

## AFRICAN RHINOCEROS POPULATIONS IN NORTH AMERICA

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### INTRODUCTION

Due to poaching, nearly all wild rhinoceros populations have suffered dramatic declines and are clearly in crisis. Only 11 000 rhinoceroses of all species survive in the wild and over 50% are white rhinoceroses (*Ceratotherium simum*) in South Africa (see Table 1)<sup>1</sup>. Another 1000 rhinoceroses are maintained in captivity, and again, over 50% of this population are southern white rhinoceroses<sup>1</sup>.

Coordinated regional management plans have and are being established for captive rhinoceroses. In North America, captive populations of African rhinoceroses are managed under the auspices of Species Survival Plan (SSP) Committees for black (*Diceros bicornis*) and white rhinoceroses, both of which were founded in 1982. There are also SSP programs for two Asian rhinoceros species: the Indian/Nepalese (*Rhinoceros unicornis*) and the Sumatran (*Dicerorhinus sumatrensis*).

In the SSP programs, each African rhinoceros species is managed as two subspecies: the Eastern (*D.b. michaeli*) and Southern (*D.b. minor*) black rhinoceros and the southern (*C.s. simum*) and northern (*C.s. cottoni*) white rhinoceros.

All the Rhino SSP programs and other rhinoceros conservation activities (including research) are coordinated by a Rhino Taxon Advisory Group (TAG). Additionally, the North American programs interact and coordinate with other regional captive programs through the IUCN-SSC Global Captive Action Plan (GCAP) for Rhino and the Global Animal Survival Plans (GASPs) which were established under the IUCN's Captive Breeding Specialist Group (CBSG).

As with other SSP committees organized by the American Zoo and Aquarium Association (AZA), those for rhinoceroses are formed of a group of 10 representatives elected from holding institutions. Each SSP Committee designates advisors from the zoo, academic and field biology communities to address specific needs eg, veterinary medicine, nutrition, research. The Rhinoceros TAG consists of the SSP Chairs, and again, selected scientific and management advisors.

There are currently 220 African rhinoceroses (97 black and 123 white) in SSP participant institutions. Additionally, there are 47 Asian rhinoceros in North American SSP facilities. One goal of the AZA SSP programs is to develop a target population of 430 over the next 7-10 years (an increase of 163 rhinoceroses in approximately  $\frac{1}{2}$  of a rhinoceros generation). The allocation of space among species and subspecies will be reconfigured as indicated in Table 2<sup>1</sup>.

Indeed, the spaces occupied by these rhinoceroses are often interchangeable. Thus, one role of the TAG is coordination of efforts and spaces of all rhinoceros facilities in North America.

The goal of these captive management plans is to maintain rhinoceros populations that are demographically and genetically stable. One genetic goal for rhinoceros populations is the maintenance of 90% of their genetic diversity over 10 generations or 150-175 years. In designing a program to fulfill these goals, each rhinoceros species and subspecies represents unique challenges that will be discussed below.

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## BLACK RHINOCEROS

### Eastern (*Diceros bicornis michaeli*)

This eastern subspecies of the black rhinoceros has had the longest history in North American collections. At the present time, 69 animals (40♂♂;29♀♀) are represented in 25 North American institutions. The current population has a relatively good founder base and 80% of the North American population is captive-born. The present rate of reproduction appears adequate for maintaining a stable or slowly increasing population, however, there are several management and demographic problems that are cause for concern. Disease has been a major factor limiting the growth of this population (see paper elsewhere in the proceedings), and the population has an undesirable age and sex structure. In any given year, approximately 15% of the adult females give birth (65% of all adult females have produced calves). However, 66% of adult females are greater than 22 years of age, and presumably past their breeding prime (a recent calf born to a 31-year-old female at the Sedgwick County Zoo in Wichita, Kansas broke the previous record of a 27-year-old dam).

At the juvenile end, the population contains only one female less than 4 years of age, and of the 22 births since January 1991, all surviving 15 are males. On a more positive note, recent moves have paired all adult females with adult males (70% of the females are with proven breeders). One impediment to population growth has been prolonged intercalving intervals in captivity<sup>5</sup>. It has been estimated that the use of early weaning and other management techniques that allow for earlier introduction of the male, may reduce the intercalving interval to 24-30 months from the present 40 months. This situation would approach intercalving intervals seen in the wild. Thus production could be doubled from the present group of proven breeder females. By the year 2000, the African Rhino Master Plan seeks to expand this population to 90 animals in North America<sup>1</sup>.

