CONSERVATION AND MANAGEMENT OF ELEPHANTS IN NAMIBIA

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ABSTRACT

Namibia's elephant population recovered from near extinction due to uncontrolled hunting for ivory at the turn of the century, to over 7000 elephants since the 1980s (currently estimated at approximately 8000), with a range of about 80,000km^2. The increase is attributed to effective management practices and a conservation policy based on law enforcement, habitat protection and sustainable use. Elephants in Namibia are amongst the most migratory-nomadic of any elephants on the continent, primarily as the result of scarce surface water resources. The elephant population is therefore unusually vulnerable to changes in access to water and migration routes.

Most elephants in Namibia occur outside protected areas on marginal agricultural land, along with some of the poorest people in the country. Conflicts between people and elephants are increasing throughout Namibia's elephant range, following the cessation of war, drought, and the acceptance of agricultural policies promoting food self-sufficiency. The preliminary elephant management strategy of the Namibian Ministry of Environment and Tourism is based on classification of elephant range, definition of elephant management units, development of preferred management densities, and formulation of simple rules to aid decision-making. This strategy promotes the use of elephants for the benefit of people and attempts to retain a high value, and thus a role, for elephants in the rural landscape in the next century.

HISTORY OF ELEPHANT CONSERVATION IN NAMIBIA

Elephants formerly occurred throughout Namibia, wherever surface water was available. Densities were likely to have been very low in the southern half of the country, where savanna vegetation is replaced mainly by karroid scrub and annual desert grasslands. Most elephants seem to have inhabited the areas along drainage lines, which in Namibia are often the only sources of shallow subterranean water or springs. As in the northern Namib Desert today, elephants are likely to have been dependent on riverine vegetation, with seasonal rivers serving as linear oases.

The scarcity of surface water and springs in Namibia indirectly led to the rapid decline in elephant distribution and numbers following the 19th century introduction of firearms and the arrival of commercial elephant hunters. By approximately 1900, perhaps only a few hundred elephants remained in the extreme north-western and north-eastern parts. The German Colonial Administration (1890-1915) had already passed hunting laws to protect elephants in 1892 and proclaimed the first three game reserves in 1907. Apart from a significant decline in the number of elephants in the Kaokoveld (northern Namib Desert and transitional zone) during the 1970s and early 1980s while northern Namibia was under South African military administration, the elephant population has continued to recover and increase throughout its range. The elephant range is also expanding southwards through the establishment of elephants on game ranches by private land owners.

KEY FEATURES OF THE NAMIBIAN ELEPHANT POPULATION

The most striking feature of the elephant population is its distribution across a rainfall gradient of <50mm->700mm per annum, along the same latitude. Despite the dramatic variation in habitat from true desert to sub-tropical forests, the population tends to share similar characteristics. Elephant densities tend to be highest along drainage lines, wet or dry, and almost all elephants show marked seasonal/migratory/ nomadic movements. Elephants in north-western and north-eastern Namibia move approximately 100km between wet and dry season ranges, and in the northwest, home ranges extend to approximately 7,000-10,000km^2.

Short-term movements and seasonal distribution nevertheless vary according to local rainfall, accounting for the ca. 80,000km^2 Namibian elephant range with an extremely low crude density of 0.06-0.10 elephants/km^2. The elephant population is dependent on sparse surface water sources, and has become increasingly vulnerable to human settlement. Regional elephant densities vary considerably from year to year, and cross-border movements occur primarily along the northern Botswana border, but elephants also move between Namibia, Angola and Zambia. Annual population size accordingly ranges from approximately 4,500 to 8,000 and is largely unpredictable from year to year.

CURRENT ELEPHANT CONSERVATION PROBLEMS

Conflict with people

A sharp increase in conflict between elephants and people occurred after Namibia gained independence from South Africa, because of the cessation of war and the settlement of people in formerly unused parts of communal lands which make up a large part of the elephant range. A national campaign to increase and diversify food production in the communal areas resulted in higher aspirations and greater intolerance towards elephant damage. The crop-growing season in Namibia is short, and only one crop can be harvested per year. The gap between perceptions of elephants internationally and locally is widening, with increasing numbers of rural people regarding the revered animals of western fantasy and wonder as irredeemable agricultural pests and obstacles to their development. People in some marginal agricultural areas have nevertheless agreed to tolerate elephants, as long as they can receive a benefit which exceeds the losses caused by elephants. The challenge remains to generate sufficient revenues, given the international ban in legal trading of ivory.

