservation co-ordination:** The IUCN SCC AfRSG provides leadership and advice with regard to Black Rhino conservation priorities on a continental scale, encapsulated in the internationally accepted action plan for Black Rhinos.¹² At the regional level, initiatives are generally aligned with Rhino conservation programmes such as SADC's Regional Programme for Rhino Conservation (SADC RPRC),¹³ the SADC RMG, and each country's own action plan for the species.¹⁴ These two SADC bodies provide the necessary political, organisational acceptance, advice, and support to facilitate exchange of information and expertise and smoother international transfers of Black Rhinos.
- **Biological management:** The objective is to manage Black Rhino populations for sustained meta-population growth of at least 5% per annum, and also promote genetic diversity. This would be achieved through:
 - The establishment of populations in suitable habitat (within the former range of the sub-species) able to comfortably support at least 50 animals. The ecological carrying capacity (ECC) should be estimated, based upon general environmental conditions and habitat type.¹⁵ Areas on more nutrient rich soils with moderate rainfall (with *Colophospermum*, *Acacia* & *Combretum* dominated vegetation types) are suggested to carry one Rhino per 10 km², which would require a minimum of 500 km² to support at least 50 Black Rhinos. More productive thicket vegetation types support even higher densities of Black Rhino,¹⁶ while areas with more dystrophic (nutrient poor) soils (such as miombo woodlands) or low rainfall would require higher area requirements per Rhino.¹⁷ These guidelines thus inform decisions on the area required for effective Rhino management, as well as the prospective population that can be supported in a given area.
 - The introduction of at least 20 unrelated founders to maximise genetic diversity. These animals should also ideally be young breeding adults, with a sex ratio slightly skewed in favour of females.¹⁸
 - The possibility of conflict on introduction should be minimised as far as possible by introducing the animals into initial areas of not less than between 115 and 185 km² and Rhino densities less than 0.5 to 0.11 Rhinos per km².¹⁹
 - Supplementing populations with a few unrelated animals once every generation (10 to 15 years) to increase genetic diversity and counter genetic drift.
 - Removing surplus bulls as the population grows to reduce the possibility of conflict. These could be young bulls or those who have dominated breeding over an extended period.
- **Monitoring:** The objective is to obtain accurate Black Rhino population estimates and demographic information to assess individual population performance and allow comparison between populations to further our understanding of the factors affecting Black Rhino population performance. This is achieved through:
 - The establishment of a formalised monitoring system, tracking population performance, demographics and in many cases the breeding performance of individual animals.
 - The SADC RMG has had such a reporting system functional since 1989 and is

now monitoring close to 80 Black Rhino populations in southern Africa.²⁰ This furthers the protection of Black Rhinos.

- **Protection:** To minimise illegal activity and losses of Rhinos through:
 - Ensuring sufficiently well-trained and equipped staff is on site.
 - Endeavouring to improve legislation associated with protecting Rhinos, and increasing criminal sentences for transgressors.
 - Cultivating a cooperative intelligence network amongst the local communities
 - Monitoring the detection, effective investigation and prosecution of cases.
 - Gaining community support for the Rhino programme.
 - Continuous monitoring of the populations.
- **Capacity:** To ensure that sufficient and appropriate human resources and skills are available and deployed efficiently, and to undertake training as needed to maintain required Rhino conservation capacity within the Rhino management authorities.
- **Financial sustainability & incentivised conservation programmes:** Where possible endeavour to increase the value of Black Rhinos through links to ecotourism or other related industries.

With Rhinos normally allocated to recipient organisations in one of five ways,²¹ they may be used in different ways to promote financial sustainability of the recipient site. The five ways in which Black Rhinos are normally allocated include:

- A donation where there are limited to no long-term relationship obligations between the donor and recipient state/agencies. In such cases, the donor often gains prestige through promoting the existence value of Black Rhinos.
- A sale which has similar no long-term relationships between the donor and recipient state/agencies.

