

The status of the black rhinoceros (*Diceros bicornis*) on private land in South Africa in 2001

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Abstract

Considerably fewer black rhinos (*Diceros bicornis*) than white rhinos (*Ceratotherium simum simum*) are found on private land in South Africa. Primary reasons are that originally there were fewer black rhinos in the wild and that black rhinos have been available to private owners only since 1990. Further contributing factors include the high price of black rhinos and the stringent habitat and security requirements imposed by sellers, essentially state conservation agencies, who want to ensure that private owners establish minimum breeding populations. Consequently few private landowners had established black rhino populations on private land. But now a survey undertaken in 2001 has shown that 118 black rhinos are privately owned on 15 properties. This is an increase of 34% since 1999, 55% of which is accounted for by sales to the private sector from state-owned conservation agencies. *D.b. minor* make up 69% of the total; *D.b. michaeli* 19% and *D.b. bicornis* 11%. Natural growth within the population is 5.7% per annum. Almost two-thirds of the population are adult animals (63%) with females outnumbering males, while among subadults males slightly predominate. There is keen interest in some sections in sport hunting surplus bulls on private lands.

Résumé

On observe nettement moins de rhinos noirs (*Diceros bicornis*) que de rhinos blancs (*Ceratotherium simum simum*) dans les domaines privés d'Afrique du Sud. Les premières raisons en sont que dès le début, il y avait moins de rhinos noirs que de blancs dans la nature et que les propriétaires privés n'ont pu acquérir de rhinos noirs que depuis 1990. D'autres facteurs importants incluent le prix élevé des rhinos noirs et les conditions strictes en matière d'habitat et de sécurité qui sont imposées par les vendeurs, ceux-ci étant principalement des organes de conservation de l'Etat qui veulent s'assurer que les propriétaires privés constituent des populations reproductrices minimales. Par conséquent, peu de propriétaires ont installé des populations de rhinos noirs sur leurs terres. Mais une étude entreprise en 2001 a montré que 15 propriétés privées abritaient maintenant 118 rhinos noirs. Ceci représente une augmentation de 34 % depuis 1999, dont 55 % sont dus à des ventes des organismes de conservation d'Etat au secteur privé. *D.b. minor* représente 69 % du total ; *D.b. michaeli*, 19 % et *D.b. bicornis*, 11 %. La croissance naturelle de la population est de 5,7 % par an. Près des deux-tiers de la population sont des animaux adultes (63 %), et le nombre de femelles est plus élevé que celui des mâles, tandis que chez les sub-adultes, les mâles dépassent légèrement les femelles. Il y a un intérêt marqué dans certaines sections pour la chasse sportive, dans les terrains privés, des mâles qui sont en surnombre.

Introduction

A telephone survey to assess the status of black rhinoceros (*Diceros bicornis* Linnaeus, 1758) on private land in South Africa was undertaken during November 2001. It included all property other than

national parks, provincial, municipal and defence force reserves and the greater Kruger reserves. The survey was funded by WWF International's African Rhino Programme. Several surveys of this nature have been undertaken on the southern white rhino in recent years (such as Buijs 2000; Castley and Hall-Martin

this issue) but none on the black rhino. However, the Rhino Management Group (RMG), a multi-agency association including conservation agencies, rhino experts and private owners has figures on the distribution and status of black rhinos on private land (Knight 2000). It coordinates black rhino management issues in South Africa and some neighbouring countries including Namibia, and more recently Swaziland and Zimbabwe. The RMG is also responsible for updating and putting into effect the South African national conservation plan. The current survey data complement and update existing RMG information.

Three of the four recognized subspecies or ecotypes of black rhino (according to du Toit et al. 1987) are found on private property in South Africa. The South African national rhino conservation plan recommends that they not be allowed to interbreed. To prevent such interbreeding and to ensure maximum breeding of the individual subspecies, a premium is placed on proper monitoring of these populations. The most numerous black rhinos on private property belong to the south-central subspecies, *D.b. minor*. A population of the south-western subspecies (*D.b. bicornis*) that is regarded as indistinguishable from the locally extinct Cape black rhino (Hall-Martin 1985) has been reintroduced into South Africa from Namibia. A population of the eastern subspecies (*D.b. michaeli*) that was originally introduced to Addo Elephant National Park from Kenya in 1961 and 1962

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Black rhino in boma at Addo Elephant National Park, ready for transport.

