

Government Gazette Staatskoerant

REPUBLIC OF SOUTH AFRICA
REPUBLIEK VAN SUID-AFRIKA

Vol. 551

Pretoria, 24 **May** 2011
Mei

No. 34304

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GENERAL NOTICE

NOTICE 302 OF 2011

DEPARTMENT OF ENVIRONMENTAL AFFAIRS

NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004)

DRAFT BIODIVERSITY MANAGEMENT PLAN FOR *DICEROS BICORNIS*

I, Bomo Edith Edna Molewa, Minister of Water and Environmental Affairs hereby publish in terms of section 43(3)(a) read with section 100 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), a draft biodiversity management plan for *Diceros Bicornis* in the schedule hereto.


Interested persons are requested to submit written representations on, or objections to the draft plan to the Minister. All such representation or objections must be submitted in writing in the following manner:
Director-General: Environmental Affairs.

Delivered to: The Department of Environmental Affairs
Attention: Ms Humbulani Mafumo
Fedsure Forum Building
(North Tower: Office 1305)
315 Pretorius Street
PRETORIA
0002

By post to: The Director-General
Department of Environmental Affairs
Attention: Ms Humbulani Mafumo
Private Bag X447
PRETORIA
0001

By fax to: (012) 320 2844; or
By e-mail to: hmafumo@environment.gov.za

Comments must reach the department within **30 working days** of the publication of this notice.
Comments received after the closing date may not be considered.


BOMO EDITH EDNA MOLEWA
MINISTER OF WATER AND ENVIRONMENTAL AFFAIRS
DATE: 10-3-2011



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

SCHEDULE

**BIODIVERSITY MANAGEMENT PLAN
FOR THE
BLACK RHINOCEROS (*Diceros bicornis*)
IN SOUTH AFRICA
2010-2020
(2010)**

**Jointly developed by South African members of the
SADC Rhino Management Group (RMG)**

Knight MH¹, D Balfour² & RH Emslie³

¹Park Planning & Development, Conservation Services, South African National Parks, & Centre for African Conservation Ecology, Department of Zoology, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa

² Eastern Cape Parks Board, East London, South Africa.

³ IUCN African Rhino Specialist Group, Hilton, South Africa

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ACRONYMS

AfRSG:	African Rhino Specialist Group of the SSC of IUCN
CBD:	Convention on Biological Diversity
CITES:	Convention in Trade in Endangered Species
COP:	Conference of Parties
DWEA:	Department of Water & Environmental Affairs
IUCN:	International Union for Conservation of Nature
NEMBA:	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
SADC:	Southern African Developing Community
SADC RMG:	SADC Rhino Management Group
SADC RPRC:	SADC Regional Programme for Rhino Conservation
SADC RRG :	SADC Rhino Recovery Group
SANParks:	South African National Parks
SSC:	Species Survival Commission (of the IUCN)
ToPS:	Threatened or Protected Species (commonly refers to the regulations issued in terms of NEMBA)
ECWG:	Environmental Crime Working Group
RESG:	Rhino & Elephant Security Group.

1. EXECUTIVE SUMMARY

Status of black rhinos in South Africa

The African black rhino, *Diceros bicornis* is listed internationally by the IUCN as *Critically Endangered* and as an endangered species under the national ToPs regulations. Primarily as a result of heavy commercial poaching of the animal for its horn as well as through habitat loss, the continental population crashed from around 65000 in 1970 to less than 2,500 in the early 1990s. Through strict conservation programmes, the numbers in Africa have since increased, reaching 4,200 by 2007 (Fig. 1).

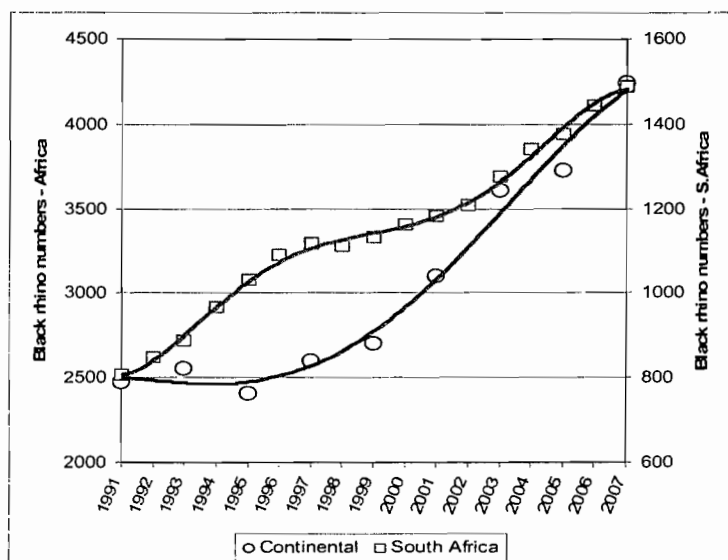


Figure 1: Trends in black rhino numbers since 1991 in Africa and in South Africa

South Africa's role in black rhino conservation was initially relatively small, increasing substantially more recently. The national population was reduced to about 110 animals in 1935, or less than 0.1% of the continent's population. By 2008 the South African population had increased to 1,750 animals (approximately 35% of the African estimate). This increase in the South African contribution was largely a result of successful conservation measures, and the declining populations in many other African range states.

Two of the now three extant subspecies of black rhinos occur in South Africa, namely the southern central *D. b. minor* and the south-western *D. b. bicornis* black rhino. South Africa (and to a much lesser extent Zimbabwe) are the remaining main strongholds of the *D. b. minor*, with South Africa conserving 1,550 or 66% of this subspecies in 2008. South Africa also currently conserves the only populations of *D. b. bicornis* outside Namibia, as well as having a single population of the "out-of-range" eastern black rhino (*D. b. michaeli*), indigenous to East Africa.

By 2008 South Africa conserved three of Africa's six IUCN SSC AfRSG rated **Key1** black rhino populations of continental significance and a third of the other rated **Key** and **Important** populations. South Africa's black rhino conservation effort, is therefore of continental importance. South Africa has justly been recognised as a world leader in rhino conservation, and has an important role to play in conserving both the black and white rhino for future generations.

The South African Black Rhino Conservation Plan for 2010-2020

The current plan is a third revised edition following the first and second editions that were drafted in 1989 and 1997, respectively. This version of the plan is drafted in accordance with national regulations for species biodiversity management plans (see Section 43 (1)(b) and (c) of NEMBA). The plan was jointly developed by South African members of the SADC Rhino Management Group (RMG).

The plan has a **Vision, Long- & Short-term Goals**, under which are **Objectives**, with their **Actions** and **Indicators**.

The **Long-term Vision** for the South Africa black rhino population is to:

‘Contribute to the recovery and long-term persistence of the global black rhino population by having viable populations of the indigenous subspecies in natural habitat throughout their former range within South Africa and managed as part of a regional metapopulation.’

with a metapopulation goal of:

‘Having at least 3,000 *D. b. minor* and 500 *D. b. bicornis* in South Africa, with at least four *D. b. minor* populations greater than 100 and another 10 greater than 50; and at least one *D. b. bicornis* population greater than a 100 and one greater than 50.’

The **Short-term (10 year) Conservation Goal** will attempt to achieve the following population targets of:

- **An average South African metapopulation growth rate for both of the two indigenous subspecies of black rhino of at least 5% per annum, and**
- **Metapopulation sizes in South Africa of at least 2,800 for *D. b. minor* and 260 for *D. b. bicornis* by the end of 2020**

These will be achieved via the following six **Key Components**

- **Biological Management** will endeavour to achieve sustainable meta-population growth through a harvesting regime of 5% per annum where required; maintenance of a genetically diverse population, establishment of new populations, and management of surplus males via various means, inclusive of limited and regulated hunting of bulls.
- **Population monitoring** will be employed to provide accurate and precise information on black rhino populations to allow management to make informed decisions.
- **Protection** remains a key activity to minimize losses of rhinos from illegal activities and will be achieved through effective law enforcement, improved neighbour relations, effective criminal investigations and prosecutions, and securing and monitoring rhino horn stockpiles.
- **Coordination of conservation management** of black rhino populations through the re-formalization of the South African Rhino Management Group (RMG) and development and implementation of rhino conservation plans by all conservation and private owners with black rhinos.

- **Human Resources** will be assessed and developed to provide the required skills to protect and manage black rhinos.
- **Economic & social sustainability** of the programme also needs to be addressed to ensure political and social support for rhino conservation efforts.

The plan also lists a number of *Indicators* that can be used to assess progress towards meeting the Conservation Goals

The plan does not seek to set out a detailed Action Plan as this is best done annually by each management authority. Rather it provides strategic direction and advice based on lessons learned and recommended best practices.

2. BACKGROUND

The black (*Diceros bicornis*) and white rhinoceros (*Ceratotherium simum*) are native to Africa with the white rhino being the second largest land animal. The black rhinoceros was historically found throughout sub-Saharan Africa, with the exception of the moist Congo Basin. This browsing mega-herbivore normally occurred in relatively low densities throughout its range. Primarily as a result of heavy commercial poaching of the animal for its horn and habitat loss, the population crashed in the 1960s, 1970s and 1980s bottoming out at a low of 2,400-2,500 in the early 1990s. Through strict conservation programmes, the numbers in Africa have since slowly increased, reaching 4,200 black rhinos by 2007 (Emslie 2008).

Although Africa had four recognized black rhino subspecies (du Toit *et al.* 1987), there are now only three as one (*D. b. longipipes*) has recently gone extinct and two of these are indigenous to South Africa (South central *D. b. minor* and the South western subspecies *D. b. bicornis*). Over and above this there is currently a single extra-limital population (Eastern subspecies *D. b. michaeli*) in South Africa.

The black rhino is listed under the international IUCN Red List as Threatened - Critically Endangered (IUCN SSC African Rhino Specialist Group, 2008), while locally Friedmann & Daly (2004) considered the *D.b bicornis* and *D.b minor* subspecies to be Critically Endangered and Vulnerable, respectively. Black rhinos (with no subspecies distinction) are listed as an endangered species according to the South African List of Threatened or Protected Species (ToPS) in terms of section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA). Thus, the national norms and standards require the development of a species biodiversity management plan (BMP-S). Furthermore, the listing of black rhinos on Appendix I of CITES requires the highest level of national and international control, particularly when it comes to international trade in the animal or its parts.

The current plan is a third revised edition following the first and second editions that were drafted in 1989 and 1997, respectively. The plan was jointly developed by South African members of the SADC Rhino Management Group (RMG) (see 2.10 below).

The purpose of this plan, in terms of the Act, is to ensure the long-term survival in nature of the species and provide for the responsible person, organization or organ of state to monitor and report on the progress with implementation of the plan; and in line with other related legislation.

2.1 Rhinos as flagship species

Rhinos act as “flagship species” as they require large areas and significant protection measures that help to conserve a wide range of biodiversity (du Toit 2006). The fact the species is both rare and charismatic attracts donor and state support. Rhinos are a major attraction for ecotourists, with 7-14% of total wildlife viewing value ascribed to rhinos (Spenceley and Barnes, 2005). Moreover, they have considerable value fetching prices in excess of R500,000 per animal on auctions.

2.2 South African Legislation and Relevant International Conventions

2.2.1 South African National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA)

The Act which fits under the NEMA framework provides for the management and conservation of biological diversity and the sustainable use of indigenous biological resources.

2.2.2 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004): Threatened or Protected Species Regulations (TOPS)

New regulations for Threatened or Protected Species (ToPS) came into force in February 2008. The regulation provides for the protection of species that are threatened or in need of protection to ensure their survival in the wild. These require a permit to be issued in order for a person to carry out a listed restricted activity concerning black rhino.

2.2.3 National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) (NEMPAA)

NEMPAA provides for the protection and conservation of ecologically viable areas representative of South Africa's biodiversity, natural landscapes and seascapes in protected areas, in turn the protection of free-ranging black rhino populations.

2.2.4 Other relevant South African Legislation

In addition to the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), the provincial conservation legislation forms the major regulatory instruments for the management of wild plant and animal species in South Africa. Supporting decision making instruments include national norms and standards and provincial policies. Other Acts such as the Animals Protection Act, Animal Health Act, Animal Diseases Act, Medicines and Related Substances Control Act and the Animal Matters Amendment Act are relevant to black rhino conservation.

2.2.5 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

South Africa is a Party to the CITES which governs and controls international trade in endangered species. The black rhino is listed in Appendix I of CITES which requires the highest levels of trade control. CITES can make recommendations with regard internal management and conservation, it is not binding on the Parties.

2.2.6 Convention on Biological Diversity (CBD)

South Africa is a signatory to the CBD and as such has an international responsibility to conserve the two indigenous subspecies of black rhino found in South Africa. NEMBA arose out of this Convention. The objectives of the Convention are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

2.2.7 SADC Protocol on Wildlife Conservation and Law Enforcement

The SADC Protocol on Wildlife Conservation and Law Enforcement provides a clear rationale for ensuring that any national or regional goals for rhino conservation refer to the interdependency between human welfare and the sustainable management of wildlife resources, within which the “flagship” role of rhinos is highlighted. The implementation of rhino conservation projects with a development orientation is also in accordance with one of the ten principles that were expressed in the “Agenda for Action” that was drafted at the World Parks Congress in Durban in 2003.

2.2.8 Lusaka Agreement

The Lusaka Agreement, of which South Africa is a signatory, is a treaty between many African nations that seeks to “reduce and ultimately eliminate the illegal trade in wild fauna and flora and to establish a permanent Task Force for this purpose.”

2.3 Continental and National Black Rhino Trends – The importance of South Africa

High levels of poaching was primarily responsible for the crash in black rhino numbers from a continental population of approximately 100,000 in 1960 (Cumming *et al.* 1990.) to a low of 2,410 in 1995. Since then, and with concerted conservation action, continental numbers have increased reaching 4,240 by 2007 (Emslie 2008). The species remains listed on the IUCN’s Red as Critically Endangered.

In 1980 the South African population of black rhino was approximately 630, accounting for < 5% of the continental population. By the end of 2008, South Africa conserved more black rhinos (1750) in the wild than any other range State and accounted for approximately 35% of the continental total. Thus the global importance of the South African population has increased dramatically over the past 30 years.

In 2008 the bulk of the black rhino in South Africa were the south central black rhino (*D. b. minor*) with South Africa conserving approximately 1550 (or 66%) of this subspecies.

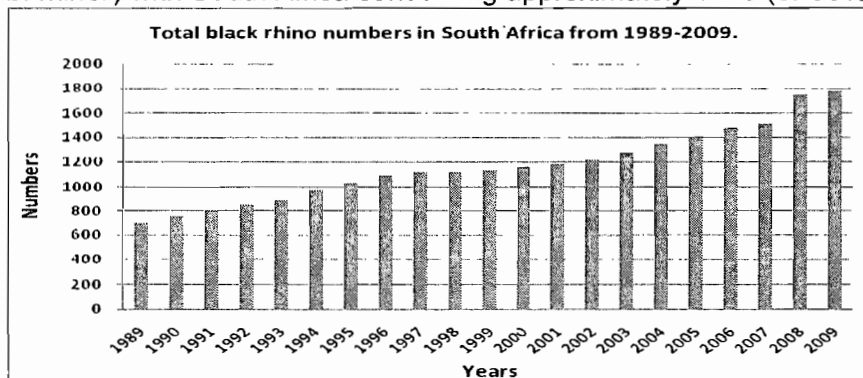


Figure 2: Numbers of black rhino (of all three sub species) in South Africa between 1989 and 2009. The pattern primarily reflects the trends in the most numerous subspecies *D.b minor*.

These animals were distributed through 40 populations in the country. South Africa also has the only populations of south western black rhino (*D.b. bicornis*) outside of Namibia. At the end of 2008 there were 142 *D.b. bicornis* in South Africa, making up 7.5% of the continental total. As of the end of 2008 South Africa also managed an estimated 7.7% (61 animals) of the “out of range” *D.b. michaeli* subspecies.

2.4 Subspecies / ecotypes in South Africa

2.4.1 Taxonomy

There were four recognized subspecies of black rhino in Africa (du Toit 1987). Two of these are indigenous to South Africa. They are *D. b. minor* and *D. b. bicornis*. In addition to this there are a further two subspecies. These are *D. b. michaeli* and *D. b. longipes*, the latter of which is now extinct (Emslie 2008). Historically the boundaries between the two black rhino subspecies indigenous to South Africa were not “hard-edged”. However, differences in the habitat and climates in the core areas of the two subspecies suggests that local adaptation, and thus differentiation, had begun to take place between them. Thus, for practical and conservation reasons, it is currently preferable to prevent the subspecies mixing. Based on expert knowledge and consensus, boundaries of the distribution of the subspecies, for management purposes, are presented in the figure below.

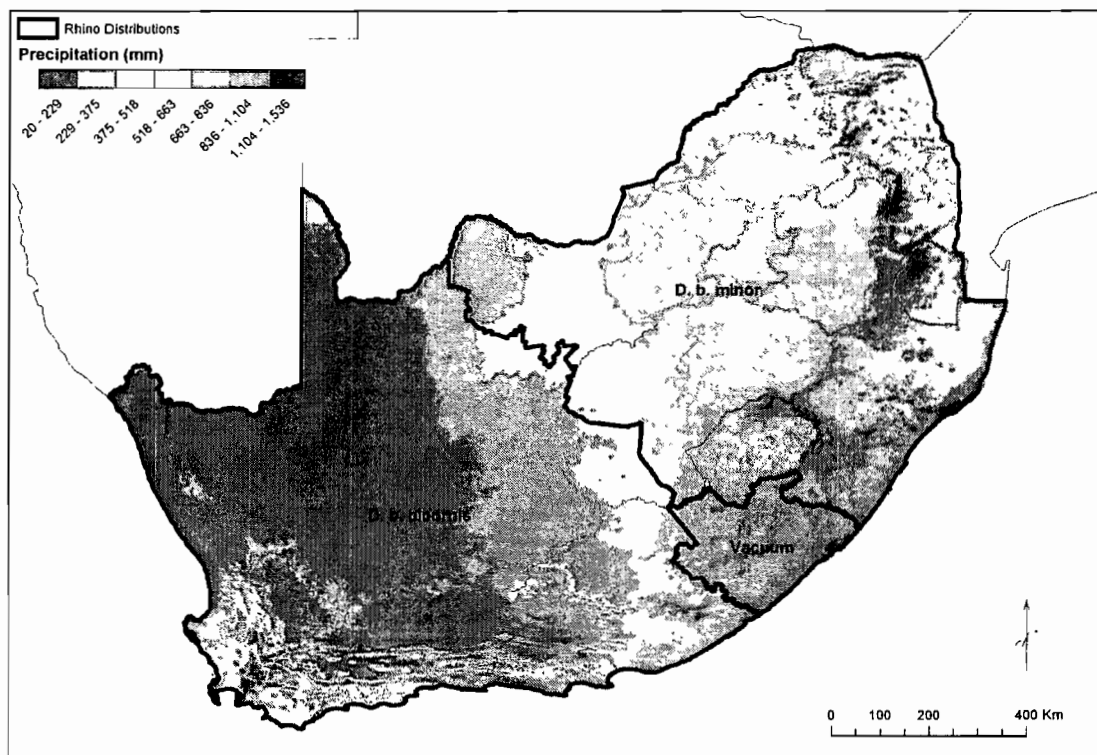


Figure 3: Distribution range for the management of the black rhino subspecies in South Africa. It is important to note that some areas marked as subspecies range in the Figure

contain unsuitable or marginal habitat in which rhinos were probably either absent or at very low densities in historical times. Refer to Annexure 1 for more details.

Trends in the populations of the individual sub species since 1989 are presented in the Figure 4. From this it is clear that they have different dynamics and it is important to understand the causes of these trends for management purposes.