Displacement by people

One of the most serious issues in Southern Africa, including Namibia, is the normalsing of post-colonial land tenure systems and the development of land-use policies aimed at sustainable development. In practice, however, human land-use patterns within the elephant range are determined by basic short-term subsistence needs. As most elephants occur outside protected areas, they are currently losing range to human settlements and agricultural expansion. Lack of intra-governmental coordination on land-use and sustainable development planning will only result in an unmanageable escalation of human-elephant contact and conflict, with a predictable outcome for the elephant.

Viability of protected area populations

Protected areas in Namibia, with the questionable exception of Etosha National Park, are inadequate to maintain isolated elephant populations through the next century. It has proven virtually impossible and economically unsustainable to attempt to confine elephants to protected areas with less than a cable fence. Confining elephants to any unit is furthermore undesirable in view of annual variation in local rainfall and availability of surface water. The vegetation and associated biodiversity of smaller parks, in particular, are highly susceptible to impacts from elephants, and some units already show signs of elephant over-abundance and require management intervention.

Resource or burden?

In some parts of Namibia elephants are, or may become, the single most valuable, renewable resource for people, especially considering the limiting effects on agriculture imposed by an arid climate and nutrient deficient Kalahari sands. The only way that elephants, with their migratory/nomadic movements, will survive on communal lands is if the people in contact with them can benefit more than they lose to elephants. Acceptable economic incentives to retain elephants are nevertheless compromised by the continued listing of Namibian elephants on CITES Appendix I, banning the legal trade in ivory. If legal ivory trading is not possible, the gradual displacement and ultimate loss of elephants as a resource are inevitable.

POLICY FRAMEWORK FOR ELEPHANT MANAGEMENT

The Namibian Ministry of Environment and Tourism (MET), as the national elephant management authority, is in the process of revising its elephant management strategy. Aspects of the current draft conservation and management policy which might be of wider interest are explained below. This particular approach

considers the available human resources for implementing a management plan and monitoring its consequences, rather than being confined to theoretical elegance. MET is undergoing a rationalisation programme aimed at decentralising decision-making and management responsibility. This additional aspect requires that the management plan should be immediately relevant and useable by a new generation of relatively inexperienced staff.

Classification of the national elephant range

The elephant range in Namibia has been provisionally classified according to recent land-use by elephants (Figure 1). It is intended that this classification be incorporated into land-use planning processes in northern Namibia. Of principal importance is the retention of access for elephants to the most important migratory corridors. Such corridors mainly follow drainage lines which present favourable habitat for agriculture and settlement.

Elephant management units

The management strategy for elephants in protected areas needs to be integrated with general land-use planning and with the management of elephants on adjacent land. This concept thus reflects the existing land-use pattern of elephants, described above, superimposed on the classification of the elephant home range as "protected area" and, for example, "communal land". Protected areas in Namibia will increasingly be regarded as protected cores or refuges for mobile species within a region, rather than the artificial conservation islands which they resemble now. Park management will thus become increasingly integrated with the management of a particular region. Elephants, as a species not confined within any park, present the ideal test case of this integrated approach.

Preferred management density

Rainfall, grass biomass, fire, elephant density and tree recruitment vary almost unpredictably from year to year in Namibia. The concept of a "carrying capacity for elephants" seems to be particularly inappropriate as a parameter in management planning for this type of system, where time lags are very long, and complex factors determine the particular state of the vegetation. Rather than use scarce research resources for a series of elephant-habitat studies - which over the usual period of study might not have revealed significantly more about elephant-tree interactions than an educated guess - a team from MET developed preferred management densities. Such densities are used as management targets within an adaptive management philosophy. Given the potential annual variation in elephant densities, preferred management densities are expressed as a minimum and maximum figure (Table 1). These figures were derived by combining the field experience and best intuitive understanding of elephant populations of 12 MET senior wildlife managers and biologists with direct responsibilities for elephant management, possessing about 170 years of collective experience between them. Preferred management densities take into account average