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Diceros bicornis michaeli cow and calf.



(Hall-Martin 1979) is also present. South African National Parks is moving the *D.b. michaeli* out to make way for the indigenous *D.b. bicornis* because Addo plans to increase its area to be able to support an independently viable black rhino population. The majority of the *D.b. michaeli* removed from Addo were translocated to a single private reserve selected as a suitable custodian of this population, while others have been translocated to reserves in Tanzania that are within the subspecies' historical distribution range.

This paper presents the findings of a recent survey of black rhinos on private land in South Africa, with the hope that it will lead to improved management. It updates population figures, demographics and trade aspects, and it provides supporting baseline data for future comparative surveys with RMG information.

Objectives

The survey was carried out to determine the numbers of black rhinos on individual private properties, the

structure of each population, the pattern and numbers of animals traded or moved between properties, the success rate of such translocations, an overview of population performance, and an estimate of rhino horn stock under private ownership. Secondary objectives were to understand the factors influencing the market in black rhinos, the owners' reasons for keeping them, and their attitude towards the possibility of legalizing rhino hunting and trading in rhino horn.

Methods

The starting point was to contact the 11 properties listed by Knight (2000) as having black rhinos and the 4 others that subsequently acquired them. Pertinent questions in a structured questionnaire were asked of either the landowner or manager or sometimes a third party (such as wildlife dealer or conservation official) for relevant information pertaining to the specific property (property registers, permit applications, sales records, and so on). Other information was obtained

through personal contacts. Records of sales of black rhinos to private landowners by Ezemvelo KwaZulu-Natal (EzKZN) Wildlife and South African National Parks (SANParks) were also consulted.

Results

Information quality

Only one of the owners of black rhinos was reluctant to be interviewed, but the status of this particular population was satisfactorily derived from other sources. The remaining owners cooperated fully in disclosing their dealings and the status of their populations. Two private animal dealers who had traded in black rhinos also gave full information on their transactions. All populations known to the various provincial conservation authorities were accounted for and we believe that the number of black rhinos on private land is accurately reflected in this paper. The nature of the questions asked and the data collected in the present survey are neither as intensive nor as detailed as the

information that RMG collected. The confidential RMG summary reports distributed to participating parties are, however, not made available to the general public.

The properties

All 11 properties that Knight (2000) listed still had black rhinos. An additional 4 properties acquired animals after the 1999 survey. Two of the properties kept a single black rhino each under confined zoo conditions. On the remaining 13, the rhinos were free ranging, and 11 had sufficient numbers to be classified as breeding populations (table 1). The total area of the private properties on which black rhinos are found is 245,000 ha. The average size of the properties is 16,333 ha which is considerably larger than the 6314 ha mean size of properties supporting white rhinos (Castley and Hall-Martin this issue). Seven properties are between 10,000 and 50,000 ha, three are less than 5000 ha, two are between 5000 and 10,000 ha and only one property is larger than 50,000 ha. Thirteen of the 15 properties have both black and white rhinos.

Table 1. Black rhino population on 15 private properties in South Africa

Property	Ecotype	Total 1999	Total 2001	Purchases	Births	Deaths	Sales	Moved	Adult male	SA male	Adult female	SA female	Un-sexed calves
A	<i>minor</i>	19	18	–	1	–	–	2	9	–	8	–	1
B	hybrid	0	1	1	0	0	0	0	0	0	0	0	0
C	<i>minor</i>	7	7	0	1	1	0	0	2	1	3	1	0
D	<i>minor</i>	5	5	0	1	1	0	0	1	1	2	0	1
E	<i>minor</i>	6	8	0	4	2	0	0	3	1	2	1	1
F	<i>minor</i>	12	11	0	2	0	3	0	2	3	5	1	0
G	<i>minor</i>	10	14	5	3	4	0	0	2	1	6	4	1
H	<i>michaeli</i>	10	22	10	5	1	0	2	6	7	4	3	2
I	<i>minor</i>	0	6	6	0	0	0	0	2	0	4	0	0
J	<i>bicornis</i>	12	13	0	3	0	0	2	1	2	5	3	2
K	<i>minor</i>	0	5	6	1	2	0	0	2	0	1	2	0
L	<i>minor</i>	0	2	2	0	0	0	0	0	1	0	1	0
M	<i>minor</i>	4	4	0	1	0	1	0	1	1	1	0	1
N	<i>michaeli</i>	2	1	0	0	1	0	0	0	0	1	0	0
O	<i>minor</i>	1	1	0	0	0	0	1	1	0	0	0	0
Total	<i>minor</i>	64	81	19	14	10	4	3	25	9	32	10	5
Total	<i>bicornis</i>	12	13	0	3	0	0	2	1	2	5	3	2
Total	<i>michaeli</i>	12	23	10	5	2	0	2	6	7	5	3	2

Tinted rows are populations classified as non-breeding.