- When animals are made available on a custodianship basis to the recipient. In this case the donor holds all ownership rights to the animals. This does encourage a medium to long-term relationship in Rhino conservation, with the recipients entering such an arrangement for the existence value, genetic material (adding to founders), prestige and possible commercial opportunities. It does, however, rest on the goodwill of the recipient.
- A barter system where the Rhinos are swapped for other wildlife or even services which encourages some form of relationship between the donor and the recipient which may not necessarily be exclusively focused on promoting long-term Rhino conservation management. This type of transaction does provide the donor some prestige value, but also some limited return on investment which may appease stakeholders who may be concerned about Rhinos being donated without any form of return whether in kind, financial, services or game species.
- A Rhino investment relationship where the donor state or agency makes rhinos available to the recipient but retains a right to receive some Rhinos back in the future. This option encourages a long-term relationship, and when between states, it would promote regional collaboration in Rhino management. This could be considered a win-win option for both recipient and donor. It provides prestige value to the donor, but a good return on investment in direct rhino terms, which may also appease possible negative sentiments held by stakeholders in the donor population.

Rhinos should ideally be used sustainably to enhance their overall commercial and existence value to the state, owners, and/or communities.²² This can be achieved through live sales, use in ecotourism operations, and limited sports

hunting. The sale of horn and meat, although an accepted principle for other species, would not be acceptable to the broader international community given current Convention on International Trade for Endangered Species (CITES) restrictions. The degree to which Rhinos could be commercially used in any country would be influenced by the rights attached to the animals and whether they are entirely private, state or communally owned or combinations of these via joint venture-type arrangements. This in turn would influence what land ownership combinations could be brought to the party. Incentives for private investment to enter such an arrangement may be in the form of commercial opportunities or land (in those cases where private land exists).

Currently, only in South Africa does private ownership of Black Rhinos occur. Elsewhere, they remain a state asset, generally on state or communal land, but in some cases held on private land, as in Namibia and Zimbabwe where they are managed under a custodianship-type basis. However, in the case of communal lands, some complications arise around perceived

ownership and rights, with most wildlife vested in the name of the state.²³

The existence value of Black Rhinos also plays a big role in Rhino conservation as it can provide a flagship status to protected areas. Given the Black Rhino's large body size and area requirements, it acts as an umbrella species in turn protecting a suite of other species that would otherwise have been exposed to external threats.

Translocations

Since 1962, a total of 910 Black Rhinos have been translocated, with 754 of these being within South Africa, and 156 animals involved in international transfers either to or from South Africa (Table 2).²⁴ The number of animals translocated as a percentage of accumulated Rhino numbers varies from 2.2% for *D.b. minor* to 20.7% for *D.b. bicornis*, with *D.b. michaeli* (8.8%) intermediate. This is indicative of the importance of this management activity in either establishing new populations or supplementing others, as part of the meta-population management strategy, or

Table 2 The number of Black Rhino (by subspecies) translocated since 1962 within, from or to South Africa. Accumulated number of Rhino refers to the number of Rhinos in South Africa.

Species	Number of black rhinos translocated		Accumulated number of rhino in free-ranging situations (until Dec. 2008)	Number of translocations as a percentage of accumulated rhino numbers
	Internal	International		
<i>D.b. minor</i>	560	85 (16 introductions, 67 exports, 2 from zoos)	2 840	2.2
<i>D.b. bicornis</i>	142	45 (all introductions)	904	20.7
<i>D.b. michaeli</i>	52	26 (7 introductions, 10 exports, 8 to zoos, 1 from a zoo)	890	8.8
Total	754	156		

Source: Author

it may be a function of animals being placed in too small areas and needing to be moved more frequently. This latter point applies to the *D.b. bicornis* population being manipulated between several parks in South Africa.

International translocation case studies

A total of nine international translocation case studies will be used as examples of how well they met best translocation practice, the degree to which they enhanced international Rhino conservation (Table 3), and what lessons have been learnt. The case studies used account for a total of 109 animals (75% of all Black Rhino in international translocations involving introductions to free-ranging situations, excluding those provided to zoological gardens). The number and diversity of such translocations would provide a broad enough assessment of whether they complied with best practice criteria, as discussed below:

International & regional coordination

The Malilangwe (Table 3: No 2) and North Luangwa National Park (Table 3: No 9) translocations had high compliance with regard to international and regional coordination, given the support from the AfrSG and regional initiatives (SADC RMG & SADC RPRC). Furthermore, the plans were aligned with national Rhino conservation plans in each country. The Malilangwe transfer complemented the national initiative in Zimbabwe of placing Black Rhinos on private land for safekeeping but it also offered good habitat adjacent to a national park suitable for further Black Rhino conservation.

