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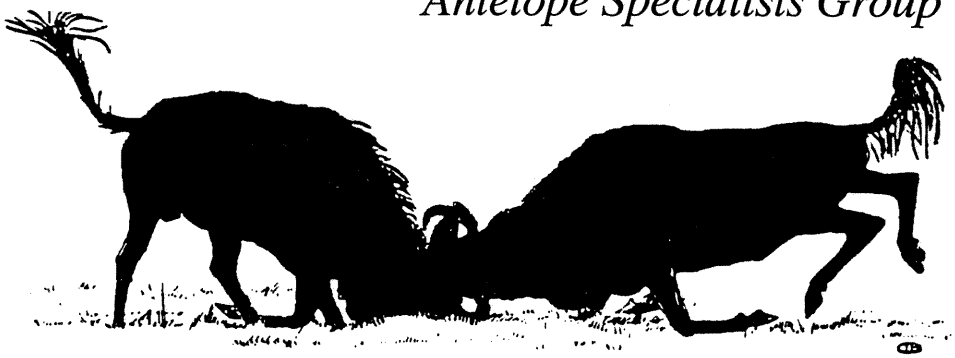
Antelope Specialists Group



GNUSLETTER

ASG News

Correction

The account of the ASG Regional Meeting in Pretoria last December published in the last *Gnusletter* [16(2):3] reported, under "Issues from previous meeting" (in August 1995, also in Pretoria): "Petri Viljoen agreed to act as coordinator of the Task Group [to produce recommendations for a unified antelope translocation policy for South Africa], but subsequently accepted a contract with the Frankfurt Zoological Society and moved to Tanzania. Peter Lloyd was approached to devise the protocol, but promotion to Deputy Director in the Eastern Cape Nature Conservation Department left him with no time for the task. Consequently, little progress had been made on the translocation protocol."

Peter Lloyd[ASG] (*in litt.* 2.3.98) found this information bemusing:

"I have just received *Gnusletter* 16(2) in the mail today and was somewhat surprised to see that I was promoted to Deputy Director of Eastern Cape Nature Conservation! Fortunately, considering the parlous state of nature conservation in the Cape, that is not true!

"Furthermore, I have no record of any invitation to the ASG meeting of 15 December 1997. Had I received an invitation, I would have either been there or sent apologies.

"I did undertake to help draw up a protocol, but I asked Jeremy to get the material previously collected by Petri (I knew he got at least something since I sent him all I had). I wrote to Jeremy that I have permission to undertake the task, and have subsequently been requested to assist Gerhard Willemse's group, but have heard nothing further.

Obviously wires have got very crossed somewhere."

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ASG News *continued*

Results of the Workshop on Sahelo-Sahara Antelopes

Here are the results of the workshop on Sahelo-Saharan antelopes organized by Tommy Smith[ASG] and Roseline Beudels[ASG] that was announced in the last two Gnusletters. The official communique has been circulated by the Convention on the Conservation of Migratory Species of Wild Animals (CMS). If the parties involved act upon the recommendations presented in the Djerba Declaration, it is conceivable that wild populations of six of Africa's most endangered large mammals could once again range free in their native homelands.

THE DJERBA DECLARATION
Seminar on the Conservation and Restoration of Sahelo-Saharan Antelopes
(Djerba, Tunisia, 19–23 February 1998)

Representatives of the Governments of the Range States of six endangered Sahelo-Saharan antelope species — *Oryx dammah*, *Addax nasomaculatus*, *Gazella dama*, *Gazella leptoceros*, *Gazella cuvieri*, *Gazella dorcas* — together with representatives of neighbouring countries, of scientific institutions, of non-governmental organizations and a panel of experts met at Djerba, Tunisia, from 19–23 February 1998, for the purpose of:

- reporting on the conservation status of the species in each Range State,
- amending and adopting an Action Plan for the conservation and restoration of the species and their habitats,
- discussing the medium and long-term concerted actions and international cooperation, including the possibility of developing an Agreement under the auspices of the Convention on the Conservation of Migratory Species (CMS/Bonn Convention).

The Seminar was convened by the Secretariat of the Convention on the Conservation of Migratory Species (UNEP/CMS) on behalf of the Conference of the Parties, at the initiative of the Scientific Council of the Convention. Preliminary status reports on the conservation of each of the six species and a preliminary Action Plan had been prepared in advance by the Institut Royal des Sciences Naturelles de Belgique (IRSNB).

The Range States represented were: Algeria, BURKINA FASO, CHAD, EGYPT, Ethiopia, Libyan Arab Jamahiriya, MALI, Mauritania, MOROCCO, NIGER, NIGERIA, SENEGAL, Sudan, TUNISIA. (States in capital letters are Parties to CMS.)

BELGIUM, FRANCE, GERMANY and the KINGDOM OF SAUDI ARABIA, the latter representing, *inter alia*, the Chair of the CMS Standing Committee, were also represented each by one or more governmental representatives and/or by one or more experts.

The Seminar was chaired by Dr. Ahmed Ridha Fekih Salem, Director General, Department of Forests, Ministry of Agriculture of Tunisia. The UNEP/CMS Secretariat, represented by its Executive Secretary, Mr. Arnulf Müller-Helmbrecht and the Institut Royal des Sciences Naturelles de Belgique (IRSNB), represented by Dr. Roseline Beudels-Jamar de Bolsée, representing also the Chair of the CMS Scientific Council, acted as the secretariat for the Seminar.

The representatives of the Range States as well as a number of invited experts presented reports on the occurrence and distribution, the conservation status, habitats, trends, population dynamics, causes of decline and measures undertaken for the conservation and recovery of the six species. These reports confirmed the extreme precariousness of the conservation status of the Sahelo-Saharan ungulates in the wild, and the urgency of implementing an Action Plan.

Six Working Groups, meeting in two parallel sessions, reviewed and amended the draft Action Plan prepared by the IRSNB.

The Seminar, meeting in Plenary, also debated the opportunity of developing, under CMS, an Agreement between the Range States, as well as the means necessary to develop international cooperation and restore, conserve and manage the species.

The Seminar:

1. • thanks the Government of Tunisia, represented by the Minister of Agriculture, for its generous hospitality,
   • thanks the various agencies and institutions that contributed to the holding of the meeting, in particular:
     - the Conference of the Parties of CMS;
     - the Department of Forests, Ministry of Agriculture of Tunisia;
     - the Environment Ministry of the Flemish Region of Belgium;
     - the Services of the Prime Minister for Scientific, Technical and Cultural affairs of Belgium;
     - the Ministry of the Environment of France;
     - the Federal Ministry for Economic Cooperation and Development of Germany;
     - the Ministry of the Environment, Nature Conservation and Nuclear Safety of Germany;
     - the United Nations Environment Programme;
   • forwards its thanks to the COP of CMS, represented by the UNEP/CMS Secretariat, and to the IRSNB, for the organisation of the meeting and for the coordination of the scientific inputs aimed at the restoration and conservation of Sahelo-Saharan antelopes;
   • thanks its Chairman, Dr. Ahmed Ridha Fekih Salem, Director General of the Department of Forests of Tunisia, for his excellent guidance of the meeting;

2. better informed of the critical conservation status of the six species concerned thanks to the reports compiled by IRSNB and those submitted by the experts of Sahelo-Saharan countries, calls upon governments of the Range States to increase their efforts towards conservation and restoration of these species and their habitats;

3. congratulates the Range States and contributing governmental and non-governmental organisations which have undertaken projects with commendable results, and encourages them to contin-

ue their efforts and to assist other Range States in benefiting from their experience;

4. • informed that serious damage is being inflicted to the wildlife of Sahelo-Saharan countries, particularly to highly endangered species, among which are the antelopes, by foreign hunters and falconers;
   • considering the commitment of the countries concerned, confirmed by their ratification of a number of international conventions, to restore and/or maintain sustainable populations of the affected species;
   • considering also the negative impact that such activities have on:
     ◆ the conservation status of the highly endangered species concerned, some of which are on the brink of extinction;
     ◆ the conservation efforts undertaken by all the local actors for the enforcement of their respective countries' laws and regulations;
     ◆ the continued assistance of the international community to the conservation efforts undertaken;
   • deeply concerned by the disastrous consequences that such practices, often illegally and excessively carried out, will have, if they continue, on the wild resources and their future, appeals to all countries concerned to comply fully with the relevant provisions of the appropriate international conventions;

5. adopts the Action Plan and requests the Secretariat of the Seminar to finalize it according to its recommendations and to distribute it to all the participants to the Seminar as well as to all organizations competent at national and international level;

6. invites
   • all national and international governmental institutions inside as well as outside the range of the species concerned, to implement the Action Plan and to integrate it into their activities,
   • international as well as supra-national governmental organizations, in particular the organs of the Convention on Biological Diversity (CBD), of the Convention on Desertification, of the Global Environmental Facility (GEF), of the World Bank, of the United Nations Development Programme (UNDP), of the United Nations Environment Programme (UNEP), the European Union, to support the implementation of the Action Plan by including recommended actions among the priorities of their work programmes and by providing technical and financial assistance to the development of transboundary cooperation and the implementation of concerted actions,
   • all international and national non-governmental organisations involved in the conservation and sustainable use of African fauna and flora, to collaborate in the development and translation into action of projects put forward in the Action Plan;

7. urges the Range States of Sahelo-Saharan ungulates to develop and conclude an Agreement under the auspices of CMS in order to provide a framework for the species' long-term conservation and management;

8. • decides to set up a Working Group of experts who will collect and circulate the necessary information:
     ◆ to enable experts from national and non-governmental organisations to develop appropriate projects;
     ◆ to provide Range States with a catalogue of appropriate measures for the development of site-management plans, for capacity building, training, research and public awareness;
     ◆ to facilitate the integration of conservation needs into other policy-sectors such as agriculture, forestry or wise use of fauna;
     ◆ to prepare, for Range States, proposals that integrate local community development with ecosystems, habitats and species conservation;
   • the Working Group will report, through the Convention Secretariat, to the Scientific Council and to the Standing Committee of CMS;

9. • decides to meet again in two years to:
     ◆ review the work performed,
     ◆ update the Action Plan,
     ◆ discuss possibilities of improving its implementation on the basis of the experience gained,
   • and requests CMS to organise such a meeting and to seek the necessary funds;

10. calls upon those Sahelo-Saharan countries who have not done so to accede to CMS as soon as possible and to implement it.