Rhino numbers and population trends

In November 2001 there were 118 black rhinos on the 15 properties, representing an increase of 30 animals since 1999: 81 *D.b. minor* subspecies, 23 *D.b. michaeli*, 13 *D.b. bicornis* and 1 thought to be a hybrid of *D.b. minor* and *D.b. michaeli*. Natural growth within the population is 5.7% per annum. Almost two-thirds of the population are adult animals (63%) with females outnumbering males, while among subadults males slightly predominate.

The increase between 1999 and 2001 was due to the birth of 22 calves, plus purchase by the private sector of 17 animals from EzKZN Wildlife and 10 animals from SANParks. The overall increase of 49 animals to the private sector was reduced by 12 deaths, 4 animals transferred to SANParks control, 2 animals sold to Mkomazi Game Reserve in Tanzania, and 1 animal sold to the Free State Provincial Nature Conservation Authority (table 1). At this time only one population is large enough (22 animals) to rank as *Important* according to the criteria of Emslie and Brooks (1999).

The rhino populations on six of the properties (A,E,F,H,J, M), of all three subspecies, are increasing in terms of biological performance, having increased from 63 in 1999 to 76 in 2001, representing an annual increase of 9.9%. However, if the natural increase in the entire breeding population is calculated, excluding properties I and K, as these rhino were bought during the survey period (table 1), the increase is 6.9% a year. The increase observed in four of the populations can be attributed to purchases during the survey period. Three populations were static and two were decreasing. Three of the properties had only one black rhino each.

Age and sex structure

Within the entire population, the sex of all the black rhinos except for nine calves is known. The ratio of adult male to adult female is 1.00 : 1.27. The sex ratio of animals sold from EzKZN Wildlife populations is weighted in favour of females, while the animals sold from Addo were more males than females. This has resulted in a sex ratio among the subadults (all animals younger than 7 years) of 1.13 : 1.00. The age structure of the population is primarily determined by the structure of groups sold at auction by EzKZN Wildlife where the ratio of adults to subadults is 1.74 : 1.00. In the overall population of breeding age, there are more

females than males, which should boost the rate of natural increase. By comparison the Addo Elephant/Mountain Zebra National Park metapopulation of *D.b. bicornis* rhino has an adult sex ratio of 1.00:1.80 in favour of females but in the subadult population males outnumber females 1.33 : 1.00. The ratio of adults to subadults is 1.00 : 1.50, indicating an increasing population.

Rhino mortality

Deaths recorded were 12, from seven properties. Three of these deaths occurred on one property, all within three months of translocation where a resident bull killed a subadult male and two adult females. Two deaths were probably due to translocation stress—a cow calved within 12 months of translocation and was then attacked by a bull that had been moved with her, resulting in her death and that of her young calf. Lightning struck and killed one subadult male, and a calf was killed by an adult bull. One adult male was killed in a fight with another bull on a relatively small property of 4000 ha. One adult bull died of old age. An adult female died and her female calf, which then tried to stay in the company of a white rhino, was killed by another white rhino. No black rhinos were poached on private property during the reporting period.

Trade in black rhinos

Black rhinos were sold largely by state conservation agencies directly to owners or through auctions. EzKZN Wildlife sold 17 animals, all *D.b. minor*, and SANParks sold 10, all *D.b. michaeli*. When the price paid is considered in South African rand (ZAR) there appeared to be an increase, but this increase is not as great when calculated in US dollars (USD) (table 2). Higher prices were paid for adult females, particularly if pregnant, while subadults and bulls generally fetched lower prices. SANParks sold rhinos to a single selected property as previously agreed with the Department of Environmental Affairs and Tourism, while those repatriated to Mkomazi in Tanzania came from SANParks as well as from this selected property. Given that this property may not sell to any other third party within South Africa, prices were negotiated and set as those at which black rhinos were recently traded between international zoos: USD 45,000 for females and USD 5000 for males.

