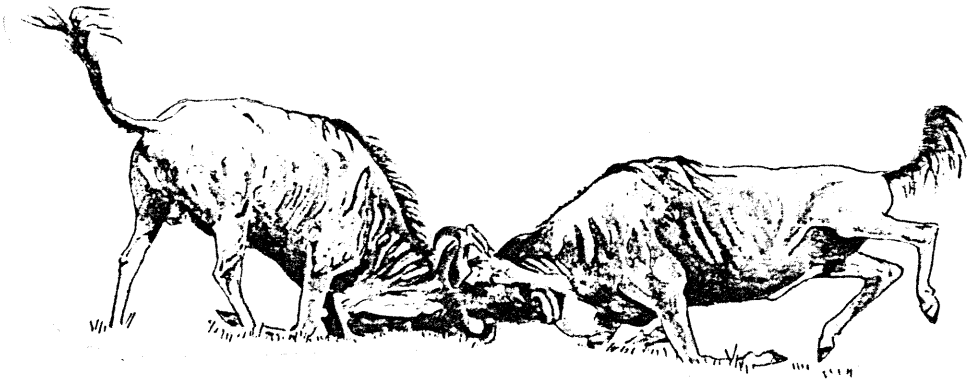
INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES
SPECIES SURVIVAL COMMISSION



ANTELOPE SPECIALIST GROUP
GNUSLETTER

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IN THIS ISSUE

ASG NEWS
The Zimbabwe itinerary and ASG agenda • Commentary by Richard Bell • 2
ASG Participation in the Wildlife Symposium 2
Notes: Mark Stanley-Price • A. R. Dupuy • John Grettenberger 3
Antelope Survey Part II is ready to go to press 3
ANTELOPE NEWS 3
The Roosevelt sable:safe in the Selous? 4
Captive Breeding: Endangered Gazelles, by Oliver Ryder 3
REGIONAL RUNDOWN 4
Nigeria: Arthur A. Green 4
Algeria: Sellami Mehdi 4
Djibouti: Jacques Blot 4
Ethiopia, Chris Hillman 5
South Africa: Anthony Hall-Martin • Richard Carr • Daryl Mason 5
Swaziland: Jeremy Anderson
6
ASIA • India: Clifford Rice • Thar Desert: Indra Kumar Sharma 6

GNUSLETTER SUBSCRIPTIONS RECEIVED

In response to the notice (carried in the last two issues of the *Gnusletter)* that a contribution of $5.00 was required from institutional subscribers to the Gnusletter, to help make it self-supporting, the following have complied:

Linda Rohr, Metropolitan Boston Zoos; Alan H. Shoemaker ($10.00), Riverbanks Zoo; Kurt Benirschke, Marvin Jones ($20.00!), Arlene Kumamoto, and Oliver Ryder—all of the San Diego Zoo; V. M. McAllister, St. Louis Zoo; D. L. Erickson, Ballisti Vet, Inc.; Alan Rost, Dickerson Park Zoo; Arthur A. Green, Nigerian Conservation Foundation. Thank you all very much and Marvin Jones in particular.

Although the cost for me to produce and mail an issue of the newsletter remains to be seen, it looks as though most of the $70.00 now in the *Gnusletter* account will be expended on airmail postage for this one issue.

NOTICE: Non-members of the ASG who want to receive the Gnusletter in 1988 must pay their subscriptions before next January.

ASG NEWS

THE ZIMBABWE ITINERARY AND AGENDA

The ASG meeting will be held in Bulawayo on 4-5 October, arranged and hosted by **Vivian Wilson** and his Chipangali Wildlife Trust.

The meeting will be open, and early arrivals for the Symposium on Wildlife Management in Sub-Saharan Africa, which begins Tuesday, the sixth, are invited to attend. Air Zimbabwe has a flight from Harare to Bulawayo on the third at 19.10 hr, and another on the fourth at 07.30 hr. The return flight to Harare on the fifth leaves Bulawayo at 20.30 hr.