Done at Djerba, Republic of Tunisia, on the 23 day of February, 1998

Confirming the correct wording of the Seminar's declaration:
Dr. Roseline C. Beudels-Jamar de Bolsée
Institut Royal des Sciences Naturelles de Belgique
(IRSNB), Brussels, Belgium

Arnulf Müller-Helmbrecht
UNEP/CMS Secretariat,
Bonn, Germany

Date: 25 March 1998

Support for Sahelo-Saharan Project
From: "SYSOP" <SYSOP@aza.org>
To: <estes@top.monad.net>
Subject: *ANTELOPE Digest* for 18 Jun 1998
Date: Fri, 19 Jun 1998 00:25:40-0500

The Bonn Convention on Migratory Species who organized the recent Sahelo-Saharan Antelope Conference in Djerba, Tunisia, has reportedly received a significant pledge of support from the Global Environment Fund for antelope conservation programs in North Africa. This is extremely good news for antelope conservation efforts in the region, and could be a very positive start in relating our captive efforts to *in situ* work there.

—Steve Shurter
Antelope TAG Chairman

Antelope News

Of Course the Giant Sable Is a Valid Subspecies

03 Mar 1998
To: estes@top.monad.net
From: Colin Groves
<Colin.Groves@anu.edu.au>

Of course the Giant Sable is a valid subspecies. Mitochondrial lineage sorting just has not occurred yet among the sable subspecies (except *roosevelti*), which is reasonable when you consider that what is characteristic of subspecies is that they do not have fixed allelic differences between them, unlike species.

Most individuals of *H.n.variani* that I have seen (all in museums, I must confess) are distinguishable at a glance from most individuals of other subspecies. Unless we take the phenotypic differences to be merely environmental — due to different conditions of rearing, no more — then the existence of such differences is *ipso facto* evidence that they differ genetically. This genetic differentiation does not reside in the control region of mtDNA, that's all: and, as Avise himself, the founder of the phylogeography concept, has shown, lineage sorting is not the same thing as population separation.

By the way, the subspecies *H.n.anselli*, which I described in 1983, seems to have got lost in all this. It is the one found east of the Luangwa valley, so at least some of Terry Robinson's "kirkii" would have been referable to that subspecies.

Over ten years ago I collected notes and measurements on Hippotragus skins and skulls in European collections, and since then I have added some from the U.S. collections. I regret that, because other heavy commitments on my time (most notably my vast teaching load), I haven't been able to work on this yet, except for one paper which I published with Celia Westwood, on the Blaubok skull. In view of this flurry of interest, I will make Hippotragus my next-but-one task.

—Colin Groves

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General Issues in the Conservation Biology of Nile Lechwe *(Kobus megaceros)* and Preliminary Guidelines for an Action Plan

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PART 2

Part 1 appeared in *Gnusletter* 16(1)

Census in nature

Most of the available information on population size comes from aerial surveys, through which the whole *Kobus megaceros (K.m.)* population was estimated at 30,000–40,000 individuals (Hillman & Fryxell 1988). Ninety-five percent of these are concentrated in the above-Sudd reserves, while the rest are scattered between the Sudan and Ethiopia (Watson *et al.* 1977, Hillman & Fryxell 1988). Outside the reserves, population size is uncertain; as noted, Hillman saw herds of several hundred individuals near the Nyuborn and Hirol lakes in 1982. The latest surveys, carried out to census wild animals in the Jonglei area (Range Ecology Survey, 1983; in Mefit-Babtie, 1983), estimated 12,711 ± 5596 lechwes in the mid-wet season, 11,924 ± 3351 early in the dry season, and 32,279 ± 15,368 late in the dry season. However, more recent information is lacking, and what occurred to these animals after the civil war beginning in 1983 in southern Sudan is unknown.

In Ethiopia, not more than 1,000 individuals (a few hundred, according to Duckworth 1974) occurred in Machar-Gambella swamps. There the species is rare and decreasing (Hillman 1982). In 1967, Blower (1968) estimated about 150 individuals in Ghilo River swamps; in 1973, in the same area and season, Duckworth counted 52 specimens (Bolton 1973). But these numbers today seem unlikely, because during the last years the boundary zone between Sudan and Ethiopia (particularly Nasir area) was involved in the civil war and in enormous people movements and resettlement, which have greatly modified the ecology of that area (UN DHA. 1994, UN HCR 1995, UN CIAA 1995, Smith-Morris 1996). Also for Ethiopian populations, no more recent information is available.

Conservation status and measures

In the 1994 *IUCN Red List, K.m.* appears in the "vulnerable" category (old IUCN categories). Sausman (1993), in her Antelope Conservation Assessment and Management Plans (CAMPs), according to the Mace-Lande (1991) criteria, includes *K.m.* in the Group of Vulnerable 2 Antelopes, with the level of captive programs: 90/100 years II — namely population sufficient to preserve 90% of average heterozygosity of the wild gene pool for 100 years, but developed more gradually (5–10 years).

In the 1988 ASG antelope survey, the Nile lechwe was declared "species potentially at risk," on account of its restricted range and small population. The species status is called "satisfactory" in the Sudan (Hillman & Fryxell 1988) and "rare" in Ethiopia (Hillman, 1988). East (1988), in the "Current Regional Status of Antelope Species in East and Northeast Africa," considers *K.m.* as "threatened" because it is confined to two discrete areas and large populations of this species occur in two or three conservation areas. He emphasizes the potential vulnerability of antelopes that have very restricted distributions, even if they occur in large numbers; thus, for *K.m.*,

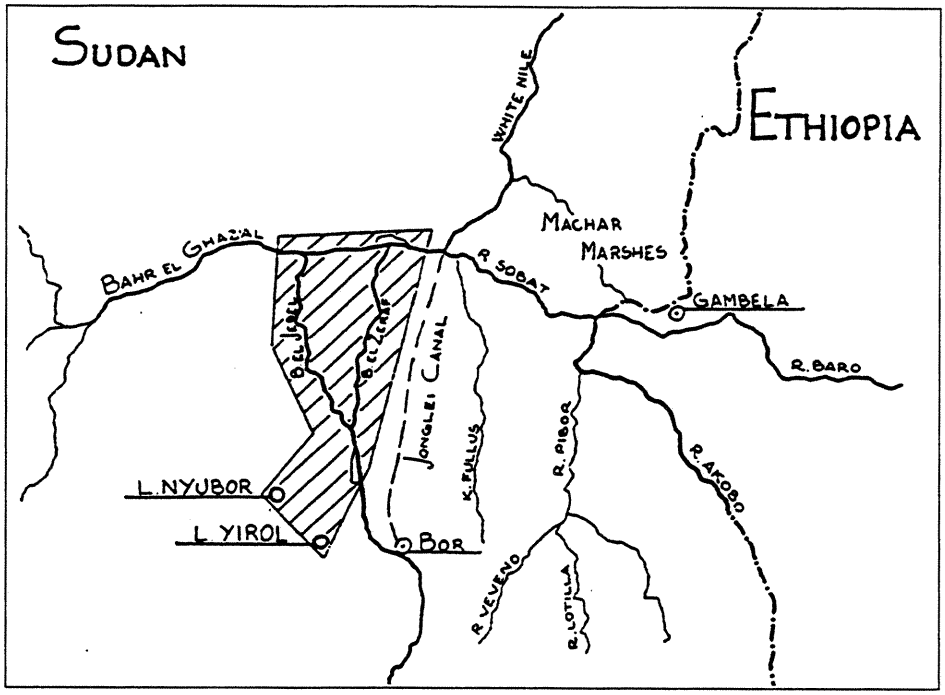

Figure 2. The union proposal of protected and unprotected areas in a single preserved area.

he advises a captive breeding program.

Since 1982, hunting in the southern Sudan is [nominally] regulated by the Wildlife Conservation and National Park Act. *Lechwe* can be hunted only with a special game license; hunting with hounds is forbidden. However, control, particularly of fire arms, has always been scarce, and Mefit-Babtie (1983) reports the persistence of local hunting with hounds. In the three Game Reserves, active management and real protection are effectively nil (East 1988). A. Guillet (pers. comm.) has recently confirmed the lack of control and management in the reserves. Outside the reserves, the individuals are scattered without any real protection. In Ethiopia, a maximum of six lechwes a year may be taken on license.

Captive populations are recommended as a component of a conservation program.

Population Threats and Potential Causes of Decline

Environmental stochastic factors may threaten lechwe, above all epidemics, such as AFTA, anthrax and rinderpest, which are frequent in Africa, the latter two being very likely to occur in the Sudan (Hillman & Fryxell 1988, UN DHA 1994).

However, the main immediate population threats and decline factors for *K.m.* are connected with human activities.

