

# Illegal killing of African rhinos and horn trade, 2000–2005: the era of resurgent markets and emerging organized crime

Simon A.H. Milledge

TRAFFIC East/Southern Africa, PO Box 106060, Dar es Salaam, Tanzania; email: traffictz@bol.co.tz

## Abstract

This paper summarizes rhino poaching, rhino horn seizure and stockpile data in Africa for 2000–2005. It is derived from a document prepared by TRAFFIC, the wildlife trade monitoring network, for the 14th meeting of the Conference of the Parties to CITES in June 2007. The volume of horn entering illegal trade from Africa has increased significantly since 2000, indicating ongoing market demand and organized trade routes to the Middle and Far East. Through law enforcement, range States collectively recovered 42% of the potential number of rhino horns moving into illicit trade, but a minimum of 386 horns are believed to have evaded detection and were lost to illegal trade. Poached rhinos continue to supply most horns, with at least 252 rhinos detected as illegally killed during 2000–2005. However, prominence has been rising of horns acquired and laundered from private stockpiles and from legally hunted white rhinos in South Africa. With effective metapopulation management strategies, most range States in Africa have minimized poaching to levels at which their overall rhino populations continue to increase in numbers. Two notable exceptions are the Democratic Republic of Congo and Zimbabwe, where respectively 59% and 12% of their 2003 rhino populations were illegally killed during 2003–2005. Where illegal activities have escalated in key rhino range States, two important factors limiting management effectiveness are the increased levels of criminal organization and a breakdown of socio-economic stability and governance. TRAFFIC recommends renewed international attention following recent CITES decisions, with a focus on problems in DRC, South Africa and Zimbabwe.

## Résumé

Cet article résume les données sur le braconnage des rhinos, les saisies de cornes et les stocks en Afrique pour la période 2000–2005. Il est tiré d'un document préparé par TRAFFIC, le réseau de suivi du commerce des espèces sauvages, pour la Conférence des Parties à la CITES de juin 2007. Le volume de corne qui entre dans le commerce illégal en provenance d'Afrique a augmenté significativement depuis 2000, ce qui indique une demande soutenue et des routes de trafic bien organisées vers le Moyen- et l'Extrême-Orient. Les états de l'aire de répartition ont réussi à récupérer collectivement, grâce à des activités de maintien des lois qui ont eu lieu entre 2000 et 2005, 42 % du nombre potentiel de cornes qui étaient absorbées par le commerce illégal, mais on estime qu'au moins 386 cornes ont échappé à toute détection et se sont fondues dans le commerce illégal. Les rhinos braconnés continuent à alimenter la plus grande partie de ce commerce, avec au moins 252 rhinos tués illégalement pendant cette même période. Pourtant, on constate l'importance croissante des cornes acquises et blanchies auprès de stocks privés et venant de rhinos blancs tués légalement en Afrique du Sud. En raison des stratégies efficaces de gestion en métapopulations, la plupart des pays africains de l'aire de répartition ont pu réduire le braconnage jusqu'à un niveau qui permet à leur population totale de rhinos de continuer à croître. Les deux exceptions notables sont la République Démocratique du Congo et le Zimbabwe qui ont respectivement perdu 59 % et 12 % de leur population de rhinos à cause de massacres illégaux entre 2003 et 2005. Là où les activités illégales ont augmenté dans les états de l'aire de répartition des rhinos, les deux facteurs importants qui ont limité l'efficacité de la gestion sont le niveau plus élevé de criminalité organisée et un effondrement de la stabilité socio-économique et de la bonne gouvernance. Les recommandations données s'inscrivent dans le contexte d'un intérêt international renouvelé suite aux récentes décisions de la CITES, avec une attention particulière pour les problèmes que connaissent la RDC, l'Afrique du Sud et le Zimbabwe.