The North Luangwa National Park translocation was unique in that it involved three countries (Namibia, South Africa and Zambia), and cooperation from a total of seven conservation

authorities/organisations, one in Namibia, one in Zambia, four in South Africa: South African National Parks (SANParks), Eastern Cape Parks Board (ECPB), North West Parks Board (NWPB), and Ezemvelo KwaZulu Natal Wildlife (EKZN Wildlife), and a non-governmental organisation (NGO), the Frankfurt Zoological Society (FZS). Although a complex project, it provided the broad base for international acceptance that Rhino conservation is best served by international cooperation, especially if one of the ideals is to re-establish Black Rhino within its former range states.²⁵

Although the introduction of *D.b. bicornis* into Vaalbos and Augrabies Falls National Park in South Africa (Table 3: No. 1) preceded any national plans at the time, it was largely in line with the international thinking and recommendations,²⁶ especially since this was the first introduction of the subspecies to South Africa and the animals were going to national parks within the historical range of this subspecies.²⁷ While the introduction of Black Rhino into Liwonde National Park, Malawi (Table 3: No. 3) was supported by Malawi's Department of National Parks and Wildlife and SANParks, it did not have greater international nor regional support post introduction, primarily given some issues with regard to security within the park, siting of the sanctuary, and the biological management of the Rhino population.²⁸

Most other translocations were considered to have moderately met the coordination criterion, given they were either private transactions (Table 3: Tswalu No 6; Majete No 8) involving a sale or an NGO, or were between two conservation bodies from two countries (hence having national support), where neither international (AfrSG) nor regional (SADC RMG) endorsement was sought nor required (Table 3: Mkomazi No. 3; Chiefs Island No 7), or where it was specifically a meta-population supplementation issue (Table 3: Ngorongoro No 4).

Table 3 International translocation case studies of Black Rhino involving South Africa since 1962, and the degree (well met = ☺☺☺, moderately met = ☺☺, poorly met = ☺) to which best practice criteria were met.

Case studies	Best practice criteria						Comments
	Regional coordination	Biological management	Monitoring	Protection	Capacity	Financial sustainability & incentives	
1. Introduction of 12 <i>D.b.bicornis</i> from Namibia to Vaalbos and Auwabes Falls National Parks, South Africa in 1986, with a further four in 1989 and again in 1990.	☺☺☺	☺☺	☺☺	☺☺	☺☺	☺☺	Successful, with population breeding well, although initial animals have been subsequently translocated to other larger parks. Rhinos have become an integral component of tourism activities.
2. Translocation of 27 <i>D.b minor</i> from South Africa to Malilangwe private reserve, Zimbabwe in 1998.	☺☺☺	☺☺☺	☺☺☺	☺☺☺	☺☺☺	☺☺☺	Successful. Population breeding very well. Rhinos part of the ecotourism operations.
3. Translocation of eight <i>D.b michaeli</i> from South Africa to Mkomazi Game Reserve, Tanzania between 1997 and 2001.	☺☺	☺☺	☺☺	☺☺☺	☺☺	☺	Slow to breed given an infertile adult bull. Have been some water limitations. Not linked to a tourism product.
4. Translocation of two <i>D.b michaeli</i> from South Africa to Ngorongoro Crater, Conservation Area, Tanzania in 1998.	☺☺	☺☺	☺☺☺	☺☺☺	☺☺☺	☺☺☺	Successfully added new genetic material to this inbred population.
5. Translocation of six <i>D.b minor</i> from South Africa to Liwonde National Park, Malawi in three batches of two in 1993, 1996 and 2000. This translocation involved the participation of two South African conservation organisations (SANParks & North West Parks Board(NWPB))	☺	☺	☺	☺☺	☺	☺☺☺	Although animals have bred well, calves have been predominantly , males. The small sanctuary has led to fighting. The park is incorporated into a meta-population management strategy placing excess bulls in South Africa and also in the Majete Reserve in Malawi.
6. Translocation of eight <i>D.b.bicornis</i> to Tswalu Desert Reserve, South Africa from Namibia in 1995	☺☺	☺☺	☺☺	☺☺	☺☺	☺☺☺	Bred successfully and form an integral component of the reserve's tourism operations. Bulls have been exchanged with SANParks animals to increase genetic diversity.