Sudanese political-social status and human relationships with Lechwe

The ethnic groups Nuer, Dinka and Shilluk dwell within the *K.m.* Sudanese range (Evans-Pritchard 1940, Howell *et al.* 1988, Allan 1996). The Nuer inhabit the wide lowlands and savannahs along the Nile, South Sobat and Bhar el Gazal confluence. Evans-Pritchard (1940) described the Nuer as mainly pastoralist and agriculturist nomads. Hunting for food was not intensely performed by them, as livestock provided their meat. The Nuer hunted through spearing and hounds and only by sight, without tracking game. Tiang, kob and other antelopes were caught mainly near fields and villages. However, both hunting and fishing were practised only in the dry season, to supplement their poor diet. Their natural habitat protected *K.m.* from hounds; lechwes escaped dogs by running into the water (Howell *et al.* 1988).

The Dinka inhabit the more north and south lands of Nuer; they are closely related to the Nuer and had similar traditions and rural economy. The Shilluk live in the far north of Sudd, also practising a mainly rural economy. A *K.m.* herd living on the Fanyikang islet, west of the White Nile confluence with Sobat, was protected by the Shilluk tribal chief; in fact, this people held Lechwe as a sacred species, which could only be killed to dress members of the royal family with its coat, during the crowning ceremonies (Warshall 1987).

Both politically and socially the Sudan has never been a quiet area and local people always fought against each other (Suliman 1992, Smith-Morris 1996, Country Report 1995, Country Profile 1995–96). In particular, a series of civil wars involved the Northern Sudan against the Southern Sudan. The last conflict began in 1983 and since then, the whole range of *K.m.* is threatened by the war (Country Report 1995, Country Profile 1995–96, Smith-Morris 1996, U.N. OLS 1996, UN DHA 1994). Efforts to obtain peace, ongoing since 1992, have again failed to produce any substantial progress and today fighting is reported nearly everywhere in Southern Sudan.

So far, a minimum estimate of 1.2 million lives have been lost in the war. Hundreds of thousands of people have suffered injuries of various kinds and degrees, and an equal number have been forced into exile (ACIS 1996). Moreover, since 1984–85 a severe famine has taken place, so that the Sudan is now one of the most damaged countries in the world (Country Report 1995, Country Profile 1995–96, Humanitarian associations and UN Reports 1994, '95, '96). All the following disastrous factors have affected the country within the life-span of one generation (Suliman 1992):

- micro- and macro-climatic changes (the practically continuous Sahel drought since 1967)

Antelope News *continued*

- diminishing and erratic rainfall and accelerating desertification (the floods and torrential rains of 1988) [and 1998]
- near doubling of population in less than a quarter of a century (14.4 million in 1970 to 25.4 million in 1990)
- displacement — both internal and external — of some 6 million people
- doubling of livestock numbers within 20 years
- deforestation on a massive scale
- renewed civil war in the South, which is now spreading to the west and east
- aggressive expansion of legal and illegal rainfed mechanised farming, from 0.42 million ha in 1967 to 7.5 million ha in 1989.

The war, together with floods, famines and human resettlement, brought about a major cultural change in local populations: the increasing importance of hunting in the local economy. The effects of the droughts in 1984–85 and 1990–91, and of devastating floods in 1988, are thought to have depleted livestocks drastically, particularly in the western and southern Sudan (Country Profile 1995–96). Local populations [came to] rely on hunting as one of the most important food resources; this was greatly facilitated by the increased availability of firearms (Mefit-Babtie 1983; Howell et al. 1988).

In Mefit-Babtie's (1983) studies, the particular threat represented for *K.m.* by proliferation of firearms is emphasized: "This animal is less easily hunted with dogs because of the shallow, swampy habitat it frequents, but is readily stalked and is highly prized for its tasty meat." Besides, in Sudan, "reports of soldiers firing on herds from moving trucks, for example, are all too common" (Spinney, 1996).

These events make the Nile lechwe more and more vulnerable: The Sudanese socio-economic and political situation can now determine this species' survival. The future of Nile lechwe depends on the following interventions and to their rapid performance:

1) the education of local people to conservation;
2) the beginning of social-economic activities, e.g., tourism, game farming, etc., presently lacking and never planned for the southern Sudan, to provide a better use of areas and resources to be conserved. These would be profitable to local populations without requiring strong changes in local rural habits;
3) the regulation and control of exploitation of wildlife and other natural resources;
4) strict, effective protection and management of wildlife in reserves.

Unfortunately however, after repeated attacks on foreigners working in the region, all programs, including those for nature protection, were cut off. All agents and operators of the main international organizations, except the humanitarian ones, left the Sudan. Reports on present and future needs of the southern Sudan for food aid, rehabilitation of community and productive infrastructure, and non-food inputs for the foreseeable future are unanimous (FAO/WFP, 1994).

One of the most severe consequences of the protracted civil war is the virtual breakdown of the formal education system in the country's southern region. Critical shortages of trained teachers, education facilities and materials are reported everywhere in South Sudan (ACIS, 1996; UN CIAA, 1995). Economic resources in the country are scarce: In the whole southern region, facilities to start economic and educational activities such as roads, communications, etc. are rare or altogether lacking. Controlling the reserves is impossible. The persisting civil war prevents any intervention and the problem of human survival has become paramount.

However, even in a future without war, international interventions may not be granted, if the North Sudan government should continue its political and economic trends of intensive exploitation of natural resources: e.g., increase of large-scale mechanised agriculture, completion of the Jonglei Canal, deforestation and overgrazing.

Jonglei Canal

Begun in 1978, to convey Bahr el Jebel water, near Bor, up to its confluence with the Sobat River, the Canal construction (Phase I) aims to bypass the broad expanses of the "Sudd" marshes, and to divert a quarter of the White Nile's waters into a newly dug 360 km channel, to reduce water losses due to evaporation and seepage, thereby increasing the downstream flow available for agricultural irrigation, hydroelectric power generation and riverine communication for the northern Sudan and Egypt (Howell *et al.* 1988, Suliman 1992). An additional 4.75 bn cu metres of water would be recuperated with Phase II, involving the widening of the canal, after completion of Phase I (Country Profile 1995–96). "With implementation of Phase II, the swamps will dry up completely, which will ultimately affect the environment of the region and its ecology" (ICPP-GR, 1995).

Opposition to the canal project came from two sources (Country Profile 1995–96): 1) the Southerners believe that, water being their natural resource, it should not be "stolen" for the benefit of the Northerners and the Egyptians; 2) conservationists consider that the realization of the canal would result in the loss of the largest swamps in the world, which would have a devastating effect on the region's ecosystem and micro-climate, thereby accelerating desertification.

Besides, the Canal will disrupt the lives of the local pastoralists, whose traditional cattle husbandry depends upon the seasonal flooding of the plains (Howell 1988, Suliman 1992). Suliman (1992) also predicts: "By drying out the swamps and taking away the 'grass curtain,' the canal would open the entire Sudd area for mechanised farming..."

Anyway, the Jonglei Canal, if completed, will heavily influence the extension of marshes and the pattern of their periodic fluctuations, and will induce an estimated decrease of up to 32% in the total area of the toiches (Howell *et al.* 1988). In the Mefit-Babtie report it is stressed: "If the river continues at its present high discharges, it is estimated that the planned

Canal throughput of 20 million cubic metres of water per day will cause the seasonal floodplain to decrease by 16.9% and the true swamp to decrease by 21.4%. If the river returns to its pre-1961 discharge volumes, it is predicted that the floodplain will decrease by 25.6% and the swamp by 47.3%." According to Howell (1988), "Any reduction in the area of these vegetation types may well lead to decline in their associated animal species," particularly *K.m.*

The future grazing resources for livestock will critically be reduced by the decrease of the toiches; in the dry season, this will cause a greater concentration of both livestock and wild herds into the reduced wet areas, so the present coexistence will turn into competition. Moreover, the wild animals that will tend to concentrate near the Canal, searching for water and grassland, will be more vulnerable. The effect of this on lechwe may be substantial.

The Canal construction was stopped in 1984 — after completion of 250 of the proposed 360 km — following a series of attacks by the SPLA on the construction site, although its building was resumed on a limited basis in 1988 (Amanor 1996). If ever restarted, the canal project will have to be revised substantially, as this is one of the SPLA's preconditions for peace (Country Profile 1995–96).

Now the Jonglei Canal collects only rains; but with its vertical sides and very few access points, it already represents a physical barrier for water seepage and movements of both men and animals (Howell *et al.* 1988, Guillet pers. comm.). The Gambellan populations of *K.m.* appear already isolated as a consequence of considerable human aggregation on ridges along and in proximity to the Canal, and by the barrier represented by the Canal itself, that cuts the few traditional wildlife corridors between human settlements.

From the 1983 aerial surveys, *K.m.* herds were never recorded on the Canal's eastern side. The Ethiopian population may be already considered a metapopulation; it could soon be subject to the demographic and genetic problems that follow isolation, and to the effects of "insularization" (Frankel & Soulè 1981).

Habitat Loss and Fragmentation

The high human and livestock densities in both the Sudanese and Ethiopian ranges of *K.m.* have induced habitat degradation and competition for grazing, and have accelerated the decrease and fragmentation of the *K.m.* habitat. Many of those areas which were preferred by *K.m.* have turned into a hostile environment, in which vital resources are greatly reduced. Guillet (1978) reports that at the end of the dry season the toich vegetation is burned to increase livestock foraging opportunities and to keep the livestock tracks open. Both seasonal and permanent vegetation is burned, the waters flow more rapidly, and most of the seasonally flooded area has already turned into an open area. Many areas are damaged by both livestock overgrazing and wild ungulate concentrations. Natural reserves in which *K.m.* lives are isolated from each other by deep rivers; moreover the strong anthropization around the reserves, particularly Zeraf, makes contacts between populations difficult.