## Introduction

The illegal killing of rhinos for horn trade to the Middle and Far East markets has long posed a serious threat to both African rhino species. Less than 15 years after numbers of African rhinos had reached their lowest level in history, both species have shown a steady recovery. White rhinos, *Ceratotherium simum*, more than doubled from 7095 in 1995 to 14,550 in 2005, while black rhinos, *Diceros bicornis*, increased from 2410 to 3725 during the same period (Emslie and Brooks 1999; Emslie et al. 2007). Indeed, the ongoing recovery of African rhino populations could be one of the most heralded conservation success stories in the making.

A two-pronged approach helped halt the decline of African rhino numbers. First, the severity of illegal activities experienced during the 1970s and 1980s was reduced through a combination of measures along the trade chain, ranging from intensive in situ protection in range States to promoting substitutes in consumer nations. Second, metapopulation management and innovative partnerships have been instrumental in improving rhino population performance and range expansion. CITES decisions have played their part in addressing illegal activities (e.g. national and international trade restrictions) and in helping to provide economic incentives for further investment in rhino conservation (e.g. down-listing of white rhinos to Appendix II in two southern African countries).

Since the early 2000s, however, several wildlife management authorities have voiced concerns over a resurgence of rhino-related criminal activities and their negative effects. Other contemporary challenges include the need to properly manage the legal trade options under Appendix II listings, and to ensure security of rapidly accumulating horn stockpiles across the continent. For these reasons, rhinos will surely continue to have strong relevance on the CITES agenda.

Following decisions made at the 13th meeting of the Conference of the Parties to CITES, in 2004, and subsequent meetings of the Standing Committee, IUCN/SSC and TRAFFIC were mandated to report on the status of rhinos and related trade issues at the 14th meeting of the Conference of the Parties (CoP14), held in June 2007. This article is derived from the report 'Rhino-related crimes in Africa: an overview of poaching, seizure and stockpile data for the period 2000–2005' (CoP14 Info. 41; Milledge 2007). It was submitted by the CITES Secretariat at the request of

TRAFFIC as an addendum to CoP14 Doc. 54 *Rhinoceroses* Annex 1 (Emslie et al. 2007).

This study used standardized indicators for monitoring the extent, severity and response to rhino-related crimes across the continent. By providing a contemporary assessment of rhino horn trade in Africa, this study served to assist CITES Parties in their deliberations at CoP14 and subsequent intersessional work. The reports IUCN/SSC and TRAFFIC submitted at CoP14 prompted several decisions to refocus international attention on rhinos.

## Materials and methods

This study was based on an analysis of all known rhino-related crimes in Africa during the period 2000–2005, and on discussions with relevant national and regional bodies. Crimes included incidents of illegal killing, horn seizures, thefts and unauthorized sales. Most data were provided by government wildlife and law enforcement authorities and stored in the TRAFFIC African Rhino Crime (ARC) database. ARC has three major components:

- *Component 1—Populations*: annual population numbers, detected mortalities and translocations are provided for every rhino population and species
- *Component 2—Poaching*: detailed information is provided for each incident, including the date, location, species, method of killing, details on horn losses and recovery, origin of poachers, destination of horns, arrests and convictions
- *Component 3—Seizures*: detailed information is provided for each incident, including the date, location, species, number, weight, origin and destination of seized horn, arrests and convictions

Due to the sensitive nature of most information on illegal rhino activities, the confidentiality of some crime data, and the understanding between TRAFFIC and range States regarding data analysis and use, this study does not attribute findings and opinions directly to individual sources. Data were collected with the willing participation of government conservation authorities, and almost every range State offered comments during peer review.

Analysis of ARC data focused on calculating various indicators (table 1). The use of standardized indicators allowed more accurate comparisons between different countries, and the measure of changes over time (TRAFFIC 1999).





and other irregular acquisitions, as outlined above. During 2000–2005, a minimum of 664 horns was acquired with the intention of illicit trading (table 3). Most of these horns were derived from poached rhinos.

Law enforcement ranging from rapid response in protected areas to investigations and confiscations in urban centres, resulted in 42% of these horns being recovered. Nine countries successfully recovered 278 horns during 2000–2005 (table 3).