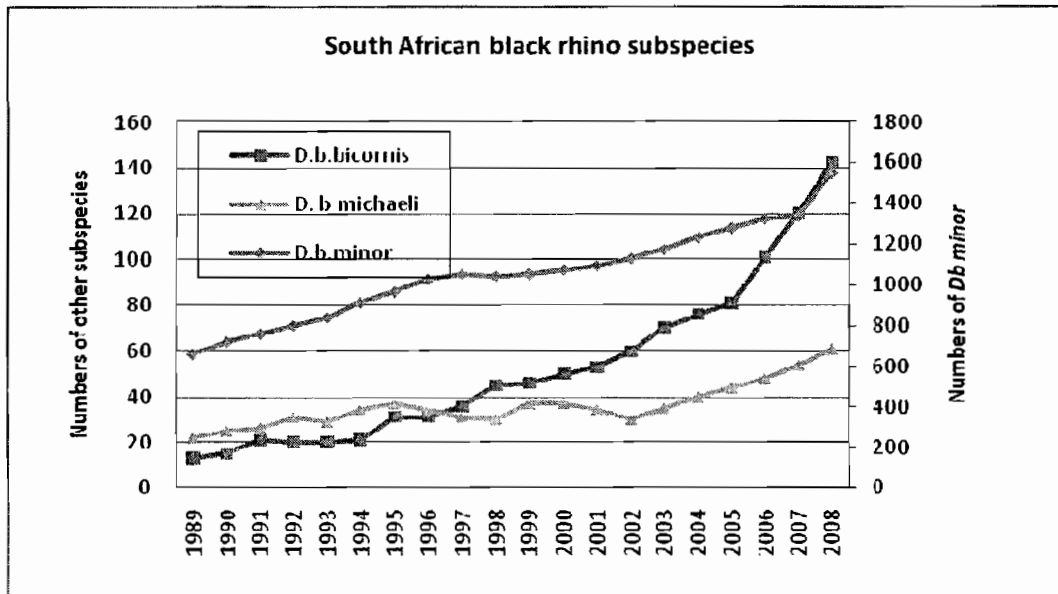


Figure 4: Increase in the population size of the three subspecies of black rhino in South Africa since 1989. NB. These figures include translocations into & out of the country.

2.5 ROLE OF THE SADC RMG

In recognition of the important role of regional cooperation in the management of black rhino, the Rhino Management Group (RMG) was founded in 1989 by South Africa and Namibia and later joined by Swaziland and Zimbabwe. The RMG was formally signed-off by all South African Provincial agencies and SANParks, giving it its mandate at the time. This body gained further political support since 2001 when it was renamed to the SADC RMG with it falling under the SADC political umbrella and comprised representatives from each of the following bodies:

State conservation agencies in South Africa, Namibia, Swaziland and Zimbabwe:

South Africa:

- Department of Environmental Affairs (DEA)
- Eastern Cape Parks and Tourism Agency
- Ezemvelo-KZN-Wildlife
- Free State Department of Tourism, Environmental and Economic Affairs,
- Gauteng - Department of Agriculture, Conservation & Environment – Directorate of Nature Conservation

- Limpopo Department Economic Development, Environment and Tourism – Chief Directorate – Environment
- Mpumalanga Tourism and Parks Agency,
- Northern Cape Department of Environment and Nature Conservation,
- North West Parks and Tourism Board;
- South African National Parks
- Cape Nature

Namibia:

- Namibian Ministry of Environment and Tourism including National Rhino Coordinator and manager of the Custodianship Programme

Swaziland:

- Big Game Parks of the Kingdom of Swaziland

Zimbabwe:

- Zimbabwe Parks and Wildlife Management Authority

Private owners of free-ranging rhinos in South Africa:

Representatives of private and communal owners of black rhino.

The SADC RMG's role is to further regional cooperation amongst rhino range states and to assist the various conservation agencies and private landowners in achieving the conservation goals for black rhinos.

3. PLAN STRUCTURE

The current South African black rhino conservation plan has a logical structure with a 10 year time horizon with annual targets schematically illustrated in Figure 5. This chart shows how all the identified *Key Components* feed in to meeting the *Conservation Goals*, and that meeting these Goals will make a contribution towards the longer-term *Vision*. The diagram also shows that a series of *Actions/Strategies* are required to meet each *Key Component Objective*. In the body of the plan, each *Key component* (together with its associated *objective, rationale, strategies/actions* and *indicators of success*) is dealt with below. The main body of this plan outlines the key actions needed and additional detail and references for more information can be found in the attached Appendices.

3.1 VISION AND LONG-TERM GOAL

Mindful of South Africa's role in the conservation of the *Critically Endangered* (IUCN Red List) black rhino *Diceros bicornis*, the vision for the species in South Africa is:

3.1.1 Vision

Contribute to the recovery and persistence of the global black rhino population by having viable¹ populations of the indigenous subspecies in natural habitat throughout their former range within South Africa and managed as part of a regional metapopulation².

3.1.2 Long-term population goal

To have at least 3,000 *D. b. minor* and 500 *D. b. bicornis* in South Africa³, with at least four *D. b. minor* populations greater than 100 and another 10 greater than 50; and at least one *D. b. bicornis* population greater than a 100 and one greater than 50.

¹ Viable = populations are secure, breeding, and managed as a metapopulation on the basis of their cultural and socio-economic value.

² A metapopulation consists of a group of spatially separated populations of the same species which interact at some level (Levins 1969).

³ The South African *D.b.minor* target has been increased as 1) Ezemvelo-KZN-Wildlife has set its own provincial target of 1,000, and the revised Strategic Plan for Conservation of Rhino in SANParks sets a goal of 2,000; and 2) because Lande (1998) has suggested that the Franklin-Soule estimate of desirable minimum effective number for long term genetic viability should be increased by a factor of 10 to $N_e = 5,000$ and if the effective number is only a quarter of actual numbers, this means we ideally need to aim for a long term metapopulation size of 20,000 instead of only 2,000. The bigger the longer term vision in terms of rhino numbers – the more any national conservation effort will have to form part of a regional metapopulation management conservation programme.

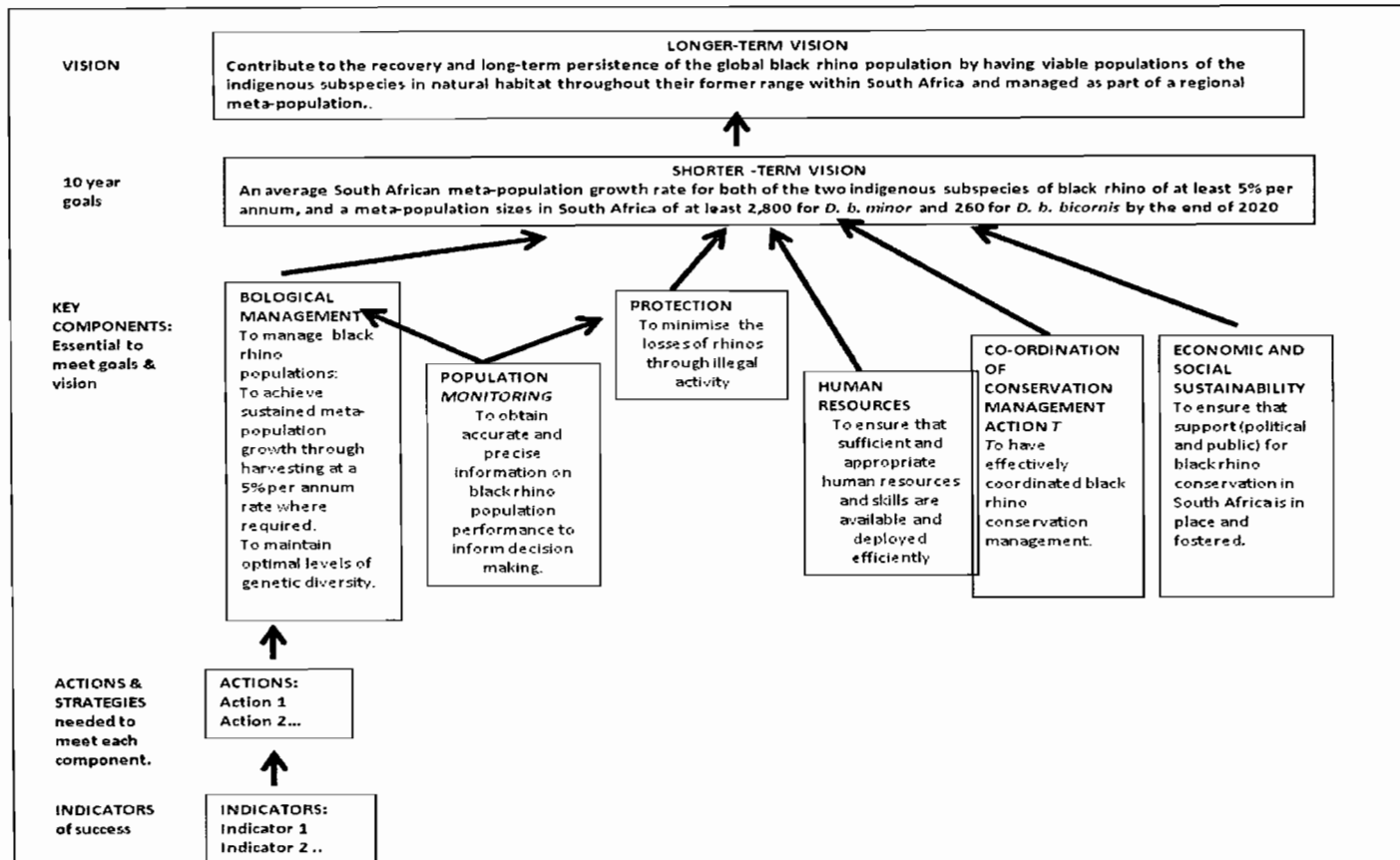


Figure 5: The South African black rhino conservation plan structure at a glance. See Key Component sections for a list of recommended actions and indicators.

4. SHORT-TERM (10 years) GOALS AND TARGETS

4.1 Population targets

To achieve:

- **An average metapopulation growth rate¹ for both of the two indigenous subspecies of black rhino of at least 5% per annum.**
- **Metapopulation sizes of at least 2,800 for *D. b. minor* and 260 for *D. b. bicornis* by the end of 2020^{2,3}**

- ¹ This growth rate reflects the underlying growth rate of the metapopulation – i.e. is independent of any increases or decreases in numbers due to export or import of rhino out or into the country.
- ² In addition to domestic South African targets, at the end of the Plan lifespan a separate assessment should also be undertaken of the performance of populations in other range states that have been established with exported South African rhinos (for the Plan period 2010-2020 as well as to date).
- ³ Progress against metapopulation targets should be assessed regularly and not just at the end of the plan lifespan and annual targets should be adjusted to reflect any imports or exports of animals into or out of the country

5 KEY COMPONENTS

5.1 BIOLOGICAL MANAGEMENT

5.1.1 Objective

To manage black rhino populations:

- **To achieve sustained metapopulation growth through harvesting at a 5% per annum rate where required.**
- **To maintain optimal levels of genetic diversity.**

5.1.2 Actions/Strategies

5.1.2.1 Harvesting for Growth

- Current population theory suggests that (unless the carrying capacity (or zero growth population density) is declining or removals exceed maximum potential growth rates) by harvesting at a fixed rate per annum, the population should respond by growing at least at that rate. Thus, by harvesting from populations (where necessary) at 5% we are attempting to ensure that remaining animals in these populations continue to grow at this predetermined target rate. Harvesting also provides rhinos that can be used to set up new populations with the potential for rapid population growth. Thus harvesting is a win-win strategy, which should both maintain or enhance population

vigour in the harvested population whilst also enhancing overall metapopulation growth. Should rhino carrying capacity (zero growth density) change in populations being managed using set % harvesting, rhino densities should simply adjust to a new higher or lower level that can support the given % removal. On the other hand, a failure to reduce densities of populations approaching or above zero growth densities by at least 5%/annum is likely to negatively impact on habitat and ultimately reduce population growth rates to below minimum target levels.

5.1.2.2 Establishing New Populations

- Follow IUCN, IUCN SSC AfRSG and SADC RPRC recommended best practices (see du Toit 2007 – downloadable link below and IUCN SSC African and Asian Rhino Reintroduction and Translocation Guidelines (available from the AfRSG webpage & Rhino Resource Centre (www.rhinos-irf.org/afRsg)). Some salient points include:
 - Establish more larger populations, and wherever possible set up populations with a minimum number of 20 unrelated founder rhino (to maximize genetic diversity) with the potential to carry at least 50 animals.
 - Provide suitable rhino habitat, within the former range of the subspecies.
 - Do not stock with more than 40% of the estimated capacity for the area in question.
 - Attempt to introduce the founders together in a distributed pattern as per the above guidelines. Where possible, use founders from several sources.
 - The founder population sex ratio should ideally be skewed in favour of breeding females but not to the detriment of the donor population/s. In addition, the founders should be young breeding adults, avoiding sub-adults, calves and old animals.

5.1.2.3 Subspecies and Range Separation

- Black rhino subspecies should NOT be mixed.
- Hard boundaries for subspecies have been proposed to guide management (see Fig. 3)
- Existing populations falling out of these guidelines can remain but all future initiatives should align with the guidelines.
- The single existing *D.b.michaeli* population in South Africa should be repatriated to their former range. They should not be allowed to expand their range beyond their current ownership in South Africa. For this reason no national target has been set for this subspecies.

5.1.2.4 Additional Management to Promote Long-Term Genetic Viability

- Introduce 'new blood' by introducing an unrelated individual every generation (10 years) per population, but this is dependent upon the population size and demographics. The introduction of adult females is generally more successful given the aggression of adult males.
- In small populations adult male swaps may be successful, and in populations with two adult males, removing the dominant male should be considered every generation.

5.1.2.5 Surplus Males

- In the context of managing black rhino populations, notably smaller ones, that demographic skewing of the population in the favour of males is likely to occur. This can have a negative impact on the population breeding performance and genetic status. These bulls are commonly known as 'surplus males'.

- The surplus male problem is addressed through a number of means such as translocation, establishing male only groups, and hunting.
- The hunting of black rhino males is managed via a strict permit application process under the auspices of the national Department of Environment who also set the annual quota, currently set at five animals. This process has the support of CITES and the AfRSG. (See Annex 1 for more details).
- As an alternative to hunting, establish male-only populations (preferably with young males that know each other) avoiding areas suitable and large enough for a larger breeding population.
- While it may not prove popular with recipient populations, consideration could be given for a limited period to “dumping” some surplus males into unoccupied areas in very large parks currently stocked well below ECC.
- Provide surplus males to intensive management institutions (Zoos and Safari Parks) worldwide in exchange for support of in-situ rhino conservation programmes. However, be aware that captive breeding institutions also have a surplus male problem and are trying to send males back to Africa.

5.1.3 Indicators

- Meta-population growth of >5% (after allowing for exports/imports).
- Individual population growth of >5%. (after allowing for removals and introductions)
- Other useful population performance indicators (some of these would be more effective in individually known versus incompletely known populations) such as (with yardsticks to achieve >5% population growth):
 - Inter-calving intervals (ICI) with an ICI of < 2.5-3.0 years considered good;
 - Age at first calving (AFC) with less than the average of 7.6 ± 1.5 (\pm SD) years considered good ;
 - Age & sex ratios such as the proportion of 1 year old calves in the population (with >8% considered good); % adult females calving per year with >30% of females calving per year considered to be acceptable;
 - Mortality rates of <4% for the whole population, <10% for <1 year olds and <5% for sub-adults (A-D age classes). Post release rates in the first year of <10.8% would be above average, while capture/boma related mortality rates should not >9% of this activity.
- Number of new populations established & rhinos translocated;
- Number of populations with genetic supplementation in last 10 years.
- Number of surplus males hunted versus number of applications.

5.2 POPULATION MONITORING

5.2.1 Objective

To obtain accurate and precise information on black rhino population performance to inform decision making.

5.2.2 Actions/Strategies

- Monitor black rhino population sizes and demography ideally every year.
- Minimum data required includes:
 - Number of animals;
 - Demographic information in line with RMG status reporting format such as sex ratios (using standard AfRSG/RMG age classes), age of first calf, ICI etc.
 - Mortality rates (natural and other (illegal, capture, hunting, exotic disease etc));
 - Spatial distribution;
 - Removals & introductions;
- Establish & maintain a population monitoring database.
- The monitoring methods to be determined by the size of the population, resources available and habitat, such as:
 - Individual population monitoring in small populations through the use of identification techniques such as ear notching, etc.;
 - Statistical estimates or sub-sampling in larger populations such as mark recapture or block counts;
- Use AfRSG/RMG approved standardised monitoring procedures & protocols e.g. condition assessment categories, population estimates.
- Produce and submit reports as specified by the RMG on an annual basis.
- Funding permitting RMG to coordinate (at least every four years) a comparative synthesis and analysis of the data in these individual reports

5.2.3 Indicators of Success

- Annual population estimates (preferably accurate to +/- 10%) produced for each population.
- Status reports produced annually by all parks/ private land.
- Status report summary reports produced at least every four years by the RMG.

5.3 PROTECTION

5.3.1 Objective

To minimise the losses of rhinos through illegal activity.

5.3.2 Actions/Strategies (see Appendix 5 for details)

5.3.2.1 Field Law Enforcement

- Secure the reserve with an adequate law enforcement focused staff component.
- Develop adequate ground surveillance, detection and reaction capabilities e.g. through patrol planning & implement patrolling strategies/plans, inclusive of debriefing. In smaller reserves staff the reserve at the very least at the level of one field ranger per 10 km², while in large reserves minimum ranger numbers should be equal to or exceed the square root of reserve area (in km²) e.g. a 500 km² reserve should have >22 rangers.
- Train and motivate staff effectively in anti-poaching procedures.
- Secure funding for ongoing ground surveillance and all law enforcement.

- Ideally establish a specialized anti-poaching unit.
- Equip staff adequately.
- Ensure appropriate boundary fencing, maintenance & checking done in accordance with fencing plan (where fences exist).
- Ensure adequate communications for coordination of patrols and reaction to incursions.
- Establish & maintain support networks with other law enforcement agencies.

5.3.2.2 Neighbouring Communities

- Implement an effective community liaison programme.

5.3.2.4 Intelligence

- Develop & implement an intelligence gathering programme.
- Integrate intelligence and information at national scale (see Appendix 5)
- Alert and brief all relevant conservation and security organisations in the RMG region following protocols recommended by RESG/Interpol ECWG

5.3.2.5 Investigate & Prosecute Illegal Rhino Activities

- Develop and implement a scene of crime and incident tracking/investigation standard operating procedures from incident to prosecution.
- Refer to RMG Scene of Crime, investigators handbook resources.
- It is essential that persons discovering a rhino poaching incident should immediately alert the officer in charge of the reserve and secure the poaching scene, minimising disturbance to the area. The discoverer, as with all staff, must know and be reminded not to touch or disturb anything in an area around the crime scene until a qualified investigator arrives.
- To maximize chances of successful prosecution it is important to maintain chains of evidence for all exhibits (as trained in Scene of Crime management)

5.3.2.6 Secure and Monitored Rhino Horn Stockpiles

- Develop and implement standard procedures for recovering, securing, marking (physical/transponder) and monitoring rhino horn as recommended by TRAFFIC (See Milledge 2005).
- Establish & maintain a rhino horn database (one available from TRAFFIC).
- Cooperate with national & provincial authorities in regulation and monitoring of rhino horn stocks.

5.3.3 Indicators of Success

- Number of rhinos lost/injured through illegal activities (poaching, snaring, darting etc), measured in relation to patrol effort.
- Other useful indicators include:
 - The proportion of rhino poaching and horn dealing cases which result in arrests and convictions.
 - The average sentence for those convicted of poaching and horn dealing does not decline below current levels.
 - Law enforcement budgets relative to rhino population.
 - Proportion of illegally killed rhino carcasses.
 - Number of private owners with declared and registered stockpiles increasing.