Some Final Issues in the Conservation of *K.m.*

K.m. is at present a species needing protection and management measures.

The risk of contemporary extinction in all *K.m.* populations, as a consequence of unfavourable environmental factors acting over its whole distributional range, is now growing considerably. Individual numbers and wild population size should not lead us to delay both *in situ* and *ex situ* conservation actions, because 1) a long time has passed from the date of the last census, and too many events have occurred in the southern Sudan to consider those data still reliable; 2) several events have occurred that teach us how an antelope population may rapidly decrease, such as the drastic decline of the hirola (*Damaliscus hunteri*) from as many as 14,000 individuals to approximately 300 in 15 years (Magin 1996).

Strict protection measures *in situ* are the first priority, but the difficulties of protecting the populations *in situ* confirm the need for *ex situ* conservation. To formulate a Global Action Plan for *K.m.*, the following researches are required to redefine its designation in the IUCN red-list categories according to Mace-Lande criteria, and to model the Population and Habitat Viability Assessment:

- a census update of both Sudanese and Ethiopian populations;
- a study on the species' biology in the wild, particularly of its behavioural and reproductive traits;
- a genetic analysis of captive and wild populations;
- an assessment of the inbreeding sensitivity and of the inbreeding role in the dynamics and management of lechwe populations.

In addition, *in situ* studies should be carried out on the present conservation status of core areas, also in the context of ecological trends related to major hydrological schemes. Finally, the impact of civil war may have induced dramatic changes in the lechwe's distribution. Post-war human recolonisation of now-deserted rural areas might lead to dramatic consequences, if unchecked. Up-to-date assessments should be performed of *K.m.* distribution patterns. These should focus on periodicity and trajectories of movements within and between core areas, with particular regard to corridors connecting non-contiguous viable habitat patches.

Preliminary Guidelines for In Situ *Conservation*

Isolation of subpopulations, caused by habitat loss and fragmentation, may become serious and cause demographic and genetic problems for the Gambella population. It already appears isolated from the Sudanese population by the Jonglei Canal and by a considerable human density along the Sudanese-Ethiopian border. The Sudanese populations in turn, if isolated in reserves, will face a similar destiny. For this reason, management actions must safeguard the lechwe's mobility and

Antelope News *continued*

ensure interpopulational genetic flow. This might be ensured with:

- widening of the protected areas (Fig. 2; Falchetti *et al.* 1993). Key habitat patches, such as Yrol-Nyubor areas, located peripherally to or between Fanyikang, Shambe and Zeraf (the three major reserves comprising the bulk of the species' total distribution), should be gazetted and unified within a single preserved area. Core areas in the reserves should ensure a suitable reproductive habitat;
- the establishment of protected corridors in the most settled areas to allow individual movements and help immigration, e.g., between individuals/populations of Fanyikang and Zeraf and those of Shambe and Yrol area. The viability of establishing eastern corridors connecting Sudan to the Ethiopian populations, possibly through southwest-northeasterly oriented strips of suitable habitat (Fig. 2), should be explored. This could be assessed within a more general management plan including migratory routes of economically important ungulate species, such as *Damaliscus korrigum tiang,* which locally cut through patches of *K.m.* habitat;
- the translocation of individuals between populations from Gambella and Sudd. This action might be requested if the reestablishment of genetic flow cannot be ensured again in a natural way;
- it would be advisable, at present, to ban all hunting activity.

Preliminary Guidelines for Ex Situ *Conservation*

It is important, in the case of *K.m.*, to practise careful management of captive populations in view of [possible] *ex situ* conservation problems. Thus, it is now difficult to start a captive breeding program for the hirola, lacking a captive population. Nile lechwe populations are now present in 19 world zoos, with some 160 specimens (Falchetti & Mostacci 1993, IZY 1995). Some individuals have been recently transferred from Rome to Belfast Zoo.

From a survey of the captive populations conducted to estimate the chances for captive breeding, the existence of several genetic and demographical problems has been found. The global captive population derives from a restricted founders' group. Founder's effect, genetic bottlenecks and genetic drift have presumably caused losses in the genetic variability of the natural population (Falchetti & Mostacci 1993). Perhaps only two founders were wild-caught, from which all the captive individuals derive.

Many individuals have a considerably high inbreeding coefficient. Thus the genetic pool of captive populations cannot ensure good fitness for new self-sustaining generations. To maximize the success of the captive recovery plans for *K.m.*, new founder stocks should be established by capturing some wild individuals and introducing them into the genetically best captive groups (after genetic checks). Collection from the wild could be undertaken in Ethiopia.

An international studbook also is needed. A North American Regional Studbook was instituted (Fulk, 1990), and an EEP studbook is in progress.

*For anaesthesia, Dr. Amerio Croce (1996) has repeatedly tested successfully both the Zoletil (Zolazepam and Tiletamine), and a Z/K/X** mixture (per ml: 50 mg Zolazepam, 50 mg Tilamine, 50 mg Ketamine and 10 mg Xilazine) producing immobilization after only five minutes. He advises using Z/K/X, because 40–50 minutes after anaesthesia induction, it is possible to antidote the Xylazine component of the mixture (using Atipazole, 1 mg per 8–12 mg di Xilazina or Yombine, 0.25 mg per kg of body weight) and get the animals to wake up quickly. Earlier antidote injection must be avoided because the presence of both Tilamine and Ketamine in the blood generally causes dangerous convulsions. To avoid a possible respiratory depression, it is advisable to use from 1/4 to 1/2 of the wakening-antidote dose.

**Z/K/X indicative dosages: adult males from 1 to 1.2 ml; females from 0.8 to 1ml.

ACKNOWLEDGMENTS

I express my gratitude to Dr. Roberto Cajati and to Istituto Italiano per l'Africa e l'Oriente for the records of the Sudan.

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APPENDIX 1

Measurements (Haltenorth & Diller 1977)
- Head & body length: m. cm 165, f. 135
- Tail length: m. cm 50, f. 45
- Height at shoulder: m. cm 100–105, f. 80-85
- Adult body weight: m. Kg 90–120, f. 60–90
- Horn length: cm 45–87

Ovulation: one month after previous birth
Gestation: mean 235.5 days
No. calves/birth: 1
Birth season: throughout year, peak between February and May in captivity
Interbirth interval: mean 11.6 months
Max. no gestations/f: 14
Sex ratio at birth: c. 1:1
Suckling duration: 6-8 months
Causes of mortality: trauma, infections in captivity
Maximum longevity: 19 years in captivity
Age of first reproduction: m. 20 months, f. 19 months
Birth frequency: annual

ADDENDUM

Demonstrating a remarkable and admirable personal commitment to the conservation of Nile lechwe and other antelopes of the region, Elisabetta Falchetti wrote (*in litt.* 6 May 98):

I have allocated about US$8,000 of my funds to produce some 4,000 70 x 100 cm divulgative posters on antelope conservation. The information will be in English, so some of the posters can be sent to the concerned countries. While I have planned the posters' subjects, i.e., one-species focused, several species focused, and geographic area focused posters, I should like to hear from you about priority subjects and any other suggestions in order to realize a fine, useful product. Also, please let me know the availability of pictures or drawings to be printed in these [posters].

On 1 June, Falchetti asked, "What do you think of these topics: 1) *Kobus megaceros* and its habitat; 2)–3) Antelope key species of Ethiopia and Somali-Eritrea?"

Readers with experience in the region are requested to contact Dr. Falchetti directly with suggestions and/or offers of help.

Buffalo Knock-Down, Drag-out and (Damn-Near) Drown

by Daniel Otte, Curator of Entomology
Academy of Natural Sciences of Philadelphia

During a three-day safari to Kenya's Marsabit National Reserve in September 1987, accompanied by colleagues from the National Museums of Kenya, Daniel Otte[ASG] (illustrator of *The Behavior Guide to African Mammals* and *The Safari Companion*) witnessed and here describes a spectacular battle between buffalo bulls (a bovine for which the ASG has good-heartedly accepted responsibility). [*Gnusletter* readers are reminded that the African buffalo has been officially placed on the ASG's "plate."—*Ed.*]

A spectacular view of the combat was afforded from the camp they pitched on the west side of Lake Paradise, below the cliffs atop which Martin and Osa Johnson lived in the 1930s and wrote *Four Years in Paradise* (a book that nourished the *Gnusletter* editor's childhood dream of living in the African wild).

"The following morning we witnessed an amazing contest between two buffalo bulls. We first noticed one male chasing another on the other side of the lake perhaps a mile or so away. It seemed a leisurely chase at first but then became more intense. The chase went right through the middle of the herd (the two males had been separated from the herd by about half a mile). Then they disappeared into the forest above the lake and then reappeared again. Now they were coming around to us. We heard heavy puffing as the [chased] male approached and thundered past our camp. A minute later the chasing bull ran by.

"When they had gone completely around the lake, the two males began butting one another viciously. Then one of them gave up and went into the water. The winner followed him and they engaged again in the water, which came up more than halfway on their sides. There was loud bellowing as the pursuer began to hook his horns beneath the other's. Several times the attacked male was turned over completely in the water so that only his feet were showing. We felt sure he was going to drown, but then he would recover with just his head peeking out of the water. The fight continued for at least a half-hour until finally the winner left the water and grazed along the shore. The attacked male remained almost completely submerged until almost dark and then also emerged onto the shore."

