

structures. In this way we can achieve synergy between continental and national initiatives, ensuring that common goals and strategies are followed.

3.7 Review of the Status and Conservation Biology of African Rhino (R. Emslie, AfRSG)

All delegates at the meeting were given copies of the recently published (1999) IUCN African Rhino Status Survey and Conservation Action plan. This background talk presented at the meeting primarily presented key background information concerning the three subspecies of African rhino's covered by the SADC rhino programme. For further detailed background information interested readers are referred to the IUCN African Rhino Action Plan. The meeting was informed that the next continental statistics are due to be compiled by IUCN African Rhino Specialist Group at its May 2000 meeting to be held in Tanzania.

This background talk began with the population totals for the two African rhino species (Black 2,600, White 8,465) and three Asian rhino species (Indian 2,520, Sumatran 300 and Javan 60). Maps from the Action Plan were then used to show the historical distribution of both species of African rhino. In the case of the white rhino, the major geographical separation between the northern and southern white rhino was pointed out. The six African rhino subspecies recognised by the AfRSG were then listed and it was explained that the SADC rhino programme only covered three of these subspecies:- the southern white rhino (*Ceratotherium simum simum*), the southwestern black rhino (*Diceros bicornis bicornis*), and the South Central black rhino (*D.b.minor*). An overhead then showed which SADC states held populations of which rhino subspecies with Botswana, Namibia, South Africa, Swaziland, Zambia and Zimbabwe holding populations of southern white rhino; Malawi, Mozambique, South Africa, Swaziland, Tanzania and Zimbabwe holding populations of southern central black rhino; and Namibia and South Africa being the only range states with populations of south-western black rhino. The northern white rhino population in the Democratic Republic of Congo, the eastern black rhino in northern Tanzania, and the out-of-range eastern black rhino populations in South Africa do not fall within the ambit of the SADC rhino programme.

The rapid decline in numbers of black rhino from approximately 100,000 in 1960 to 2,475 in 1992 was described, showing that the number of range states with black rhino decreased from 1980 to 1982 from 18 to 13. It was then explained that since 1992 numbers of black rhino in Africa appeared to stabilise (primarily with increases in Namibia and South Africa cancelling out declines in some other range states) with a slight increase being recorded between 1995 and 1997. By 1997 there were an estimated 2,600 black rhinos in Africa spread throughout ten range states. Since 1980 it is presumed that the black rhino has gone extinct in Angola, Botswana, the Central African Republic, Chad, Ethiopia, Malawi (since reintroduced), Somalia, Sudan, Uganda and Zambia.

Black rhino estimates by country were then compared for 1980 and 1997. Over this period numbers only increased in Namibia and South Africa with black rhino also being re-established in Swaziland. The 1997 estimates also showed how four major range states conserve the majority of Africa's black rhinos with three of them being members of SADC, namely Namibia, South Africa and Zimbabwe (Kenya is the fourth major range state). Tanzania, Mozambique, Swaziland and the Malawi are the other SADC range states with lesser populations of black rhino. A map from the IUCN African rhino action plan was then shown, giving the current distribution of black rhinos by subspecies. It was mentioned that the boundaries between black rhino subspecies were not "hard-edged" like the boundary between the two white rhino subspecies. In 1997 there were five AfRSG-rated *Key1*, six *Key2* and 17 *Important* black rhino populations in Africa. The numbers and proportions of the four black rhino subspecies conserved by the SADC region were then shown. The two subspecies of

black rhino covered in the SADC rhino programme (740 south-western and 1,365 south-central) now only occur within the SADC region (i.e. 100%). Of the other two black rhino subspecies (excluded from the SADC rhino programme), only 57 eastern black rhino (12% percent of African total) and no western black rhino were conserved in SADC countries.

The rapid decline in numbers of northern white rhino from an estimated 2,230 in 1960 in five range states to 25 in one population in one range state (DRC) in 1997 was described. The southern white rhino has shown an opposite trend, increasing from about 20 in one population in one range state in 1895 to a total of 8,440 in 248 populations in eight range states in 1997 within additional 650 in captivity world-wide. Indeed, the recovery of the southern white rhino is one of the world's great conservation success stories. The same four range states conserve most of Africa's remaining southern white rhino (South Africa 7,913, Zimbabwe 167, Namibia 141, and Kenya 137 out of range). In 1997 other SADC range states were Swaziland with approximately 50, Botswana 23, with small numbers out of range in Zambia (6) and the Ivory Coast (5). In 1997, there were five AfRSG-rated *Key1*, six *Key2* and 33 *Important* white rhino populations in Africa. White rhinos were reintroduced into Angola and Mozambique but have gone extinct in those countries for a second time. With the exception of out-of-range animals in Kenya and Ivory Coast, all remaining southern white rhino in the wild occur in the SADC region.