Table 2. Trade statistics on black rhinos sold within the private sector with average price comparisons at the time of each sale

Seller	Year	Type of sale	Numbers		Price per rhino	
			Males	Females	ZAR	USD
EzKZN Wildlife	2000	auction	2	4	375,000	54,230
EzKZN Wildlife	2001	auction	2	4	550,000	68,247
EzKZN Wildlife	2001	direct	2	4	undisclosed	
EzKZN Wildlife	2001	direct	1	0	150,000	21,692
SANParks	2000	direct	8	2	108,537	13,000
Private	2001	dealer	1	1	175,000	21,054

ZAR – South African rand; USD – US dollar; EzKZN – Ezemvelo KwaZulu-Natal; SANParks – South African National Parks; tinted cells are subadult sales

Rhino horn stocks

At least 37 black rhino horns are in private ownership. No data were obtained on the weights of these horns as many owners did not differentiate between black and white rhino horn. The rhino horn stocks on private land have been summarized by Castley and Hall-Martin (this issue). These figures include a number of black rhino horns, most of which have been registered with the provincial conservation authorities.

Discussion

Availability of black rhinos to the private sector

The number of black rhinos available from EzKZN Wildlife has varied from year to year. The usual number offered on auction is five or six animals per year since the first animals were auctioned in 1990. Initially prices were high when compared with white rhino prices; consequently demand and then prices declined. In 1998 when several black rhinos offered in the auction were not sold, a later negotiated transaction resulted in 28 black rhinos being sold to a private landowner in Zimbabwe. Many landowners questioned in the recent white rhino survey (Castley and Hall-Martin this issue) indicated that they would be interested in acquiring black rhinos if prices were lower and revenue could be generated by trophy hunting of surplus males.

The sale of the *D.b. michaeli* animals from SANParks' Addo population has been completed, although not all the animals have yet been delivered.

SANParks has no plans to sell any of its *D.b. minor* animals from Kruger, which has adequate habitat available. Although its population is large, it is still far below its estimated ecological carrying capacity of 3000 animals (Brooks and Adcock 1997). The population will therefore be allowed to grow for some time before any sales are considered.

It has been suggested that the populations of black rhinos in the EzKZN Wildlife reserves that are showing low birth rates at present could be stimulated if population density was lowered (Knight 2000). One way of doing this would be to transfer more animals to Kruger, where adequate habitat is available. Another way would be for EzKZN Wildlife to sell more black rhinos to the private sector. Such a course of action should, however, be critically assessed against the overall breeding record of black rhinos on private land since 1990. At least 99 black rhinos have been sold to private properties from EzKZN Wildlife, SANParks and Namibia since 1990. Yet the total number now stands at only 118, indicating that on the whole the birth rate has been low or that mortality has been unnaturally high. This trend is not true in all properties, as some are doing well, but it does highlight the complexities of managing black rhinos that have been clearly outlined by Emslie (2001) but that are not widely appreciated by all private wildlife owners and managers.

Costs of establishing viable populations

The costs involved in establishing viable populations of black rhinos are significantly higher than for white rhinos, prices being strongly influenced by the age and sex of the animals needed. Also, properties are

supposed to meet certain area requirements to support a minimum ecological carrying capacity of rhinos in line with recommendations in the national conservation plan, although these recommendations are not always adhered to. Direct field-to-field translocation of black rhinos, such as is often done with white rhinos, is not advised. Holding pens for black rhinos need to be much more substantial than those required for white rhinos and consequently are far more expensive. Intensive monitoring is often required when animals are introduced. The need for tight security and the level of staff training needed to deal with potential incidents add to the costs. Wise handling of many of these issues rely on the management ability of the owner or manager, suitability of the property, and adequate funds.

Hunting and land use

As the black rhino is currently listed in Appendix 1 of CITES, trade is restricted because of the threatened status of the species. Permits for black rhino hunting fall within the South African provincial conservation ordinances, and any quotas, if set, would need to comply with international trade restrictions in terms of movement of trophies as well as with CITES regulations. Five properties are prepared to allow hunting of surplus males if this becomes legalized, while seven properties, used for tourism or recreation, do not consider hunting compatible with their objectives. The other three properties are used purely for recreation, education and conservation. The economic potential of black rhinos has not been as great a reason for acquiring them as it is for white rhinos (Castley and Hall-Martin this issue). Owners of black rhinos appeared to have greater appreciation than did white rhino owners of the part they can play in conserving a rare and endangered species.