Vivian has drawn up the following program:

Sunday, 4 October:

1. Wilson will meet all ASG members and Symposium guests at Bulawayo airport. (also any Saturday-night arrivals, if informed beforehand)
2. Members and invited guests will stay at the Hotel Rio.
3. 10.00 hr departure for Matopos Hills and National Park to see various antelopes and several rock-art sites. If attendance warrants, a 20-seater minibus will be hired for the day.
4. A cold buffet luncheon will be served at Maleme Dam in the Matopos Hills.
5. After lunch, drive to Nswatugi Cave to see rock art, then proceed to Game Park to see sable, white rhino, and other wildlife.
6. Leave by 15.30–16.00 to return to Bulawayo.
7. Leave Bulawayo at 17.30 for Chipangali to see duiker breeding enclosure and wildlife orphanage.
8. Barbecue ("braai") and drinks at Chipangali Wildlife Orphanage.

Monday, 5 October.

08.15. Collect all ASG members and guests from hotel.
08.30. Begin meeting.
10.30–45 Coffee break.
13.00–14.00. Cold buffet lunch at Wilson residence.
14.00 . Meeting resumes.
16.00–16.20 Refreshments.
18.00 Dinner at Wilsons'.
19.15 Depart for airport.
21.30. Arrive in Harare.

Apart from airfares, all other costs, including hotel accommodations, will be met by the Chipangali WildlifeTrust. This extraordinary generosity will also be extended to Symposium guests, apart from hotel accommodations, for which they will have to pay.

The ASG Agenda

The subjects that have been selected for deliberation address basic concerns raised by Rod East, Richard Bell, Chris Hillman, Simon Stuart, and other contributors to the Antelope Survey. Additional subjects may be raised during the meeting(s).

1. Timetable for completing and publishing the Survey. Progress report by Rod East.
2. What tangible results can be expected from publication of the survey, and what can the ASG do to promote implementation of Regional Action Plans?
3. The need to integrate ASG recommendations and action plans with those of other SSC specialist groups.
4. Where does the ASG go from here (i. e. after the antelope survey has been published)?
5. How can the Antelope Survey and Regional Action Plans be improved and expanded/implemented, and how can they be aligned more closely to the work of national conservation agencies?

    a. By intensifying efforts to recruit nationals from all countries where antelopes occur?

    b. By inviting government planners, senior officials in parks and ministries involved with wildlife conservation and management to be ex-officio ASG members?

    c. By campaigning for funds to employ fulltime staff and/or undertaking specific projects?

The following comments of **Richard Bell** (in lit. to East, 3 Feb 87), in response to Rod's draft Status/Summary Action Plan for Part I of the Antelope survey, are appended hereare appended here to set the tone for the forthcoming meeting. One of the foremost authorities on ecology and management of African wildlife, Bell has worked closely with and for the governments of several African countries for nearly 20 years, and is presently Co-Director of the Luangwa Integrated Resource Development Project. (His ideas are fully set forth in the U. S. Peace Corps. handbook, *Conservation and Wildlife Management in Africa*, of which he is an editor and principal author.)

"The most important question raised in your paper is that of the national and regional strategies for conservation of antelopes and, implicitly, many other aspects of the environment. I would hammer the point here that what this implies is an overall national and regional strategy for development, that is, an integrated master plan for the nation/region. In order to plan the future of wildebeest, say, or elephant, or baobab trees, a national/regional land use zoning is needed. This must embody decisions about agricultural, livestock and industrial production and zoning, and all the decisions concerning infrastructure, (i. e. roads, agricultural inputs and marketing, schools, clinics, etc.), plus the associated political, governmental and private organization that goes with it. These are in addition to decisions specifically relating to wildlife and environmental issues, to which they are complementary.

The point I want to emphasize is that when one talks about a strategy for conservation of antelope (or elephant, rhino, forest, the environment, etc., etc.), one is talking about the future of the country and its people as a whole, about the way of life of future generations. I think this means three things:

a) The issue is in this sense much bigger than most people...seem to realize;

b) That much more serious attention should be paid to the 'constitutional' aspects of devising and ensuring implementation of such strategies. As Jim Thorsell [CNPPA Executive Officer] has emphasized, *the process of planning* is at least as important as the content of the plan. A conservation strategy...must, in order to have any meaning and chance of implementation, be an integral aspect of the national development plan and must be developed and implemented by the government hierarchy, starting at the top...and supported from the grass roots. The conservation strategy must be synonymous with government policy. Not a part of it; not an addition to it; not guidelines for it: *synonymous* with it.

