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ASG NEWS

PREVIEW OF ANTELOPE SURVEY PART 3: WEST AND CENTRAL AFRICA

The Antelope Survey of West and Central Africa includes over twice as many countries (22) as any of the other three parts on Africa. If as much information was available about these countries as for those in Part 1, East and Northeast Africa, and Part 2, South Central and South Africa, it wouldn't all fit into one portable volume. But this is also the most populous region of the continent, and in such countries as Nigeria and Ghana, precious little wildlife survives outside the dwindling patches of primary and secondary forest, where antelopes and other wildlife survive by dint of concealment both from hunters and researchers. So there is much less to report, despite the unremitting efforts of Compiler and Editor (and now ASG Deputy Chairman), Rod East. From the recently received drafts of his three summary chapters, I have extracted parts that outline Rod's analysis of the problems and prospects of preserving viable examples of the various ecosystems in this huge and varied region, which ranges from the lowland rain forests of the Congo Basin to the southern margin of the Sahara Desert.

Chap. 26: Status of Antelope Communities and Identification of Regional Conservation Priorities

Status of Antelope Communities outside Conservation Areas

Human population density is relatively high in the savanna and forest zones of West Africa (i. e., from Senegal and Gambia to Nigeria), where most species of antelopes and other large wild animals have been largely or entirely eliminated from extensive areas. A few species, e. g., Maxwell's and gray duikers and bushbuck persist in settled regions, but fully representative West African antelope communities are now generally confined to protected areas.

In contrast, large parts of Central Africa (Chad, Cameroon, Central African Republic [CAR], Equatorial Guinea, Gabon, Congo and Zaire) are relatively sparsely populated and retain substantial areas of good wildlife habitat. In some of these areas most antelopes have been reduced to fragmented, remnant populations by uncontrolled hunting, e. g. in the *Brachystegia* woodlands of southeastern Zaire. Other areas continue to support a diversity of antelope species despite hunting and, in semi-arid and arid areas, habitat degradation caused by a combination of frequent droughts and overgrazing by domestic livestock. Notable wildlife areas include the savanna woodlands of the northern, south-central and southeastern CAR, and the remaining extensive tracts of moist lowland forest in Gabon, southeastern Cameroon, northern Congo, the southwestern CAR, and Zaire. The rich antelope faunas which persist in these areas are major renewable natural resources. Controlled exploitation of these resources is a potentially important factor in the development of higher living standards for rural people in these countries.

Status of Antelope Communities within Conservation Areas

The existing network of conservation areas in West and Central Africa is generally adequate to ensure the survival of most of the region's large mammals, at least on paper. In practice, protection and management of these areas varies from highly effective to non-existent.

Selection of priorities:..Given the limited resources available for international conservation action, attention can be focused on maintaining the status of prime areas with high scores for both biological importance and conservation status, and/or improving conservation status where it is currently moderate or low in areas of high biological importance. There are several other important considerations in setting priorities. These include the cost-effectiveness of any proposed action, its feasibility, practicality, and chances of long-term success, and the resources required...Other things being equal, areas requiring few inputs to maintain or improve their status should be given a higher priority than those requiring greater inputs.

...There is a general lack of protected areas with high conservation status in West and Central Africa, but most of the region's major biogeographic divisions contain several outstandingly important areas with moderate—high status. An exception is the Sahel regional transition zone. Some of this zone's major conservation areas, such as the Air and Tenere National Nature Reserve and Ouadi Rime-Ouadi Achim Faunal Reserve, extend into the Sahara regional transition zone. More effective protection and management of these reserves may provide the last opportunities for the survival of naturally occurring antelope communities of subdesert and desert habitats, which include species such as addax, scimitar-horned oryx, dama, dorcas and slender-horned gazelles.