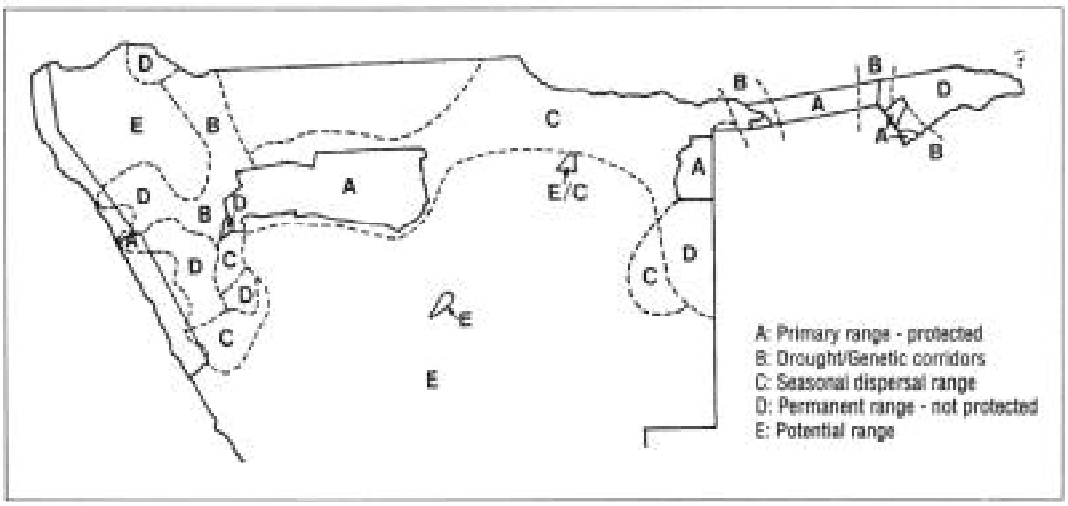

Figure 1. A preliminary classification of the elephant range in Namibia.

Table 1. Preferred management densities and target elephant population sizes for some categories of land in Namibia.

	Elephant range ca.(km²) *	Provisional preferred management densities (n/km2)	Present pop. (approx.)	Target range
(Protected areas and known contiguous elephant range on adjacent land)				
Etosha Management Unit				
Etosha N.P.	18600	.08-.13	1500	1500-2500
Hobatere	300	.10-.30	30	30-90
Adjacent land[1]	3000	.05-.08	50	150-250
	21900	.08-.13#	1580	1680-2840
Kunene Management Unit				
Skeleton C.P.	2000	0- .02		0-40
W. Kaokoland[2]	4000	.02-.05		80-200
Palmwag Conc.	7000	.02-.04	300	140-280
Huab-Ombon. bas	6000	.03-.04		150-250
	19000	<.02-.04#		370-770
Khaudom Management Unit				
Khaudom G.R.	3840	.15-.30		580-1150
Adj. Kavango[3]	10000	<.01-.01		50-100
E. Bushmanland	6000	.03-.08	1100	150-450
W. Bushmanland	12000	0-.01		0-120
N. Hereroland	1000	0-.01		0-10
	32840	.02-.06#		780-1830
Okavango RiverManagement Unit				
Mahango G.R.	250	0-.50		0-125
W. Caprivi'	1200	.42-.83	500-1800	500-1000
Kavango[5]	500	0-.10		0-50
	1950	.26-.60#		500-1175
Quando River - Eastern Caprivi Management Unit				
W.Caprivi[6]	1600	.38-1.00		600-1600
Mamili N.P.**	320	0-1.00		0-320***
Mudumu N.P.	900	0-.50	500-3500	0-450***
E.Caprivi[7]	2500	0-.60		0-1500
	5320	.11 -.73#		600-3870
	81010	.05-.13		3930-10485

Footnotes

1. *Adjacent land here includes indeterminate sections of former Owamboland, eastern Kaoko, and possibly as far north as southem Angola and as far east as the Mangetti area of south-western Kavango.*

2. *Estimated extent of marginal elephant range west of the escarpment in former Kaokoland, included in the unproclaimed Kaokoland "G.R."*