### Southern (*Diceros bicornis minor*)

Twenty-eight (10♂♂;18♀♀) animals of the southern subspecies are housed in 10 institutions in North America. Included are several ranch facilities in Texas that are part of a cooperative effort with the AZA's SSP program. The majority of the southern black rhinoceroses has been imported from Zimbabwe over the past 7 years. A complication of this program has been the death of 30% of these imported animals within 6 months of arrival (losses after that period appear to be unremarkable). The population currently exhibits a desirable age distribution with majority of the animals in their breeding prime. Seventeen percent of the population was captive-bred and born, and when animals that arrived pregnant are included, 57% of the females are proven breeders. At the present time, it appears the North American population has a good start towards becoming self-sustaining. Indeed, the current population of 28 is 20% larger than the number of imports (23 adjusted for deaths that occurred within 180 days of importation (6 of 10 total import deaths). These deaths may have been due to stress and possibly toxic factors such as creosote<sup>2</sup> that can be avoided in the future. As with the eastern subspecies, it is a goal to maintain a 30-month intercalving interval<sup>6</sup>. The African Rhino Masterplan recommends that this subspecies be expanded to 50 animals in North America by the year 2000<sup>1</sup>.

## WHITE RHINOCEROS

### Southern (*C.s. simum*)

Currently there are 119 (50♂♂;69♀♀) animals North American SSP program for southern white rhinoceroses. One goal of the SSP is to reduce the population of this subspecies from approximately 200 animals in 1982, to 100 by the year 2000. This effort is designed in large part to make North American holding space available for the other rhinoceros species (black, greater one-horned, Sumatran). Although there was a dramatic influx of founder animals from Natal in the 1970s, many of these animals have not bred in captivity and are now growing senescent. The limited founder base is compounded by over representation of a few individuals (75% of the F1

generation were sired by one male)<sup>4</sup>. The most successful captive breeding situations have occurred when a single or several males were grouped with multiple females. Breeding has also taken place in pairs when animals were introduced in adulthood, or when previously platonic pairs were moved to new environments. In an attempt to increase the founder representation of this aging population, preference has been given to moving nulliparous animals to successful breeding groups. The Rhino Master Plan sets a goal of 100 southern white rhinoceroses in North American institutions (with 20 additional animals in a research group)<sup>1</sup>.

#### Northern (*C.s. cottoni*)

The status of captive populations of the northern white rhinoceros is ominous<sup>1</sup>. Only 4 (2♂♂;2♀♀) individuals, all 20+ years of age, are present in North America, and only 5 more are in captivity globally. At the present time the status and future of these animals is uncertain. Intensive efforts are underway to evaluate and manipulate these animals reproductively to induce breeding. Additionally, scenarios are being explored to combine some or all of the captive animals, augmented by a few from Garamba National Park, in an environment more conducive to breeding.

#### SUMMARY

Despite the challenges that each of these species/subspecies presents in establishing viable and self-sustaining populations in captivity, progress is being made. Recent animal moves and pairings, plus management changes will hopefully result in increased reproductive rates and more equal genetic representation for these populations<sup>1,4</sup>. Under the direction of the Taxon Advisory Group's Research Advisory Group (RAG), a comprehensive, coordinated research program is being developed to address many of the problems in the captive management of these species. Included in this effort will be program to address health, reproduction, behaviour, genetics and husbandry of these species<sup>1</sup>.

As nearly all wild rhinoceros populations are undergoing increased poaching pressures, the percentage of rhinoceroses in captivity is increasing (currently 9-10%). It seems reasonable to note that the survival of black rhinoceroses in eastern Africa has been in small, managed parks; preserves that contain isolated, protected populations. Thus, as wild populations become more threatened, the demographic, management and genetic principles of captive breeding programs become important to their survival as well<sup>3</sup>. As captive populations become larger through regional management programs, and many wild populations become more fragmented and isolated, the management techniques for the two groups are likely to grow more similar and offer increased opportunities for interaction between the wild and captive communities.

#### REFERENCES

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Table 1: World populations of rhinoceroses<sup>1</sup>

<u>Species</u>	<u>Wild</u>	<u>Global Captive</u>	<u>N.Am. Captive</u>
E. black	500	165	69
S. black	1250	45	38
S. white	6740	630 +	119
N. white	30 +	9	4
Indian/Nepalese	1900	124	42
Sumatran	less than 500	23	5

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Table 2: Genetically effective populations for North America<sup>1</sup>

<u>Species</u>	<u>Present genetically effective #N</u>	<u>Desired N</u>	<u>Target Population</u>
E. black	27-29	45-50	90
S. black	11-13	50	80
S. white	25-40	50	120*
Indian/Nepalese			90
Sumatran			50

\*20 are research animals

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