The information summarized in Tables 2 and 3 [not included here] underlines the high international importance of the small number of very large conservation areas (> 120,000 sq km), viz., Air and Tenere National Nature Reserve (Niger), the W-Pendjari-Arli complex of contiguous national parks and reserves (Benin, Burkina Faso and Niger), Ouadi Rime-Ouadi Achim Faunal Reserve and Zakouma National Park-Bahr Salamat Fauna Reserve (Chad), the Manovo-Gounda-St. Floris National Park and Faunal Reserve complex (CAR), and Salonga NP (Zaire). Other exceptionally important protected areas also tend to be large, e. g., Comoe NP (Ivory Coast) (11,500 sq. km), Niokolo-Koba NP (Senegal) (9,130 sq km), and the Bamingui-Bangoran NP and Faunal Reserve complex (CAR) (17,160 sq km) in the savanna zones; Sapo National Park-Krahn-Bassa National Forest (Liberia) (15,930 sq km), and Tai NP-N'Zo Faunal Reserve (Ivory Coast) (>4,5009 sq km) in the moist lowland forests. These areas are also very important for other large herbivores, such as elephant and buffalo, and for large carnivores, in accordance with biogeographical, genetic and ecological considerations (Soule et al. 1979; East 1981a,b, 1983; Soule and Simberloff 1986). Continued evolution of antelopes by natural selection may be confined to very large conservation areas which preserve the full spectrum of competitive herbivore species and natural predators (Frankel and Soule 1981).

National and International Conservation Priorities

"Care must be taken in reconciling national interests with a regional or conti-

nental overview such as that sought here. The aim of allocating scores to individual conservation areas in Table 2 is to assist the identification of areas of such exceptional importance that their conservation assumes very high international priority. It must not be inferred that areas which are given moderate or low scores are unimportant."

In practice, national conservation objectives are of primary importance, since long-term conservation of antelopes depends on the commitment by individual countries to wildlife conservation and management, and the actions of national wildlife agencies. All of the areas listed in Table 2 are of national importance for antelope conservation. All of these areas are also of international significance, since conservation of genetic material requires the survival of each species in as wide a range of its natural habitats as possible.

Chapter 27: Regional Action Plan for Antelope Conservation

STRATEGIES FOR ANTELOPE CONSERVATION

The Goal

As part of overall environmental conservation, the goal of international antelope conservation...should incorporate the maintenance in perpetuity of selected major antelope communities. This will require a minimum set of properly managed and protected national parks of international significance, which can be used as the foundation for a network of diverse types of protected area at the national level to further the maintenance of life-support systems and sustainable development (Cumming 1984). As stated in chapter 1, antelope conservation must not be an end in itself, but part of an overall environmental conservation strategy which takes full account of, and is integrated with, human development needs.

The Problem

The major problem confronting wildlife management in sub-Saharan Africa is the over-exploitation of rangeland and forest resources caused by the needs of the increasing human population (Asibey 1987). Africa's rapidly increasing population does not necessarily imply imminent ecological collapse, elimination of major biotic communities, or widespread species extinctions (Bell 1987), but most antelopes have already been widely eliminated outside protected areas in the more densely settled parts of West and Central Africa. The only exceptions are secretive species which prefer cover and can withstand considerable hunting pressure, such as bushbuck, gray duiker and Maxwell's duiker. Effective protection and management of areas of land which are specifically set aside for wildlife conservation and/or game production are essential for the long-term survival of representative examples of the region's antelope communities. Successful conservation will require increased efforts to reduce the conflict between short-term individual interests and long-term communal interests, and to balance the costs and benefits of conservation equably between different sectors of the community, international, national and local (Bell 1987).

OPTIONS FOR ANTELOPE CONSERVATION

In this section, Rod discusses strict protection of core sanctuaries, effective promotion of public awareness and support of conservation, tourism (both game-viewing and trophy hunting), sustained-yield utilization, local participation in conservation planning, and National Conservation Strategies in which the value of wildlife is incorporated into government economic planning. Speaking of local participation in conservation planning, he writes:

"Important initiatives in this area are also in progress or planned in West and Central Africa, such as the Nazinga Wildlife Utilization Project and institutionalized village hunting in Burkina Faso (Yaro and Belemsobgo 1987), the Boucle du Baoule project in Mali (de Bie et al. 1987), wildlife utilization in the Central African Republic (Pironio 1987), and the establishment and development of the Air and Tenere National Nature Reserve in Niger, Sapo NP in Liberia, and Korup NP in Cameroon. The success of these projects in reducing or eliminating the conflict between rural people and wild animals, and providing incentives for local people to discourage illegal offtake of wildlife, may have major implications for the future direction of wildlife conservation in African countries which retain rich wildlife resources. Demonstration of the socio-economic benefits of an effectively managed wildlife resource in these countries may have spin-off effects on other countries which are in danger of losing their wildlife resources. At present, West African countries such as Nigeria lack both the political will at governmental level to implement urgently required conservation measures, and public awareness of the need to introduce such measures (Areola 1987)."

References

Areola, O. 1987. The political reality of conservation in Nigeria. In *Conservation in Africa: People, Policies and Practice*, ed. Anderson, D., Grove, R., pp. 79-101. Cambridge Univ. Press.

Asibey, E. A. O. 1987. Wildlife issues in sub-Saharan Africa. In *Proceedings of International Symposium and Conference on Wildlife Management in sub-Saharan Africa, 6-12 October 1987, Harare, Zimbabwe*, pp. 32-50.

Bell, R. H. V. 1987. Conservation with a human face: conflict and reconciliation in African land use planning. In *Conservation in Africa:: People, Policies and Practice*, ed. Anderson, D., Grove, R., pp. 79-101. Cambridge Univ. Press.

Cumming, D. H. M. 1984. Toward establishing priorities for funding and other international support for protected areas in Africa. In *Proceedings of the 22nd Working Session of Commission on National Parks and Protected Areas, Victoria Falls, Zimbabwe, 22-27 May 1983*, pp. 108-11.

De Bie, S., Geerling, C., Heringa, A., C. 1987. L'utilisation du gibier. Part B1 of *Rapport final du Projet de Recherche pour l'Utilisation rationelle du Gibier au Sahel*, ed. Geerling and Diakite. Direction Nationale des Eaux et Forets, Bamako, Mali and Nature Conservation Dept., Agricultural University/Wagengingen, Netherlands.

East, R. 1981a. Area requirements and conservation status of large African mammals. *Nyala* 7:3-20.

East, R. 1983b. Species-area curves and populations of large mammals in African savanna reserves. *Biological Conservation* 21:111-26.

Frankel, O. H. and M. E. Soule 1981. *Conservation and Evolution*. Cambridge

Univ. Press.

Pironio, E. 1987. Plan d'utilisation de la faune en Republique Centrafricaine. In *Proceedings of International Symposium and Conference on Wildlife Management in sub-Saharan Africa, 6-12 October 1987, Harare, Zimbabwe*, pp 403-07.

Soule, M. E. and D. Simberloff 1986. What do genetics and ecology tell us about the design of nature reserves? *Biological Conservation* 35:19-40.

Soule, M. E., Wilcox, B. A., Holtby, C. 1979. Benign neglect: a model of faunal collapse in the game reserves of East Africa. *Biological Conservation* 15:259-72.

Yaro, I. and U. Belemsobgo 1987. Institution de la chasse villageois au Burkina Faso. In *Proceedings of International Symposium and Conference on Wildlife Management in sub-Saharan Africa, 6-12 Oct. 1987, Harare, Zimbabwe*, pp 393-99.

INTERNATIONAL THERIOLOGICAL CONGRESS

The meetings of the ITC in Rome next August presents an opportunity for a meeting of ASG members who will be attending. All that is needed is a volunteer to serve as Acting Chairman, and notification within the next few months by everyone who is planning to go (send to me). If the Acting Chairman wants to arrange with the ITC organizers to hold a public meeting, it would be a good way to promote awareness of ASG projects. Most important of all, the ITC offers an unequalled opportunity to connect with people who can provide the information required for the Asian Antelope Survey. Whoever is going to be in Rome, please be on the lookout for informants and potential ASG members.

EAST GOES WEST: VISITS TO WCMC, ZSL, AND IUCN

A business trip to the UK last December gave Rod East an opportunity to visit the World Conservation Monitoring Centre (formerly the IUCN Conservation Monitoring Centre) in Cambridge, the Zoological Society of London, and the IUCN Directorate in Gland.