The Antelope Specialists Group and the Pronghorn

By Steve Kingswood[ASG]

A year ago, an insert entitled Pronghorn News appeared in the *Gnusletter* (see vol. 16, no. 1). By giving a little coverage in the *Gnusletter* to conservation and management issues regarding the pronghorn *Antilocapra americana*, I had hoped to "plant a few seeds" that might increase mutual awareness of antelope and pronghorn biologists that would benefit everyone concerned. It seems to me that this would serve one of the main goals of IUCN's Species Survival Commission: "To enhance the efforts of individuals working on biodiversity conservation by linking them and providing access to an international forum."

In last year's *Gnusletter* insert, Dick Estes raised a reasonable objection to having the pronghorn added to the Antelope Specialists Group. While it may be either unwarranted or premature to include pronghorn officially with the other taxa that are under the purview of ASG, the *Gnusletter* editor has agreed to publish pronghorn news — not as an insert, where it tends to get lost as published literature — but rather within the body of the *Gnusletter*. Kim Brinkley of Los Angeles Zoo has volunteered to submit reports periodically on pronghorn to the *Gnusletter*. Here is her report on a recent pronghorn workshop.

Report on the 18th Biennial Pronghorn Workshop

By Kim Brinkley
Los Angeles Zoo, 5333 Zoo Drive, Los Angeles, CA 90027, USA

The 18th Biennial Pronghorn Workshop, chaired by Richard Ockenfels of the Arizona Game and Fish Department, was held 23–27 March 1998 in Prescott, Arizona. The workshop was sanctioned by the Western Association of Fish and Wildlife Agencies. Attendees consisted of wildlife biologists from state and federal agencies, graduate students and professors from various universities, and a few representatives from environmental organizations and zoos.

This meeting was multi-faceted, and it featured a keynote address by Guntram F. A. Werther entitled "Stabilization processes, emerging patterns of societal change, and the future challenges of wildlife management."

A general address by James C. deVos, Jr. of Arizona Game and Fish and entitled "Challenges to pronghorn managers into the next millennium: A case study" presented four challenges: 1) strengthening land-use planning to preserve suitable habitat for pronghorn, 2) countering long-term landscape habitat changes, 3) shifting from descriptive to manipulative research studies, and 4) striking the best deal possible for wildlife.

State status reports followed the introductory addresses. Reports were given by all states having pronghorn populations except California, Texas, and the Canadian provinces. Survey numbers ranged from a high count of 386,000 pronghorns in Wyoming to the lowest count of approximately 34 individuals in Baja California. These 34 animals represent the entire population of *A. a. peninsularis*. The total number of the three threatened subspecies A. a. mexicana, *A. a. peninsularis*, and *A. a. sonoriensis* in Mexico is estimated to be 1,000 animals.

Research projects in progress were reported from four states and Mexico. In Arizona, habitat limitations, genetics, diseases (i.e., bluetongue) and copper/selenium deficiencies are being studied in all pronghorn populations, while productivity, recruitment, water use and the effects of bombing on U.S. Air Force ranges are also under investigation in populations of *A. a. sonoriensis*. Nevada has an active program of pronghorn reintroduction. North Dakota is evaluating pronghorn range, distribution, and density using Geographic Information System (GIS) technology. Studies in Mexico of *A. a. mexicana* include fawn survival, population structure, food habits, predation and home range. Wyoming is surveying pronghorn movements that occurred in response to massive fires.

Technical sessions included papers on health and genetics, management techniques, management issues and life history. Two workshop sessions were held. One featured an informal training introduction to the use of ArcView v3.0, a GIS mapping and query software for personal computers. The second was an open forum discussion on the various factors that limit pronghorn populations. Poster session topics included the status of the northern Yellowstone pronghorn herd, the status of the Navajo Nation pronghorn herd, prenatal/neonatal deaths occurring in a pronghorn population that had been released on the National Bison Range in Montana during 1951–52, and density-dependent survival rates of pronghorns during summer in the northwestern Great Basin.

Conservation efforts for the three threatened subspecies were discussed in a paper by F. Ramirez *et al.* entitled "Past and present Mexico-United States relationship concerning the pronghorns." This work has been undertaken by various Mexican federal and state agencies and academic institutions in cooperation with U.S. governmental agencies. For *A. a. mexicana*, aerial surveys were conducted in 1995–96 and 1997, a habitat evaluation is underway, and a pronghorn management plan for the State of Chihuahua is in place. The management plan includes plans for fence modification, capture and translocation of isolated animals, hand-rearing for semi-captive management and predator control during fawning season. The 1982 plan for *A. a. sonoriensis* includes telemetry studies, habitat evaluation, population surveys and modeling, and education programs.

Two proposals are under development to aid the recovery of *A. a. peninsularis*: a habitat nutrient analysis and plans for embryo transfer. AfricanSafari Zoo in Mexico has the capacity and desire to receive a small herd of *A. a. americana* with two objectives in mind: 1) to train females to act as recipients for transfer of embryos from *A. a. peninsularis* and 2) to reinforce environmental education through exhibition of a captive herd. The embryo transfer project will be a joint effort with

Antelope News *continued*

veterinary faculty in Mexico and "El Vizcaino" Biosphere Reserve.

In a personal conversation with Jorge Cancino of Centro de Investigaciones Biologicas del Noroeste, Baja California Sur, I was brought up-to-date with recent developments concerning *A. a. peninsularis* in "El Vizcaino" Biosphere Reserve of Baja California. Once known to range from San Felipe Bay south to Magdallena Bay, *A. a. peninsularis* has radically declined in number during the past few years. A survey taken November 1995 counted 149 pronghorns, one taken April 1997 counted 13 animals, and one taken June 1997 revealed only three pronghorns. Surveys were taken using a combination of two ultralights and a Cessna 182 with a ground support team plus frequent ground searches and close observation to identify individuals. Poaching and coyote *Canis latrans* depredation are the main causes for the population decline.

In a desperate attempt to aid recovery of *A. a. peninsularis*, five fawns (three females and two males) were captured during late January to early March 1998 to be hand-reared in a semi-captive environment. None of these fawns were full siblings. They were placed in a one-ha pen (100 x 100 m) enclosed by a triple fence. The fence consists of a 1.5-m high woven wire fence buried approximately 30 cm in the ground, a single strand of barbed wire at ground surface level below the woven wire, and a six-strand electric fence operated by a solar-powered generator that runs 24 hours/day. There is a small, covered pen (10 x 10 m) in the center of the larger pen, to which the fawns have access during the day, but are closed into at night. Feedings take place every 4 hours from 0600 to 2200 hours. Sometime after weaning, the fawns will be moved to a larger pen (1,400 x 1,900 m) enclosed with the same type of fencing. There is a water source, predator control and habitat monitoring for both enclosures. If successfully hand-reared, these fawns will be the nucleus for a semi-captive breeding herd. Genetic testing of all three Mexican subspecies is planned for June/July 1998.

A conversation with Dan Friese of Luke Air Force Base, Arizona, gave me insight into what is being done for *A. a. sonoriensis* on the Barry M. Goldwater Range in Arizona. Population estimates in the United States are 150–200 animals, where approximately 90% of its known range lies beneath restricted airspace of the U.S. Air Force. Because the U.S.A.F. is a federal agency, it is mandated by the Endangered Species Act of 1973 to manage any endangered species inhabiting land within its jurisdiction. A large number of *A. a. sonoriensis* occupy land within the Barry M. Goldwater Range, which is administered by Luke Air Force Base.

After many studies, U.S. Fish and Wildlife Service biologists concur with the assessment of Luke Air Force Base biologists that air force activities could affect *A. a. sonoriensis*. The Fish and Wildlife Service suggests taking the following reasonable and prudent measures: 1) study the effects of noise on pronghorn behavior (this study is in progress), 2) conduct a study on vegetation and water contaminants, particularly aluminum and magnesium (this study is in the final planning stages), 3) study the effects of military activity on fawning and fawn behavior, and 4) study the vegetation in known pronghorn locations. These projects are to be funded by the U.S.A.F.

For about the past 2 years, prior to bombing activity within ranges included in pronghorn habitat, a team of biologists has gone into the areas to monitor targets and check for any presence of pronghorns. If pronghorns are found within these areas, the bombing missions are either canceled or rescheduled for other sites. It is also the responsibility of the biologists to brief explosive ordinance personnel on pronghorn recognition and what to do if sightings occur; they also brief contractors on such issues as biological and archeological studies occurring on the Barry M. Goldwater Range.

The Arizona Game and Fish Department hopes to have proceedings of this workshop published within one year. Those interested in obtaining a copy should contact Richard A. Ockenfels, Arizona Game and Fish Department, POB 41716, Phoenix, AZ 85080-1716, USA.

Captive Breeding and Genetics

Steve Kingswood, Editor

Centric Fusion Polymorphisms in Waterbuck *Kobus Ellipsiprymnus*

Kingswood, S. C., Kumamoto, A. T., Charter, S. J., Aman, R. A., and *Ryder, O. A.* 1998.*The Journal of Heredity* 89:96–100.