Case studies	Best practice criteria						Comments
	Regional coordination	Biological management	Monitoring	Protection	Capacity	Financial sustainability & incentives	
7. Three-way country arrangement where Namibia provided four <i>D.b.bicornis</i> to South Africa, who in turn provided four <i>D.b minor</i> to Botswana as a founder population established on the Momba Concession on Chiefs Island, Okavango. In return for these animals Botswana was to provide certain Antelope species to Namibia.	☺☺	☺	☺☺	☺☺	☺☺	☺☺☺	Limited success of animals moved to Botswana given the large uncontained introduction area and small founder population. The introduction of the four <i>D.b.bicornis</i> to the SANParks population has added to its genetic diversity.
8. Translocation of six <i>D.b minor</i> from South Africa to Majete Wildlife Reserve, Malawi in 2007.	☺☺	☺☺	☺☺☺	☺☺☺	☺☺	☺☺	Too early to assess success, but due to the fact that the animals have been introduced into a large, fenced sanctuary with fair habitat and good management support, it is expected to succeed. Increasing the founders should be a priority.
9. Translocation of 20 <i>D.b minor</i> from South Africa to North Luangwa National Park, Zambia from 2004-2008. A further five are to be moved in 2009, bringing the founder population to 25. Ten of the <i>D.b minor</i> were made available as part of an exchange deal between Namibia and Zambia. As Zambia was not within the former range of <i>D.b bicornis</i> , South Africa provided the <i>D.b minor</i> in a three-way exchange between Namibia, South Africa & Zambia. In exchange for the 12 <i>D.b bicornis</i> provided to South Africa, ten <i>D.b minor</i> and four White Rhino <i>Ceratotherium simum</i> were provided, the latter of which were used to supplement a small extralimital population of this species in the Sioma Ngwezi National Park, Zambia. The 25 <i>D.b minor</i> from South Africa came from SANParks, with contributions from Eastern Cape Parks Board (ECPB), North West Parks Board (NWPB) and support from Ezemvelo KwaZulu-Natal Wildlife (EKZN Wildlife). The SANParks and ECPB black rhinos were made available as part donation and exchange for the <i>D.b bicornis</i> , while the NWPB animals were a donation. In exchange for the 12 <i>D.b bicornis</i> animals, Zambia was to provide certain Antelope species to Namibia.	☺☺☺	☺☺☺	☺☺☺	☺☺☺	☺☺☺	☺	Showing signs of success, but complicated by the fact that the habitat is not ideal for black rhino. Founder number, skewed sex ratio in favour of females and the fact that most animals are young, in conjunction with good management bodes well for this population. Not linked to a tourism product. Used in a local but extensive awareness programme.

Biological management

The Malilangwe (Table 3: No 2) and North Luangwa (Table 3: No 9) operations again score highly with respect to this criterion, given that they included the correct subspecies and a sufficiently large unrelated founder population, introduced into suitable habitat able to support in excess of 50 animals.

The Liwonde (Table 3: No 5) and the Chiefs Island (Table 3: No 7) translocations were not good examples with regard to biological management, given that they were very small founder groups, with the former going into too small a sanctuary, and the latter going into too big an area where the small group of founders could not be contained to enhance associations and breeding performance. Moreover, even with subsequent introductions into adjacent extensions to the Liwonde sanctuary, the area was not consolidated, exacerbating the situation further. This led to the Rhino sanctuary becoming a major physical barrier to other species occurring within the park.²⁹ It is, however, worth stressing that the introduction into Liwonde was relatively early in the Black Rhino reintroduction programmes and thus preceded a lot of the best practice principles that later emerged from an assessment of the findings from the status reporting system.