With the help and guidance of Michael Green, Jane Thornback and Jeremy Harrison, Rod extracted valuable information on Asian antelopes from the files of the Protected Areas Data Unit and the Species Conservation Monitoring Unit (see *Gnusletter* 7(2):4). He also had several good discussions with Jane Thornback, who will soon compete the final editing of the *Red Data Book on Threatened Antelopes of Africa and the Middle East*. The Red Data Book will include an introductory contribution from Rod. As he pointed out a year ago *(Gnusletter* 7[1]:4), this Red Data Book, which focuses on threatened species and subspecies, and the publications of the ASG's Antelope Survey and Regional Action Plans, which adopt regional overviews, are complimentary. The Antelope Survey has so far concentrated on sub-Saharan Africa and does not highlight threatened species to the same degree. Unfortunately he missed meeting ASG member Jane Williamson, who compiled the data sheets for the *Antelope Red Data Book*. She and husband Douglas recently moved from Cambridge to the King Khalid Wildlife Research Centre, Riyadh, Saudi Arabia.

Rod also met with David Jones and Alexandra Dixon at the Zoological Society of London. There he learned more about their exciting proposals (with John Newby) to release captive-bred addax into Niger's Air and Tenere National Nature Reserve, and to establish a regional captive breeding center for the reintroduction of sahelian wildlife. The proposed site for the regional center is in Niger's Gadabedji Faunal Reserve. The Niger Government and the local people at Gadabedji are very enthusiastic about the proposal.

From England, Rod flew to Switzerland to visit the IUCN. There he had valuable discussions with various staffers and fellow visitors, including Simon Stuart (SSC Species Programme Officer), Stephen Edwards (SSC Executive Officer), Jeffrey Sayer (Director of IUCN's Tropical Forest Programme), Per Ryden and Peter Hislaire of IUCN's Sahel Programme, Patrick Dugan of IUCN's Wetlands Programme, George Rabb (SSC Deputy Chairman and Director of Chicago's Brookfield Zoo), Charles Santiapillai (Executive Secretary of the Asian Elephant Group), and others. While at IUCN, Rod collected the proofs of Part 2 of the Antelope Survey (Southern and South-Central Africa), which he reports will be published in the very near future.

ASG MEMBERSHIP REQUIREMENTS

In the last *Gnusletter* (vol. 7 no. 3), I expressed concern that the flow of information which provides the basis of the ASG newsletter will decline once *Antelopes: Global Survey and Regional Action Plans* has been compiled and published.

With Part 3 almost ready to go to press and scheduled for publication later this year, coverage of sub-Saharan Africa, where the vast majority of antelopes live, is nearly complete. An important milestone will have been reached, however, it is hardly the end of the road. All the labor of finding informants, gathering data, compiling and publishing the results of the Antelope Survey of North Africa, the Near and Middle East, and the vast expanse of Asia remains to be done.

Furthermore, the Antelope Survey is only Phase One of the ASG's responsibilities. It is not enough to define the problems of antelope conservation and recommend solutions, then leave it to others to carry them out. The larger and more demanding task is to work for the implementation of the Regional Action Plans, and their integration with the action plans of other IUCN/SSC specialist groups. The ASG must also undertake to monitor the status of antelopes in all these different regions on an ongoing basis.

Rod East is continually updating the computerized Antelope Survey data base he has created. Commencing in 1989, he plans to write all ASG members on an annual basis with specific requests for new/updated information on antelope distribution, abundance, and conservation status in the countries where they work or reside. Rod believes that all ASG members should be required to contribute information to the ASG's data base at least once per annum. I agree that this is a completely reasonable request, fulfillment of which is very necessary for the ASG's monitoring function to be effective.

As significant new information comes to hand, it will be reported in the

Gnusletter. But the *Gnusletter* cannot afford to rely solely on these annual contributions. A continuing flow of information about antelope research and conservation is needed to fill the pages of the three yearly issues.