c) This leads to reconsideration of the means by which the international conservation establishment...should set about encouraging the generation of national conservation strategies(=modifying national government policies). It seems self-evident that such strategies must be developed by country nationals (with technical advice from expatriates if necessary). The question of the mechanism by which the policy is to be prepared and implemented is a constitutional one which is likely to be country specific. However, the top policy making level (i e. President and Parliament) and the grass roots level (i. e. wards, districts, provinces) should both be involved, to a relative extent depending on the degree of decentralisation in the country concerned, in bringing pressure to bear on the real mischief makers (the middle levels of government and upper levels of business/industry—including agro-industries).

The main point I am making is that [conservationists] are learning too slowly that they must come to terms with, and work with/through governments and government channels. It is almost no use putting an expat. consultant into a country to produce a conservation strategy, even if he is in a government department. I think that the best way to exert influence is by inviting country nationals (preferably in influential positions...) to join SSC specialist groups, etc., so that they are exposed to the best available technical information and planning and management ideas, and to plenty of peer group pressure. Then to support those people to initiate the process of putting together the mechanisms within their own government systems that can develop and implement a sustainable national resource use strategy.

d) As a necessary preliminary to this strategy, I have argued for a long time that the IUCN specialist groups need to be reorganized somewhat, i. e:

• There should be a more active coordinating body to integrate the proposals of the various different groups...I think there should at least be an Africa group consisting perhaps of the chairmen of the specialist groups, to put together an action plan for Africa.

• At least the major groups should have full-time salaried chairmen and secretaries.

• Groups should be allocated sufficient funds to carry out or commission competent technical studies (like the antelope survey you are now doing)...This will require recognition of the need for technical competence and specific fund raising and allocation.

• Government agencies concerned with the speciality in question should be ex-officio members, along with technical specialists."

ASG Participation in the Wildlife Symposium

Although only two ASG members are listed as invited speakers in the Symposium program (E. Asibey and Richard Bell), the Symposium organizers clearly expect our group to contribute to the proceedings:

•The Ethnozoology Specialist Group will pay the traveling and per diem expenses of the ASG Chairman and Rod East.

• Bertrand des Clers, chairman of the ESG, writes (in lit. to RDE, 11 Aug 87), "Concerning the participation by members of the Antelope Specialist Group in the Symposium, the program...was already drafted many months ago, in accordance with CIC, the FAO and UNESCO. As you will see, 50% of the time is devoted to discussion, which will allow all participants to provide an input in the meeting. For this reason, we have not specifically provided for input or reports by members of the Ethnozoology Specialist Group as such. I believe this formula will enable highly interactive discussions and fruitful results to be proposed for the adoption of the High-Level Conference."

Simon Stuart has suggested that our group schedule an evening meeting or workshop during the Symposium, where members would have the opportunity to discuss their work for the benefit of Symposium participants. I have acted on this suggestion by writing the organizers of the Symposium program.

Michael Woodford, ASG member, has scheduled an evening session of the Veterinary Specialist Group, of which he is Chairman.

Mark Stanley-Price, who assumed his new position as Director of African Operations of the African Wildlife Foundation last spring (address P. O. Box 48177, Nairobi) will soon be wearing another hat, too: he has been asked to organize and chair a new specialist group on reintroductions. Mark says (*in lit..*6 July 1987), that he will be on hand for the Zimbabwe ASG meeting and the Symposium.

A. R. Dupuy writes (10 July 87) that he is retiring after 20 years as Director of Senegal's National Parks and Reserves. His new address is "Les Folies," 3, rue des Forges—Ormoy, 28210 Nogent le Roi, France. M. Dupuy will continue to be involved in nature conservation, and would like to continue to serve as an "expert consultant" to the ASG, and to receive the *Gnusletter* and other ASG publications.

John Grettenberger has returned to the U. S. from Niger, where his new address is 4335 NE 73 Ave., Portland, OR 97218. He and **John Newby** have recently published a paper on the dama gazelle: The status and ecology of the dama gazelle in the Äir and Ténéré National Nature Reserve, Niger (*Biol. Conserv.* 38:207–16, 1986); and Grettenberger has also drafted an article on the dorcas gazelle.