The remaining translocations were considered to moderately meet biological management criteria, given that the areas were generally considered to be marginally too small or have an insufficiently founder number.

Monitoring

Comprehensive individual and population monitoring programmes have been instituted in about half of the cases described (Table 3: Malilangwe No. 2, Ngorongoro No. 4, Majete No. 8 & North Luangwa No. 9) that allowed one to track individual and population performance in detail.

Liwonde National Park has possibly the

weakest monitoring programme given its limited human and resources capacity. What monitoring is undertaken is done so on a voluntary basis by an NGO.

All the other translocations had moderately effective monitoring programmes in place.

Protection

More than half of the translocation sites had good protection measures in place (Table 3). This reflects the emphasis placed upon this easily understood aspect of protected area management, for which sufficient resources are required for effective protection.³⁰

All other translocation sites appeared to have moderately effective protection measures in place. The Liwonde sanctuary and the Chiefs Island areas (Table 3: Nos 5 & 7) had a small but dedicated team of field rangers, both with support from a local NGO. The Chiefs Island animals are granted further protection by a monitoring support team from a local tourism concession, which linked the Rhinos to their commercial tourism operations.

Capacity

A third of the sites appeared to have sufficient capacity in the form of personnel and financial resources (Table 3: Malilangwe No 2, Ngorongoro No. 4, North Luangwa No 9). Two of these sites (Malilangwe and North Luangwa) are largely privately funded. The Ngorongoro site has local support, supplemented by FZS funds.

Some concerns were raised by the AFRSG as to the sustainability of the Mkomazi project (Table 3: No 3) given that it was primarily driven by a single individual (Knight, personal correspondence) with support from a small NGO, although the Tanzanian national Department of Wildlife fully supported the project. Ideally, the sustainability of projects in terms of project management staff and financial support should

be emphasised for all such projects given their generally long time frames.

The Liwonde National Park site appears, as mentioned earlier, to be the one area with the greatest shortfall in capacity. The issue of institutional sustainability was an issue of concern.³¹ This in itself was linked to the relatively poor protection and monitoring programme.

All other sites appeared to be moderate with respect to meeting capacity needs.

Financial sustainability & incentivised conservation

Five of the cases showed some commercially incentivised activities directly associated with the introduction of Black Rhinos as follows:

- Malilangwe (Table 3: No 2) involved a private financial acquisition of the animals which resulted in a major cash injection into the donor organisation (EZKN Wildlife). In addition, the animals are directly linked to an upmarket tourism product, thus increasing their overall value. Moreover, the project saw new genetic stock being added to the Zimbabwe population, thus increasing overall genetic diversity of their population as well as promoting the value of meta-population management.
- Although the two Rhinos introduced into the Ngorongoro Crater population (Table 3: No 4) were primarily for genetic reasons, the crater's Black Rhinos are linked to a well established tourism industry, where the Black Rhinos remain one of the prime tourism attractions.
- The Black Rhino sanctuary in Liwonde National Park (Table 3: No 5) is linked to a successful private tourism concession in the park. The sanctuary's close proximity to the lodge enhances its overall value to the tourism operation. The sanctuary does not receive any direct financial return from the tourism activities, although monitoring staff are provided free accommodation in lodge facilities.
- The Liwonde sanctuary has fulfilled a major role in conserving viable populations of otherwise threatened species in Malawi such as roan antelope *Hippotragus equinus* and Lichtenstein's hartebeest *Sigmoceros lichtensteinii*. These animals have formed the basis of founder populations for other protected areas in Malawi, such as Majete Wildlife Reserve.³² Although the sanctuary is considered to be too small and strategically impacting on the greater park's ecology, the introduction of Black Rhinos to Malawi has given the national conservation authority (National Parks & Wildlife) greater focus and pride. The Rhinos also provided Liwonde National Park with a unique attraction over other products in Malawi. With few Black Rhinos, possibly considered to be of limited international strategic significance, they are of great national importance to Malawi in highlighting the plight of this species that used to occur in many of its reserves until relatively recently. The Rhinos have also increased the profile of Liwonde National Park and the national conservation authority.
- The eight *D.b. bicornis* introduced into Tswalu Desert Reserve (Table 3: No 6) were a result of a private acquisition from Namibia. Although these funds went directly into Namibian national coffers, the sale would have increased the monetary and existence value of this important species in the country. Further auctions followed this first one on a two-yearly basis. In addition, the Tswalu animals were directly integrated into the reserve's upmarket tourism operation, with the Rhinos as one of their prime and guaranteed game-sighting attractions.
- The Chiefs Island animals (Table 3: No 7) introduction was part of a national swap between Botswana and Namibia, with Namibia providing Black Rhino in exchange