SUBDIVIDING THE MEMBERSHIP

With membership now over 100 and due to go higher as Asian specialists are added, the time has come to consider subdivisions of the group based on areas of special interest and expertise.

The core membership consists of people who live and/or work in the countries where antelopes occur, and who are in a position to provide information about antelopes; either wildlife researchers engaged in field work, or members of government or non-government agencies concerned with wildlife conservation/management. A division into African and Asian subgroups is one obvious subdivision that already exists.

Another logical division can be made between members who live and work in countries where natural antelope populations occur and those who do not. A large percentage of ASG members in the latter category are associated with zoos, and most of them have a particular interest in captive breeding. Many of them can and do make valuable contributions to the ASG's data base in areas such as taxonomy and captive breeding. Others may not be in a position to contribute information but are nevertheless keen supporters of antelope conservation. An associate membership/ subscriber status may be appropriate in such cases, without the requirement of regular contributions of information expected of regular ASG members.

At the moment these are only ideas that are under consideration. But if nothing else happens, divisions of the African and Asian specialists into smaller geographic units, each with a regional chairman, are very likely — always provided that suitable candidates can be found.

GAZELLE RESEARCH GROUP

About five years ago Chris Furley, Andrew Greenwood, and Colin Groves decided to form a group and launch a publication devoted to gazelles. Furley and Greenwood are both zoo veterinarians, connected with the International Zoo Veterinary Group in Kent, UK, and Groves is a systematist and paleontologist at the Australian National University. All three are ASG members. .At the time, Chris was veterinarian at the Al Ain Zoo and Aquarium in Abu Dhabi. (The formation of this group, known at first as the Gazelle Studies Unit, was reported in the January, 1985 *Gnusletter.)*

Financed by the Abu Dhabi National Company for Onshore Oil Operations, the Gazelle Research Group brought out the first issue of *Chinkara*. (a local name for the Indian gazelle, *Gazella bennetti*, which Groves formerly considered a race of dorcas gazelle). In the Introduction, the editor (Chris Furley, called for "contributions from people working in any capacity with gazelles, particularly in the following fields:

i. Taxonomy and paleontology; ii. ecology and conservation, iii. behavior; iv. physiology; v. genetics; vi. medicine; vii. distribution and status, viii. management in the wild and in captivity."

"Chinkara," the Introduction continues, "will contain detailed and general articles, a list of research projects connected with gazelles currently in progress, annotated bibliography, information on recent papers or books, records of sightings in the wild, and readers' correspondence.

"The Group was established to study the members of the genus *Gazella*, although of course gazelles have very close relationships with other antelope, explained by Colin Groves in his first article in this issue. Information about these related species may certainly be relevant to gazelles.

"Our knowledge of this genus is minimal, in particular of the rarer members such as Pelzeln's gazelle, the Mongalla gazelle or Heuglin's gazelle. Many of the rarer species and subspecies are not represented in captivity and the vast majority have never been studied in the wild. Much information about gazelles is hidden in article on ungulates in general, or in obscure tracts in a wide variety of languages. We hope this publication will provide a focus for such material to encourage a wider readership in the future."

Three issues of *Chinkara* may be ordered for $28.00, from Chiron Publications Ltd., P. O. Box 24, Keighley, West Yorkshire, UK.

During discussions last May at the Ungulate Conference at Texas A&M (see Jan. 1988 *Gnusletter)*, Chris Furley, Chairman of the Gazelle Research Group, and I agreed that his group should be recognized as a subgroup of the ASG. With the Asian Antelope Survey beginning, the affiliation of a group with a special interest and knowledge of the Antilopini is bound to benefit everyone concerned.

ANTELOPE NEWS

GOITERED GAZELLE

From the King Khalid Wildlife Research Center, P. O. Box 61681, Riyadh, Saudi Arabia, Dr. Chris Thouless has written to ask for information about *Gazella subgutturosa*.