ANTELOPE SURVEY PART II IS READY TO GO TO PRESS

Rod East put Part II, on Southern and South-Central Africa , to bed at the end of August. It will follow Part I to press within the next couple of months, and Simon Stuart is pushing to have both published before the IUCN General Assembly next February. The title of the survey publication is, *Antelopes: World Survey and Regional Action Plans.*

The Conservation Monitoring Centre is preparing its own publication on threatened antelopes of Africa and the Near East, as a separate part of the *Red List of Threatened Animals.* Rod has been asked to provide on overview of the status of each of the 29 species to be included, as well as a summary about the status of non-threatened species. Workhorse and Christian gentleman that he is, Rod has agreed to shoulder this extra burden, despite the failure of an earlier arrangement with CMC to conduct and publish the Antelope Survey jointly.(see Sept 1982 *Gnusletter).*

ANTELOPE NEWS

The Roosevelt Sable:

Safe in the Selous?

The range of the Roosevelt sable appears to be much larger than I had supposed (in the May, 1987 *Gnusletter*). Alan Rodgers, who is the foremost authority on the fauna and flora of the Selous Reserve in particular and eastern Tanzania in general, *and* the co-author of the Tanzania chapter in Part I of the Antelope Survey, disputed my assertion that the range of this subspecies is limited to northeastern Tanzania and Kenya's Shimba Hills National Reserve. In response to the changes I proposed making in the Part I sable accounts, he says (in a cable to Simon Stuart), a) that the Shimba Hills population was formerly continuous to the Selous population, b) that maybe the connection from Pangani south still exists, and c) "it is probable that the Selous population is.*roosevelti*, in which case it is not endangered." He goes on to say that the Uzungwa – Ukaguru mountains effectively separate the western Tanzanian (presumably *kirkii*) populations from those of the Selous and northeast, but that there are no barriers (e. g. the Rufiji R.) to prevent *roosevelti* from reaching the Selous.

Although the exposure of my own ignorance is embarrassing, it is comforting to learn that the Roosevelt sable is not endangered (except in Kenya)—assuming the Selous population is indeed *roosevelti*. The fact remains that, a) two different races of sable inhabit Tanzania; b) their geographic distribution has been described differently in almost every guide and checklist that distinguishes between the races; and c) their ranges remains unclear to this day. The existence of two different races has been ignored by some authorities, and is actually disputed by Kingdon who, in *East African Mammals,* (p 556) asserts that,."...the types from which the subspecies *roosevelti* and *kirkii* were described are not representative of recognizable populations with definite ranges." I maintain that adult males of the two races, anyway, are distinctively different. *Roosevelti's* horns are the shortest of any race—it would be accurate to call it the short-horn sable and *variani* the long-horn rather than the giant sable.

If the attempt to distinguish between these two sable races proves anything—beyond lack of knowledge about their past and present distribution— it is the wisdom of Rod East's decision to generally ignore subspecies in the antelope survey because, as he said before, "The validity and precise distribution of described subspecies are uncertain for many species."

Captive Breeding

ENDANGERED GAZELLES

Oliver Ryder, of the San Diego Zoo's Center for Reproduction of Endangered Species, has recently published an article entitled Conservation action for gazelles: an urgent need, in *Trends in Ecology and Evolution.*. The following excerpt illustrates the reduction in genetic variability that accompanies captive breeding, and points to the existence of genetic adaptations to local conditions in different populations.

"There are 11 species of gazelles in the genus *Gazella*. Currently IUCN lists nine gazelle taxa as threatened, endangered, or for which it is suspected that endangered or threatened status is warranted but for which insufficient data are available."

"Genetic studies, especially recent chromosomal studies of gazelles in captivity, have provided evidence for unanticipated genetic subdivision in some species of gazelles, achieved mainly through centromere fusion (Robertsonian) rearrangements Most species of gazelle share a particular translocation between the X-chromosome and an autosome.

"A dramatic example of chromosomally-based outbreeding depression has been documented for zoological park specimens classified as *Gazella soemmerringii*. In a study of 28 individual specimens, three independent Robertsonian translocation events were documented producing karyotypes varying in diploid number from 34–39 elements. The reduction in numbers of captive *G. ssoemmeringii* is currently attributed to the decrease in fitness that is assumed to accompany the production of significant numbers of duplication./deficiency gametes and resultant zygotes, although this has yet to be tested directly.