for plains game from Botswana. A tourism operator helped with both the introduction and regular monitoring, thus adding to their tourism product.

Besides the benefit of the exchange arrangement between Zambia and Namibia, with Zambia having to provide plains game species in exchange for the Namibian *D.b. bicornis* Black Rhino, there appears to have been limited commercial benefits to the introduction of Black Rhino to the North Luangwa National Park (Table 3: No. 9). The park has no tourism-related operations. The value of the Rhinos to the Zambian Wildlife Authority (ZAWA) and supporting private institutions primarily lies in their existence value, given that this was the first reintroduction after this species was exterminated from Zambia, and the fact that the Black Rhinos' endangered status carries a huge ecological and management responsibility. The cash-strapped ZAWA rose to the challenge in providing a large, well-trained ranger team to protect and monitor the sanctuary.³³ The provision of Black Rhinos by the donor organisations (SANParks, ECPB, NWPB, and now EKZN Wildlife) to a worthy conservation project, also gave the donors some pride and publicity value. This point was particularly important to the newly formed ECPB in donating their animals to the project as it improved their sense of international conservation worth.

The introduction of Black Rhinos into Mkomazi Game Reserve (Table 3: No 3) appears to have limited commercial incentive on the recipient side, as there was no ecotourism operation in place, with the greater benefit coming from the Rhinos' existence value in a once important Black Rhino area. The Rhinos are used in extensive awareness programmes run by the privately managed reserve. The establishment of the Rhino population later contributed to the reserve being upgraded to national park

status³⁴. The incentives to SANParks were partially financial, with a financial donation for the Rhinos returned directly to the organisation's conservation efforts, as well as the pride associated with re-establishing Black Rhinos into an important former range area. This effort was important as it was the major precursor to SANParks relinquishing its extralimital population of *D.b. michaeli* population which it had received from Kenya in the 1960s to make the important Addo Elephant National Park available for the local *D.b. bicornis* subspecies.

The introduction of Black Rhinos to Majete Wildlife Reserve (Table 3: No 8) is expected to play an increasingly important ecotourism role in the business plan for the reserve.³⁵ This reserve had to be restocked with most game given earlier rampant poaching. Professional hunting will be used to provide necessary income until such time as the game populations are of suitable sizes to sustain an ecotourism industry, after which hunting will be phased out.

The introduction of *D.b. bicornis* into Augrabies Falls and Vaalbos National Parks (Table 3: No 1) was primarily focused on their existence value to SANParks, given it was the first introduction of this extirpated subspecies to South Africa. The commercial value of the Rhinos to both parks was secondary. A dedicated rhino experience ecotourism operation was later started in Augrabies, while in Vaalbos it formed part of a small general tourism experience.

Political goodwill

Although rarely quantified, these black rhino translocations served to develop political communication and goodwill between the states involved. This occurs through the fact that movements of such high-profile species invariably require high-level political support, both within and between states. This improves the communication between politicians on an international

level, particularly as these interactions are on environmental grounds, which tend to be politically neutral and hence supportive of positive dialogue. This aspect is however poorly understood and requires more research.

Conclusion

The above case studies of Black Rhino reintroductions provide different examples of how this endangered species has both furthered international conservation efforts and, importantly, black rhino conservation as a whole within Africa. The reintroductions have led to a greater realisation by participating range states that black rhino conservation would be further improved through international cooperation.