Twenty-six captive individuals of the *ellipsiprymnus* subspecies group of *Kobus ellipsiprymnus* were found to have chromosomal complements of 2n = 50-52 (FN = 61-62), and 26 of the *defassa* subspecies group, including three specimens from Lake Nakuru National Park, Kenya, had complements of 2n = 53-54 (FN = 62). G-banded karyotypes that were numbered according to the standard karyotype of *Bos taurus* revealed that variation in diploid number was the result of polymorphism for two independent centric (Robertsonian) fusions. The *ellipsiprymnus* group was polymorphic for a 7;11 centric fusion. Both elements of chromosome pairs 7 and 11 were fused in fusion homozygotes (2n = 50); in fusion heterozygotes (2n = 51), only one element of each pair was fused. The 7;11 fusion was lacking in specimens with 2n = 52. The *defassa* group was polymorphic for a 6;18 centric fusion; individuals were either heterozygous for the fusion (2n = 53) or lacking it (2n = 54). There were no *defassa* group individuals that were homozygous for the 6;18 fusion (2n = 52), but this may be a sampling artifact. The 6;18 fusion was fixed in the *ellipsiprymnus*

group, whereas the 7;11 fusion was absent in the *defassa* group. In G- and C-banded karyotypes, all autosomal arms and the X chromosomes of the two subspecies groups appeared to be completely homologous. However, the Y chromosome was acrocentric in the *ellipsiprymnus* group and submetacentric in the *defassa* group, possibly the result of a pericentric inversion. Fixed chromosomal differences between the two subspecies groups reflect a period of supposed geographic isolation during which time they diverged genetically and phenotypically, and the centric fusion polymorphisms raise the possibility of reduced fertility in hybrids. These data, in conjunction with phenotypic and mitochondrial DNA data, suggest to us that populations of the *ellipsiprymnus* and *defassa* groups should be managed separately.

Cryptic chromosomal variation in suni *Neotragus moschatus* (Artiodactyla, Bovidae).

Kingswood, S. C., Kumamoto, A. T., Charter, S. J., and *Jones, M. L.* 1998 (In press). *Animal Conservation* 1.

Thirty-eight captive-born suni *Neotragus moschatus* had chromosomal complements of 2n = 52-56 (FN = 60). Variation in diploid number was the result of two centric fusion polymorphisms: a 4;19 fusion and a putative 18;22 fusion. Specimens that were descendants of wild-caught *N. m. akeleyi* and *N. m. zuluensis* were 2n = 52 and 56, respectively, but 2n = 53, 54, and 55 cytotypes were likely the result of hybridization in captivity between the two subspecies. Although populations of suni from different geographic regions are phenotypically indistinguishable, cytogenetic differences between *N. m. akeleyi* and *N. m. zuluensis* indicate that they should be recognized as distinct management units. Chromosomal variation among our panel of captive-born specimens and evidence of higher perinatal mortality in supposed hybrid cytotypes suggest that these two subspecies be managed as separate populations, particularly with regard to captive breeding, reintroductions and animal translocations. Inasmuch as our findings are restricted to the captive population, the cytogenetics of natural populations of suni should be investigated to determine if indeed *N. m. akeleyi* and *N. m. zuluensis* have fixed chromosomal differences or if the centric fusion polymorphisms found in captive animals also occur in wild suni.

NEW STUDBOOKS

North American Regional Studbook, Blue Duiker, Fourth Edition, 1997. Studbook Keeper: Joseph Roman, Virginia Zoological Park, Norfolk, VA 23504

1997 Regional Studbook, Gerenuk, Seventh Edition. Studbook Keeper: Robert G. Barnes, Los Angeles Zoo, 5333 Zoo Drive, Los Angeles, CA 90027.

Regional Rundown

ETHIOPIA

Ground Survey on Wildlife in the Ogaaden Region in Eastern Ethiopia. Report to the Zoological Society for the Conservation of Species and Populations (ZSCSP), Munich, 1997

by Friedrich Wilhelmi

Preface

The Ogaaden, the southeastern part of Ethiopia, is well known among zoologists and wildlife conservationists as a main part of the endemicity centre at the "Horn of Africa." Its species diversity is remarkable and the fauna is well adapted to the semi-arid and arid environment of the Ogaadeni-Somali plateau.

Several ungulate species endemic to the Horn of Africa and actually considered as endangered or vulnerable (IUCN Red List), such as the Dibatag *Ammodorcas clarkei*, Speke's gazelle *Gazella spekei* or the Grevy zebra *Equus grevyi* extend or extended their range into the Ogaaden. More widely distributed animals, like the Gerenuk (*Litocranius walleri*), the two Kudu species (*Tragelaphus strepsiceros, T. imberbis*), the Beisa oryx *Oryx gazella beisa*) or Dik-Diks (*Madoqua* spp) occur in this vast area. Additionally, the sparsely populated area of the Ogaaden, where agriculture plays a minor role in land use, may still bear the potential as a recovery area for these and other wildlife species.

Despite the outstanding importance of the Ogaaden for biodiversity conservation, neither a national park, a sanctuary nor even a controlled hunting area is established or actually planned in this area. One reason was certainly the political unrest that made the area inaccessible to scientific investigation and wildlife conservation measures during the last decades. In addition to this, the overwhelming presence of weapons, the uncontrolled shooting of animals, the lack of enforced wildlife conservation laws as well as environmental degradation gives reason to suspect the decline of most of the larger mammal species in the region. Some are now considered to be locally extinct or endangered.

Existing references are scarce and literature review reveals that data are almost nonexistent on the present population status of most of the species.

Hence there is urgent need to conduct wildlife surveys in the Ogaaden region as a requirement for future conservation measures for these taxa in the Ogaadeni-Somali plateau. This is particularly important, because protection activities in the adjacent Somalia will not function for unforeseeable time due to the continuing civil war.

REGIONAL RUNDOWN *continued*

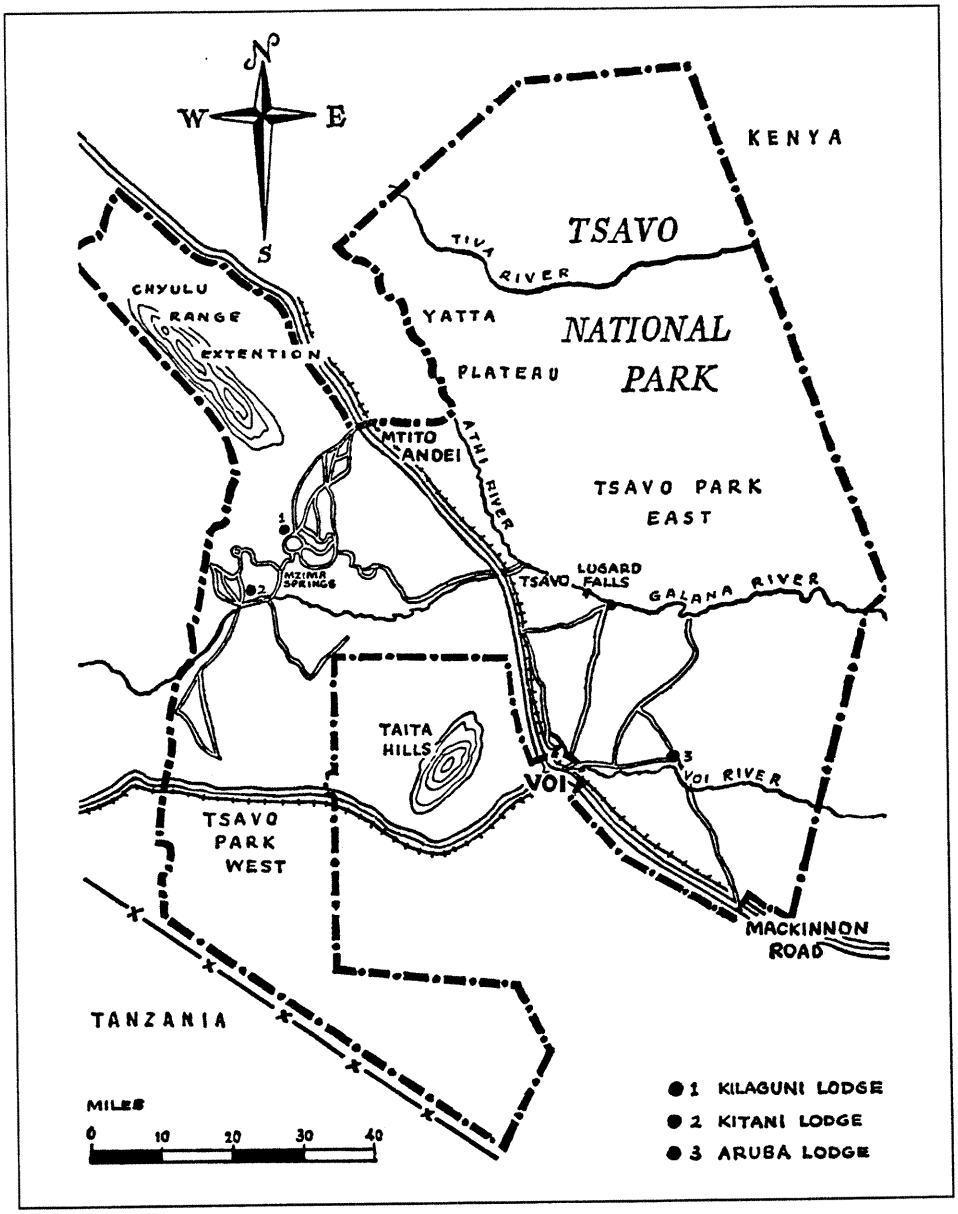
KENYA

Some Good News for Wildlife Conservationists and Researchers

East African Ornithological Safaris (EAOS), under the dynamic leadership of Steve Turner (Don's boy), have leased a significant amount of undeveloped and unprotected savanna in the enclave between Tsavo East and Tsavo West National Park. As I recall from driving the road between Taveta on the Tanzania/ Kenya border to Voi and Mombasa, this is some of the finest plains game habitat in the area, where I used to see oryx, hartebeest, Grant's gazelle, zebra, giraffe, etc. I always wondered why such prime wildlife habitat wasn't included in the park.

Now in effect it will be, joining the Taita Hills Game Sanctuary, which was established in 1973 (leased by Hilton International.) One could imagine that the value of the remaining undeveloped parts of the enclave for wildife conservation and ecotourism will be enhanced; if more land is leased, maybe something similar to the private game reserves bordering South Africa's Kruger NP will develop and serve as buffer zones for Tsavo wildlife.