"Thirteen taxa of gazelles are held in captivity in zoological parks that participate in the International Species Inventory System (ISIS). Captive gazelle populations are commonly derived from very small numbers of wild-caught individuals (founders of the captive population). For example, the captive population of Speke's gazelle, *Gazella spekei*, numbers 7 males and 15 females, being derived from one male and three female founders. Inbreeding depression was manifested as reduction in birthweight and increased probability of neotnatal demise associated with the degree of consanguinity of the parents. Extinction of the zoo population was at hand and, thus far, a reprieve has been managed by selecting as parents of the next generation individuals that are themselves inbred and, by definition, have reduced genetic load. Of course the cost of invoking this extreme breeding strategy is the depletion of neutral allelic variation.

"For all specimens of the genus *Gazella*, ISIS reports that ,as of June, 1986, 877 individuals were held in reporting institutions. All gazelle taxa held in captivity represent small populations (*very* small) from the population geneticist's standpoint. Furthermore, the ISIS census population sizes for some taxa, e. g. *Gazella dorcas, G. thomsonii, G. soemmerringii,* are declining. Thus, the situation for conservation of gazelle gene pools in captivity is not encouraging based on current zoo populations. Unfortunately, the acquisition of new founder individuals is problematical and complicated by the declining status of wild populations, lack of information about the capture location of the ancestors of existing zoo stocks, import-export regulations, and costly intermediate-site quarantine requirements."

"It would appear that, in consideration of the documentation of the imminent extinction of some gazelle taxa and the recent findings raising concern about local co-adaptation and chromosomal divergence for antelopes in general and gazelles in particular, a limited time is available for conservation intervention to save locally-adapted gene pools. Some form of intervention is necessary to prevent the impending extinction of local populations, subspecies and species of gazelles. *Ex situ* conservation prospects for gazelles do exist as zoological gardens have developed expertise in husbandry and management. However, current efforts in zoos suffer from insufficient founder stock, inbreeding, and presumed introgressions. Captive breeding efforts in zoological parks, especially involving any newly-imported stock, should be preceded by

complete chromosomal studies and should include detailed information about the capture locale of all specimens.

"Urgently needed are protection for existing populations of gazelles, establishment of captive breeding programs for the expressed purpose of reinforcing wild populations and, in conjunction with these activities, an increased effort to understand the natural history and systematics of these remarkable and fragile creatures."

REGIONAL RUNDOWN

NIGERIA

Arthur A. Green (Nigerian Conservation Foundation, Mainland Hotel, Box 467, Lagos) has filled out two checklists for the antelopes of Nigeria: one on the whole country and another covering 20 different game reserves. Judging from his covering letter to Rod East (3 June 87), the outlook for wildlife conservation in Nigeria is presently very bleak.

"All large antelopes are rare in the few reserves where they still occur. Outside the reserves they are endangered. Another 10 years and I don't expect there will be much of anything left anywhere in Nigeria. After two years here I still have not been able to get Bauchi State to protect Yankari Game Reserve. And...the Federal Government has let Kainji Lake National Park go to pieces. Other conservation areas in the country have less attention."

ALGERIA

Sellami Mehdi (B. P. 59, Hacen-Badi, 16200 El–Harrach, Algeria) has sent a copy of a letter he wrote (4 July 87) to the Director of IUCN, in which he reports that he has been studying the mountain gazelle (*Gazella cuvieri)* since 1986, particularly its spatial distribution and food habits (using fecal analysis). His study area is the 20,000 ha Mergueb Reserve, 180 km south of Algiers and 50 km from Bousaada, which contains one of this species' most important populations.

Selami has asked for IUCN support to pursue his research. What are his chances? If efforts to enlist more nationals in the conservation of their country's wildlife are crucial (see ASG's agenda and Richard Bell's comments above), then encouraging researchers like Selami who are actually studying their wildlife should have an even higher priority.