- The ratio of the number of horns recovered in relation to the total number of known illegal horn in circulation (based on known thefts from carcasses and stockpiles).

5.4 HUMAN RESOURCES

5.4.1 Objective

To ensure that sufficient and appropriate human resources and skills are available and deployed efficiently

5.4.2 Actions/Strategies

- Develop the skills (staff & training) requirement for the protected area in question
- Conduct a skills audit and establish & fill the skills-gap.
- Make use of available training resources from the AfRSG, RESG/Interpol ECWG and RMG, such as: anti-poaching field ranger security training; rhino ID-based monitoring training; scene-of-the-crime techniques; RHINO mark-recapture; block count population estimation; rhino database management; Wildlife Investigator etc.
- Review & develop career paths to ensure adequate law enforcement experience and opportunities.
- Attempt to secure sufficient funding to meet requirements.

5.4.3 Indicators of Success

- Proportion of skills-gap filled (staff & training).
- Proportion of required resources secured.

5.5 CO-ORDINATION OF CONSERVATION MANAGEMENT ACTION

5.5.1 Objective

To have effectively co-ordinated black rhino conservation management.

5.5.2 Actions/Strategies

- Department of Environment (DEA) to coordinate & monitor the implementation of this plan.

- Formalize the status and functions of the South Africa membership of the SADC RMG as the coordinating group for this plan defining its roles, procedures, membership, meeting schedule, as well as links with other coordinating/advisory groups such as the SADC RMG, IUCN SSC AfRSG, law-enforcement groups/bodies (National Wildlife Crime Reaction Unit & the RESG/Interpol ECWG) etc.
- Every conservation organization & private owner managing black rhino to develop and implement a rhino plan in line with this national plan.
- Every effort should be made to coordinate national efforts in rhino conservation. Current security threats call for concerted national efforts in this regard ranging across the national-provincial conservation estate through to the private sector (see Appendix 5).

5.5.3 Indicators of success

- Acceptance of the rhino plan by DEA.
-
- Provisional/conservation organization/private rhino plans in place & implemented.
- SADC RMG to meet regularly, with minuted and implemented resolutions.
- Assessment of progress towards targets at least every two years.
- Review of plan every ten years .

5.6 ECONOMIC AND SOCIAL SUSTAINABILITY

5.6.1 Objective

To ensure that support (political and public) for black rhino conservation in South Africa is in place and fostered.

5.6.2 Actions/Strategies

- Justify rhinos as flag-ship species and refer to the interdependency between human welfare and sustainable management of wildlife resources, within which the “flagship” role of rhinos can be highlighted.
- Lobby and educate politicians to maintain the funding levels necessary to maintain capacity and management standards by demonstrating the tangible benefits of rhino conservation (especially with resource economic and social upliftment and empowerment arguments following from conservation activities).
- Promote the importance and opportunities presented by black rhino conservation in the sub-region.
- Encourage the sustained ‘consumptive’ and ‘non-consumptive’ use of rhinos (with appropriate monitoring and controls in place), and develop means for rhinos to help pay for the cost of their conservation.
- Develop incentives, build capacity and empower land-owners and communities in their establishment and management of rhino populations.
- Develop support for rhino conservation through actively pursuing awareness programmes aimed at highlighting the benefits and advantages of black rhino conservation.

5.6.3 Indicators of Success

- Budgets for rhino conservation increasing.
- Political & social perceptions of rhino conservation improving.
- Ease with which new rhino re-introduction projects are accepted by authorities.
- Number of rhino populations with community participation in management or part/total ownership.
- Number of educational/tourism opportunities that use rhinos (e.g. documentaries, EE programmes etc) as an educational/tourism tool.
- Number of rhino training packs distributed or developed (e.g. SADC RPRC rhino cards, BRREP).
- Numbers of rhino on community owned land increasing.

6. ACKNOWLEDGEMENTS

- Rob Brett is thanked for facilitating the 2003 SADC RMG workshop session to develop the original 3rd edition of this plan building upon a straw-dog draft prepared by Richard Emslie and Martin Brooks which incorporated comments from South African RMG members on an earlier draft. The SADC Regional Programme for Rhino Conservation is thanked for sponsoring the holding of the meeting at which the workshop session was held. Martin Brooks and Richard Emslie compiled the original 3rd edition of this plan.
- Richard Emslie would like to thank core sponsors of the AfRSG Scientific Officer in 2007, namely Save the Rhino International, The International Rhino Foundation, EAZA Rhino Campaign and WWF African Rhino Programme (with funding from WWF Netherlands) for providing the funds which enabled him to compile and update this revised edition of the Plan as well as chair the RMG Working Group which developed the revised system for assessing and allocating black rhino hunting permits. WWF ARP funded the 2008 revision of the document.
- This plan has been jointly developed by members of the South African Rhino Management Group and has benefited from comments on drafts by Martin Brooks, Rob Brett, Mike Knight, Peter Lloyd, Pierre Nel, Pieter Nel, Johan Eksteen, Julius Koen, Johan Kruger, Brad Fike, Keryn Adcock, Tony Conway, Caiphus Khumalo and Dave Balfour.
- Thanks are extended to the following sponsors:



7. REFERENCES (these include those cited and others of possible interest)

Adcock K. 1995, 1996, 1998, 2000, 2003, 2004, 2009. *Confidential SADC RMG Status Report Synthesis and Summary documents for periods Mar89-Mar94, Apr95-Dec96, Jan97-Dec98, Jan99-Dec01 and Jan2002-Dec2004.* – provided only to participating populations.

Adcock K. 2001. User guide to the Rhino Management Group Black Rhino Carrying Capacity Model Version 1. SADC RPRC report.

Adcock K. & R.H. Emslie. 2004. Monitoring African Rhino – Trainee's Guide – Part of AfRSG's 5th Edition of Sandwith's Training Course for Field Rangers downloadable at http://www.rhinoresourcecenter.com/ref_files/11930555638.pdf (2.4 mb)

Adcock K. & R.H. Emslie. (compilers). 2009. AfRSG ID Training Course and manuals (available free from AfRSG and training course modules all available in .pdf form available).

Adcock K., M Knight, P du Preez, B Koting, B Fike, M Hearn, D Hofmeyr, S Dell & Ezemvelo KZN Wildlife. 2009. Lessons from black rhino: An analysis of 16 years of SADC Rhino Management Group population history data. SADC RMG report Port Elizabeth.

Adcock K. in prep. Browse Availability Assessment Method – contact Keryn Adcock directly for latest version and/or details of training at adcocka@telkomsa.net

Adcock K., R. Amin & C. Khayale. in prep. Modelling black rhinoceros (*Diceros bicornis* L.) carrying capacity relationships in Africa.

Brett R., R Emslie, P Goodman, P Hartley & G van Dyk. 2001. Report of Working Group 3: Approaches to Harvesting. In: R Emslie (ed) Proceedings of a SADC Rhino Management Group (RMG) workshop on biological management to meet continental and national black rhino conservation targets. SADC Regional Programme for Rhino Conservation, Harare. Proceedings of this workshop including this paper and a related paper by **RF du Toit** downloadable at http://www.rhinoresourcecenter.com/ref_files/1175860813.pdf

Cumming D.H, R.F du Toit & S.N. Stuart. 1990. *African Elephants and Rhinos: Status survey and conservation action plan.* IUCN, Gland.

Daconto G. & R. Du Toit. . 2006. Developing awareness of rhino conservation issues. In Du Toit R.F (editor and compiler) with contributions from R.H.Emslie, M Brooks, G Daconto and L Mungwashu. Guidelines for implementing SADC Rhino Conservation Strategies – Available from SADC Regional Programme for Regional Conservation, WWF SARPO (Harare) Whole manual downloadable at http://www.rhinoresourcecenter.com/ref_files/1190402386.pdf (2.3 mb) with Awareness chapter downloadable at http://www.rhinoresourcecenter.com/ref_files/1190402149.pdf du Toit 2006

Du Toit R.F, T.J. Foose & D.H.M. Cummings. 1987. Proceedings of African Rhino Workshop, Cincinnati, October , 1986. *Pachyderm* Special Issue No9, .

Du Toit R. & R. Emslie. 2006. Maximizing the incentives for rhino metapopulation management in Du Toit R.F (editor and compiler) with contributions from R.H.Emslie, M Brooks, G Daconto and L Mungwashu. Guidelines for implementing SADC Rhino Conservation Strategies – Available from SADC Regional Programme for Regional Conservation, WWF SARPO (Harare) with Incentives chapter downloadable at http://www.rhinosourcecenter.com/ref_files/1190402292.pdf

Du Toit R & G. Daconto. 2006. Retaining and Enhancing Human Resources for Rhino Conservation. In **Du Toit R.F (editor and compiler)** with contributions from R.H.Emslie, M Brooks, G Daconto and L Mungwashu. Guidelines for implementing SADC Rhino Conservation Strategies – Available from SADC Regional Programme for Regional Conservation, WWF SARPO (Harare) Whole manual downloadable at http://www.rhinosourcecenter.com/ref_files/1190402386.pdf (2.3 mb) with specific human resources chapter above downloadable at http://www.rhinosourcecenter.com/ref_files/1190402183.pdf

Du Toit R, P.M. Brooks & R.H Emslie. 2006. Strategic Planning. In **Du Toit R.F (editor and compiler)** with contributions from R.H.Emslie, M Brooks, G Daconto and L Mungwashu. Guidelines for implementing SADC Rhino Conservation Strategies – Available from SADC Regional Programme for Regional Conservation, WWF SARPO (Harare) Whole manual downloadable at http://www.rhinosourcecenter.com/ref_files/1190402386.pdf (2.3 mb) with Strategic Planning chapter downloadable at http://www.rhinosourcecenter.com/ref_files/1190402314.pdf

Du Toit R., L. Mungwashu & R. Emslie. 2006 Ensuring Security of rhino populations. In Du Toit R.F (editor and compiler) 2006 with contributions from R.H.Emslie, M Brooks, G Daconto and L Mungwashu. Guidelines for implementing SADC Rhino Conservation Strategies – Available from SADC Regional Programme for Regional Conservation, WWF SARPO (Harare) Whole manual downloadable at http://www.rhinosourcecenter.com/ref_files/1190402386.pdf (2.3 mb) with Security chapter downloadable at http://www.rhinosourcecenter.com/ref_files/1190402204.pdf

Du Toit R.F (editor and compiler) 2006 with contributions from R.H.Emslie, M Brooks, G Daconto and L Mungwashu. Guidelines for implementing SADC Rhino Conservation Strategies – Available from SADC Regional Programme for Regional Conservation, WWF SARPO (Harare) and whole manual downloadable at http://www.rhinosourcecenter.com/ref_files/1190402386.pdf (2.3 mb) Chapters 3 on Ensuring optimal biological management (**Emslie & du Toit 2006**) is also downloadable separately at http://www.rhinosourcecenter.com/ref_files/1190402258.pdf , as is Chapter 4 Reintroducing rhinos - biological and management considerations (**du Toit 2006**) which is downloadable at http://www.rhinosourcecenter.com/ref_files/1190402204.pdf and from www.rhinos-irf.org/afRSG Selected non-confidential reports on biological management and property/park/habitat assessments from Confidential Biennial Proceedings of the AfRSG if made available in due course on the Rhino Resource Centre website or from AfRSG web page

Emslie R.H. (compiler). 2001. Proceedings of the RMG black rhino biological management symposium held at Giant's Castle - available in .pdf form from RMG and AfRSG downloadable at http://www.rhinosourcecenter.com/ref_files/1175860813.pdf

Emslie R. H. 2001. Strategic achievement of metapopulation goals – Why rapid population growth is so important. In: R Emslie (ed) Proceedings of a SADC Rhino SA black rhino Biodiversity Management Plan - 2010

Management Group (RMG) workshop on biological management to meet continental and national black rhino conservation targets. SADC Regional Programme for Rhino Conservation, Harare. Proceedings of this workshop including this paper and a related paper by **RF du Toit** downloadable at http://www.rhinoresourcecenter.com/ref_files/1175860813.pdf

Emslie R.H. (compiler). 2007. Proposed system for assessing and allocating permits for hunting black rhino in South Africa (version 2.0) – Annexe1 to Conservation Plan for the Black Rhino (*Diceros bicornis*) in South Africa – Revised 3rd Edition. RMG, Pietmaritzburg, South Africa.

Emslie. R.H. 2008. Rhino population sizes and trends. *Pachyderm* 44 (January-June), 2008, p 88-95.

Emslie R.H. (compiler). in prep. IUCN SSC African and Asian Rhino Reintroduction Guidelines – will be downloadable from Rhino Resource Center website when ready

Emslie R.H. and Brooks P.M. 1999. IUCN SSC African Rhino Status Summary and Conservation Action Plan downloadable at http://www.rhinoresourcecenter.com/ref_files/1175863242.pdf

Emslie R.H. compiler. 1991. Draft proceedings of black rhino property assessment workshop held in Pilanesberg NP in 1991

Emslie R.H. (2003) Block count spreadsheet data analysis and count stratification planning tool (available free from AfRSG)

Emslie R.H., R. Amin & K. Davey. Rhino 2.1. A Bayesian mark-recapture based population estimation analysis software package, designed specifically for rhinoceros in particular, but applicable to other species. Software (Emslie RH, R Amin and K Davey), User manual (Emslie RH), Reference Guide (Emslie RH) with context sensitive help/training videos (Emslie RH)

Friedmann Y. & B. Daly. 2004. Red Data Book of the Mammals of South Africa: A conservation Assessment: CBSG Southern Africa, Conservation Breeding Specialist Group (SSC/IUCN), Endangered Wildlife Trust. South Africa.

Goodman P. S. 2001. Black rhino harvesting strategies to improve and maintain productivity and minimize risk. In: R Emslie (ed) Proceedings of a SADC Rhino Management Group (RMG) workshop on biological management to meet continental and national black rhino conservation targets. SADC Regional Programme for Rhino Conservation, Harare. Proceedings of this workshop including this paper and a related paper by **RF du Toit** downloadable at http://www.rhinoresourcecenter.com/ref_files/1175860813.pdf

IUCN SSC African Rhino Specialist Group. 2008. *Diceros bicornis*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.1. <www.iucnredlist.org>. Downloaded on **02 June 2010**.

Knight M.H. 2001. Current & possible population performance indicators for black rhinos. In R Emslie (ed) Proceedings of a SADC Rhino Management Group (RMG) workshop on biological management to meet continental and national black rhino conservation targets. SADC Regional Programme for Rhino Conservation, Harare. Proceedings of this SA black rhino Biodiversity Management Plan - 2010

workshop including this paper and a related paper by **RF du Toit** downloadable at http://www.rhinosourcecenter.com/ref_files/1175860813.pdf

Leader Williams N., S. Milledge, K. Adcock, A. Conway., M.H. Knight, P.M. Brooks, S. Mainka, E.B. Martin & T. Teferi. 2005. Trophy hunting of black rhino, *Diceros bicornis*: proposals to ensure its future sustainability. *Journal of International and Wildlife Law and Policy* **8**:1-11

Levins R. 1969. Some demographic and genetic consequences of environmental heterogeneity for biological control. *Bulletin of the Entomological Society of America* **15**: 237–240

Milledge S. 2005. Rhino horn stockpile management : minimum standards and best practices from east and southern Africa Dar es Salaam TRAFFIC East/Southern Africa downloadable at http://www.rhinosourcecenter.com/ref_files/1175857457.pdf

Milledge S. 2007. Rhino related crimes in Africa: an overview of poaching, seizure and stockpile data for the period 2000-20005. Report to CITES 14th meeting The Hague CoP14Inf41 downloadable at http://www.rhinosourcecenter.com/ref_files/1181373723.pdf

Morkel P. & A. Kennedy-Benson. 2007. Translocating Black Rhino – Current techniques for capture, transport, boma care, release and post-release monitoring – Report to IUCN SSC AfRSG and SADC RMG

Spenceley A. & J. Barnes. 2005. Economic analysis of rhino conservation in a land use context within the SADC region. SADC RPRC Task 6.3-1.2 (Phase II), SADC Regional Programme for Rhino Conservation, report to IUCN-ROSA.

Springett C. 2006 WILDb database software (available free from AfRSG and SADC RPRC)

Appendix 1: Detailed Background Information

BACKGROUND

The Rhinoceros, commonly known as the Rhinos belong to the few remaining mega-fauna surviving today. The black rhino and the white rhino are native to Africa with the white rhino being the second largest land mammal weighing up to 2,700 kg. The Black Rhino has seen the most drastic decline of all rhino species, because of poaching and habitat loss. But due to conservation efforts numbers are stabilizing and slowly rising. However, tremendous effort is still needed to secure the future for the Black Rhino. There are four subspecies of Black Rhino, but the West African Black Rhino (*Diceros bicornis longipes*) is tentatively declared extinct.

The Black Rhino is listed under the **IUCN Red List as Critically Endangered** and in Appendix I of the CITES which require the highest level of control. The black rhino is also listed as an endangered species according to the South African List of Threatened or Protected Species in terms of section 56(1) of the National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEMBA).

NEMBA provides the opportunity for any person, organisation or organ of state desiring to contribute to biodiversity management to submit to the Minister, for approval, a draft management plan for an indigenous or migratory species warranting special conservation attention. The Norms and Standards for the development of BMP-S, developed in terms of section 43 of NEMBA, outlined the process, format and scope that should be used to develop biodiversity management plans for indigenous species.

Biodiversity Management Plans for Species (BMP-S) is a tool to guide the management of indigenous species (and any sub-specific taxa) and groupings of indigenous species that are adversely affected by similar threats and enables the evaluation of progress with regard to such management. It establishes measures to ensure the protection, conservation and sustainable management of indigenous species. It forms part of a dynamic and continuing management planning process and allows for review and monitoring of actions to accommodate changing priorities and emerging issues.

The conservation Plan for the Black Rhino (*Diceros bicornis*) in South Africa was jointly developed by South African members of the SADC Rhino Management Group to promote the development and long term maintenance of viable populations of the various sub-species of African rhinos in the wild. This conservation plan was developed essentially for coordinated directional action to clearly identify goals within an approved policy framework, mechanisms for achieving the goals, and to allow success to be evaluated.

This conservation plan is a third revised edition following the first edition which was developed in 1989 and the second edition of 1997 consecutively, in order to update the latest information on Rhino numbers and to realign the plan with the norms and standards for BMP-S in published in terms of the NEMBA and other recently developed environmental management tools.

The purpose of the plan, in terms of the act, is to ensure the long-term survival in nature of the species and provide for the responsible person, organization or organ of state to monitor and report on the progress with implementation of the plan; and in consistent with biodiversity act, the national environmental management principles, the national

biodiversity framework, any relevant international agreement, and any other relevant environmental management plans.

2.1 Rhinos as flagship species

Where wildlife-based land-use systems are established, rhinos act as true “flagship species” because they require large areas and significant protection measures that help to conserve a wide range of biodiversity (du Toit 2006). The conservation of these rare and charismatic animals also attracts donor as well as state support, with the latter being stimulated by the national prestige of rhino conservation projects; and the fact that rhinos are a major attraction for eco-tourists, in turn creating jobs and bringing in Forex. Where markets have been established, such as in South Africa, rhinos have a high value in live sales, thus generating revenue for wildlife operations. Black rhino are a national heritage, and also have spiritual/existence value for many people.

Rhinos can add significant value to wildlife operations. For example between 2000 and 2005, live sales of white and black rhinos from Hluhluwe-iMfolozi Park generated the equivalent of 60% of the park’s conservation budget; and surveys of tourists in this park, as well as in private reserves in South Africa and Namibia, indicate that 7-14% of total wildlife viewing value can be ascribed to rhinos (Spenceley and Barnes, 2005).

2.2 South African Legislation and Relevant International Conventions

2.2.1 South African National Environmental Management and Biodiversity Act, 2004 (Act No. 10 of 2004) – (NEMBA)

The Act gives effect to the constitutional commitment to taking reasonable legislative measures that promote conservation by providing for the management and conservation of biological diversity and the sustainable use of indigenous biological resources. Chapter 3 provide for the planning and monitoring of biodiversity.