As a result of these recoveries, the minimum amount of horn from Africa calculated to have entered illegal trade during this period was 386 horns, or an annual average of 64. The majority (86%, equivalent to 49 horns annually) came from southern Africa, and the remaining 15 horns annually from eastern Africa (fig. 1). The actual quantity of lost horn is almost certainly higher due to a combination of undetected poaching or thefts (especially from large rhino areas) and as yet undetected, further illegal sale of private stock.

Using average horn weights for black and white rhinos, these 64 horns were equivalent to an annual average of 102.4 kg entering illegal trade during 2000–2005. This amount can be compared with the devastating poaching era during 1970–1986 when an estimated 2648 kg of horn left Africa annually (Martin and Ryan 1990). Despite volumes in the current trade being far lower than in the 1970s and 1980s, available information raises concern by suggesting a steadily upward trend in the volume of horn entering illegal trade since 2000, while showing no fundamental change in the number of horns recovered through law enforcement (fig. 2).

Table 3. Known rhino horn flowing to illegal markets in Africa, 2000–2005

Source or recovery of horns	No. of horns
<i>Source of horns to illegal markets</i>	
Horns taken from poached rhinos	(535)
Horns stolen from natural mortalities	(25)
Horns suspected sold from legal trophy hunts or private stocks	(>100)
<i>Thefts from government stockpiles</i>	
Subtotal of horns lost	(4)
<i>Recovery of horns by government enforcement agencies</i>	
Recoveries in the field	105
Confiscations and seizures	173
Subtotal of horns recovered	278
Total balance of horns lost to illegal trade chains	(386)

( ) indicates horns lost

### Impact of illegal trade on rhino population status

While the trend in rhino population numbers is ultimately the main gauge of population growth and recovery rates, two other indicators provide an accurate picture of where poaching pressure is most serious in terms of *intensity* or *impact* on the rhino populations:

- *Proportion of carcasses killed illegally*: range States where a higher proportion of detected carcasses were poached indicates high poaching intensity
- *Percentage of population killed illegally*: a high proportion of living rhinos killed illegally is more likely to be unsustainable

Poaching intensity varied greatly among range States during 2002–2005 (fig. 3). For example, not a single mortality was attributed to illegal causes in Swaziland, whereas all carcasses found in DRC over this period were poached. The highest levels of poaching intensity were witnessed in DRC, Zimbabwe and Kenya (depicted as a time series in figure 4). Poaching has caused greater damage to rhino populations in DRC and Zimbabwe than in any other range States in recent years (fig. 3). During 2003–2005, the DRC rhino population declined by over 40% per annum, while the total black and white rhino population in Zimbabwe grew at just 3% per annum.

For other range States, the net annual increase in national populations (black and white rhinos combined) exceeded 6%, accounting for count variance in annual estimates from the larger populations. Kenya was a notable range State in this regard, with good population growth between 2003 and 2005 despite the fact that illegal killing caused more than 40% of the documented mortalities.

### Effectiveness of law-enforcement responses to rhino crimes

Effective law-enforcement responses to rhino-related crimes are important for two main reasons. First, they help to reduce to a minimum the quantity of rhino horn flowing onto the illegal market.