"I will shortly be starting a baseline ecological study on a population of the subspecies *marica* on the northern edge of the Nafud desert and I have also been managing a captive group of about 300 for the last year. There seems to be virtually no published information on *marica*, but an absolute mass of papers, all in Russian, on *subgutturosa*. Do you know if anyone, anywhere, has had any of them translated?"

If any reader can help Chris, please write him direct.

JENTINK'S DUIKER

Glyn Davies and Bastian Birkenhäger sent the following report (dated 1 October 1988), bearing out previous suggestions that Jentink's duiker occurs in Sierra Leone (see last *Gnusletter* 7[3]:4).

"Recent evidence has come to light confirming the presence of Jentink's duiker, Africa's largest and rarest duiker in the hills of the Freetown Peninsula...[According to my books, the yellow-backed is a little larger; Ed.]

"As part of the Conservation Society of Sierra Leone's nationwide surveys, scientists have been interviewing hunters about rare animals in the Freetown Penin-

sula. In addition to skins of Diana monkeys, two hunters produced horns of adult and juvenile Jentink's duikers. The largest pair of horns were straight, narrow with downward pointing tips, and measured 21.5 cm in length. The base had a circumference of 9.5 cm and the lower 3.5 cm were conspicuously ridged. Only black hairs were found on the skin between the horns; there was no evidence of a tuft of red/brown hairs. .In addition to this specimen, the hunters gave full and accurate descriptions of black and gray adult animals standing about 1 m tall. There can be little doubt that Jentink's duiker occurs in Sierra Leone.

"According to reports, there is a small population...living in the hills at the southern tip of the Freetown Peninsula. The animals feed in the forest and , during the rainy season, enter farmbush at night to feed on young shoots. This is when hunters use lamps to spot their eyeshine, dazzle them and shoot them. Farmers also set traps for them. At least five animals have been killed this year, and urgent conservation action is needed to preserve the few remaining individuals of Jentink's duiker in Sierra Leone."

In a letter (21 Oct 88) to Rod East, Harald Roth takes issue with the suggestion in the above-mentioned *Gnusletter* story, that Jentink's duiker may not actually be endangered. "Hoppe and myself," writes Harald, "are just now putting together all sightings and records collected during 10 years [of field work in Ivory Coast]. Due to its low density there cannot be any question about its 'endangered' status, although geographically it is more widely distributed than was thought."

BUSHBUCK, SITATUNGA, AND BUSH DUIKER

In the last issue of *Gnusletter* (7[3]:4), Peter Grubb raised several questions about the habitat preferences and distributions of these antelopes as given in Rod East's West African draft chapters. In the same letter to Rod cited above, Harald Roth gives these answers:

Whether bushbuck are really absent from primary rain forest

"As regards bushbuck in West African rain forest, there are quite reliable observations from my collaborators and myself that it does not permanently inhabit rain forest, as for example, bongo or forest duikers do. I should like to refer to my publication in *Säugetierkundliche Mitteilungen* , based on years of most intensive observations in Tai [Forest], where *Tragelaphus scriptus* is classified as a versatile species adapting to different kinds of habitats, but definitely not dependent on primary rain forest; it was *never* seen in primary forest, only around cultivated areas. These observations were confirmed in the Azagny NP where *T. s.* was abundant around abandoned and grown-over coffee plantations, but never ever seen in the closed humid forest."

Whether sitatunga really occur in Nigeria

"I do concur with him on the doubt about the occurrence of sitatunga: although its presence in Ivory Coast has been repeatedly claimed, I know of no definite record in this country, apart from one trophy exhibited in a roadside restaurant at Tissali (which could well have been a young female bongo)."

The puzzling absence of records of the bush duiker from Sierra Leone

"As regards the absence of *Sylvicapra grimmia* in Northern Sierra [Leone], I would not be puzzled at all. This zone is ecologically moist (Guinea) savannah which also in Ivory Coast is not inhabited by *S. c.;* it occurs only in drier Sudanese savannah."

SALT'S DIK-DIK IN KENYA

The distribution of *Madoqua saltiana* is also a subject of dispute, again involving Peter Grubb as one of the principals. Although concern with such details might seem petty to some, the letters serve to demonstrate the difficulties and dangers biogeographers have to face in mapping species' distributions.