Section 43 (1)(b) and (c) of the Act provide for any person, organisation or organ of state, desiring to contribute to biodiversity management, to submit to the Minister for approval a draft management plan for an indigenous or migratory species warranting special conservation attention.

NEMBA section 44 empowers the Minister to enter into an agreement with any person, organisation or organ of state for the implementation of a BMP-S

2.2.2 National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004): Threatened or Protected Species Regulations (ToPS)

New Threatened or Protected Species (ToPS) regulations under NEMBA came into force in February 2008. The regulation provide for the protection of species that are threatened or in need of protection to ensure their survival in the wild and give effect to the Republic’s obligations. These require a permit to be issued in order for a person to carry out a listed restricted activity concerning black rhino. This will include hunting, capturing, killing, cutting parts off, importing or exporting into or from South Africa, having in possession of exercising physical control over any black rhino; breeding, translocating,

moving, selling, donating or accepting any black rhino or any of its products or derivatives as a gift.

The black rhino is listed as the endangered species under ToPS. Therefore, it is compulsory for any black rhino conservation sanctuary owner, rehabilitation facility owner, wildlife trader, captive breeder or zoo owner to register for the operation of the facility. Game farmers with black rhinos can voluntarily apply for registration and obtain a standing permit valid for three years.

Under ToPS the put and take hunting of a captive bred black rhino, when released from its captive environment onto an extensive wildlife system, is outlawed. Captive bred animals also cannot be obtained with the intention of put and take hunting them; but this does not apply to black rhinos kept in extensive fenced wildlife systems where the animals have been fending for themselves for at least two years. TOPS regulations have been taken into account in designing the revised black rhino hunting permit application and approval system.

Further black rhino may not be transported to a protected area if the protected area falls outside the natural distribution range of black rhino. This prohibition is not applicable to extensive wildlife systems that have **NOT** been declared as protected areas. Black rhino may also not be transported to extensive wildlife systems where white rhino already occur and there is a risk of hybridization, and vice versa.

The current penalty in NEMBA for transgressions involving black rhino is:

1. A fine, not exceeding the amount prescribed in the Adjustment of Fines Act, or not exceeding 3x the commercial value of the specimen in question, whichever is the greater amount, or
2. Imprisonment not exceeding 5 years, or
3. Both such fine and imprisonment.

However, DEAT has requested amendment of the penalty clause, to be as follows:

1. A fine, not exceeding R10 million;
2. Imprisonment, not exceeding 10 years, or
3. Both such fine and imprisonment.

2.2.3 National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) (NEMPAA)

NEMPAA provides for the protection and conservation of ecologically viable areas representative of South Africa's biodiversity and natural landscapes and seascapes in protected areas. Protected areas in South Africa are viable tool for habitat protection and create a viable tool for the protection and maintenance of ecologically viable numbers of the black rhino and their associated habitats for the long-term persistence of the black rhinos.

2.2.4 Other relevant South African Acts

Apart from the National Environmental Management Act, 107 of 1998 (NEMA) and its related Acts, the nine provincial conservation ordinances/acts are the major regulatory instruments for the regulation of wild plant and animal species in South Africa.

Supporting decision making instruments include national norms and standards and provincial policies. In extreme cases prohibition of activities involving wildlife may be instituted either at national or provincial level by means of a moratorium. Other Acts such as the Animals Protection Act which regulates animal welfare in South Africa is also applicable to wildlife. The Animal Health Act, Animals Diseases Act, Medicines and Related Control Substances Act and the Animal Matters Amendment Act which falls under the jurisdiction of the Department of Agriculture, Forestry and Fisheries may also be relevant to black rhino conservation as it plays a significant role in veterinary care of animals.

5.1.4 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

South Africa is a Party to the CITES which governs and controls international trade in endangered species. The black rhino is listed in Appendix I of CITES which require the highest levels of control.

Under CITES all commercial international trade in rhino products such as horn is banned. However permits may be issued for the translocation of live animals to another country provided the principle purpose of the supposed importation is not detrimental to the survival of the species in the wild and the specimen has been obtained legally. Low intensity, non-consumptive tourism (provided it does not develop into the type of intrusive commercial activity that could compromise the breeding programme) can be considered to be a secondary, rather than a primary reason for importation. However the interpretations that may be made of the CITES regulations are complex and potentially contentious, especially the interpretation of what constitutes "primarily commercial purposes". It therefore is recommended that prior to export or import of any black rhinos clarification on this matter is sought from the CITES Management Authorities in South Africa (at the nine provincial conservation departments or the Department of Environmental Affairs and Tourism in Pretoria). For a black rhino translocation to another country the importing country's CITES Management Authority has to issue a CITES import permit before the exporting country's CITES Management Authority will issue a corresponding export permit.

At the 13th CITES Conference of the Parties (CoP) a quota for the annual hunting of up to 5 black rhino to deal with the surplus male black rhino problem and further a number of demographic or genetic goals, was approved. An attempt to have these quotas rescinded at the 14th CITES CoP by Kenya was unsuccessful; but nevertheless this highlights the need for South Africa to ensure its hunting permit approval system is defensible and follows recommended best practices. The revision of the system for approving applications for hunting ensures this will be the case (see Annexe 1 for details)

2.2.6 Convention on Biological Diversity (CBD)

South Africa is also a signatory to the CBD and as such has an international responsibility to conserve the two indigenous subspecies of black rhino found in South Africa. The objectives of the Convention are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The programmes of work developed

under the CBD encourage parties to take a wide range of actions to biodiversity conservation and sustainable use

The convention also provides for the establishment of a system of protected areas or areas where special measures need to be taken to conserve biodiversity. Parties are required to promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species of threatened species in natural surroundings through development and implementation of plans and other management strategies.

2.2.7 World Heritage Convention

Is a Convention concerning the protection of the world cultural and natural heritage. It provides for the identification, protection and preservation of cultural and natural heritage, including the habitats of threatened species, around the world considered being of outstanding value to humanity and countries submit places for designation under the World Heritage List.

2.2.8 SADC Protocol on Wildlife Conservation and Law Enforcement

The SADC Protocol on Wildlife Conservation and Law Enforcement provides a clear rationale for ensuring that any national or regional goals for rhino conservation refer to the interdependency between human welfare and sustainable management of wildlife resources, within which the "flagship" role of rhinos is highlighted. Implementation of rhino conservation projects with a development orientation is also in accordance with one of the ten principles that were expressed in the "Agenda for Action" that was drafted at the World Parks Congress in Durban in 2003. Rhinos are particularly appropriate as "flagships" for regional cooperation in resource management because the decline of many of the sub-continent's rhino populations was due to cross-border poaching and illegal trading networks that extended through several countries. Showing a reversal of this trend, through regional cooperation in law-enforcement, sharing of rhino management expertise, and sharing of rhinos through metapopulation management, would be a very graphic demonstration of SADC's effectiveness. Phase II of the SADC Regional Programme for Rhino Conservation (SADC RPRC) is likely to focus on regional re-establishment of rhinos in the SADC region, and as one of the major rhino range States South Africa can play a key role in the SADC RPRC.

2.2.9 Lusaka Agreement

South Africa is a signatory to the Lusaka Agreement. The Lusaka Agreement is a treaty between many African nations that seeks to "reduce and ultimately eliminate illegal trade in wild fauna and flora and to establish a permanent Task Force for this purpose." The Task Force members, endowed with broad diplomatic immunities, are charged with the task of investigating violations of various national laws and presenting evidence to the appropriate countries.

2.3 Continental and National Black Rhino Trends – The importance of South Africa

Heavy commercial poaching was primarily responsible for the crash in black rhino numbers from a guesstimated 100,000 around 1960 to bottom out at only 2,410 in 1995. Since then, numbers in Africa have slowly increased reaching 4,240 by 2007. The black

rhino, *Diceros bicornis* is rated as *Critically Endangered* on IUCN's Red List of Threatened Species.

The last black rhino in Kruger NP died in 1934. By 1935, there were only about 110 black rhino (*Diceros bicornis minor*) left in South Africa and these were restricted to two parks in KwaZulu-Natal (Hluhluwe and Mkhuze). At the time these animals probably represented less than 0.1% of the world's population. By 1980, South Africa conserved 630 black rhino accounting for 4% of the continent's population. By the end of 2007, South Africa conserved more black rhinos in the wild (1,488) than any other range State. From having less 0.1% of the world's population in the mid 1930s, by 2001 South Africa conserved just over a third (35.1%) of Africa's total. Thus the world importance of South Africa to black rhino conservation has increased dramatically over the last 70 years.

Taxonomy will be discussed in more detail later, but currently three ecotypes/subspecies of black rhino are internationally recognized by IUCN SSC's African Rhino Specialist Group, and it is feared that a fourth, the western black rhino (*D.b.longipes*), has recently gone extinct. There are also differences between the climates and habitats in the core area of each of the ecotype's distributions, and it is likely that each has specific behavioural and genetic adaptations, and so the subspecies have also been called ecotypes. However recent genetic research (Harley *et al.* 2005) supports the subspecies classifications. It has been decided at a Continental level, as well as within South Africa, not to mix the different subspecies of black rhino. Of the three surviving black rhino subspecies, two are indigenous to South Africa (the southern-central *D.b.minor* and south-western *D.b.bicornis*). The country also has a single out of range population of the third surviving subspecies (eastern black rhino *D.b.michaeli*).

South Africa, and to a lesser extent Zimbabwe are currently the main strongholds of the southern central black rhinoceros (*D.b.minor*) with South Africa conserving 1,321 or 66.2% of this ecotype in 2007. While the bulk of these rhinos are descended from the original Hluhluwe and Mkhuze stock, 12 of the 70 founder animals introduced from 1971-1982 to establish the Kruger NP black rhino population were imported from Zimbabwe.

From having only 2 surviving breeding populations by 1935, by the end of 2007 South Africa had 37 discrete potentially breeding *D.b.minor* populations with 4 other male only populations. A number of *D.b.minor* have also been exported to re-establish/augment populations in Swaziland, Zimbabwe, Malawi and most recently Zambia and Botswana.

South Africa also currently conserves the only populations of south-western black rhino (*D.b.bicornis*) outside Namibia, with founder animals having been introduced from Namibia. By the end of 2007 there were 113 of this ecotype in South Africa, making up 7.3% of the continental total.

In 1960-61, seven eastern black rhino (*D.b.michaeli*) were imported from Kenya to establish an out of range population of this ecotype at Addo Elephant National Park. Numbers bred up from what turned out to be an effective founder population of only four animals, and in the last decade some animals were translocated back to within-range populations in Tanzania. In view of the small founder number, new blood was introduced in the form of an orphaned male from Ngorongoro and another animal from Port Lympne Zoo. All of the Addo population of eastern black rhino have since been moved to a private reserve in South Africa, and the latter population at the time of writing is rated by the AfRSG as a *Continental Key2* population. By December 2007 South Africa conserved an estimated 7.7% of this subspecies in the wild. This population is out-of-range, and to give priority to the conservation of indigenous black rhino subspecies, a condition of the sale of this subspecies to private reserve by SANParks was that surplus SA black rhino

animals could not be translocated to any other reserve within South Africa. It is hoped that this population will be a source of animals, which can be translocated back to areas within the ecotype's former range. At the time of writing over half of these rhinos are soon to be translocated back to former range in Tanzania.

2.2 Trends in South African black rhino numbers since the establishment of the RMG in 1989

Figure 3 below shows that following a period of rapid growth from 1989 to 1996 the growth of black rhino numbers in the country slowed from 1996 to 2001 before increasing again in recent years.

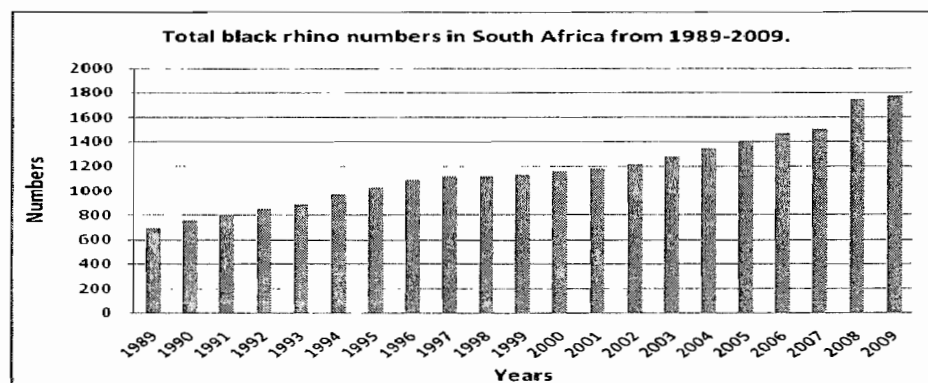


Figure 3 – Numbers of black rhino in South Africa from 1989-2009 (RMG and AfRSG Data)

The pattern shown in Figure 3 primarily reflects the trends in the most numerous subspecies in South Africa – the south-central black rhino, *D. b. minor*.

As of December 2007 South Africa conserved three IUCN AfRSG rated Continentally **Key1** populations, three **Key2+3** populations and ten Continentally **Important** *D.b.minor* populations. As of Dec 2007 these 16 populations conserved 1,208 or 81.2% of South Africa's black rhino.

2.5 Subspecies/ecotypes in South Africa

2.5.1 Taxonomy

There are two recognized indigenous subspecies of black rhino in South Africa (*D.b.minor* and *D.b.bicornis*) with a single out of range population of *D.b.michaeli*.

With the exception of two surviving *D.b.minor* populations in KwaZulu-Natal (Hluhluwe-iMfolozi and uMkhuze); all other South African black rhino populations have been created through translocations. As of December 2007 re-introduced and introduced populations conserved 80.6% of South Africa's black rhino.

Historically the boundaries between the three remaining black rhino subspecies were not "hard-edged" in contrast to the markedly discontinuous range of the two white rhinoceros *Ceratotherium simum* subspecies. However, there are major differences in the habitat and climates in the core areas of the various subspecies, and it is likely that each

subspecies developed specific genetic or behavioural adaptations to the environment. Centuries ago, when black rhinos were common and more widely distributed, one can have expected a clinal genetic gradient to have existed across areas of contiguous rhino habitat between subspecies core ranges. However, for practical and conservation reasons, it has been decided that the subspecies should not be mixed.

Given this decision, there is a practical need for a distributional map to clearly demarcate which subspecies can be introduced where.

Some areas within subspecies areas of occurrence (*sensu* IUCN Red Listing) may have unsuitable or more marginal habitat, with rhinos probably either being absent or likely to have only occurred at very low densities in these areas. Thus it is important to realize that some areas marked as range for a subspecies on a map such as Figure 3 may be unsuitable for black rhino reintroduction (such as areas of Highveld grassland in the Free State). Thus before the establishment of a new population takes place, not only should the reintroduction area fall within the area demarcated for that subspecies (Figure 3), but it should also have been rated by black rhino habitat experts as having sufficient suitable habitat to hold a breeding population. In time, it may be possible for the SADC RMG to refine Figure 3 by identifying and excising (or marking) more areas of unsuitable/marginal habitat unsuitable for black rhino within currently demarcated subspecies areas of occupancy.

Due to a combination of topography, changing geology and unsuitable habitat, the Transkei area north of the Kei river up to Lesotho and just southwards of the southern KwaZulu-Natal boundary has resulted in an area of the country where black rhinos or kudu apparently never historically occurred (Skead et al 2007, Kerley *et al in prep*, Mike Knight, David Balfour and Peter Goodman *personal communication*). It is now believed that this "Transkei Gap" acted as an effective barrier to the spread of *D.b.minor* south from KwaZulu-Natal creating a hard edge between subspecies in northern Eastern Cape and southern KwaZulu-Natal. For this reason, it is likely that *D.b.bicornis* would have spread westwards through the Eastern Cape up to the Kei river; rather than being restricted to only the drier areas in the west of the province as was postulated in previous plans based largely on the 500mm rainfall isohyet (Hall-Martin & Knight), or as proposed in an earlier version of this plan based on the 400mm rainfall isohyet.

There have been differences of opinion regarding nomenclature and possible historical ranges of the two indigenous subspecies in South Africa (for further details see Appendix 1). However, following consultation with RMG provincial representatives and their colleagues and some IUCN SSC African Rhino Specialist Group members, a revised subspecies distributional map (Figure 3) has been drawn up which more closely reflects latest knowledge and majority thoughts (including that of IUCN's AfRSG) on probable historical rhino distributions in the country.

2.5.2 Subspecies distribution areas within South Africa

Figure 4 gives the revised SADC RMG recommended distributional ranges for the two indigenous subspecies/ecotypes of black rhino in South Africa, and these hard subspecies distribution boundaries have been set for future management simplicity. For practical reasons, the use of "grey" zones where mixing of subspecies could be allowed has not been supported. There must be no possibility of subspecies mixing.

Gauteng, KwaZulu-Natal and **Mpumalanga** have been classified as *D.b.minor* only provinces. In North West province, the more arid south western areas west of the N18

highway could potentially have been demarcated as a *D.b.bicornis* area. However, because provincial boundary changes are set to reduce the size of the potential *D.b.bicornis* area (which much of this area being incorporated into the Northern Cape), **North West** has decided that for ease of management the whole province should also be classified as a *D.b.minor* only area.

The private reserve in **Limpopo** with the one *D.b.michaeli* population is the only allowable area for this out of range subspecies in South Africa. The rest of Limpopo province is demarcated as a *D.b.minor* only area.

The south-western black rhino (*D.b.bicornis*) is still considered as the more arid-adapted subspecies and **Northern Cape** has been classified as a solely *D.b.bicornis* province. However the potential for different subspecies to spread or not spread also needs to be taken into account when setting subspecies boundaries. On account of both the 'Transkei' gap limiting movement of *D.b.minor* southwards from KwaZulu-Natal and the postulated spread of *D.b.bicornis* from Namibia down into the Western Cape along drainage lines¹; **Western Cape** has been defined as a *D.b.bicornis* area, despite the area's wetter climate, and that in terms of ecotypic adaptations the more mesic *D.b.minor* might be more suitable. The Western Cape currently has one private reserve with a surplus male *D.b.minor*.

Following the decision by North West to classify this province as *D.b.minor* range, there are only two remaining provinces which could have separate areas for both indigenous South African black rhino subspecies.

In the **Free State**, the bulk of the province is classified as Grassland biome (Low & Ribelo 1996) and this has been classified as a *D.b.minor* area (although much of this area is unsuitable for black rhino). The more arid south west of the province that largely covers the Nama Karoo biome (Low & Ribello 1996) has been demarcated as a *D.b.bicornis* area. The proposed revised boundary between the two subspecies areas follows the N6 north from Allival North to Bloemfontein, and westwards following the main road to Kimberly via Petrusberg. Historically two male-only *D.b.minor* populations have been set up in this newly demarcated *D.b.bicornis* area (Tussen die Riviera) and a private reserve close to the subspecies boundary in the north-west of the province. Free State Department of Environment and Tourism have indicated that they are seeking to stock Tussen die Riviera with *D.b.bicornis* and if founder animals were to become available for this they would remove the one remaining *D.b.minor* bull. As permission was granted to the other private owner to get *D.b.minor* bulls in the past (before the revised subspecies boundaries were established) then should this owner wish to start a breeding population he will be strongly encouraged to rather stock with *D.b.bicornis* and move his *D.b.minor* bulls out.