Using the IUCN Red List criteria, the south central black rhino is rated as *Critically Endangered*, the southwestern black rhino as *Vulnerable* and the southern white rhino as *Lower Risk-Conservation Dependent*.

In terms of CITES status, with the exception of South Africa's populations of southern white rhino which are listed on CITES Appendix II, (with an annotation regarding continued export of hunting trophies, and live sales to approved and acceptable destinations), all other black and white rhino populations are currently listed on CITES Appendix I.

The background talk concluded by mentioning a few factors relevant to the conservation management and ecology of rhinos, including listing some broad-scale factors which affect rhino densities.

It was mentioned that the historical distribution of grazing white rhinos is more limited than that for browsing black rhinos, with the latter species living in a wider range of habitats and densities.

The critical importance of obtaining good biological growth as a key component of any successful rhino conservation strategy was emphasised. The point was made that poor breeding is like poaching - one ends up with far fewer rhino. A key to achieving good biological growth includes maintaining populations in a productive state at densities at least 25% below estimated ecological carrying capacity. The importance of population monitoring was emphasised. Examples of annual population growth rates and inter-calving intervals for populations performing well (7% per annum, ICI < 2.5 yrs), averagely (5-6%, 2.8 yrs) or very poorly (<3%, >3.5 yrs) were given. Delegates were warned that non-experts generally grossly overestimate black rhino ecological carrying capacities, and this could lead to overstocking, poor performance and even death of animals. Fortunately estimation of ecological carrying capacity for black rhinos is improving. However apart from keeping rhinos stocked below ecological carrying capacity, there is a need to understand the influence of other factors (such as fire, browsers, plant succession and plant chemistry) on rhino performance.

A few key factors affecting rhino carrying capacity and hence densities were briefly mentioned. These included soils and geology which govern nutrient status and water availability with higher carrying capacities of rhinos being found on more nutrient-rich basalts and dolerite derived soils compared to more nutrient-poor soils on sandstone and granites. It was explained that the total and seasonal distribution of rainfall

influences carrying capacity, but that higher rainfall doesn't necessarily mean higher rhino carrying capacity. Bush and grass densities, species composition and size structure were also identified as key factors influencing carrying capacity. It was stressed that all trees and grasses are not good rhino food, as they may have poor digestibility, be nutritionally poor or contain high levels of secondary plant chemicals. In colder parts of southern Africa, frost can also reduce carrying capacity.

3.8 **Rhino Conservation Principles: Genetic, Demographic and Management Issues** (R. Brett, Department of Wildlife and National Parks, Botswana)

Several key principles for successful rhino conservation are shared by African rhino ranges states, and have particular application for the management of rhinos in relatively small fenced areas (< 200 km²). These centre on the following issues: (a) effective field protection and surveillance; (b) genetic concerns; (c) demographic concerns; and (d) management issues.

Effective protection and surveillance of rhino populations depend on concentration of manpower and resources to sufficient levels (e.g. 1 scout/ranger per 10-30 km²) to ensure adequate patrol effort, detection of illegal activity and rhino mortalities. Adequate levels of surveillance are essential for monitoring rhinos, including confirming the presence and health of rhinos through individual identification, detection of matings, calves, and estimating population sizes. Provision of good information gathered in rhino surveillance engenders confidence in the capacity of the organization/conservation authority involved. Consolidation of vulnerable rhinos (e.g. away from international boundaries), exchange and removal of surplus rhinos, and establishing new rhino populations through translocation have all been key ingredients of successful rhino conservation programmes. A range of options for establishing rhino protection areas is described in the IUCN African rhino plan (page 15); these are helpful in developing solutions appropriate to the local situations, habitats and threats, and the limitations of funding and expertise.

Guidelines for the prudent genetic management of rhinos on the basis of least regret were agreed at a rhino conference held in Cincinnati in 1986, and have been adopted by AfRSG and used as a foundation for rhino management policy by most range states since then:

- ◆ Manage the agreed subspecies of the black and white rhinoceros separately.
- ◆ Use a minimum goal of 2,000 animals per subspecies, but use smaller short-term goals for very small national populations.
- ◆ Manage metapopulations through periodic translocation of animals between populations (1 immigrant per small population every generation: 12-15 years), but maintain at least one population of a locally adapted ecotype within a subspecies (e.g. highland vs lowland).
- ◆ Use a minimum of 20 animals to found new populations (ideally unrelated). Achieve high growth rates, and allow rapid expansion of populations in order to minimize loss of genetic diversity.
- ◆ Avoid inbreeding in small populations (e.g. father-daughter, mother-son matings) by rapid removal of surplus animals, substitution of single breeding males, or the addition of adult females.

Associated guidelines for the demographic management of rhinos are equally important, particularly in establishing healthy small populations of rhinos. Small populations are very vulnerable to unpredictable demographic upset or upheaval, and demographic problems are usually more of a short-term constraint on population