Of particular interest to the ASG is the possibility of captive-breeding hirola on the EAOS land, in case the augmented population in the park fails to prosper.



June 1998

I'm working on something new here that may or may not be of interest to "The Antelope Specialist Group."

EAOS have recently taken the sole and exclusive tourism concession of 170,000 acres of land on two adjoining ranches Rukinga and Taita. This is the land immediately south of Tsavo East National Park across the Voi/Mombasa road at "Bachuma Gate" — it is the elephant migration route from Tsavo East to Lake Jipe in Tsavo West. As a result we are going to try (with the help of some donors & NGO's) to establish a private — Taita/Rukinga Wildlife Conservancy.

The properties have a good population of wildlife which is surely going to improve as we are going to start supplying permanent water and reducing the cattle levels. They are incredibly vast remote areas of land — and unbelievable wild — it's our private piece of Tsavo. As you know, Tsavo is everything that people expect Africa to be — a special rugged beauty.

On Taita Ranch we are building "Galla Camp" in exactly the same style as our other properties, and on Rukinga Ranch we are building the "Taita Education and Field Study Centre" for environmental education of Kenyans and foreigners. We have a great set of activities and education curriculums lined up, and hope to open late in the summer of 1998.

As you know, this is almost exactly the same area/eco-system that many of the Hirola were released into in Tsavo East. (In fact, some of the Grevy Zebra released into Tsavo East years ago have turned up on Taita/Rukinga. However, should you be interested, I believe this "conservancy in the making" may well have a couple of benefits as a future translocation site for the Hirola.

Since this is an ex-cattle ranch, the lion population is somewhat less dense than in the National Park, reducing the risk of predation — they seem to eat more cattle than anything anyway! Being private land, one does not face much of the red tape faced with "KWS," and we can obviously manipulate favorable conditions for the Hirola that would not be possible inside the parks — i.e., provide permanent water, etc. The Students at our Education Centre could help monitor the population, or the facility could even provide accommodation etc for researchers.

So, should you be making any future plans for the Hirola, please do think of us at Taita/Rukinga.

That's all for now. Keep in touch.

—Steve

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ZAMBIA

Aah, the Joys of Life in the Bush

*The following e-mail (*in litt. *15 Apr 98) highlights the difficulties of doing field research in remote parts of Africa. Janice May and Rolf Lindholm's sitatunga study would have given them headaches even without El Niño. But what they need most — and clearly deserve — is a financial bail-out. Contributions can be sent either directly to the Wildlife Conservation Society of Zambia or c/o the ASG, and I'll see that they get it.—Ed.*

Dear Dr. Estes,

For the last three months, my husband and I have been stuck and will be for another 2 months (because of the rainy season we can't drive out) in a remote area of Zambia where we are researching sitatunga. The study area is a swamp, river and the surrounding floodplains on the border of the Kafue National Park (Busanga Swamp, approx. 14 ° 05'E, 25 ° 50'S). Our research is mainly aimed at an estimate of population size, population structure and resource needs of the sitatunga. We spent the better part of last half year setting up our bush camp and getting supplies in to last us the rainy season, then commenced serious work in January.

We are working on a volunteer basis, are research associates of the University of Zambia, but doing the work through the Wildlife Conservation Society of Zambia, the output going to the Department of National Parks & Wildlife Service for management purposes. We have a small grant from the Australian Government which covers mainly the operating costs of our own microlight (our main research tool) and fuel for our Land Rover, the rest is now coming from our own pockets.

We have been using Distance Sampling (from a microlight) for population estimates, and once the animals came out onto the floodplains with the rising floodwaters we have been getting some remarkably good data. Come the dry season we will be collaring (including 5 radio collars) as many animals as we can catch. Because of the great results so far, we would like to continue the work until the end of the next wet season and so, I suppose like every other wildlife biologist, are looking for funds to cover our work. Do you know of any organizations which we could approach for such funds?

On a different note, I've just noticed on the back of the last *Gnusletter* I received (No. 1 of 1997), a subscription renewal. It had been overlooked in the rush to get our research going, but now I can't send a cheque until about mid June when we hopefully can drive out of here. I could then send a two-year subscription if this would be acceptable. Otherwise I could pay now with VISA if you can handle that.

Do you have an email address for Rosemary Beudels of the Belgium Research Institute? [Rosemary take note, please.]

Janice May & Rolf Lindholm, Busanga Swamps, Kafue National Park, Zambia. Please: no attachments to e-mail without prior consultation. Satellite Phone: Only between 10:00 to 12:00 GMT. Voice call: international dial code (e.g., 00) then 873 761 469 165. Fax call: international dial code (e.g., 00) then 873 761 469 166 (must alert us first). PO Box 32796, Lusaka, Zambia. Fax: 260 1 254858 (in Lusaka)

BOTSWANA

Better Late Than Never

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28 May 98 by *Environmental News Network*, (all rights reserved).
Original text by Paul Bartel USAID/AFR/PSGE/ENV Environmental Monitoring and Information Advisor

Botswana confirmed this week that it will begin a major rollback and realignment of cattle fences that will allow Africa's last free-ranging wildlife herds to regain access to seasonal feeding grounds and water holes, according to Conservation International. The fences caused a major disruption in the migration patterns of wildlife.

The move affects more than 62 miles of fence in northern Botswana between the Okavango Delta and the Caprivi strip in Namibia. More than 18 miles of fence along the Caprivi border will be removed outright, allowing wildlife greater access to the Kwando River. Other fence realignments are under consideration pending environmental impact studies and community planning.

Conservation International and other organizations led a lobbying effort to bring the government's attention to rapid declines in wildlife populations caused by the cattle fences. The government erected the fences in 1995 in an attempt to contain an outbreak of cattle lung disease. Herds of antelope, zebra and other mammals were seen struggling as they tried to reach seasonal food and water blocked by the fences. Hundreds of animals starved. "This move marks the first time that the Government of Botswana has committed to large-scale fence removal and realignment based solely on wildlife and community considerations," said Dr. Karen Ross, director of CI's Okavango Delta Program.

The world's largest delta, the Okavango region of Botswana, contains one of the richest arrays of animal and plant life in

Africa, provides critical habitat and food resources for wildlife, and is home to several communities.

Commentary

The news that the Botswana Government has agreed to take down the most wildlife-restrictive section of the new cordon fence along the Caprivi Strip is encouraging. The new Minister of Environment is to be congratulated for accepting the recommendation of the Environmental Impact Assessment Scoping Team, on which Karen Ross[ASG] and Chris Weaver, Chief of Party, WWF/Living in a Finite Environment (LIFE) Project both served. (The last two *Gnusletters* carried articles on the fence, based on information provided by Chris Weaver.)

The statement in Paul Bartel's account that "the government erected the fences in 1995" is misleading. The fence (singular) put up along the Caprivi strip in 1995 is just the latest of the gameproof cordon fences constructed over the past 30 years or so that crisscross the whole country. They were constructed to protect Botswana's livestock industry/cattle barons without any consideration of their effect on the wildlife. Combined with a series of droughts, the cordon fences are blamed for a 90% reduction in Botswana's wildlife. Taking down 18 miles of fence along the Caprivi border is a tiny first step toward restoring conditions that could lead to the resurgence of Botswana's wildlife resource. If it turns out to be the "thin edge of the wedge," it will mark a milestone in African wildlife conservation.—*Ed.*

Comments on the Botswana Antelope Survey Update January 1998

by C. A. Spinage[ASG]

Clive Spinage, now retired and living in the UK (The Bungalow, Steventon Rd. East Hanney, Wantage, Oxon OX12 OHS), was an ecologist with the Botswana Department of Wildlife and National Parks in the 1980s and early 1990s. After reading the chapter on Botswana, he analyzed population trends of some of the antelopes, the results of which are presented here.

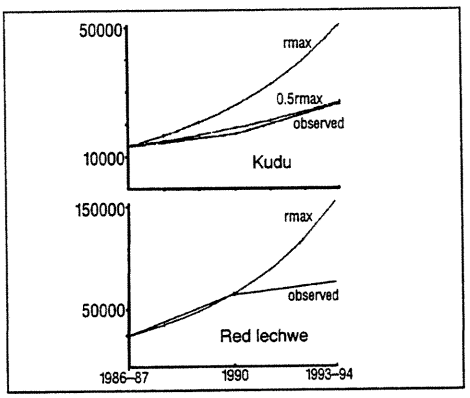
Changes in species numbers

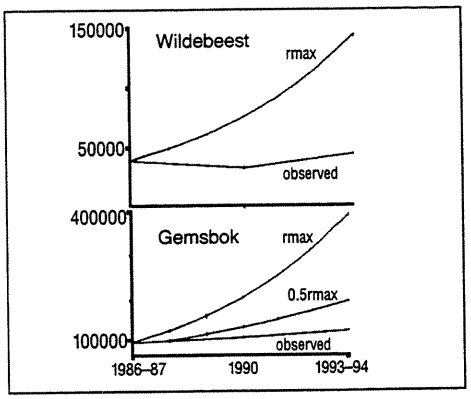
During the period 1986–1994, some species have apparently increased in numbers, others have remained almost static, and yet others have declined drastically (Ross *et al.* 1998). It would be a great help in trying to understand what may have influenced these changes if annual rainfall figures for the years under review could also be provided. Increased rainfall, if there was such, could explain the increases in size of populations of gemsbok, wildebeest and kudu in the Central Kgalagadi Game Reserve. We are told of poor rains, but also of good rains in northern Botswana in 1996–97.