Whether the black rhino population of South Africa should be downlisted from Appendix 1 of CITES, to stimulate trade and sustainable use of the species is an ongoing debate. Public interest in whether hunting black rhinos should be allowed is likely to be keen. The opinions gathered in the present survey tilt towards the view that legalizing the hunting of surplus male black rhinos, one of the management options listed by Brooks (2000), will stimulate a desire to provide more privately owned habitat for the species. It would probably also drive up prices, as hunting white rhinos was shown to have done some two decades ago (Buijs 2000).

Landowners, however, are prepared to make large investments if there is a reasonable prospect of long-term profit. The current shortage of black rhinos in the market will likely stimulate demand for the few animals available each year.

Security

No black rhino has ever been poached on private land in South Africa whereas at least 20–30 white rhinos have been poached on private property over the past decade. This may be because the properties where black rhinos are found are relatively larger, better funded, better managed and have better security than properties keeping white rhinos, but it may also be a function of black rhino social structure and general behaviour. Or it may simply be that there are significantly more white rhinos than black rhinos on private land.

Metapopulation management

To avert potential deleterious genetic consequences of interbreeding in small populations of black rhinos a national metapopulation strategy has been worked out (Brooks and Adcock 1997) and adopted by various conservation agencies (such as SANParks 2002). The issue of adopting such a policy for the small populations of black rhinos on private land was also raised. Some owners thought that it might be possible to exchange bulls with the larger populations in state facilities or to hire the services of bulls as is done in horse racing and other livestock industries. It is clearly desirable to increase population sizes on private properties, if capture and translocation mortality can be avoided (see Adcock 1995). As the risk associated with introducing new bulls to existing groups of black rhinos is considerable (Emslie 2001), introducing adult females may be more advisable.

Greater collaboration among private sector owners to maximize population viability where possible makes conservation sense, but not necessarily business sense. Nevertheless, there is little value in having single animals or populations with only two or three animals. As the national plan advocates that potential black rhino properties have an ecological carrying capacity of at least 20 animals, efforts should be made to encourage owners to stock larger numbers.

Habitat and management requirements

When the specialized habitat requirements of black rhinos and effective population size are considered

together, it becomes evident that breeding rates are markedly different in different regions of the country. Evidence is already available that black rhinos in the low-nutrient, mainly broadleaved savannah regions on both private and state land are not thriving as well as those living in higher nutrient areas. A model for predicting carrying capacity for black rhinos in different environments has been developed (Adcock 2001). This model should be of great value in guiding private landowners in purchasing and managing black rhinos and should be used, together with property size, when assessing the suitability of a property for raising black rhinos.

A recent publication produced by the RMG gives prospective owners of black rhinos a comprehensive guide to keeping the species successfully on private land (Emslie 2001). Whether the state conservation agencies have the legal power, or the ecological knowledge, to discourage or prohibit introducing black rhinos to an unsuitable habitat is, however, debatable.

Conclusion

Black rhinos of three of the four recognized subspecies are now established on private property in South Africa. The single largest population, however, is only 22 animals and the average size of the groups is less than 10. The record of success on individual properties has been varied. Despite the good performance of some of these populations, it appears to be necessary for landowners to re-examine the recommendations made in national plans to ensure that conservation objectives for the species are met while still providing the private owner with an opportunity to make a profit. The data from this survey will contribute to the existing databases of RMG and the African Rhino Specialist Group (AfRSG) to help evaluate black rhino performance on private land. Such an evaluation should be done before any decision is taken by the state authorities to sell more black rhinos to the private sector.

More landowners would like to have black rhinos on their properties, but the numbers that can be provided are limited. Managing black rhinos is clearly more demanding of expertise than is managing white rhinos. For this reason the RMG's efforts to provide better guidelines (Emslie 2001) is to be welcomed as is their commitment to producing status reports for the species.

Black rhinos have been acquired by properties that do not meet minimum criteria for number of animals and quality of habitat, resulting in unnecessary deaths. Indications are that translocating a pregnant female tends to cause miscarriage or the loss of a calf born prematurely and therefore selling these females is counterproductive for black rhino conservation.

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