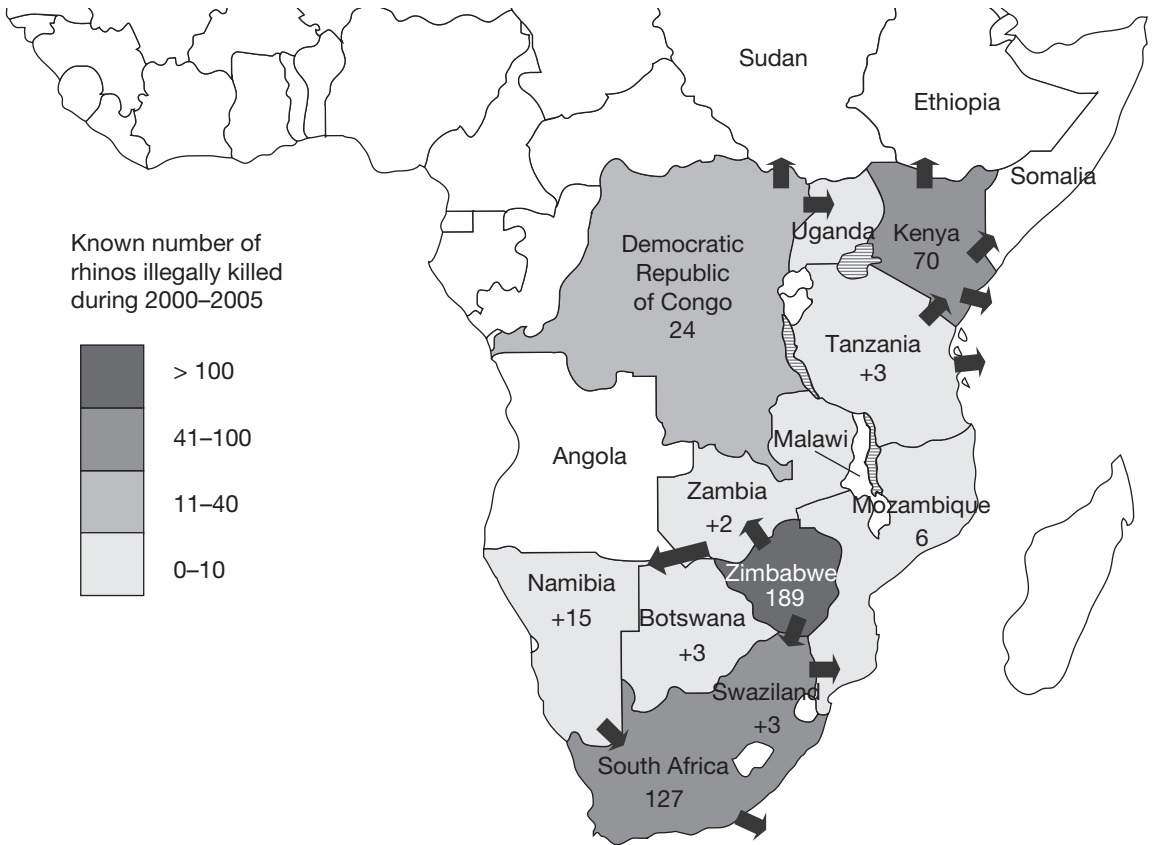
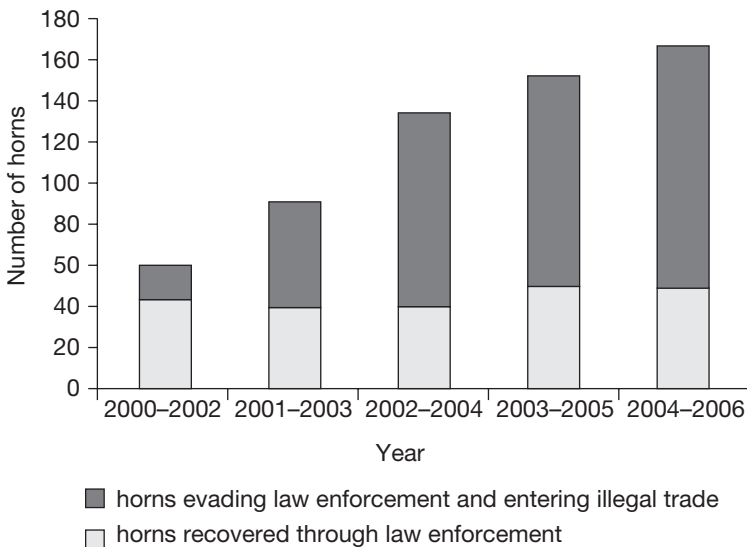


Figure 1. Distribution of rhino poaching incidents (shaded), primary trade routes (arrows) and numbers of horns lost to illegal trade (numeric values), 2000–2005. Values written as + or – are the *net* minimum flow of horns in or out of each country during 2000–2005. For example, accounting for recoveries, at least 70 horns were lost to illegal trade from Kenya during 2000–2005. In Namibia, more horns were recovered than could have been lost from illegal killing, resulting in a net recovery of 15 horns that probably came from another country. Relatively little knowledge exists on trade routes in Ethiopia, Mozambique, Tanzania and Zambia.



from another country. Relatively little knowledge exists on trade routes in Ethiopia, Mozambique, Tanzania and Zambia.