In all earlier versions of the South African Black Rhino Conservation Plan (including earlier versions of this 3rd edition) rainfall isohyets (selected somewhat arbitrarily at 400-500mm) were used as the primary basis for setting the putative east-west subspecies boundaries in the **Eastern Cape** (Brooks & Adcock 1997 based on proposals by Hall-Martin & Knight). However since the 2007 revision of the plan, the subspecies boundaries in the Eastern Cape have been substantially revised to take into account of the probable impact of the "Transkei Gap" on rhino movement. Figure 4 shows that the north-east of the province ("Transkei Gap" area north of the Kei river) has been classified

¹ This is currently the generally held view but there are differences of opinion (Kees Rookmaaker personal communication and Lloyd P 2003) as to whether *D.b.bicornis* spread all the way from the Western Cape to Namibia and was the same subspecies.

by Eastern Cape as extra-limital, and as a result no populations of black rhino will be allowed to be established in this area, with the rest of the province being designated as *D.b.bicornis* range, with no new *D.b.minor* populations being established in the Eastern Cape. Recently the first *D.b.bicornis* population in the Eastern Cape was established. Historically three *D.b.minor* populations and one male only population were set up in a limited area of the Eastern Cape to the east of the 400mm isohyet, at a time when the wetter east of the province was defined as a *D.b.minor* area. These now "out of range" *D.b.minor* populations have done well since they were established. In particular, the Great Fish River Reserve population, has grown rapidly to become one of only six **Key1** black rhino populations of continental significance, and this population has also recently become an important donor population. Given the history, and on pragmatic species conservation grounds², the **Key1** Great Fish River donor population should be maintained as an out of range *D.b.minor* population. The other smaller privately-owned *D.b.minor* populations in the Eastern Cape however will be encouraged to replace their *D.b.minor* with *D.b.bicornis* should the opportunity arise in future (for example the need for *D.b.bicornis* for *D.b.minor* swap deal involving South Africa should Namibia wish to donate some founder black rhino to a *D.b.minor* range state).

It is important to realise that the South African black rhino plan revised subspecies boundaries shown in Figure 4 represent a practical construct for management purposes and may not exactly match historical subspecies distributions, which in any event are imperfectly known and probably always will be.

² Given (i) the very high costs of establishing and/or re-locating a population as large as Great Fish River (likely to cost in the millions of rands and take many years); (ii) possible losses of rhino during translocations; (iii) likely temporary losses in productivity during a population establishment phase (iv) the fact that this population is performing well (v) it has become a major donor population and (vi) *D.b.minor* is still classified in both IUCN and South Africa's Red List as Threatened – Critically Endangered it is not recommended that any attempt be made to remove the *D.b.minor* from this population and replace them with *D.b.bicornis*.

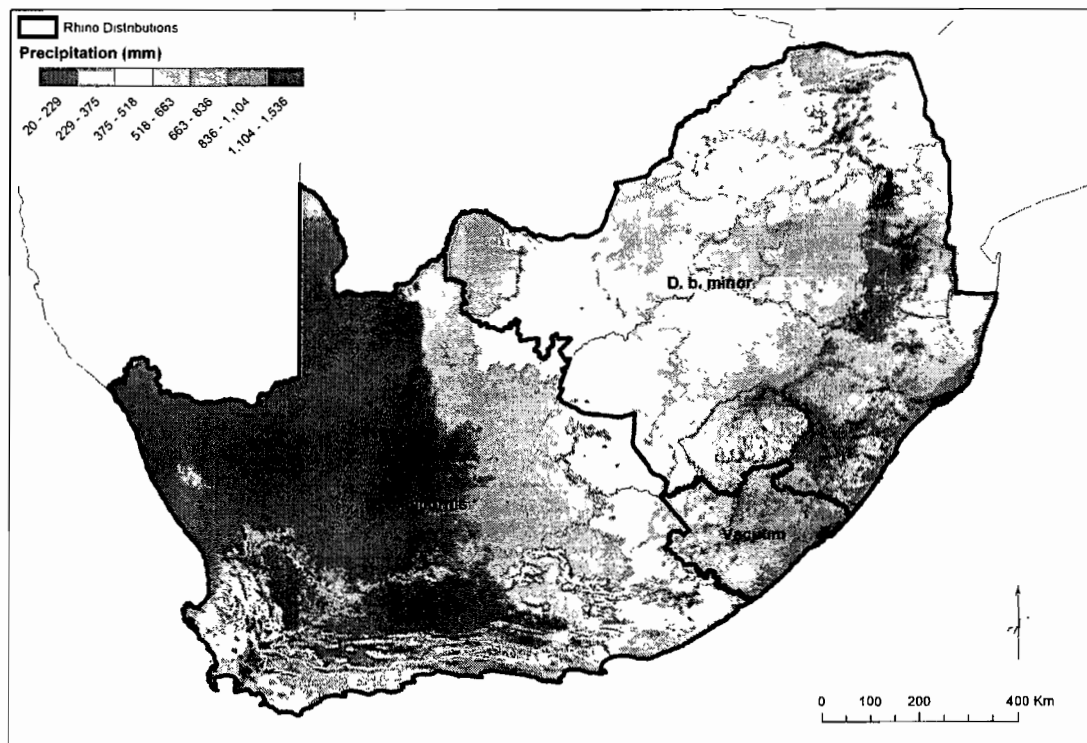


Figure 4: Revised subspecies ranges and annual rainfall with *D.b.bicornis* being the more arid adapted subspecies. Note the *D.b.bicornis* area in south western Free State, and that deemed *D.b.bicornis* range in the Eastern Cape has now expanded westwards up to the "Transkei Gap" which is now classified as extra-limital (and not range for either indigenous subspecies) and a barrier to movement of *D.b.minor* southwards. It is important to realise that some areas marked as subspecies range in Figure 3 contain unsuitable/more marginal habitat, with rhinos probably either being absent or likely to have only occurred at very low densities in these areas (e.g. parts of Free State).

2.6 Trends in South African southern-central black rhino (*D.b.minor*) numbers

Figure 5 shows *D.b.minor* metapopulation performance since 1989 when RMG annual status reporting started has had three different phases. During an initial rapid growth phase from 1989-1996, the South African *D.b.minor* metapopulation achieved a net growth rate of 6.6%, and in only 7 years was 101 ahead of minimum target numbers. However, as the densities of black rhinos (and sometimes other potentially competing browsers) built up in a number of populations following conservative removals, the overall growth rate of South Africa's *D.b.minor* metapopulation (after allowing for exported animals) slowed dramatically to average only 2.1% per annum over the period 1996-2001 before increasing to 3.7% from 2001-2007. From having been ahead of target in 1996, this reduction in metapopulation growth since then has resulted in numbers dropping to 181 below the 5% target line by the end of 2007 (Figure 5).

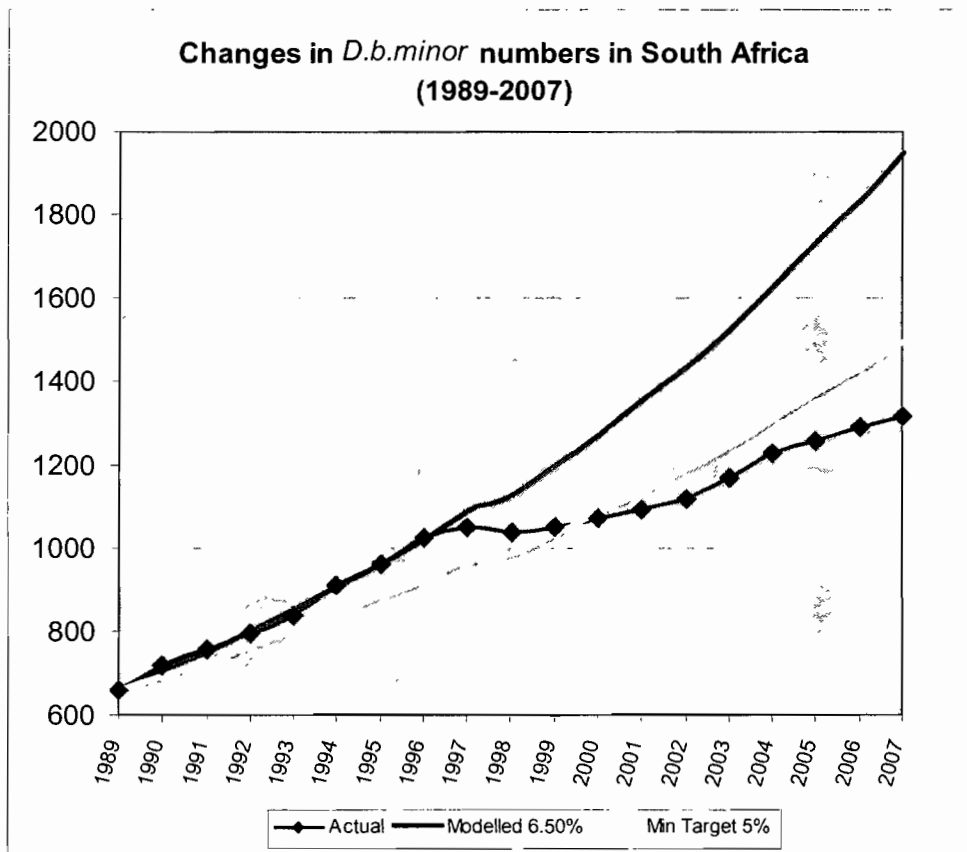


Figure 5 : Trend in estimated numbers of *D.b.minor* in South Africa () since the start of the RMG and annual status reporting. The other two lines show the expected numbers of black rhino given the minimum desirable target metapopulation growth rate of 5% per annum () and for 6.5% () (close to the 6.6% achieved for the seven year period 1989-1996). The calculations used to derive Figure 4 allow for a net 65 *D.b.minor* that were exported from South Africa during the period. Note, how following the period of rapid growth from 1989-1996, growth rates declined to 2.1% for the 5 years 1996-2001. Following increased removals metapopulation growth has increased since 2001 to 3.7% from 2001-2007.

Concerns led to the RMG holding a Biological management workshop in 2001, and IUCN SSC AfRSG, SADC RMG and SADC RPRC have actively promoted the importance of improved biological management and harvesting for growth since then. Metapopulation growth has started to increase since 2001 to around 3.7% (2001-2007). Although this is an improvement, current metapopulation growth is still below target levels.

The potential impact of even this improvement can be appreciated by considering that at 3.7% it will take only 23 years to meet the long term plan aim of 3,000 *D.b.minor* compared to 40 years if 2.1% had been maintained (i.e. almost half the time). At the minimum growth target of 5% it will take 18 years to reach the target.

Average annual *D.b.minor* growth over the 18 year period 1989-2007, after allowing for introductions and removals has been 4.3% just below minimum target levels. If this average rate of growth can be maintained, it will take 20 years to reach the South African metapopulation target of 3,000 *D.b.minor*.

However, if a rapid metapopulation growth of 6.5% (similar to the 6.6% achieved for 1989-96) could have been maintained for the whole period 1989-2007, there would have been a staggering 47.5% (627) more *D.b.minor* by 2007 (1,948 vs 1,321).

Over the 18 years a 1.5% difference between achieving a 6.5% or 5% growth rate would translate to 451 more rhinos, which is equivalent to just more than two-thirds the size of the South African *D.b.minor* population in 1989. Small differences in growth rates translate into many more or many fewer rhinos in future.

These facts highlight the critical importance of maintaining rapid growth rates, and show how small improvements in growth rate, can over time, result in a big increase in the number of rhinos. Removals have increased in some populations but in some cases this has not yet translated into rapid growth in response, and the potential negative impacts of possible selective removal from certain areas, social factors, habitat change and increasing numbers of potential competing browsers deserves increased attention.

Current *D.b.minor* population estimates are also likely to be improved once better data are available for the Kruger NP population and an inaugural block count was undertaken in Southern Kruger in 2007. Numerical targets for subspecies metapopulations will be adjusted to take any improved information into account. The key principle of seeking to achieve a minimum 5% annual net growth rate remains when calculating targets.

While this plan focuses on performance of rhinos remaining in South Africa, the country has played an important role in providing founder rhinos to help re-establish *D.b.minor* populations elsewhere, namely in Swaziland, Zimbabwe, Botswana, Malawi and Zambia (as well as *D.b.michaeli* to Tanzania). The Malilangwe population in Zimbabwe has performed very well. At the end of the Plan period performance of exported rhinos should also be assessed to determine whether black rhinos exported from South Africa have been invested wisely.

2.7 Trends in South African south western black rhino (*D.b.bicornis*) numbers

Figure 6 below shows that not only has average growth of south-western black rhino in South Africa exceeded the minimum acceptable target growth rate of 5%, growth has exceeded 6.5%. Average annual growth over the period 1989-2007, after allowing for introductions and removals has been 7.1%. If this good rate of growth can be maintained, without any importing any more animals it will take 22 years to reach the South African metapopulation target of 500 *D.b.bicornis*. At the minimum target growth rate of 5% it will take 31 years. Obviously if additional founder animals can continue to be sourced from Namibia then it will be possible to reach conservation targets much sooner.

The growth of this subspecies for the period 1989-96 (6.7% per annum) was similar to that achieved by the south-central black rhino (6.6% per annum). However in contrast to *D.b.minor*, average *D.b.bicornis* growth rates have increased after 1996, and this metapopulation has been performing very well.

The consolidation and expansion of Greater Addo also offers the potential for this park to eventually conserve a significant AfRSG-rated **Key** population of *D.b.bicornis* which would then become the first **Key** population outside of Namibia which is the stronghold for this subspecies.

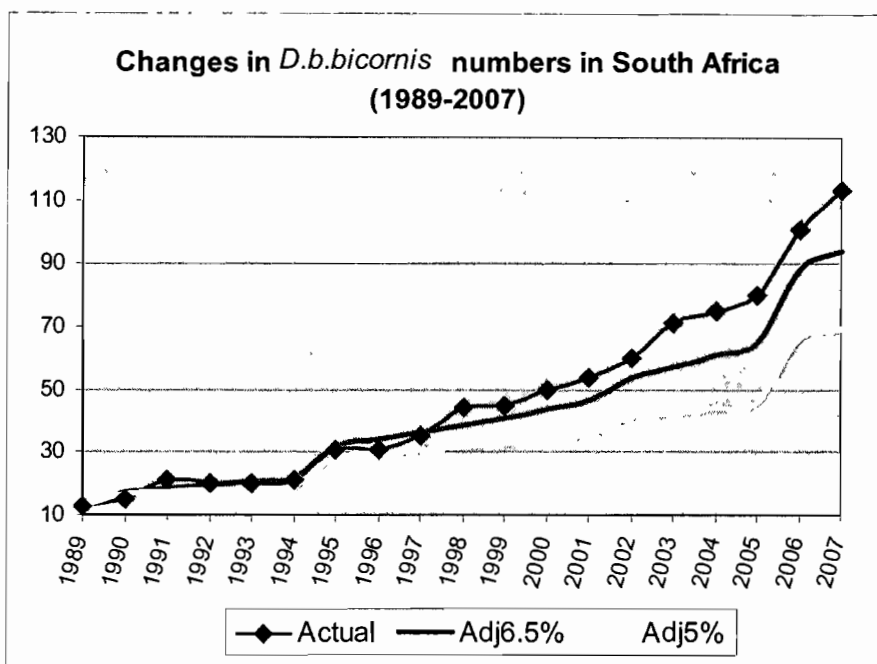


Figure 6 : This graph shows the trend in estimated numbers of *D.b.bicornis* in South Africa () since the start of the RMG and annual status reporting. The other two lines show the expected numbers of black rhino given the minimum desirable target metapopulation growth rate of 5% per annum () and for an average annual 6.5% growth rate (). The calculations allow for a net 33 additional founder *D.b.bicornis* that were imported to South Africa during the period.

2.8 Trends in out of range eastern black (*D.b.michaeli*) rhino numbers

Figure 7 below shows that the South African *D.b.michaeli* metapopulation growth rate has not only exceeded the minimum acceptable target growth rate of 5%, but has in general exceeded 6.5%. For periods growth has exceeded 10%. The apparent dip in performance in the late 1990s coincided with the movement of most of the *D.b.michaeli* out of Addo.

To keep this population productive in the longer term there will be a need to export surplus animals to zoos and to the former range of this subspecies. It is a condition of sale that this subspecies only be kept on this property in South Africa. Ideally it would be desirable if all out of range eastern black rhino could be translocated back to former range freeing up more space for the indigenous southern-central black rhino. A detailed assessment of the carrying capacity of this population has recently been carried out to inform management decision-making. It is probable that over half of this population will shortly be translocated back to former range for this subspecies in Tanzania.

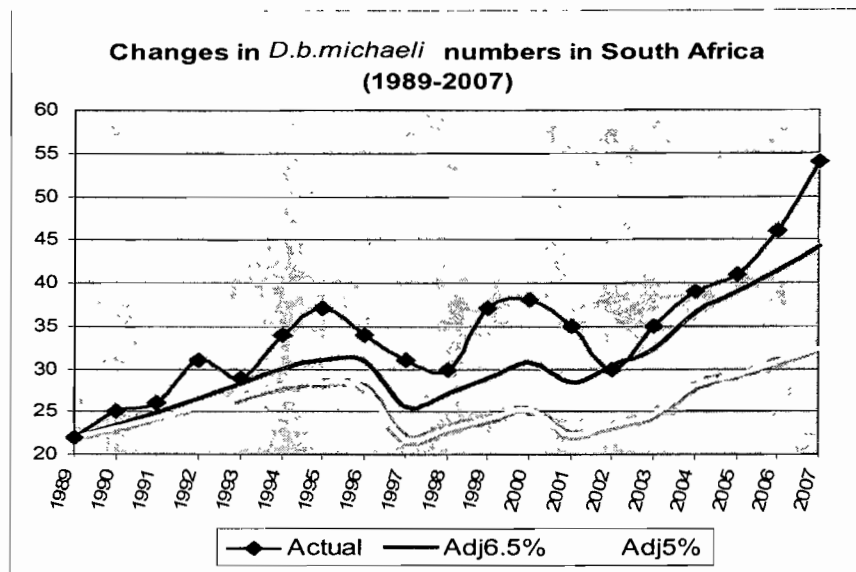
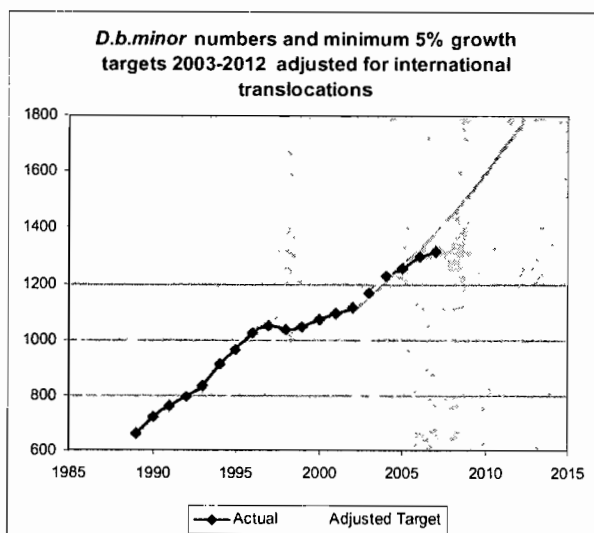


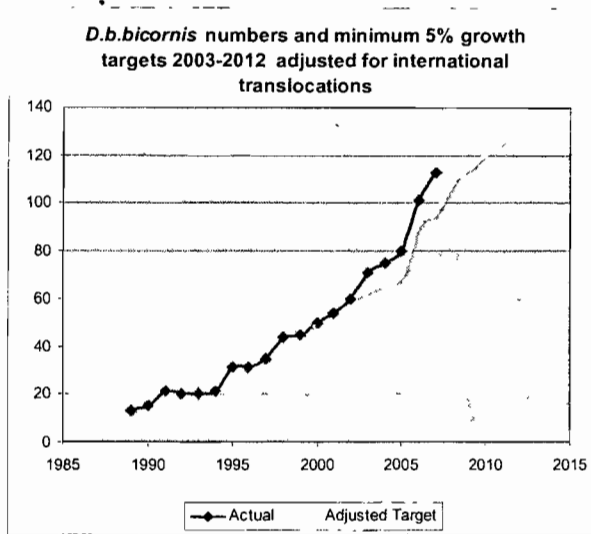
Figure 7 : Trend in estimated numbers of *D.b.michaeli* in South Africa () since the start of the RMG and annual status reporting. The other two lines show the expected numbers of black rhino given the minimum desirable target metapopulation growth rate of 5% per annum () and for an average annual 6.5% growth rate (). The calculations allow for net export of 12 *D.b.michaeli* during the period.

