

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 km<sup>2</sup>). 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 km<sup>2</sup>) 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

growth then genetic problems (e.g. inbreeding). Some of the following guidelines are based on more recent analysis of the main causes of mortality in rhino populations, and the need to minimise losses of translocated animals.

- ◆ Stock new areas with large founder groups; this also helps to minimize unpredictable losses of key animals. Maintain high growth rates, also as buffer against losses through poaching (see IUCN Rhino Action Plan, page 64).
- ◆ Found new populations in one event, with large groups of rhinos (e.g. a minimum of 20), rather than incrementally. Stock at low density, encourage dispersal of rhinos and/or move release sites.
- ◆ Move adults, preferably with more than 20 years of potential future fertility, and avoid moving subadults (especially females).
- ◆ Do not compromise the continued high growth rates and health of donor populations (e.g. by removal of too many females).

In practice, genetic guidelines are often achieved in sorting out demographic problems in small populations, and prudent early genetic management is more likely to avoid problems in the long term. Starting new populations successfully with fewer animals (e.g. < 5), and subsequent incremental stocking with more rhinos, is possible, but is likely to give more trouble and expense in the process and is unlikely to lead to sustained high growth rates. In small black rhino populations, high mortality and upheaval are to be expected from fighting between translocated rhinos and residents. Stocking with sex ratios biased towards females often leads to higher initial growth rates, and possibly also fewer problems with fighting, but this may cause problems with excess/surplus male rhinos in donor populations.

In all range states, it is vital that existing and potential areas for conserving rhinos are assessed for their suitability. This should include evaluation of management capacity (e.g. resources, staffing, maintaining electric fences), community setting (socio-political, community relations, potential for active involvement of local people) and threats (e.g. poaching, predation and disease). Most important is the achievement of sound estimation of Ecological Carrying Capacity, particularly in small areas where social capacity of adult males may also be an important limitation. ECC assessments need to be made regularly: rhino habitats are continually changing in response to environmental effects, and the effects of the rhinos themselves and other browsers/grazers. The capacity to expand (area and rhino population) will minimise the need for future management and interventions.

There are a number of wider concerns over the future performance of rhino populations in Africa associated with the practicability of achieving many of the management guidelines listed above. Development of single large populations of 2,000 rhinos is unrealistic in most range states. Metapopulation management and translocation of rhinos within and between populations is necessary in order to satisfy genetic and demographic concerns. This will depend on co-operative management of rhino populations within and between range states under range of management/ownership regimes. Because of the small protectable areas available for most black and white rhino populations in Africa, high levels of management capacity and resources will continue to be required. Large protected areas of good rhino habitat are and will be at premium, since there is less need for expensive interventions and management inputs, and undisturbed breeding of rhinos over long periods is possible. Finally, the high live value of rhinos, important for maintaining support for rhino populations by private sector and state conservation authorities, is limiting the development of new rhino populations of ideal minimum size. Few private land areas (and state authorities) have the resources to purchase at least 20 black rhinos at current market prices, and the result is an increasing proportion of undesirable small founder populations (e.g. < 5 animals), which are themselves relatively expensive to manage.

Consensus, followed by formal agreement on principles of rhino management is key to co-operation and development of partnerships between management authorities, custodians, and private owners, initially on a national basis. On a regional basis, co-operative management of subspecies, where countries may one day effectively share rhinos kept and exchanges under common management practices, may solve some of the problems outlined. This is one of the main objectives of the SADC rhino programme.

### 3.9 Priorities for Rhino Conservation (M. Brooks, AfRSG)

Dr. M. Brooks went through the AfRSG system for categorizing rhino projects, according to priority for donor funding. This system is outlined in the African Rhino Status Survey and Conservation Plan, published IUCN in 1999. This report was given to all participants and the system therefore does not have to be repeated in these proceedings.

The presentation of this priority ranking system led to some confusion at the meeting, since participants wondered how it might be applied within a regional programme that should involve even those member states that do not currently contain “key” or “important” rhino populations (as defined by AfRSG). Dr. Brooks and other members of the regional consortium clarified the debate by saying that range state representatives must be informed of the factors that give some populations a greater continental conservation priority than others, but it is not intended that these criteria should automatically apply to the SADC programme. Within this programme, attention must be given to regionally significant projects which may not currently include “key” or “important” populations but which have definite potential to do so, or which can be linked within a viable metapopulation plan (incorporating more than one population). Dr. A. Guillet endorsed this as a view that is shared by the Italian Government. He said that as far as his government is concerned, their aid should be not necessarily be used up equally in each country and nor should it be devoted only to those countries with the largest rhino populations. The funding should, first and foremost, be used to catalyse regional co-operation in rhino management.

### 3.10 Outline of Activities in Year 1 (R. du Toit, WWF-SARPO)

The remaining period of Year 1 is up until September 2000. Although the funding for the programme is significant, it will not go far if it is used to attempt major field projects in all the range states. If asked to state their primary requirements related to rhino conservation, most range states are likely to identify surveillance and management needs (for which the programme would not be a sustainable source of funding) and/or restocking and infrastructural needs (for which the programme simply does not have sufficient funding to achieve any regional impact). Therefore, it is the implementing consortium’s view that rather than trying to do a little bit here and a little bit there, the programme should focus on achieving a target that would be catalytic and strategic at the SADC level: the creation of a framework for the sharing of information, expertise and other resources within range states and between range states. Thus the emphasis of the programme must be on process (co-ordination, strategic planning and motivation of rhino conservation initiatives, taking advantage of the political impetus of SADC) rather than on fragmented products.

Activities within Year 1 of the programme should concentrate on developing or enhancing the institutional and co-ordination arrangements that are required within each country as well as at the regional level (i.e. Output #1 listed in the Technical Framework for the SADC Rhino Programme – see Section 6). Once such