3. *A large part of the Okavango region bordering the Khaudom G.R. has no surface water, but forms part of the wet season dispersal range of elephants of the region.*

4. & 5. *Parts of the Okavango region and the Caprivi G.R. adja cent to the Okavango River and Mahango G.R.*

6. *Remainder of the Caprivi G.R. including settled areas.*

7. *The distribution of elephants in the Eastern Caprivi region seems to be highly variable, but the area adjacent to the two small national parks could be regarded as part of the centre of elephant distribution in the Caprivi region.*

*not corresponding to actual sizes of land units/ variable
** *Nkasa-Lupala*
*** *elephant numbers are highly unstable*
# crude preferred management density per elephant management unit

rainfall, amount of surface water available, size of unit, other management objectives, state of vegetation, incidence of fire, amount of staff available, current and expected future budget allocations in each management unit, existing degree of conflict with people, apparent trend in human land-use of the unit, and the elephant management policies of neighbouring countries, where appropriate.

Rule-based management

In order to deal with the unpredictable annual variation in elephant densities in a given region, a qualification was required in the decision-making process. Simple rules were developed from the same intuitive process described above, particularly to facilitate decisions about starting any management intervention. Provisionally, the first general rule is applied when elephant densities begin to approach the upper preferred limit. For this rule the specific target management density must be evaluated by assessing the status ad behaviour of an indicator or system close to the threshold elephant density, eg. by monitoring tree recruitment, etc. The second general rule is applicable when elephant densities begin to approach the minimum preferred density, and involves evaluating whether local limiting factors could have caused a population decline, rather than short-term changes in density and distribution in response to rainfall. This necessitates, for example, determining carcass ratios, examining the incidence of illegal hunting, calculating the proportion of calves in annual mortalities, etc.

Examples of provisional rules applicable to a specific management unit or sub-unit are:

- If elephant densities exceed 0.3/km^2 (1,150 elephants) in the Khaudom Game Reserve in more than two consecutive dry season population estimates, the density should be reduced through intervention (e.g. sport hunting, culling, live capture, or providing water on adjacent land).

- As the upper limit is approached on the state land component of the Khaudom Management Unit, management plans to cope with or prevent further elephant increases should be initiated jointly by MET and the relevant communities.

- If elephant densities exceed 0.5/km^2 (125 elephants) west of the Okavango River in Mahango Game Reserve for longer than two consecutive dry seasons, the density should be reduced through intervention, regardless of relative abundance of the combined Mahango Game Reserve- western half of the Caprivi Game Reserve population.

- If elephant densities exceed 1.0/km^2 (1,600 elephants) in the eastern half of the Caprivi Game Reserve for longer than two consecutive dry seasons, the density should be reduced through intervention.

- If elephant densities exceed **0.5/km^2** in Mudumu National Park in more than three consecutive dry season population estimates, the population should be reduced through intervention. Brief episodes of much greater elephant densities exceeding 1.00/ km^2 can be expected to occur as this area serves as a cross-border migratory corridor.

Sustainable use

MET remains convinced that elephants are doomed on the communal lands, and thus ultimately also in the protected areas of Namibia, unless elephant and other wildlife utilisation is allowed to surpass subsistence farming in terms of benefits. Numerous cases throughout southern Africa show that wildlife populations on communal or private land, in competition with another form of land-use, eg. agriculture, remain viable in the long run only if the economic value and yield from wildlife exceed that of another land-use, or at least significantly supplement the yield from other competitive forms of land-use. In a free and democratic society, the role of the central government diminishes to a level which people will allow. People living throughout Namibian elephant range can make a conscious decision about whether they want to live with elephants or just have a few token elephants confined to a game reserve. Unless a real incentive is provided, people in harsh environments will insist on living in security from elephants, ad will not be prepared to carry a burden created by any so-called "international conservation community". The listing of Namibian elephants on CITES Appendix I, against which Namibia holds a reservation, will therefore not save the elephants of Namibia from gradual loss of range and displacement by people. The only option in Namibia is to provide people with a real economic incentive for retaining elephants as part of their rural resource base. No one can otherwise deny them their intention of making all the important land-use decisions themselves.