5.3 Adjusted Growth targets by sub-species



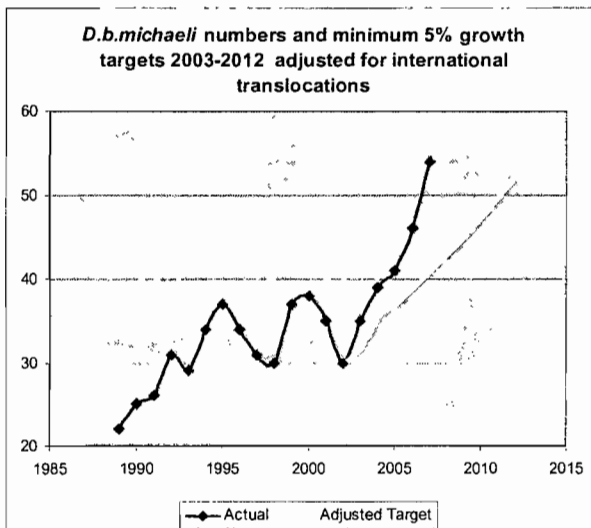
D.b.minor adjusted targets for 03-12

<i>D.b.minor</i>	
End Year	Target
2003	1164
2004	1223
2005	1284
2006	1338
2007	1400
2008	1465
2009	1538
2010	1615
2011	1696
2012	1780



***D.b.bicornis* adjusted targets for 03-12**

<i>D.b.bicornis</i>	
End Year	Target
2003	63
2004	66
2005	69
2006	91
2007	96
2008	109
2009	114
2010	120
2011	126
2012	132



***D.b.michaeli* adjusted targets for 03-12**

<i>D.b.michaeli</i>	
End Year	Target
2003	32
2004	35
2005	37
2006	39
2007	41
2008	43
2009	45
2010	47
2011	49
2012	52

2.9 Population and subspecies trends since 1989

Previous versions of the South Africa black rhino conservation plan have always included tables of estimated numbers of rhinos by population by year broken down by subspecies and management authority. However, given that some private owners do not want to widely publicise their numbers and population names; these numbers can be found in the confidential RMG status report summary reports, and to give more focus on the main trends since 1989; these tables have been replaced by some summary graphs and a table showing the current status and trends in overall numbers of rhinos and populations overtime broken down by subspecies, organisation and management type. These graphs have primarily been based on data supplied to the RMG as part of status reporting and analyses in RMG Status Report Summaries as well as to the IUCN SSC African Rhino Specialist Group.

	<i>D.b.minor</i> Dec-07	<i>D.b.michaeli</i> Dec-07	<i>D.b.bicornis</i> Dec-07	Total
Eastern Cape	127		5	132
KwaZulu-Natal	402			402
SANParks	428		75	503
Limpopo	12			12
North West	104			104
Free State	3			3
Private - Owner	170	54	33	257
Private - Cust	70			70
Total	1316	54	113	1483

Table 1: Numbers of black rhino conserved by management agency/private sector by subspecies as of the end of 2007

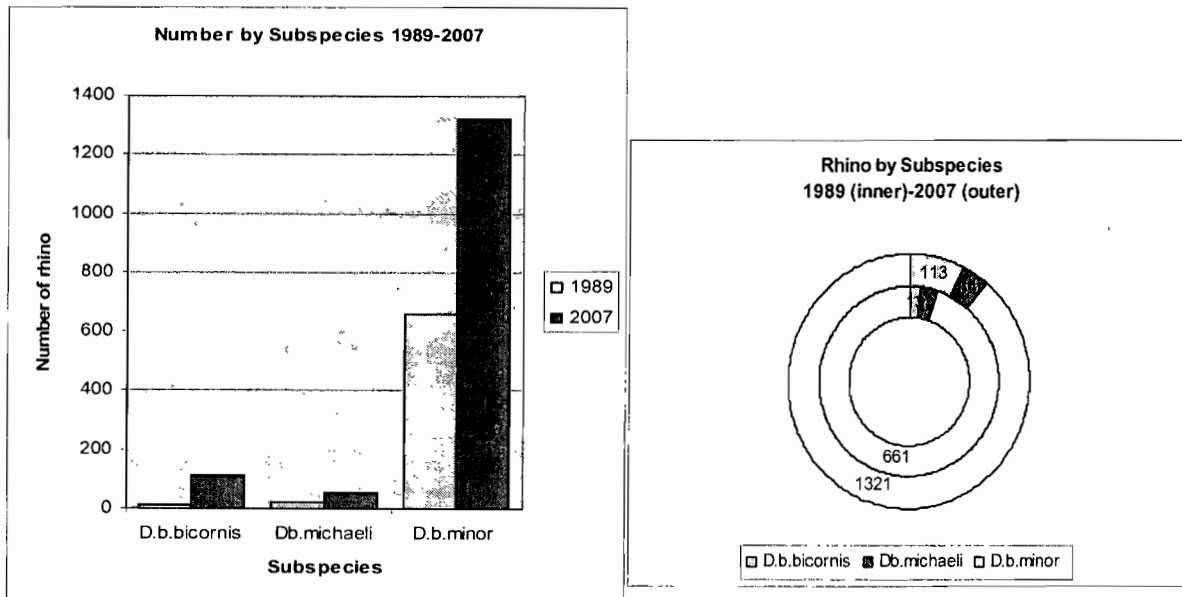


Figure 8: Changes in numbers and proportion of black rhino conserved in South Africa by subspecies since the formation of the RMG in 1989. Note how numbers of all subspecies have increased significantly. South Africa is the major stronghold for *D.b.minor*, conserving just over two-thirds (66.2%) of this subspecies in December 2007 (as well as 7.3% and 7.7% of Africa's *D.b.bicornis* and *D.b.michaeli* respectively). While the proportion of total rhino made up of *D.b.bicornis* and *D.b.michaeli* has increased since 1989, the vast majority of black rhino in the country continue to be *D.b.minor*.

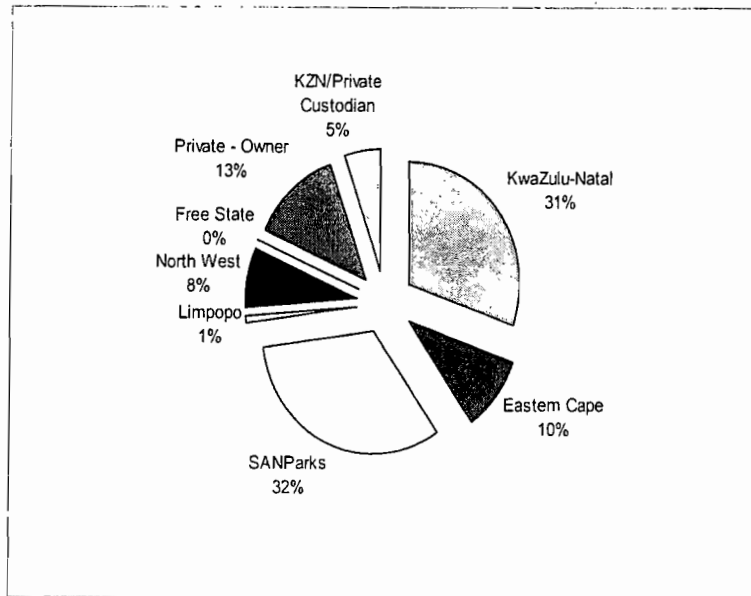


Figure 9: Proportions of the most numerous black rhino subspecies (*D.b.minor*) conserved in reserves run by each management authority/private sector as of the end of 2007. While the majority of black rhino managed by the private sector are privately owned, an increasing number of *D.b.minor* are being managed under a custodianship agreement with Ezemvelo-KZN-Wildlife as part of the EKZNWildlife/WWF black rhino range expansion project. Ownership of founder rhino remains with EKZNW, but with private custodians and EKZNW equally sharing the benefits of founders born in these populations.

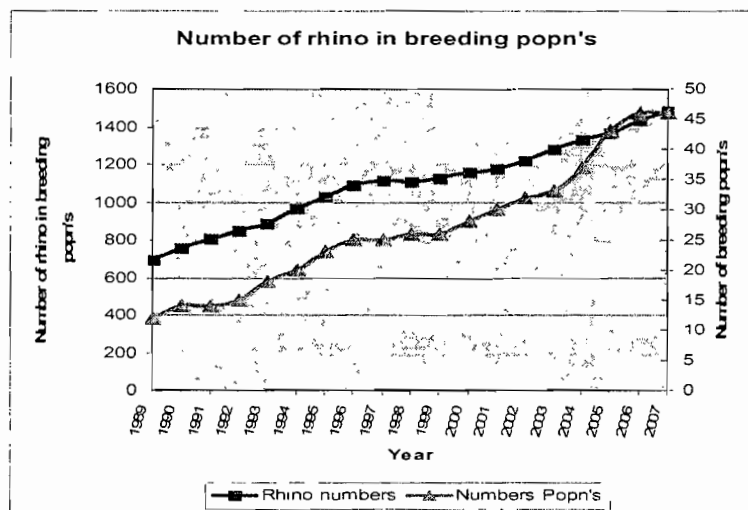


Figure 10: Graph showing the increase in numbers of black rhino in South Africa in breeding populations (all subspecies but excluding male only populations) since the formation of the RMG in 1989. Much of this increase has come about because of regular translocations to set up new breeding populations. With increased attention to biological management, performance recently appears to have improved in many but not all of the donor populations.

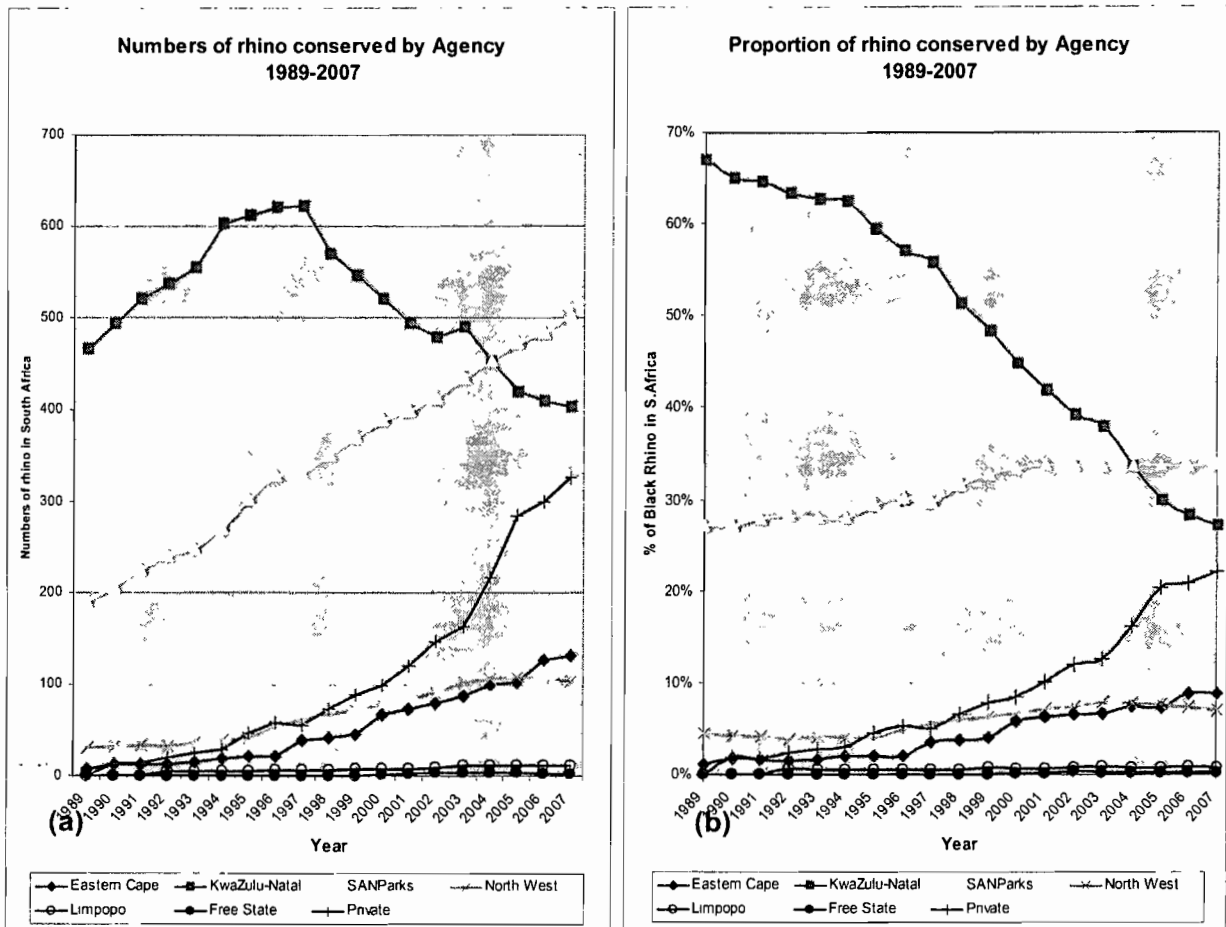


Figure 11 (a) Numbers of rhino and **(b)** Proportion of total rhino numbers conserved in reserves managed by formal conservation agency/private sector since the formation of the RMG in 1989. From 1989-2004 Ezemvelo-KZN-Wildlife (EKZNW) populations provided 260 black rhino to other (non-EKZNW) areas in southern Africa (Adcock 2005). These animals have increased in number, increasing numbers under management by other authorities and the private sector. This is one of the main reasons for the declining proportion of South Africa's rhino in EKZNW run reserves. Among five areas that received 224 of the EKZNW introductions from 1989-2004, and where subsequent population growth could be traced, by the end of 2004 there were 115 more *D.b.minor* than were introduced (Adcock 2005). The majority of *D.b.minor* rhinos in SANParks reserves are also derived from EKZNW founder rhino. KwaZulu-Natal has thus played a major role in helping increase overall black as well as white rhino numbers in the country. However, some of the decline in numbers in EKZNW reserves is also due to decreases in underlying performance of some established donor populations. This may be due to a combination of rhino densities having been allowed to exceed or approach estimate ECC's in some areas in the late 1990's, increasing densities of competing browsers and/or changing habitat in some parks or selective removal from some areas or off specific age classes. This highlights the need to better understand the various factors affecting the underlying performance of established source black rhino populations, so as to enhance biological management decision-making and translocations in future. Performance has recently increased in some but not all of these EKZNW donor populations following increased removals and research is underway to try to understand SA black rhino Biodiversity Management Plan - 2010

why one Key donor population in KZN has to date not positively responded to increased removals unlike other areas.

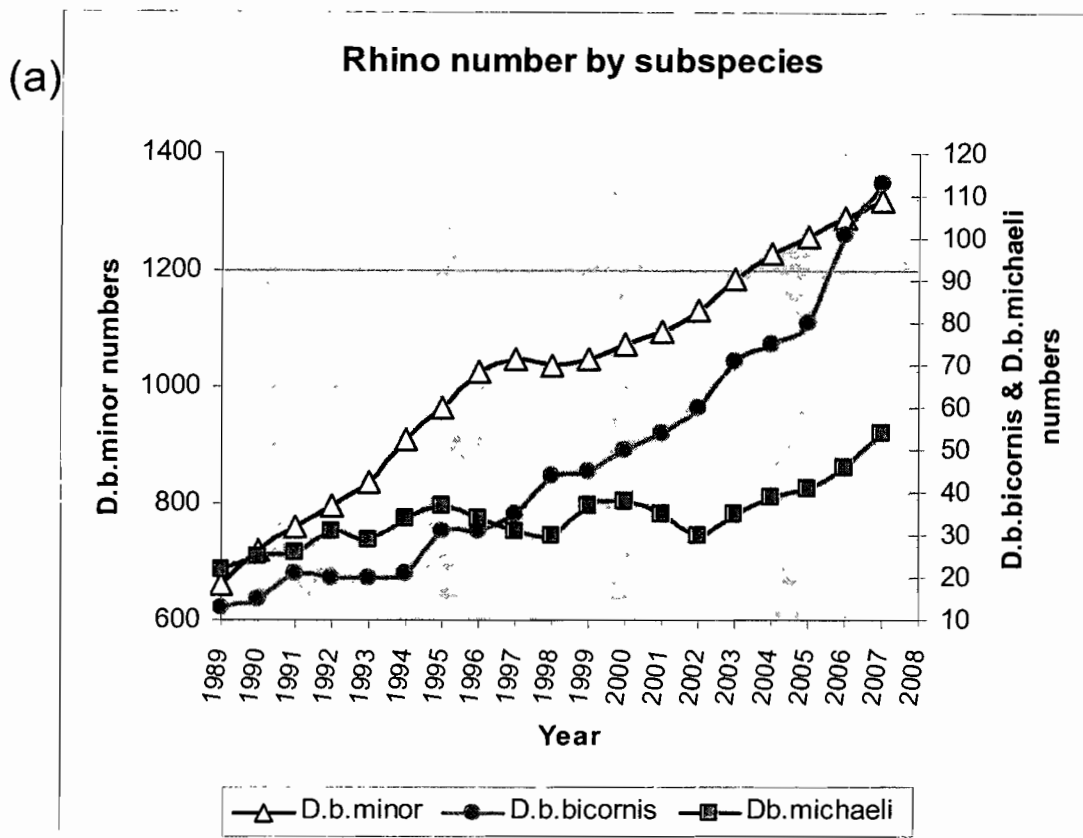


Figure 12: Graph showing increases in numbers of different subspecies since the formation of the RMG in 1989. The rapid increase in numbers of *D.b.bicornis* is due to a combination of rapid growth, and the importation of additional founder rhino from Namibia. Similarly *D.b.minor* metapopulation growth has been reduced as a result of the export of some founder rhino to Swaziland, Malawi, Zimbabwe, Botswana and Zambia over the period. Small numbers of *D.b.michaeli* have also been translocated both in and out of the country over the period.

2.10 ROLE OF THE SADC RMG

The Rhino Management Group (RMG) was founded in 1989 by South Africa and Namibia. Since then Swaziland and Zimbabwe have also joined. Since 2001 The Rhino Management Group (SADC RMG) has fallen under the SADC political umbrella and comprises representatives from each of the following bodies:

State conservation agencies in South Africa, Namibia, Swaziland and Zimbabwe:

South Africa:

- Department of Environmental Affairs (DEA)

- Eastern Cape Parks
- Ezemvelo-KZN-Wildlife
- Free State Department of Tourism, Environmental and Economic Affairs,
- Gauteng - Department of Agriculture, Conservation & Environment - Directorate of Nature Conservation
- Limpopo Department Economic Development, Environment and Tourism– Chief Directorate – Environment
- Mpumalanga Tourism and Parks Agency,
- Northern Cape Department of Environment & Nature Conservation,
- North West Parks and Tourism Board;
- South African National Parks (SANParks)
- Cape Nature

Namibia:

- Namibian Ministry of Environment and Tourism including National Rhino Coordinator and manager of Custodianship Programme

Swaziland:

- Big Game Parks of the Kingdom of Swaziland

Zimbabwe:

- Zimbabwe Parks and Wildlife Management Authority

Private owners of free-ranging rhinos in South Africa:

- Until recently one member represented the joint interests of private owners, but at the last RMG meeting in November 2007 a number attended as observers. A private owners and custodians meeting was also held in October 2008. Representation on the RMG is to be increased with regional representatives being appointed. Community black rhino custodians are also to be invited to be represented on the RMG.