Figure 2. Annual average number of horns recovered and lost to illegal trade in Africa, 2000–2006, plotted as moving three-year windows to reduce the inaccuracy of some data, especially the imprecise periods during which some private horn stocks were sold to the illegal market.

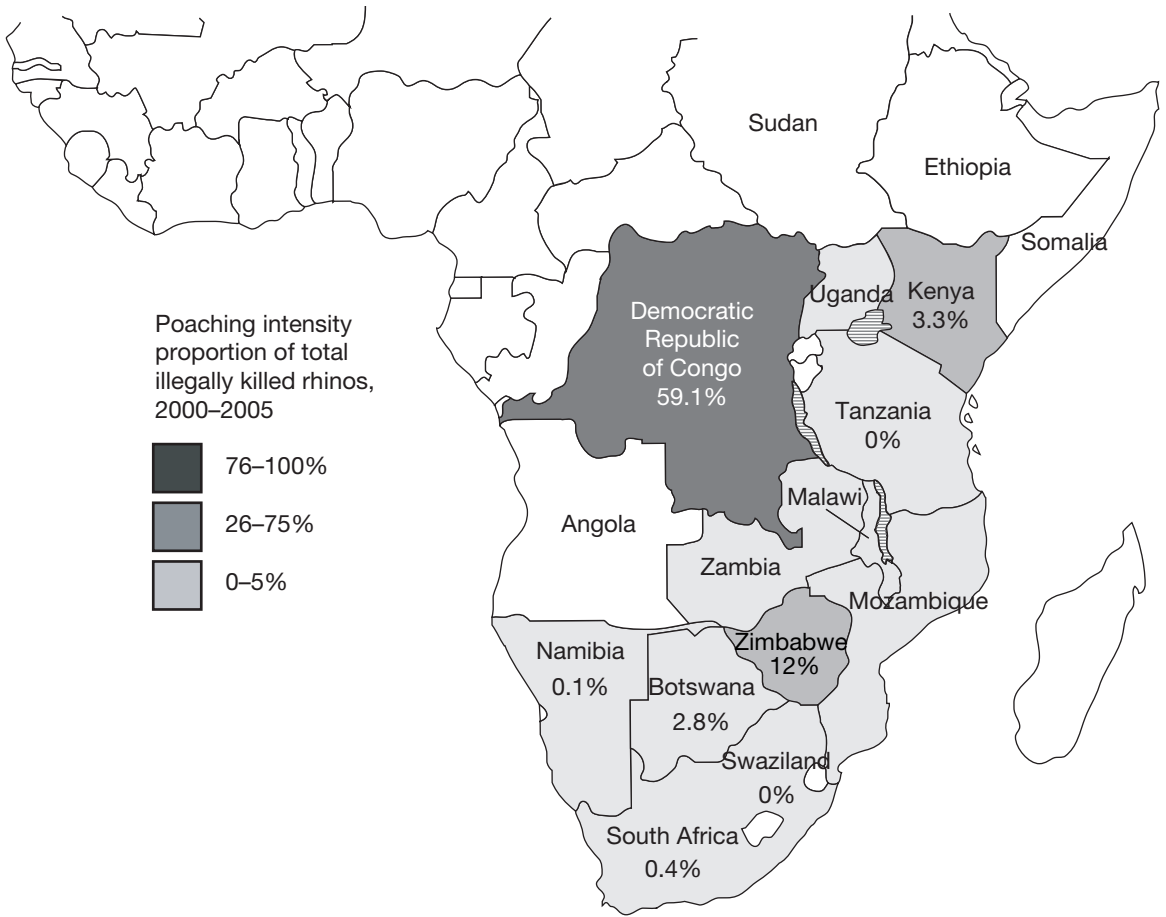


Figure 3. Relative poaching intensity (shaded) and impact on populations (numeric values) in African rhino range states, 2000–2005. Values written as a percentage are the proportion of the total end-2003 rhino population illegally killed, 2003–2005.