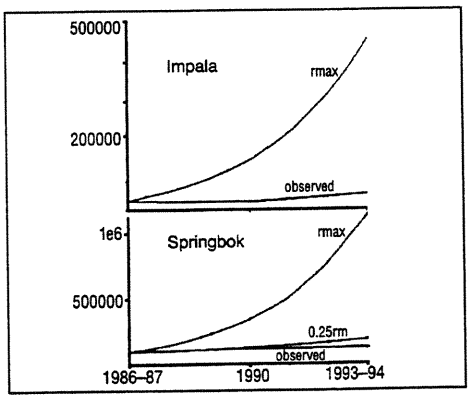
Looking at some of the main species, kudus have apparently increased at a rate equivalent to approximately $0.5r_m$ (maximum rate). The red lechwe has increased at r_m to 1990, and then almost levelled off — perhaps conditions changed around 1990 — or it is leveling off to its carrying capacity. The wildebeest appears to be holding its own, as does the gemsbok, while in relation to their r_m, impala and springbok have barely increased at all. Unfettered increase at r_{max} would have meant that these populations would have reached seven and nine times, respectively, the totals reported.

Of course, they are not increasing at r_{max} because of hunting, both legal and illegal. Thus it would also be helpful to interpreting the figures if the hunting quotas, which are published in the *Government Gazette* at the beginning of each season, were given. We could then see whether projected increases at values of r_m which took into account the hunting quotas (see, for example, Spinage and Mathlare, 1992) appeared to be related to the observed increases (Table 1).

The table shows that, theoretically at least, all populations have increased at a rate below $0.5r_m$. In the case of springbok, although the increase in numbers appears to be high, it is actually below $0.25r_m$. In 1991, the DWNP was unwilling to set citizen hunting quotas based upon biological estimates of sustained yield, arguing that the issues of licenses had to meet citizen demands. One wondered, therefore, what was the purpose of the large amounts of money spent on aerial surveys? Was it simply to have a record of the demise of a species? When populations were found to be seriously depleted in some areas, granted,







no licenses were issued for those areas, but hunting to the brink is a risky undertaking.

Buffalo and Sitatunga

Buffalo and sitatunga are both shown in the report to have declined drastically, and in cases like these suspicion should always fall upon disease, especially rinderpest, where these species are concerned. Although it is unlikely to be rinderpest if the disease has not been reported in Angola, Zambia or the Caprivi Strip, nevertheless, sampling for rinderpest ought to be undertaken. Should it be present, it is obviously being contained within the populations and there would be no cause for alarm as long as cattle are excluded from the Delta.

TABLE 1: SPECIES INCREASES IN RELATION TO ^{RM}

Species	Observed Total 1993–1994	Calculated Total at Increase of ^{rm}	Observed Increase as % of ^{rm}	Calculated % if Increase was at 0.5^{rm}
Kudu	26,080	50,550	52	53
Lechwe	70,270	140,484	50	60
Wildebeest	42,870	142,050	30	64
Gemsbok	126,510	382,025	33	50
Impala	61,510	452,634	14	55
Springbok	120,550	1,127,474	11	55

No mention is made of buffalo on the Boteti River in the Makagadikgadi Pans National Park. It was a popular misconception in the 1980s that buffalo did not exist there (apparently attributable to Raseroka, 1975), but during the drought in the 1980s I came across a freshly-dead bull in the Parks near the Boteti, and saw three subadults, as well as the ground being covered with spoor. Yet an aerial search of the area was unable to locate any buffalo there (Calef, pers. comm.)

Puku

I am surprised that there is no update on my figures for puku (which date from 1990), since anyone who has visited the Chobe National Park should know whether they are still present or not, and in what number. The information could no doubt be obtained from the Chobe Lodge, which conducts daily boat trips past their habitat.

Blesbok

Mention is made of the blesbok. In 1991, I left recommendations with the Attorney General's Office for this species (and deer) to be classed as Game Animals under the Seventh Schedule Part II of the Wildlife Conservation and National Parks Act, 1992. However, when the Act was produced, these species had been dropped from the Schedule. What this means is that the Department of Wildlife and National Parks has no empowerment over these species. As nondesignated species, any citizen can hunt them without a license. If they are on private land it is possible that anyone hunting them without the landowner's permission could be charged with theft, but a clever defense advocate might ask the owner to prove *animus revertendi*, without which the animals could be classed as wild and therefore no offense would have been committed, other than trespass. If the animals escape from private land, then the DWNP has no legal control over them and citizens are at liberty to kill them for food.

The Maun Dam

Although proposals to develop the water supplies of the Delta in various ways are referred to, I note that the proposed dam on the Boro River near Maun is no longer mentioned as a threat. Has the Government definitely withdrawn its proposal for this project?

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SYRIA

Sand Gazelle in the Syrian Harrat

Khushal Habibi^{ASG}, Ph.D.

22 June 1998

The sand gazelle *Gazella subgutturosa marica* occurs throughout the Arabian Peninsula and the Euphrates River seems to be the northern limit of its distribution in Syria. East of the Euphrates, the nominate goitered gazelle *Gazella subgutturosa subgutturosa* is found from Turkey to Pakistan.

The two subspecies have been geographically isolated for thousands of years. Genetic testing shows a consistent gap between the gene structure of the two subspecies (R. Hammond, pers. comm.). The goitered gazelle, also known as the Persian gazelle, can be differentiated from the sand gazelle by the absence of horns in the females. The sand gazelle has been reported to occur in the basalt lava fields (harrats) of Syria, Jordan and Saudi Arabia (Habibi and Boef, 1998). Historically these gazelles were caught in stone traps known as desert kites during pre-historic times. Stone implements found in the sites date back to about 10,000 years ago (Helms and Betts, 1987). The desert kites are scattered in the lava fields or black deserts.

In April 1998, a survey of the harrat near the Syrian-Jordanian border was conducted by the author. The area lies 120 km southeast of Damascus. A total of 14 groups were observed. Group size ranged from 1–31 animals. Mean group size was 7.21 animals. Altogether, 101 gazelles were observed. Only two animals were sighted on the first day at 1830 and the rest were seen between 0745 and 1030 the next morning. All the large herds were composed of mixed groups. Five sightings were of single females. In a group of eight animals, a lamb was also observed.

Lambing takes place in late March and April and lambs remain hidden during the first four weeks after birth. Because of the long observation distances and the propensity of the animals to take off immediately after seeing or hearing the vehicle, lambs in other groups were not seen. Some of the groups were out of sight within a minute and only their total number in the group could be counted.

Before going into the field, discussions regarding the status of gazelles in the area were held with Bedouins residing in the area. One of them had seen a group of 93 animals last year in winter. Our guide informed us he had seen a herd of 50 animals two months ago. The presence of gazelles in groups as large as 100 animals suggests that the area contains a viable population. Through protection, the population has proliferated and is likely to increase if habitat conditions do not deteriorate in the area. Due to high rainfall this year, annual grasses were growing in profusion among the basalt rocks. The Bedouins reported that during the dry spell the gazelles depend on perennial plants with a high moisture content. As a result, the animals are not water dependent even during the hot summer days.

The Harrat which covers a large area in Syria, Jordan and northern Saudi Arabia has the largest concentration of sand gazelles in the Arabian Peninsula. Recent estimate of the animals in Harrat al Harrah, the southern extension of the basalt desert, which continues through Jordan into Saudi Arabia, shows that the population has grown to about 1,300 since the area was declared as a reserve in 1986 and the hunting of gazelle banned there (T. Washer, pers. comm). The harrat in Syria encompasses about 10,000 sq. km. The protected area along the border is a vital habitat for this extant population and may be one of the largest concentration of the subspecies in the Middle East.

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INDIA

Bhagwati Bhavan
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5.4.97

I am writing you quite late as I was striving to confirm my observations and inferences on status and conservation of the gazelle (chinkara), blackbuck and the nilgai. I have confirmed that populations of the chinkara and more particularly the blackbuck which is less hardy, much dependent on green forage suffered much less of suitable habitats and forage. Hence got much reduced because of starvation, predation by village pariah dogs and communication of domestic livestock diseases of villagers, such as anthrax.

The nilgai, which is large enough not to be predated by pariah dogs, hardy and more particularly because of religious protection by Hindus as wild sacred cow, it is not molested by rural masses although [it] causes considerable damage to agricultural crops. New generations of rural farmers are less religious [and] less tolerant of damages and losses caused by wildlife fauna causing much clamour against damages to crops by the nilgai. Urban elite wildlife charlatans are even trying to declare the nilgai a vermin fauna, but these have not succeeded because of opposition of the religous rural masses. I have written [an] article in a leading regional periodical why the problem of pestilence by nilgai arose and how it can be tackled by habitat management, check on indiscriminate extension of agriculture in natural fields, transfer of excess population of nilgai from areas of overpopulation to areas of moderate population. I have suggested culling of notorious male nilgai which attack man, by licensed hunters with handsome hunting-fee, under supervision as in well-maintained wildlife sanctuaries. I have also suggested erection of live-thorn *Prosopis juliflora* and *Euphorbia caducifolia* fences, and keeping of stout dogs to scare away damaging nilgai. Concerned officials have very little practical interest to conserve farming. Their interest is to pass time in urban offices and misappropriate available funds.

I hope information furnished by me will be useful information for *Gnusletter* for the Asian region. It is not desirable to furnish exaggerated notes, hence I desisted to write earlier. Well, I am one of the foremost members of the SSC/IUCN Antelope Group from Asia since its inception. Please continue to keep my name and address in the *Gnusletter* list and mail other circulars to me.

—Indra Kumar Sharma

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