Elected rhino experts

The Chair of the Rhino and Elephant Security Group (RESG) of Southern Africa

The SADC RMG's role is to further regional cooperation amongst rhino range states in the region dealing with similar issues of metapopulation management, and to assist the various conservation agencies and private landowners in achieving the conservation goals for black rhino. It's sister body is the SADC Rhino Recovery Group (SADC RRG) which comprises of countries (Angola, Botswana, Malawi, Mozambique, Tanzania, and Zambia) which have no or few rhino, but which are busy or wanting to re-establish rhino in their countries. However this latter group has been ineffective and it is likely that its role would be taken on by a refocused SADC Regional Programme should this get underway.

As all the Provincial State Conservation Agencies in South Africa, SANParks and the South African private black rhino owners each have a representative on the SADC RMG – the RMG is ideally suited to manage and update the South African black rhino plan, which it has done since 1989. The first RMG black rhino conservation plan was released in 1989 and a revised second edition was produced in 1997. This version represents an extensively update and revised third edition of the plan.

The SADC RMG's strategies include the following.

- Evaluate the performance and management of each black rhino population in the region at regular intervals based on the annual RMG status-reporting programme.
- Identify problems or information needs affecting the achievement of the goals for black rhino in each country.
- Initiate, develop and coordinate appropriate programmes (meetings, workshops, projects) necessary to provide management advice and to develop appropriate conservation strategies to achieve the goals.
- Evaluate project proposals and make recommendations to relevant bodies.
- Provide advice on request to conservation agencies.
- Liaise closely with all relevant conservation authorities and funding agencies
- Manage the Conservation Plan for the Black Rhinoceros in South Africa (SA membership of RMG only), by collecting, analysing and interpreting the information it requires, by keeping it updated and ensuring its continued relevance, and by publicising the results of these activities in appropriate ways.

2.11 Other Rhino Conservation Groups

2.11.1 IUCN SSC African Rhino Specialist Group (AfRSG)

This was reconstituted in 1991, with a continental scope, following a period during which it was amalgamated with the African Elephant Specialist Group. As one of more than 100 specialist groups within IUCN's Species Survival Commission, the mission of the AfRSG is: *"To promote the long-term conservation and maintenance of viable populations of the six subspecies of Africa's rhinos in the wild"*.

The AfRSG comprises a Chairman, a partially-funded Scientific Officer, representatives of most African rhino range states and a variety of rhino experts who operate as a network to address both strategic (e.g. government rhino policy) and implementation challenges for rhino conservation, ensuring that the best scientific knowledge is used as the basis for decision-making and field conservation programmes. To achieve this, meetings attended by the 30-40 members are held every two years, and in addition individuals or groups of members are assigned to contribute to important international, regional and national initiatives where their expertise is required. The value of the face-to-face nature of the exchanges helps establish a sense of belonging to a serious and relevant professional peer group, which strengthens the confidence and influence of government rhino conservation managers in particular. The AfRSG Chairman or individual members may be approached by any range state wishing technical support or advice. Further details of the AfRSG's role are provided on the AfRSG's web page www.rhinos-irf.org/afRsg.

The AfRSG together IUCN's Asian Rhino Specialist Group and TRAFFIC currently has a mandate under CITES Resolution 9.14(rev), to on behalf of Range States, prepare and submit a summary report on rhino conservation for consideration at the next CITES CoP.

2.11.2 SADC Regional Programme for Rhino Conservation (RPRC)

From 1999-2005 Phase I of the SADC RPRC was funded by the Italian Government and has now come to an end. Phase I of this programme was run by a consortium of SADC FANR, WWF SARPO, IUCN SSC AfRSG, CESVI (an Italian NGO) and IUCN ROSA. The programme provided expertise, specialized logistical support, training and catalytic funding for a wide range of projects of a regional nature or importance. The SADC RPRC Phase I helped bridge the gap between the high level umbrella strategy provided by the AfRSG and programme implementation by range states, by providing technical and financial support for a variety of regional projects.

Phase II is likely concentrate on promoting a regional strategy for rhino conservation that is orientated towards SADC development policies with a specific focus on cross boundary translocations and rhino re-establishment in minor and former Range States within SADC. To this end the SADC RPRC is likely maintain collaboration with key NGO's under SADC auspices in such as the SADC RMG thereby giving regional political momentum to initiatives such as re-introduction projects.

A SADC Rhino Recovery Group was established by the SADC RPRC in 2001 to place particular emphasis on the management needs of 1% of Africa's rhinos that are in the minor range states and where there is considerable scope for re-introduction projects and population expansion (Zambia, Botswana, Malawi, Mozambique, Tanzania, Angola). The RRG's aim was: "*To coordinate and facilitate the application of regional resources in establishing re-introduced rhino populations and managing remnant rhino populations, and ensuring their future viability*". However to date the RRG has achieved little and been largely ineffective. At the time of writing it appears that the RRG is likely to disband and be absorbed into the SADC RPRC which in its Phase II is set to focus on cross boundary support and translocations into RRG countries. It also makes sense for such any body focusing on regional translocations to also include the major SADC RMG countries with extensive rhino conservation experience and capacity and which are to source of founder rhino for re-establishment projects in other countries.

Terms of reference for Phase II of the SADC RPRC have been designed to be complimentary to and not duplicate the work of longer established bodies such as IUCN's AfRSG, SADC RMG and SADC RESG.

2.11.3 SADC Rhino and Elephant Security Group (RESG)

This grew out of a Security Sub-committee of the RMG. It was formed in 1989 and met regularly till 1998 when it became dormant. The group was re-launched in 2001 with new, more focused terms of reference. More recently the group has also come under the SADC framework. The overall objectives of the RESG are to develop guidelines, strategies and databases for the effective and efficient protection of African rhino and elephant populations, to assist the various conservation agencies, communities and private landowners to minimise rhino and elephant poaching and the illegal trade in rhino horn and ivory, and to provide advice, training and coordination. The group also promotes procedures for effective investigation and

prosecution of rhino and elephant crimes. Membership comprises representatives (usually wildlife investigators or managers) of rhino conservation management agencies, specialist police units, including the Interpol Environmental Crime Task Group (IECTG), and co-opted specialist technical members as required (e.g. from TRAFFIC, AfRSG, etc). To save on costs and increase sharing of information, RESG meetings have, since the group's re-launch, been held back-to-back with regional IECTG meetings.

2.11.4 Provincial Rhino Committees

Ezemvelo-KZN-Wildlife has a long established Rhino Management Group that meets regularly. Its Chair is also a specialist member of the AfRSG and he is also a member of the SADC RMG.

SANParks also has its own Rhino Management Committee chaired by the Exec. Director of Conservation Services Division. They meet twice a year.

Appendix 2: Additional information on black rhino taxonomy in South Africa

The following text is largely taken from a draft of Emslie & Adcock's (*in prep*) black rhino species review which will appear in the next edition of Jonathon Kingdon's *Mammals of Africa*.

- Groves (1967) described seven subspecies of black rhino; but this classification has been questioned, as it was based on small sample sizes (du Toit 1986), and was not supported by a preliminary analysis of data from more skulls (du Toit 1987).
- A proposal from a 1986 African Rhino Workshop in Cincinnati was adopted by the first IUCN African Elephant and Rhino Action Plan (Cumming et al. 1990), resulting in the recognition of four black rhino ecotypes or "subspecies" conservation units (Cumming et al. 1990). Since then IUCN Species Survival Commission's African Rhino Specialist Group has recognized these four subspecies in different areas (Emslie & Brooks 1999): southern-central (*Diceros bicornis minor*); south-western (*D. b. bicornis*); eastern (*D. b. michaeli*) and western (*D. b. longipes*) Black Rhino. Only two of these subspecies – the southern-central (*D. b. minor*); south-western (*D. b. bicornis*) are indigenous to South Africa; and the western black rhino is recently feared extinct.
- Historically the boundaries between the three remaining subspecies were not "hard-edged" in contrast to the markedly discontinuous range of the two white rhinoceros *Ceratotherium simum* subspecies. However, there are major differences in the habitat and climates in the core areas of the four subspecies, and it is likely that each has specific genetic or behavioural adaptations to the environment. Some conservationists have preferred to refer to the black rhino subspecies as ecotypes due to the contiguous distribution of three subspecies and perceived limited genetic differences between them (Lloyd *in litt*). However, recent genetic analyses indicate that the southern-central, south-western and eastern black rhino are sufficiently distinct to support the current subspecies distinction (E. Harley et al. 2005). Genetic variation in mitochondrial DNA of *D.b.minor* (from Zimbabwe animals) and *D.b.michaeli* (from East Africa) revealed that these two subspecies represent separate ancestral lineages, which diverged between 0.93 and 1.3 million years ago (Brown & Houlden 2000). These genetic studies support the currently recognised subspecies.
- Controversy also surrounds the use of formal subspecies nomenclature and determination of former ranges, with Rookmaaker (2005) arguing that given current accepted subspecies distributions, *D.b.minor* and *D.b.michaeli* should be re-named *D.b.keitloa* and *D.b.brucii* respectively. In addition *D.b.bicornis* has been described as being restricted to the Western Cape and further north, at least to the middle of Namibia, and is believed to have gone extinct (Ansell 1974, Rookmaaker & Groves 1978) leading to a questioning of the use of the subspecies name *D.b.bicornis* to refer to the animals derived from the surviving arid-adapted animals from northern Namibia (Hopwood 1939, Groves 1967, Lloyd *in litt* and Rookmaaker 2005). However this view has been challenged. It has been argued that the animals from northern Namibia can be amalgamated with those in the Western Cape and Southern Namibia which died out (du Toit 1987, Hall-Martin 1985), on the basis that 1) the largest skulls du Toit (1987) measured were from northern Namibian animals which was in keeping with Rookmaaker and Groves'

(1978) description of *D.b.bicornis* in the Western Cape and Southern Namibia as a "very large rhino"; and 2) on the ecological similarities between the earlier postulated range of *D.b.bicornis* and that of extant Namibian rhino (Hall-Martin 1985). Further evidence supporting this amalgamation; which Rookmaaker (1996) concedes may be correct; comes from an old map of Greater Kudu (*Tragelaphus strepsiceros*) distribution in Namibia (Shortridge 1934) which shows this species had a contiguous distribution along the Molopo, Nossob, Oliphant, Auob, Great Fish and Orange Rivers (i.e. all the way to the south of the country and well into the supposed range of *D.b.bicornis*). Dietary overlap (for both species and size classes) between Kudu and Black Rhino can be quite considerable (Macfarlane 1997); and it has been noted that where Greater Kudu generally do well, Black Rhino normally also thrive. For these reasons Emslie suggests it is quite possible that at one time there may have been a continuous distribution of black rhino from northern Namibia all the way to the Western Cape supporting the current use of the *D.b.bicornis* subspecies name (although much of the clinal genetic variation in the southern part of the range will have been lost).

- As explained in the plan the stipulated boundary between the south-western and southern-central subspecies' in Cape in the past was a somewhat arbitrary practical construct which primarily used rainfall to differentiate between more arid adapted south-western black rhino areas and wetter southern central black rhino areas in the country. However, problems with previous putative subspecies distributions were highlighted by Skead et al (2007), Knight et al. (in prep), Mike Knight and Dave Balfour (personal communication) who indicated that the Transkei was probably an extra-limital area which formed a barrier to north south rhino movement between the Eastern Cape and KwaZulu-Natal. Following consultations, it was decided to factor in the probable effect of the "Transkei Gap" in determining likely subspecies distributions. As a result the wetter east of the Eastern Cape up to the Kei river has now been defined as *D.b.bicornis* range (with this subspecies spreading into this area from the west); given that it is now thought unlikely that *D.b.minor* could have expanded its range southwards through the Transkei area of northern Eastern Cape.

Appendix 3: Glossary of Terms

Biodiversity Management Plan for Species or Conservation plan:- A tool to guide the management of indigenous species (and any sub-specific taxa) and groupings of indigenous species that are adversely affected by similar threats and enables the evaluation of progress with regard to such management

The IUCN Red List of Threatened Species:- (also known as the **IUCN Red List** or **Red Data List**), is a comprehensive inventory of the global conservation status of plant and animal species which provides taxonomic, conservation status and distribution information on plants and animals that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those plants and animals that are facing a higher risk of global extinction (i.e. those listed as **Critically Endangered**, **Endangered** and **Vulnerable**).

Species:- NEMBA defines a species as a kind of animal, plant or other organism that does not normally interbreed with individuals of another kind, and includes any sub-species, cultivar, variety, geographic race, strain, hybrid or geographically separate population. This definition applies in this document.

Subspecies:- Any natural subdivision of a species that exhibits small, but persistent, morphological variations from other subdivisions of the same species living in different geographical regions or times

Meta-population:- consists of a group of spatially separated populations of the same species which interact at some level (Levins R. 1969. Some demographic and genetic consequences of environmental heterogeneity for biological control. *Bulletin of the Entomological Society of America* 15: 237–240).

Native Species/Indigenous species:- A species is defined as **indigenous** or **native** to a given region or ecosystem, if its presence in that region is the result of only natural resources, with no human intervention. NEMBA defines an indigenous species as a species that occurs, or has historically occurred, naturally in a free state in nature within the borders of the Republic, but excludes a species that has been introduced in the Republic as a result of human activity. It thus excludes agricultural and domesticated livestock and plants

Appendix 4: Harvesting strategy

While the national population was in a recovery stage, and in order to increase the size of the South African national herd for black rhino as rapidly as possible the RMG initially advocated the objectives of both promoting the number of viable populations of the species, as well as maximizing individual population growth (Emslie 2001). This approach relied upon the central caveats of:

- A good understanding of the potential of each rhino area to support black rhinos with estimates of the ecological carrying capacity (ECC) (better referred to as zero-growth density).
- Reliable population estimates, and
- The assumption that harvesting at 75-80 % of the zero-growth density would provide a maximum sustainable yield for the species. This would only be advocated in populations approaching the estimated zero-growth density.

Although this approach was implemented in a number of reserves for a number of years, uncertainties around the estimated zero growth density (with all its complications associated with fluctuations in population size in time & space), unreliability in population estimates and the fear of possible over harvesting of populations however led to a general discomfort with this approach.

This led to an alternative approach referred to as the constant harvest strategy (Goodman 2001). This approach proposes the use of a set harvesting rate (say 5% of the population) which is set below the estimated intrinsic rate of increase for black rhinos (between 8-9%). This in itself provides a safety net and is a self correcting strategy as it relies on a proportion of animals being removed as opposed to a previously set (estimated) number of animals. Application of the strategy must be adaptive in nature with accurate monitoring of the population, with the set removal strategy applied for at least five years to see its effect followed by a review and adjustment as required. Variations in the strategy such as the implementation of the set removal once the population had been reduced to about 70% of its ECC were contemplated (see Brett et al. 2001). The advantages of the set harvesting rate include:

- It does not require an accurate estimate of the ecological capacity for black rhinos, thus removing any controversy around this idea.
- It does not require knowledge of the maximum sustained yield for the population.
- It is a simple and applicable concept for management.
- Small more regular removals from a population would pose less of a threat than fewer larger ones if there were overestimates of the ECC.

References

Emslie R. H. 2001. Strategic achievement of metapopulation goals – Why rapid population growth is so important. In: R Emslie (ed) Proceedings of a SADC Rhino Management Group (RMG) workshop on biological management to meet continental and national black rhino conservation targets. SADC Regional Programme for Rhino Conservation, Harare. Proceedings of this workshop including this paper and a related paper by **RF du Toit** downloadable at http://www.rhinosourcecenter.com/ref_files/1175860813.pdf

Goodman P. S. 2001. Black rhino harvesting strategies to improve and maintain productivity and minimize risk. In: R Emslie (ed) Proceedings of a SADC Rhino Management Group (RMG) workshop on biological management to meet continental and national black rhino conservation targets. SADC Regional Programme for Rhino

Conservation, Harare. Proceedings of this workshop including this paper and a related paper by **RF du Toit** downloadable at http://www.rhinosourcecenter.com/ref_files/1175860813.pdf

Brett R., R Emslie, P Goodman, P Hartley & G van Dyk. 2001. Report of Working Group 3: Approaches to Harvesting. In: R Emslie (ed) Proceedings of a SADC Rhino Management Group (RMG) workshop on biological management to meet continental and national black rhino conservation targets. SADC Regional Programme for Rhino Conservation, Harare. Proceedings of this workshop including this paper and a related paper by **RF du Toit** downloadable at http://www.rhinosourcecenter.com/ref_files/1175860813.pdf

Appendix 5: National Strategy for the Safety and Security of Rhinoceros Populations in South Africa

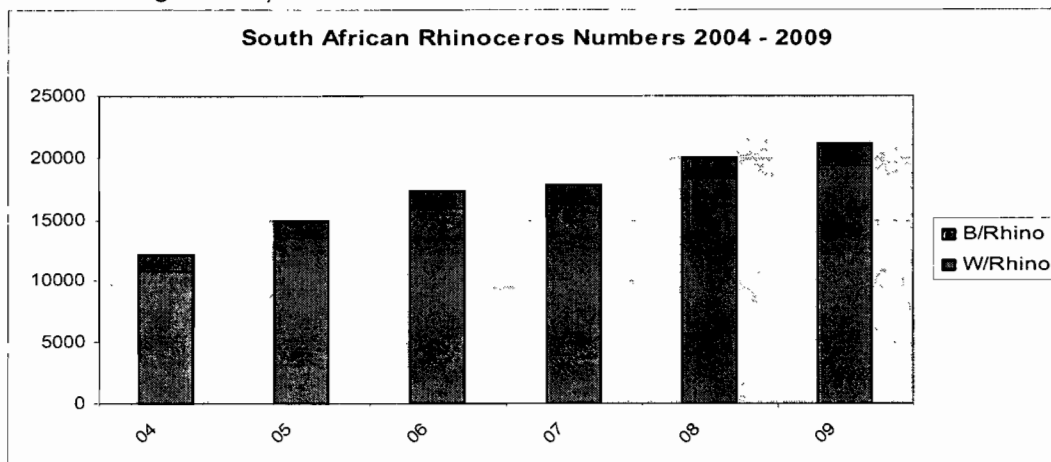
Part A: Introduction and Background

1. Introduction

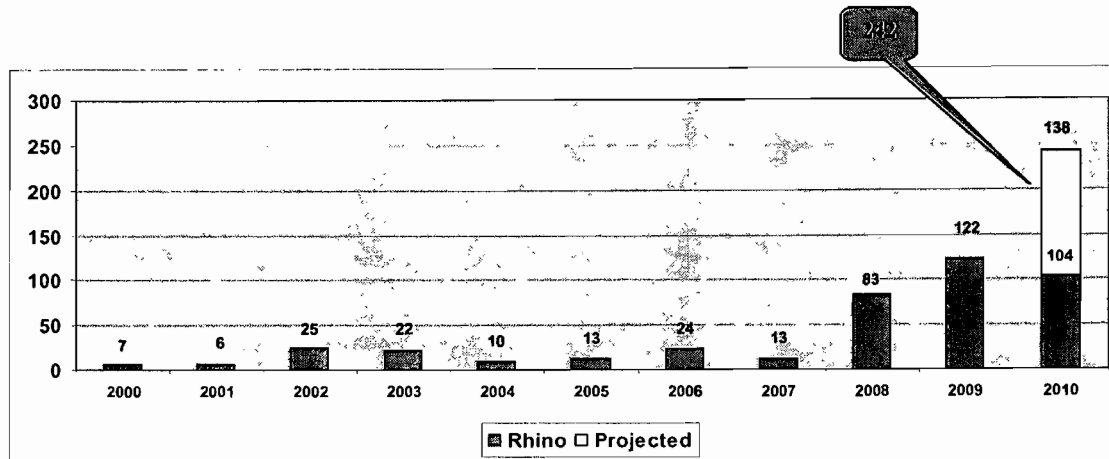
This strategy has been necessitated by a drastic increase in the number of incidents of rhino (rhino) poaching in the country and the continued leakage of certain horn stocks into the international illegal trade. This has raised concern with conservation bodies, private landowners and attracted international attention including media coverage worldwide, and increased the focus on South Africa at the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

South Africa has a proud track record of successful rhino conservation. The figure below shows how numbers of rhinos in the country have steadily been increasing. At the end of 2007 South Africa conserved 35% of Africa's black rhino in the wild and 93% of the continent's white rhino. To date the rhino populations have grown at a healthy annual 5% growth rate, with the total rhino population for the country estimated to be close to 20,000 by 2008 (Fig. 2) and over 20,000 animals in 2009.