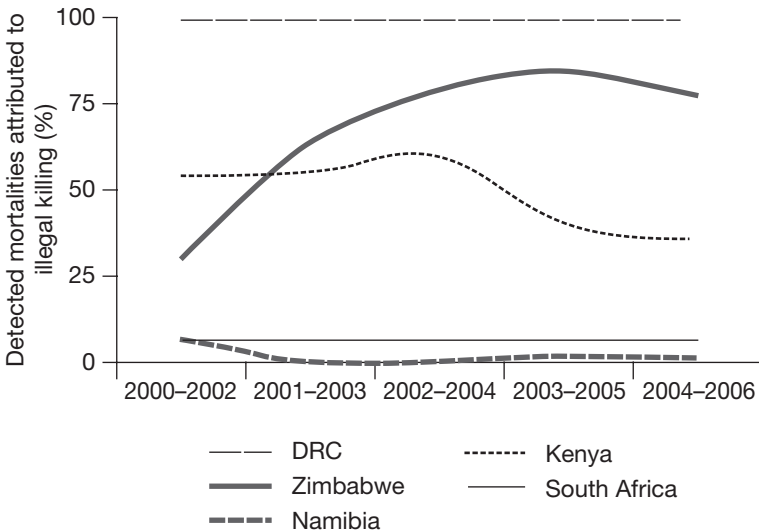


Figure 4. Smoothed poaching intensity trends in five range States expressed as the percentage of detected mortalities attributed to illegal killing. Since some detected carcasses in a given year may have been more than one year old, data points are expressed as moving three-year windows, thus helping to reduce the degree of inaccuracy.

Second, effective enforcement is important in reducing the impact of illegal activity on rhino populations. This applies to rhino populations both in the country in which enforcement action is being taken, and in neighbouring countries since illegal trading networks operating with relative impunity may soon set up cross-border operations.

A combination of adequate legislation, capacity and implementing appropriate enforcement strategies is needed to successfully prevent and respond to rhino crimes. The following are useful indicators of law-enforcement response to rhino-related crimes:

- *Arrest and conviction rates*: the proportion of rhino crimes (e.g. poaching and seizure incidents) where suspects were arrested, and the proportion of cases where arrests were made resulting in successful convictions. Data from all range States at the time of this analysis were insufficient to present these indicators.
- *Horn recovery rate*: the proportion of horn potentially lost from poached rhinos and other sources (e.g. stockpile thefts or illegal sales) later recovered through field recoveries and seizures.

Overall, 42% of all horns potentially lost to illegal trade during 2000–2005 were recovered—about one-third were recovered in the field as part of rapid responses to poaching incidents and two-thirds from subsequent seizures at other locations (table 3). Horn recovery rates varied among different range States, with five countries actually recovering more horns than could be accounted for from detected poached rhinos or other sources (Botswana, Namibia, Swaziland, Tanzania, Zambia; fig. 1). Of the remaining countries, South Africa had the highest horn recovery rate (54%), followed by Kenya (47%), Zimbabwe (13%) and DRC (8%).

One concern is the increasing proportion of horn lost to illegal markets since 2000 (fig. 2). Available data from Kenya and South Africa indicate that the declining proportion of horns recovered is largely attributed to increased organization of illegal poaching and horn-trading networks. As a result, horns are acquired and moved using far more efficient and clandestine modus operandi. A drop in wildlife-enforcement budgets and capacity may also have had an effect. South Africa has taken commendable steps to investigate organized rhino-related crimes that link different parts of the country, as well as neighbouring countries. One obstacle to overcome in completing these outstand-

ing investigations is the limited jurisdiction of the various provincial authorities and law-enforcement institutions involved.