This has seen populations being re-established in areas (Table 3: such as Mkomazi Game Reserve, Tanzania; Liwonde National Park and Majete Wildlife Area, Malawi; Chiefs Island, Botswana; Au-grabies Falls and Vaalbos National Parks, South Africa; North Luangwa National Park, Zambia) from which Black Rhinos were exterminated. The Black Rhinos have also become a flagship species that have provided both greater national impetus and status to the protected area (Mkomazi Game Reserve, Liwonde National Park, North Luangwa National Park). This in turn has seen protection being extended to other species within the protected area or sanctuary. This has happened notably in Mkomazi Game Reserve, Liwonde National Park, Majete Game Reserve and North Luangwa National Park. In the case of Mkomazi, the black rhino sanctuary provided an additional catalyst towards re-establishing the reserve, which in turn has seen it be proclaimed as a national park. Both the North Luangwa and Liwonde National Park reintroductions have played important national roles in improving conservation focus and pride

in countries that had lost their Black Rhinos through rampant poaching.

The reintroductions have also played a major role in sharing knowledge and expertise on Rhino conservation with the former range states. Besides enhancing Rhino conservation in their countries, witnessed through increasing Black Rhino population sizes (Table 3) and a general lack of poaching, it has established a network of conservation scientists and managers, sharing knowledge and experiences and a general increase in trust. This in turn has laid the basis for further reintroductions, as witnessed in the three separate introductions into North Luangwa National Park, the meta-population exchange and management with Liwonde National Park, and the supplementation of the Mkomazi population. The principles associated with best management practice have also been shared between conservation organisations. In this regard, with the regional establishment of Black Rhino populations in Liwonde National Park and Majete Wildlife Reserve in Malawi, and the adjacent North Luangwa population in Zambia, the idea of a meta-population exchange between these populations in the future has been promulgated.³⁶ The IUCN AFRSG has also played a major role in promoting knowledge sharing and the required networks to promote international Rhino conservation³⁷ between Black Rhino range states.

In all cases the reintroductions have followed the precautionary principle of re-establishing populations of the appropriate subspecies. Unfortunately, the same has not been applied as best practice with regard to the establishment of extralimital populations of White Rhinos in Kenya and Zambia³⁸ and other numerous species such as in the Eastern Cape, South Africa.³⁹

Some of the Black Rhino introductions involved considerable risk given threats of poaching such as in Liwonde National Park, local antagonism such as in Mkomazi Game Reserve,⁴⁰

the possible long range movements of the introduced animals away from the introduction and protection area, as occurred in the Chiefs Island introduction, and insufficient founder numbers for both Liwonde National Park, and Chiefs Island (Table 3). All of these projects, with the exception of the population on the Botswanan Chiefs Island,⁴¹ are growing and thus successful in their own rights. These projects in themselves have greater socio-political-ecological-economic spin-offs that would collectively exceed the actual commercial value of the Rhinos themselves, given the greater national existence value. The Liwonde National Park population reflects this very well.⁴² With the establishment of the Majete population in Malawi, there is scope to radically improve the biological management of the country's Black Rhino population.

No international translocations involved a direct Rhino investment strategy as is currently being advocated in the Black Rhino range expansion project in KwaZulu-Natal, South Africa.⁴³ This project may provide some innovative ideas to extend this concept into an international context.

Although the ideal would be to establish sufficiently large numbers in large areas, such as Malilangwe and North Luangwa National

Park, these circumstances do not always exist. As such, any introduction should be weighed up for its socio-political-ecological-economic merits. In some situations, although a relatively small number of founders may be introduced, there is always the chance further animals may be sourced at a later date to add to the genetic pool. This happened in the North Luangwa National Park project, with subsequent translocations being introduced into adjacent fenced-off sanctuaries, with the intention to drop internal fences once all founders are in place.

Thus, from an international conservation perspective, the re-establishment of Black Rhinos in their former range is an excellent example of international collaboration of conservation and best practice. It would be ideal to incorporate the lessons learnt here (namely the need for international/national conservation plans, cooperative advisory groups (such as the SADC RMG), accepted principles for biological management, and areas integrity) to other such international conservation projects. The role of conservation and environmental management projects in providing neutral grounds for developing higher level international collaboration within Africa merits further research.

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