DJIBOUTI

In response to a request by Chris Hillman, passed through the Djibouti embassy in Addis Ababa, a report on the antelopes of this small country at the junction of the Red Sea and Gulf of Aden has been forthcoming, entitled, Notes concerning the distribution and ecology of gazelles in the Republic of Djibouti. The author is Jacques Blot, of the Institut Superieur à Études et de Recherches Scientifiques et Techniques, B. P. 486, Djibouti, with the participation of Silah-Eddine A. S., Section des Sciences de la Vie. This information came too late to be inserted in Part I of the Antelope Survey, but Rod East has managed to include a summary as a "Note added in proof." The following excerpts are freely translated and condensed from the French original.

Gazelle populations in Djibouti suffered grave harm up until 1972, at which time hunting was forbidden in the whole territory. At present, certain species have totally disappeared, while others are succeeding only laboriously to recover their position due to various unfavorable factors, and notably the important concurrence which exists with herds of domestic ungulates.

The phenomenon of desertification is an equally unfavorable and not a negligible factor.

Gazella (dorcas) pelzeni. . his is undoubtedly the most abundant species. Its habitat is very diverse: herbaceous steppe, in stony ground as well as the loose soil of depressions. Bushland [or scrub] where the cover is not so thick as to be a security risk (it does not frequent habitats where the bush cover is > 40%). The same may be said of shrubland. Wooded steppe where the cover or the understory provides a sufficient quantity of browse. Since 1980, the population of this species has been increasing, but very slowly It is mainly restrained by competition with herds of goats. The uncontemplated restocking of carnivores [see below], though negative in the ecological plan, has nevertheless aided in the increase of this species, of which the density is still very low.

Gazella soemmerringii. This species seeks habitats with higher nutrient potential and less encumbered terrain. The type of vegetation it frequents is essentially herbaceous steppe. It tolerates tree cover up to 30% maximum. Its population is reduced because of hunting in years past; competition with herds of goats and sheep, moreover, permits only very slow growth of its herds.

Litocranius walleri. Much rarer than the preceding species, it has only been seen in large wadis (*lits d'oueds*), in formations of *Acacia cyanophylla* and *mellifera* having a low-density understory. This species' density is even much lower than that of Soemmering's gazelle. Its population is not over 200 individuals.

Oreotragus oreotragus. Limited to the mountains of the Godas and Mablas chains. Within this zone it frequents all vegetation types that occur at altitudes of over 600 m. Although its habitat is so limited, an increased density is noted (on the forested massif of Day, the population is around 250 head); it is this species which seems to have suffered least from human predation. Competition with domestic herds is limited to the dry season. The birth season extends from February to June. However the young are in demand for sale to city dwellers.

Madoqua saltiana. The most diverse habitats are favorable to it, from open juniper forest to bushy steppe of *Righozum somalense*; however it avoids herbaceous steppe and the desert zone where even so it is always present in wadis having enough tree or bush vegetation. It is difficult to estimate the population of this species (very hard to observe because of its size); however its situation is generally satisfactory.

Sylvicapra grimmia. A single sighting of this species was made in Day Forest; anyway this is the only habitat capable of sheltering this duiker. In any case this may only be a relic population.of this species.

Oryx (gazella) beisa. The oryx is limited to the Gammari Plateau, at an altitude of 1000 m where the vegetation consists of grass and succulent euphorbias. It is actually a fragment of a more important Ethiopian population.

Tragelaphus strepsiceros. Although this animal was very well known in

Djibouti in the past, its population is now almost totally decimated; only a few survivors have been sighted during the last 60 years. It has been decimated by hunting, but equally by food competition and ever more frequent occupation of water points by man and his herds. Only two observations have been recorded recently, close to the Ethiopian frontier (in one case of an adult accompanied by a juvenile).

Predation. Carnivores have been strongly limited in recent years for "protecting the livestock. industry." However, despite everything we may count a certain number of species in the territory: cheetah (on plains) leopard (in the mountains); lion (stray individuals from Ethiopia and Somalia but these are rare cases), caracal, spotted and striped hyenas.

Another predator, of much greater influence, is man. He acts directly on the animals, and nowadays on the smallest species (klipspringer, dik-dik, Pelzeln's gazelle), by the capture of the young for sale to the European population. He impacts equally on the habitats of all species by degrading the vegetation, due to regression of the rural population in the management of natural habitat: his action is characterized by overgrazing, deforestation, and burning.