## Discussion

### *Summary of spatial and temporal patterns in rhino crimes*

Three main patterns are evident from rhino-related crime data analysed during 2000–2005. First, the overall volume of horn entering illegal trade has increased since 2000. This matches a switch to commercial rhino poaching targeting horn in Kenya, Zimbabwe and DRC during the period 2001–2003 (du Toit 2002; Mulama 2002; Hillman Smith et al. 2003; Matipano 2004). Also key to this development has been the rising prominence of horn entering trade from sources other than poaching, including horns acquired and laundered from private stockpiles and legally hunted white rhinos. This laundering does not appear to have negatively affected rhino population performance, but it has contributed to the quantities of horns entering illegal trade for commercial purposes.

Second, the intensity of poaching—measured using the proportion of total mortalities that were killed illegally—rose to levels of serious concern in Zimbabwe up to 2005 (fig. 4). In Kenya, poaching intensity peaked during 2001–2003 but has actually fallen in recent years. Rhino populations in Zimbabwe and DRC have experienced the greatest impact from poaching. Poaching does not appear to have prevented positive growth in total rhino populations in other range States.

A third pattern in rhino-related crimes was the overall decline in the proportion of enforcement-related horn recoveries. This appears to be most linked to the increased organization of criminal horn-trading networks operating in Africa. Several wildlife enforcement officials have expressed concern over the increased levels of sophistication by which some South-East Asian horn-trading networks operate, which may pose a more serious threat to rhino populations if left unaddressed.

Table 4 presents a summary of the main rhino crime indicators for the eight largest rhino range States. These countries can be placed into four groups according to their similarities.







T TTTTTTTTTTTTT TTTTTTTT TTTTTTTTTT TTTTTTTTTT  
TTTTTTTTTTTT

As a result of the apparent increasing trend in volume of horn leaving Africa and the existence of sophisticated criminal operations involving several countries, Decision 14.89 was adopted to more closely examine cross-border collaboration, the accumulation of horn stocks (including trophies) and illegal trade flows. As part of this decision, TRAFFIC will be reviewing information on priority countries. With regard to cross-border collaboration, it is apparent that bilateral wildlife-enforcement relationships between the following countries need to be strengthened to ensure successful investigation outcomes: Zimbabwe–South Africa, South Africa–Mozambique, Zimbabwe–Zambia, Namibia–Zambia, DRC–Sudan and Kenya–Somalia. Wildlife crime investigators and prosecutors in many range States need capacity building.

T TTTTTTT TTTTTTTT TTTTTTTTTTTTTTTTTTTTT

A critical issue requiring attention is the emergence of more sophisticated criminal operations in South Africa, including the laundering of horns acquired legally (e.g., white rhino hunting trophies and horns registered on private property). The new NEMA Biodiversity Act regulations, coming into effect on 1 February 2008, should improve controls in hunting and horn possession, and in the interim some provinces have initiated stricter measures to more closely scrutinize and monitor trophy hunters. We recommend a number of measures to fully address a situation that has the potential to seriously undermine legal, sustainable use permitted under CITES. These issues are likely to be reviewed in the context of Decision 14.89.

First, a national task force should be commissioned to finalize outstanding investigations into rhino poaching and illegal horn trade. Existing enforcement bodies (e.g., at provincial level) do not have the mandate or resources to effectively act on horn-trading networks that have elements of organized crime, involve foreign diplomats, and operate nationwide and with links to neighbouring countries.

Second, we recommend that the South African CITES management authority request that certain importing countries confirm the presence, location and ownership of all horn trophies that have been exported with valid CITES permits, but under suspicious

circumstances. Third, to reduce sales of privately held horns to illegal traders, a national audit of horns in private possession should be completed expediently to guide compliance measures. We further recommend introducing a compulsory, nationwide moratorium on domestic horn sales (i.e., intra- and interprovincial). While positive white rhino population growth has continued in South Africa, conservation agencies should seriously consider establishing a national white rhino hunting (and trophy export) quota, as a precautionary measure.

T TTTTTTTTTTTTTTTTT TTTTTTTTTTTTT

Yemen, East and South-East Asia remain important destinations for African rhino horn, with an apparent increasing trend in volume of horn leaving the continent. The precise nature of markets in East and South-East Asia is not fully understood. For example, the degree of speculative buying of rhino horn compared with purchases to meet current market demand, has not been ascertained. It has been suggested that trade in wildlife medicinals is increasing in Vietnam as a result of increasing affluence (Venkataraman 2007). It is therefore necessary to conduct and update end-market research, including a detailed assessment of trade dynamics, enforcement and status of horn stocks in key consuming nations.