First, a letter to Rod East from Derek Yalden (10 Oct 88), an authority on dik-dik taxonomy, questioning the presence of *M. saltiana* in Kenya, as reported in Volume 1 of the Antelope Survey:

"The text and and map for Kenya suggests that this dik-dik is only found, in Kenya, around Mandera in the extreme northeast of [the] N.F. D. [Northern Frontier District]. Given its distribution in neighboring Ethiopia, this is at least plausible. However, I think this record is based on a misidentification of Mandera. There are in the BM (NH) [British Museum of Natural History] at least 5 specimens of *M. saltiana* labelled 'Mandera'...They were collected by Gilbert Blaine on 13 March 1932, and, from these and other specimens, it is quite clear that he was collecting in 'British Somaliland.' *This* Mandera is at 09°55' N, 44°44' E. It is *not* the Mandera in Kenya at around 03°40' N, 41°45'E on the border with Ethiopia. The specimens themselves also fit their attribution to N. Somalia, in that they have the pale shoulder flares of *M. s. phillipsi.*

"I did, of course, detail these and all other localities for *M. saltiana* in my 1978 review [A revision of the dik-diks of the subgenus *Madoqua (Madoqua). Monitore zoologico Italiano* New Series Supplement 11:245-64].

"I conclude that there is probably no reliable evidence that *M. saltiana* occurs in Kenya, *pace* Jonathan Kingdon!"

In responding to Yalden's letter, Peter Grubb writes (in lit. to Rod East, undated):

"Drake Brockman started it all. He was the senior medical officer in what was British Somaliland but was also a keen naturalist. In the early 1900s he made one of several collecting trips, in this case across eastern Ethiopia. During this trip, he obtained specimens of *Madoqua saltiana* and *M. guentheri.* He took *guentheri* only, along the Daua River on the Kenya Border, at two places (Mandera and Gonlika), and these specimens are listed in Lydekker's catalogue of ungulates in the British Museum as coming from this river. Unfortunately, there was a mix-up in the museum and a *saltiana* skull has been given the same catalogue number as another of the *guentheri* skins. This led Derek Yalden to give the Daua River as a locality for *M. saltiana* both in his review of the species and in his paper with Largen and Kock on Ethiopian ungulates [1984. Catalogue of the mammals of Ethiopia, 5. Artiodactyla. *Monitore zoologico Italiano* New Series Supplement 8:1-118], and in both papers, a dot is shown in the distribution maps on the Daua, near Mandera. This probably led Kingdon (who cites Yalden's

paper) to include *M. saltiana* in the Kenya fauna, as occurring in the Mandera area. But there is no reliable evidence that Drake Brockman got any *saltiana* on the Daua River at all, and though the species might just occur in Kenya, at present there is a Mandera in Somalia from which *M. saltiana* has been reliably recorded, as Derek points out in his letter.

"Very complicated, I'm afraid," says Peter in conclusion. How true, but isn't it comforting that both experts end up agreeing? There is no good evidence that Salt's dik-dik occurs in Kenya.

ADDAX AND SCIMITAR-HORNED ORYX

Considering that these are two of the most endangered antelopes, it is surprising to learn that neither is included on the U. S. List of Endangered and Threatened Wildlife. If there are good reasons why it would not be helpful to have them listed (possible complications in captive breeding or reintroduction efforts, for instance), I'd like to hear about them. Otherwise, I propose to address a formal petition to have them listed, by writing the Director of the Fish and Wildlife Service, and including documentation in the form of status reports and publications that confirm their endangered status.

DESERT ANTELOPES

Papers presented at the 1987 Symposium to mark the 25th anniversary of Operation Oryx, in London, have been published in a book, *The Conservation and Biology of Desert Antelopes*, edited by David Jones, Director of Zoos, and Alexandra Dixon of the Zoological Society of London. In keeping with the main purpose of the symposium, which was to discuss the conservation biology, veterinary care, captive breeding and management of the Hippotragini, most of the chapters deal with this tribe. Nine out of 22 focus on the Arabian oryx *(O. leucoryx)*, three chapters deal with the scimitar-horned oryx *(O. dammah)*, and one is about the Kalahari gemsbok *(O. gazella)*. A chapter on "social organization and ranging behavior in the Hippotraginae" is one of the more interesting-looking contributions; in addition there are a few papers on gazelles (one on the genus *Gazella*, and two on Arabian gazelles).