Conclusion. Although no precise information can be obtained before 1978, it may be considered that hunting, which took place up to 1972, was very destructive and more particularly for the species sought as trophies (oryx, greater kudu). The populations of these species still existing in the country may be considered relic. As for the other species, this impact was less important because the location of their herds was much less precise. One notes, however, a very slow increase of their populations due to an important limiting factor: the concentration of domestic herds in the country for divers reasons (absence of commerce and consumer products, the phenomenon of [foreign] assistance...). The campaign of destroying carnivores pursued until 1981, although a grave ecological error, has nevertheless allowed an increase of the [wildlife] populations, particularly of the two most important species of gazelle (Soemmering and Pelzeln).

ETHIOPIA

In a note to Rod East (10 July 87), Chris Hillman mentions that a photo he took of the Simien jackal has been made into an Ethiopian stamp, and that one of his mountain nyala photos is also being turned into a stamp.

SOUTH AFRICA

Interesting comments on South Africa's national parks and on antelopes in Kruger N. P. and Transvaal provincial reserves are contained in letters written by two contributors to the chapter on South Africa in Part II of the Antelope Survey.

Anthony Hall-Martin, Chief Research Officer of Inland Parks and Coastal Areas, writes (*in lit.* to Rod East, 18 June 87) "I think it is important to stress that national parks cannot be deproclaimed or any of the land alienated without a two-thirds majority of Parliament. It is therefore the only absolutely permanent land set aside for conservation in the country. Provincial nature reserves can be deproclaimed by the Provincial authorities.

"...although the Kruger National Park is a major area for the conservation of antelopes, it is unfortunately not possible to translocate any ungulates from Kruger to other areas in South Africa because of it being an endemic foot-and-mouth disease area. It must therefore be regarded as something somewhat separate from the rest of South Africa, as far as antelopes are concerned.

"Although you have concentrated on species rather than subspecies, I think it may be interesting to mention that the southern mountain reedbuck is a totally isolated population endemic to South Africa.

"A second operation to translocate Lichtenstein's hartebeest from Malawi to South Africa was undertaken by a private game catcher. This has resulted in the population at Kruger receiving another 13 animals, and there are now also 15 animals on private land in the Transvaal. The hartebeest in Kruger have calved again and the total number in Kruger Park now stands at 23."

Richard Carr, ASG member and Nature Conservation Scientist in the Transvaal Nature Conservation Division, added these details about kudu and sable, respectively (*in lit.* to Rod East, 3 June 87).

Kudu. Present distribution [in the Transvaal except for Kruger N. P.] is much the same as its natural distribution. Because of the kudu's specific dietary requirements (browse), introductions to areas outside its natural range are impractical. The kudu is a real survivor because of its secretive habits, cryptic coloration, mobility and its jumping abiltiy. Animals in prime condition are not easily confined by many game fences."

"The Hans Merensky sable moved off the reserve voluntarily during a severe drought. Sable are notorious fence breakers and utilize warthog burrows and drainage lines to force their way under the game fence. Many of the farms surrounding Hans Merensky NR have naturally occurring sable herds."

Daryl Mason, Senior Research Officer in Kruger N. P., has sent a copy of his memorandum, "Monitoring of ungulate population structure in the Kruger National Park." The excerpts quoted here are of general interest to wildlife managers/researchers, and provide a good example of the detailed ecological monitoring that has long been carried on in Kruger and other South African parks.

"Long-term monitoring of ungulate populations is essential for understanding their dynamics vis-á-vis environmental variables and thereby providing a basis for enlightened management. Monitoring of the major ungulate populations in the Kruger National Park (KNP) has largely depended on standardised aerial censusing techniques. These aerial surveys are conducted annually during the dry season and also provide some data on calf percentages and social structure for certain large herbivore populations, but not the more comprehensive data on sex and age composition that can be obtained from periodic sample counts on the ground. Moreover, apparent trends in population numbers based on aerial counts may be subject to counting variability between successive years. Field classifications of sex and age classes also have limitations, particularly in that they do not provide information on adult mortality, which is necessary for interpreting age ratios. Adult mortality rates may markedly influence estimates of juvenile mortality based on the proportions of juveniles and adults at different times, and increases or decreases in population size may occur without change in age ratios...Ideally therefore, a combination of aerial and

ground surveys should facilitate more reliable assessment of population trends by providing complementary data on population size and structure.