Figure 1 Rhino numbers in South Africa 2004 – 2009 (Based on data from the IUCN Species Specialist Commission's African Rhino Specialist Group M. Knight *in litt.* 2009 M. Knight 2009)



Over the years there have also been various successful breakthroughs in rhino poaching investigations by the many law enforcement agencies. Until relatively recently, thanks to these law enforcement efforts, poaching of rhino had been kept under control and held at relatively low levels. However from 2008 onwards rhino poaching has escalated at an alarming rate as has the leakage of both legal and illegal rhino horns held in the various private and government stockpiles with no indication of decreasing.

Figure 2 Rhino poaching incidents recorded for SA 2000 – 10 June 2010

The brunt of the rhino poaching onslaught over the years has been borne largely by the Kruger National Park (KNP), managed by South African National Parks (SANParks), and the provincial reserves under the management of Ezemvelo KZN Wildlife (EKZNW). Since 2000 the KNP have lost a total of 207 animals and EKZNW a total of 82 animals. The last two years, (January, 2008 through to June, 2010) has shown a dramatic spike in rhino poaching incidents in South Africa. All provinces except Western Cape and Northern Cape, have experienced an increased level of poaching activity. In 2008, 83 animals were poached and in 2009, 122 animals were poached, followed by 105 animals already recorded by 10 June for 2010. As Figure 2 shows if poaching continues at the current rate, by the end of the year December 2010, 242 animals will in all likelihood have been poached.

The modus operandi being utilised both locally and internationally in the illegal killing of rhino and the smuggling of their horns in recent years clearly indicates the increasing involvement of highly organised and well structured crime syndicates that are operating a lucrative international enterprise. In addition to the loss of horns through increased poaching, concerns have also been raised regarding "leakage" of South African horns onto the illegal international markets from stocks in the public and private sector. These syndicates are also involved in the "legal / unethical" hunting of rhino in the country.

When comparing the statistics on rhino population growth with the actual number of animals lost through poaching shown in the figures above, it is clear that current levels of poaching are not preventing South African rhino numbers from increasing. However the concern is that should poaching continue to escalate at the current rates, unabated, one could reach the situation where numbers start declining to a point when more animals are being poached than are born into the population – as has been experienced in other rhino range states in the recent past. A properly structured and concerted effort by government and other relevant role-player's, is therefore urgently needed to address this problem, as it poses a significant threat not just to the rhino population but also to the reputation, eco-tourism industry and public image of South Africa. This threat, if ignored, may consequently have a direct or indirect socio-economic impact on people employed at multiple levels in a number of

local industries. It might also lead to international pressures to up-list South Africa's white rhino population from Appendix II to Appendix I at CITES which would have very negative consequences to the country.

This strategy is in line with the national white rhino strategy titled: *A strategy for the conservation and sustainable use of wild populations of southern white rhino Ceratotherium simum simum in South Africa* which was developed at a stakeholders workshop organised by the Rhino Management Group (RMG) and subsequently approved by Members of the Executive Council (MINMEC) meeting on the 29th February, 2000 (Publication of National Environmental Policies and Strategies No. 874, and approved for publication on the 13th June 2003). It is also in line with the National black rhino conservation plan (a revision version of which is in final stages of revision by the RMG (on which the Department of Environmental Affairs (DEA), SANParks, Provincial Conservation Agencies, and the Private Sector are represented) before being submitted for ratification as a Biodiversity Management Plan under the National Environmental Management: Biodiversity Act (NEM:BA).

The objective of a security, protection and law enforcement strategy according to the national white rhino strategy should be to: *"Reduce the effects of poaching, and ensure the successful conviction and sentencing of rhino poachers and illegal traders"*. Rhino protection is also one of the six key components of the revised national black rhino conservation plan and its related objective is *"To minimise illegal activity and losses of rhinos, through appropriate management action, improved legislation and sentences, cooperative intelligence, detection, effective investigation and prosecution, law enforcement and community support"*. The rationale behind these objectives is that, *"the major threat to white and black rhino numbers is poaching and illegal trade in rhino horn. These must be minimised to sustain population growth and maintain the economic, tourism, social and community value/benefits of rhino"*.

Until recently there was also an unexpected problem with significant numbers of white rhino being suspiciously legally sport hunted by nationals from non-traditional hunting countries in the East. However, following a number of new legislative measures in South Africa and increased attention from police and wildlife investigators this legal hunting is no longer a major problem. Following the introduction of the new measures there has however been a marked reduction in rhino sport hunting. This unfortunately has coincided with a rather rapid escalation in rhino poaching activity. The question still remains however of how many illegal non-permitted hunts are still taking place within some of the private areas – hence there is a need to stay abreast of numbers and trends in private sector populations.

2. Application

This strategy is applicable to all relevant law enforcement and conservation agencies as well as private land owners, non-government bodies and communities involved in the management of rhino populations.

3. Purpose

To provide guiding principles to inform decision making processes, strategic planning and operations aimed at reducing the effects of poaching on rhino species and to ensure the successful arrest, conviction and sentencing of poachers, illegal traders and crime syndicates operating locally (at reserve level), nationally, regionally and internationally. The purpose is to also provide better controls and monitoring of rhino horn stockpile management and to promote improved management of the conditions under which rhino may be legally hunted.

4. Objectives

The strategy sets out to inform strategic planning and critical intervention strategies aimed at:

- Implementing an immediate action plan aimed at mitigating the current escalation in the poaching of rhino and the illegal trade in rhino horns;
- Securing the shared commitment of government (at national and provincial level), private land owners local communities and international stakeholders, as well as the necessary financial and manpower resources and political will to implement this policy;
- Supporting the establishment of a national coordination structure for information management, law-enforcement response, investigation and prosecution;
- Developing an integrated and coordinated national information management system for all information related to rhino species in order to adequately inform security related decisions;
- Investigating proactive security measures aimed at facilitating regulated and controlled international trade in the species, and any associated by-products.

5. What informs this strategy?

In the consultative process of developing this strategy reference is made to;

- International conventions that have been signed and ratified by the Government of South Africa and especially CITES;
- Existing legislation such as the National Environmental Management: Biodiversity Act No. 10 of 2004; (NEM:BA) and the National Environmental Management: Protected Areas Act No. 57 of 2003; (NEM:PAA); and
- The South African White rhino strategy and revised National Black Rhino Conservation Plan (currently near to be being finalised for submission as National Species Plan under NEM:BA and building on previous RMG plans);
- National policy documents.

Part B: Principles

South Africa is internationally recognised as a significant international role-player in rhino conservation. This is due mainly to it currently conserving more rhino than any other country, the crucial role the country fulfils in the global conservation of rhino species and the shared commitment by the government, communities and private land owners in addressing the threat posed by the upsurge in poaching and smuggling of rhino horn. South Africa has also played a major role helping to re-establish rhino populations in other countries which had lost their rhino in the past. Mindful of this status the following principles are proposed, and the stakeholders:

(i) ...acknowledge that the focus of this strategy is on safety and security, as Biodiversity management plans for species are concurrently being revised, as part of a holistic approach to managing, utilizing and securing rhino populations in South Africa;

(ii) ...recognize that due to the unexplained increase in the demand for rhino horn in recent years, there has been a marked escalation in the threat to the security of rhino populations. Concerns have also been raised about significant numbers of horns flowing into the illegal market from other sources in South Africa such as illegal non-

permitted hunts or illegal sale of privately owned horns. These threats are driven by sophisticated crime syndicates operating locally, nationally and internationally;

(iii)...accept that increased resources for financial and human capacity of the initiatives, backed by political will, are paramount to the success of any intervention or subsequent strategies;

(iv)...accept that positive interaction and relationships with communities, private rhino owners and other stakeholders backed up by effective communications structures, public awareness or education campaigns and incentive schemes facilitate effective and efficient information exchange;

(v)... support the development of a national organised environmental crime investigation unit under the auspices of the Department of Environment Affairs in conjunction with the South African Police Service (SAPS), National Prosecuting Authority (NPA) and all other relevant stakeholders;

(vi)...support the development of centrally coordinated national crime investigation and information management mechanisms, supported by law enforcement and conservation agencies and the private sector at all operational levels. This includes the development and maintenance of an integrated crime information database and national permit system by the Department of Environment Affairs;

(vii)...accept that an adequate number of highly motivated, well trained, resourced and equipped personnel, are the single most important factor ensuring the success of proactive and reactive operations aimed at countering rhino poaching;

(viii)...accept that research data, including rhino population census statistics and estimates, on public and especially private land (where information for many properties is currently not adequate and efforts to collate numbers are reliant on outside NGO funded surveys), and the movement of rhino around the country, are essential for the development of rhino protection plans. These plans inform threat and risk analyses which prioritize actions and ensure that resources are deployed effectively and also guide decision-makers in formulating or revising strategic conservation and utilization policies;

(ix)...adhere to accepted and lawful criminal investigation procedures under the auspices of the Environmental Management Inspectorate (EMI) which recognize that the successful apprehension, prosecution and neutralization of poaching syndicates relies on support from the SAPS, NPA, including the Asset Forfeiture Unit, South African Revenue Services (SARS), a sensitized Judiciary with Courts specialized in environmental crime and on the effective recruitment and management of informer networks;

(x)...recognise the need for Research and Development of new investigation techniques to improve the effectiveness of the safety and security efforts resulting in improved investigation methods and in a better understanding of the crime dynamics;

(xi)...recognise that monitoring and evaluation systems are essential to ensure that individual animals are monitored where possible, populations are securely maintained, law enforcement actions are effective in maintaining area integrity and that the National Safety and Security Policy to Counter Rhino Poaching in South Africa is being implemented as prescribed by the strategy and standard operating procedures;

(xii)...accept that for the successful implementation of any strategy an understanding of the end-user demand for rhino horn at the off-shore consumer level is required. Outcomes of this research will inform and may redirect emerging actions;

(xiii)...adopt a cooperative and supportive relationship with all recognized non governmental stakeholder groups engaged in the protection of rhino and the countering of the illegal trade in associated by-products.

PART C: Proposed Intervention strategies and/or activities

INTERVENTION

Strategy Outcome 1

Implementing an immediate action plan aimed at mitigating the current threat, to the rhino population, posed by the escalation in poaching and the illegal trade in rhino horns and associated by-products;

Strategies / activities

- Establishment of an interim National Wildlife Crime Reaction Unit (NWCRU) to respond to the current spate of wildlife crimes and more specifically the upsurge of rhino poaching and smuggling of rhino horn. This unit should eventually evolve into a permanent NWCRU structure within the Department Environmental Affairs (hereafter referred to as "the Department");
- Obtain support for the establishment, and structure of the NWCRU from Provincial Conservation authorities including the South African National Parks (SANParks), South African Police Services (SAPS), National Prosecuting Authority and Provincial conservation agencies, mindful of the existing agreement prescribed in the document titled "Standard Operating Procedures for Cooperation between the Environmental Management Inspectorate (EMI) and the South African Police Services (SAPS)". The exact composition of the structure, interim criteria for staff appointment and skills set required are to be finalised after consultation between all stakeholders;
- Seek support for the secondment of appropriate and carefully vetted officials from the above mentioned government departments or institutions to the Department, to form an interim NWCRU to make an immediate impact on the current escalating illegal wildlife trafficking including but not necessarily limited to the upsurge of rhino poaching and rhino horn smuggling activities in South Africa;
- Conduct joint operations, law-enforcement actions and where applicable provide related assistance to provincial structures and private rhino owners;
- Establish a database and information sharing mechanisms for available information in respect of rhino poaching incidents in the country; and
- Conduct an extensive inter-departmental analysis of all available information, culminating in an accurate risk and threat assessment and identification of criminals;
- Convene regular meetings, information sharing discussions and workshops between government and private sector stakeholders;
- Promote cooperation, sharing and a common understanding of best practices on security, crime prevention, combating poaching, illegal or unethical practices and related environmental crime;

- Recommend interim minimum standards, specifications, operating procedures and protocols for security measures aimed at preventing poaching incidents;
- Identify and implement common community-based security and policing initiatives; and
- Provision of an adequate budget and sufficient skilled manpower for this unit to function effectively;
- A need to improve monitoring of rhinos, horn stockpiles and rhino movements nationally especially on private sector;
- Assist in trying to build support for coordinated conservation initiatives and to sensitise the private sector to training opportunities (e.g. in monitoring, law enforcement *etc*) and need for increased vigilance and communication in the face of the current escalating poaching threat.

LONGER TERM STRATEGIES

Strategy Outcome 2

Securing the shared commitment of government (at national and provincial level), private land owners' local communities and international stakeholders, as well as the necessary financial and manpower resources and political will to implement this policy;

Strategies / activities

- Obtain high-level political commitment and mandate, inter-departmental and legislative support through regular briefings to the Minister of Environmental Affairs, relevant Parliamentary Portfolio Committees and other role-players identified by the Minister;
- Identify relevant role-players/stakeholders in all spheres both national and international who could be impacted by or contribute to any activities implied by this policy;
- Ensure stakeholder participation and commitment in the implementation of this strategy by conducting workshops/work sessions between government (national and international) and private stakeholders, on the establishment of long-term structures, cooperation, information sharing, the drafting of protocols, processes and procedures, and the sharing of best practices on security, crime prevention, combating poaching, illegal or unethical practices and related environmental crime issues, inclusive of giving consideration to the establishment of Public Private Partnerships (PPPS);
- Establish a communication structure to liaise between the Department, the Unit, other government departments (national and international) and private stakeholders in order to promote close working relationships and information sharing, by conducting regular meetings, public awareness or conservation education campaigns and community outreach programmes;
- Encourage information sharing and public participation through mechanisms such as an information reporting hot line, incentive schemes and community-based security and policing initiatives;
- Allocate an adequate budget for the implementation of this policy and derived strategies or actions;
- Lobby and secure additional financial resources, through private sector donors and/or grants to augment the government budget and/or to embark on PPP projects;

- Lobby support and acceptance for the implementation of the strategy to ensure optimal rhino security in South Africa and the Sub-region through existing inter-governmental agreements and mechanisms (e.g. Southern African Development Community (SADC));

Strategy Outcome 3

Supporting the establishment of a national coordination structure for information management, law-enforcement response, investigation and prosecution;

Strategies / activities

- Establishment of a permanent Biodiversity Special Investigation Unit (BSIU) (also referred to as "the Unit") in the Department of Environmental Affairs to adequately respond to the current upsurge in wildlife crime and smuggling activities in South Africa;
- Develop an implementation plan aimed at building the Unit's capacity and resources, inclusive of the definition of the required skill set, training standards, specialised equipment requirements;
- Establish Memorandums of Understanding (MOU's) between the Unit, the Department, all relevant government departments and private stakeholders, inclusive of the development of Public Private Partnerships (PPP's);
- Drafting and development of protocols, deployment actions, Standard Operating Procedures (SOP's) and monitoring tools for all activities to be conducted by the Unit, inclusive of joint operations at national, regional and international level, law-enforcement actions, information management and provision of related assistance to provincial structures and private owners;
- Promote cooperation and sharing of best practices on security, crime prevention, combating poaching, illegal or unethical practice, wildlife inspection, law enforcement, forensics skills and related environmental crime issues;
- Recommendation of minimum standards and specifications for enhancing compliance with treaties and laws, security measures and policing initiatives which are applicable to government and private stakeholders and aimed at enhancing protection plans and conservation management of rhino populations;
- Establishment, recruitment and maintenance of informer networks and informer management training;
- Supporting the establishment of specialised environmental courts and the sensitising of the prosecutors in environmental crime related prosecutions;
- Promote the acquisition of adequate human capital at the government and private sector level to support the implementation of this policy and derived strategies or actions.

Strategy Outcome 4

Developing an integrated and coordinated national information management system for all information related to rhino species in order to adequately inform security related decisions;

Strategies / activities

- Establish and maintain a database for all crime related information in respect of any activities impacting on rhino populations, rhino horns and associated by-products in South Africa;

- Establish secure electronic reporting and information sharing mechanisms for populating the above database, inclusive of the information emanating from informer networks;
- Integrate the above database with applied scientific research data, including rhino population census statistics and estimates for public and private land, surveys, monitoring reports or other data related to rhino population, horns or associated derivatives; Efforts should also be coordinated to dovetail with existing efforts for black rhino and white rhino on state land (under SADC, RMG and IUCN, SSC, AfRSG). There is a definite need to also routinely monitor white rhinos and horn stocks on private and community land;
- Integrate the above database with the national permit system data for all CITES, National and Provincially issued permits relevant to rhino species and any associated by-products;
- Conduct extensive inter-departmental analysis of all available information, culminating in regular risk and threat assessments, trend identification, the identification of modus operandi and criminals;
- Conduct or commission research (as well as cooperating and contributing to international research initiatives) applicable to the protection, conservation or utilisation of rhino species or associated by-products; such as explaining the escalation in poaching, the demand for rhino products, gaining an understanding of the end-user market dynamics, examining alternative approaches which might reduce illegal horn prices and hence reduce illegal demand and ultimately poaching.

Strategy Outcome 5

Investigating proactive security related measures aimed at possibly facilitating a better understanding for any possible future regulated and controlled international trade in the species, and any associated by-products;

Strategies / activities

- Conduct a comparative technical study on current international projects, research being conducted or other initiatives, inclusive of documenting case studies involving successful security related measures, in both the legal and illegal wildlife trade on which to base possible future interventions or recommendations;
- Engage in and support all international initiatives aimed at obtaining a clearer understanding of the consumer demand dynamics involving the use of rhino horn and rhino horn derivatives;
- Engage with and support Regional initiatives through the INTERPOL / Rhino and Elephant Security Group to obtain a clearer understanding of the trends, modus operandi, suspects and initiatives taking place in other Regional rhino range states;
- Support the optimal demographic and genetic management of rhino populations and allocation of rhino to achieve national demographic (>5% annual population increase) goals as called for in the national black rhino conservation plan and national white rhino strategy. Seeking to breed up numbers rapidly forms another key component of all national rhino plans and strategies. This aspect (biological management to meet demographic and genetic goals) is currently covered nationally for black rhino by the SADC, RMG;
- Assess and re-evaluate the success of, and determine possible loopholes in, the local mechanisms currently in place for stockpile management, control and movement;

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- Support the finalization of the development and execution of Biodiversity Management Plans for species (currently nearing completion for black rhino by the RMG but which should be modified in the light of any new initiatives to emerge from this strategy) which incorporate a holistic approach to managing, utilising and securing the rhino populations, inclusive of comprehensive crime prevention strategies based on industry best practice and lessons learnt as well as supporting all efforts to reduce human-rhino conflicts;
 - Monitoring: To cooperate with existing initiatives to maintain accurate population estimates and demographic measures of performance for populations (e.g. through SADC RMG and IUCN SSC AfRSG), and where necessary, and information is currently inadequate (white rhinos on private and community land), seek to obtain and collate such data on a regular basis. Where possible these data should be synthesized at a National meta-population level to aid in future rhino security management;
 - Consider the impact of agreements, legislation and policies not related to NEMA but which may impact on rhino security; including protected area and reserve management conservation issues and security;
 - Support Research & Development of new investigation techniques to improve the effectiveness of the safety and security efforts resulting in improved investigation methods and in better understanding of the crime dynamics, eg. liaison with United States Fish and Wildlife laboratory, the geographic origin of rhino horn project and the field identification of rhino horn/products.
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