T TTTTT TTTTTTTTTTTTTTTTTTTTT

We recommend that South Africa and Namibia develop legal provisions to ensure that black rhino quota allocations are biologically sustainable, maximize incentives across sectors, reward good management, and ensure appropriate controls — as recommended by the IUCN/SSC African Rhino Specialist Group and by Leader-Williams et al. (2005) and further developed by the SADC Rhino Management Group.

## Acknowledgements

Gratitude is extended to members of the IUCN Species Survival Commission (SSC) African Rhino Specialist Group, the SADC Rhino and Elephant Security Group, the Interpol Working Group on Environmental Crime, the Rhino Management Group, the Lusaka Agreement Task Force, TRAFFIC, other wildlife enforcement practitioners and specialists working on rhino trade issues. The WWF Global Spe-

cies Programme and WWF Netherlands are sincerely thanked for their financial support.

## References

- Castley JG, Hall-Martin AJ. 2003. The status of the southern white rhinoceros (*Ceratotherium simum simum*) on private land in South Africa in 2001. *Pachyderm* 34:33–44.
- du Toit R. 2002. Black rhino crisis in Zimbabwe. *Pachyderm* 32:83–85.
- Emslie R, Brooks M. 1999. *African rhino status survey and conservation action plan*. IUCN/SSC African Rhino Specialist Group, IUCN, Gland, Switzerland, and Cambridge, UK.
- Emslie R, Milledge S, Brooks M, van Strien NJ, Dublin H. 2007. *African and Asian rhinoceroses—status, conservation and trade*. CITES CoP14 Doc. 54 Annex 1.
- Hillman Smith, K. 2006. Past population dynamics and individual information on possible surviving northern white rhinos in Garamba National Park and surrounding reserves. *Pachyderm* 40:106–114.
- Hillman Smith K, Smith F, Tshikaya P, Ndey A, Watkin J. 2003. Poaching upsurge in Garamba National Park, Democratic Republic of Congo. *Pachyderm* 35:146–150.
- Leader-Williams N, Milledge S, Adcock K, Brooks M, Conway A, Knight M, Mainka S, Martin EB, Teferi T. 2005. Trophy hunting of black rhino *Diceros bicornis*: proposals to ensure its future sustainability. *Journal of International Wildlife Law and Policy* 8:1–11.
- Martin EB, Ryan TCI. 1990. How much rhino horn has come onto international markets since 1970? *Pachyderm* 13:20–25.
- Matipano G. 2004. Black rhinoceros mortality in Matusadona National Park, Zimbabwe: 1992–2003. *Pachyderm* 36:109–112.
- Milledge SAH. 2007. Rhino-related crimes in Africa: an overview of poaching, seizure and stockpile data for the period 2000–2005. CITES CoP14 Info. 41.
- Milliken T, Burn RW, Sangalakula L. 2007. The Elephant Trade Information System (ETIS) and the illicit trade in ivory: a report for the 14th meeting of the Conference of the Parties to CITES. CoP14 Doc. 53.2 Annex 1.
- Mulama M. 2002. Renewed threat to Kenya's rhino conservation efforts. *Pachyderm* 32:85–87.
- TRAFFIC. 1999. *Interim report on developing indicators of success for evaluating rhinoceros conservation initiatives*. Report on the workshop to develop standardized indicators to measure the success of rhinoceros conservation measures in the context of CITES Resolution Conf. 9.14, 9–11 December 1998, Cambridge, UK.
- Venkataraman B. 2007. *A matter of attitude: the consumption of wild animal products in Hanoi, Vietnam*. TRAFFIC South-East Asia, Greater Mekong Programme, Hanoi, Vietnam.

## Note

<sup>1</sup> Other rhino products are also in demand for traditional Asian medicine, with two incidents recorded in South Africa during 2004 involving the attempted export (by Vietnamese nationals) of rhino genitals and dried intestines.