Objectives. To facilitate understanding of the processes which naturally regulate ungulate populations in the KNP, regular field classifications of sex and age classes are undertaken to establish base-line data on long-term population dynamics which may then be interpreted in relation to rainfall cycles, predation pressure, management practices, etc.

Methods. Sex and age classifications of ungulates (excluding buffalo, hippopotamus and impala) were conducted by vehicle throughot the KNP from 13 August to 30 October 1986 in 18 representative sampling regions (Fig. 1) delineated and simplified from the 35 landscape units described and mapped by Gertenbach (1983). Because impala frequently occur in large herds comprising several sex and age classes, sampling of their population structure was entrusted to a team of two observers in a vehicle...Criteria and methods used for sampling population composition of the various ungulates have been detailed in previous reports (Mason 1984, 1985, 1986). Estimates of ungulate population levels for the entire KNP are derived from aerial counts using a fixed-wing aircraft to cover most of the park (Joubert, Hall-Martin and Whyte 1986) and a helicopter to census specific areas..."

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SWAZILAND

Jeremy Anderson, Director of KaNgwane Parks and Environment Affairs Board and author of the survey chapter on Swaziland, reports on reintroductions of several antelopes in a 16 June letter to Rod East.

"Roan will be reintroduced perhaps this year from Namibia. Nyala have been reintroduced to some of the larger commercially owned cattle ranches. .(These also have naturally occurring kudu, impala, waterbuck, duiker, and steenbok.) The springbok introduced into Mlilwane have succumbed to 'heartwater.' It is doubtful whether this reintroduction will be repeated."

ASIA

INDIA

Clifford Rice, who studied Nilgiri tahr (*Hemitragus hylocrius)* in Kerala State a decade ago, is renewing research on selected bovids of South East Asia this fall, funded by a grant from the N. Y. Zoological Society's Wildlife Conservation International. The subject of his field work in India will be the four-horned antelope (*Tetracerus quadricornis).* After conducting a survey by correspondence to locate promising study sites, he plans to assess densities and gather information on habitat use, group dynamics, reproduction, and behavior for 1.5 months beginning next March.

WESTERN RAJASTHAN, THAR DESERT. Indra Kumar Sharma (*in lit.* 13 August 78) has filed one of his periodic reports on the following is a paraphrased excerpt.

"The Wildlife Warden of Jodhpur Division (Western Rajasthan), Mr. Sunayan Sharma, and I are jointly performing surveys of antelopes in the region. Two antelope reserves have been surveyed:

	Guda-Bishnoi (20 km from Jodhpur)	Dhawa (50kmfrom Jodhpur)
Blackbuck		
Males	1824	1279
Females	3543	958
Young	796	453
Indian Gazelle		
Males	1673	2001
Females	2620	2602
Young	664	836
Nilgai		
Males	162	226
Females	245	400
Young	56	70

antelopes in his home range, from which the "Counts of these antelopes will be carried out successively in other reserves. The populations are scattered in several pockets large and small, with an estimated total of more than four times those already counted.

"On the whole, the population trend is positive though slow, but this year starvation and epidemics will cause heavy losses as there is a drought unprecedented in this century. It is regretted that at present there is no plan to provide supplementary fodder to starving antelopes in the reserves. I am pursuing concerned authorities for supplementary feeding in the reserves and may press higher authorities and arouse public opinion through appeals in the mass media."

"In my 'Studies on ecosystems and wildlife conservation of Aravalli ranges,' I noted that the four-horned antelope is badly suffering loss of range.as its habitat of high valleys with dense grassy scrub is rapidly vanishing due to heavy cutting of grasses, shrubs and trees for firewood and fodder by tribal people and especially by forest contractors. I have drawn public and concerned authorities' attention to this concern through the mass media."

Dr. E. Bharucha, Representative of the World Wildlife Fund, Maharastra State of India, is surveying populations of the blackbuck in Maharastra. He will report his findings to me in due course."

"Hey, buddy . . . You wanna buy a hoofed mammal?"