FOUR-HORNED ANTELOPE

Cliff Rice has sent a copy of the manuscript he submitted to the *Journal of the Bombay Natural History Society*, entitled, The status of four-horned antelope *(Tetracerus quadricornis)*.

A mail survey sent in 1986-87 to 106 wildlife administrators and 33 non-governmental organizations or private individuals in 10 states (including the southern 2/3 of India) indicated that the four-horned antelope (FHA) is still very widely though sparsely distributed.

"A total of 83 sites with FHA were recorded...It is likely that FHA occur in other locations, particularly on forested lands outside national parks and sanctuaries. However, it is likely that the geographic and ecological distribuitions of FHA are reasonably represented by the material obtained.

"FHA populations were reported from sites in all 10 states. Only two sites reported that FHA were locally extinct, so despite the potential for local population reductions, the overall geographic range of the FHA has apparently not been significantly reduced in the recent past. Of the 30 sites for which habitat type information was available, 26 (87%) contained southern tropical dry deciduous (teak, *Tectona grandis)* forest "

"FHA usually occur at low densities...of less than 0.5/km² (minimum=0.01, maximum=1.28, median=0.25, N=23). The 5 sites with densities greater than 0.7 are listed in Table 2 [reproduced above].

"For most populations little information was available beyond the presence or absence of FHA. Solid figures are needed on population sizes and trends. In addition, many aspects of the biology of this species remain unclear. Informed management of existing populations cannot proceed without further information.

"With numerous widely-spread populations, there is little need for concern for the immediate survival of this species. However, many of the populations are small, the majority for which we have information being under the recommended minimum of 500 for sustaining genetic variability...It is likely that FHA populations are becoming increasingly isolated as human impacts intensify and spread. Given the low densities and small population sizes that are common for FHA, there is every bit as much justification for concern over the genetic management of these populations as there is for the populations of more spectacular species such as tigers. The HFA would, in fact, be an excellent candidate for trial efforts for techniques in genetic monitoring and conservation management."

Populations of four-horned antelope with reported densities greater than 0.70/km², which may be considered optimum sites.

Site	State	Area (km²)	Pop. Size	Density (/km²)
Gir NP and Sanctuary	Gujarat	1,412	1,063	0.75
Pench Sanctuary	Madha Pradesh	118	94	0.80
Panna NP	Madha Pradesh	543	478	0.88
Anamalai Sanctuary	Tamil Nadu	950	-	1.00
Dhaknakolkaz Sanctuary	Maharashtra	382	488	1.28

CAPTIVE BREEDING

CAPTIVE-BRED LESSER KUDUS BEAR TWINS

J. Smielowski of the Zoology Department, Academy of Agriculture, Poznan,

Poland, has sent the abstract of a paper he gave at the 1985 International Theriological Congress, entitled Some aspects of reproduction biology of lesser kudu.

Reproduction of a group of 3 male and 14 female *Tragelaphus imberbis* imported from Kenya was compared for a period of 11 years with captive-bred lesser kudu in Vychodoceska Zoo, Dvur Kralove, Czechoslovakia. In a total of 124 births, wild-caught females produced one offspring usually every year, with a nearly equal sex ratio (N=72 calves). Females born in captivity produced twins every year, with a preponderance of males (31:19).

Confirmed records of twins are so rare among African antelopes that this is really an extraordinary exception to the rule. Would some reproductive physiologist or captive-breeding expert care to write an explanation and cite precedents for the next *Gnusletter?*

BONGO

Marvin Jones, Registrar of the Zoological Society of San Diego, has sent information about the early captive breeding of this species (in lit. 21 Sept 88):

"You will be interested to know that [the] Paris Jardin des Plantes had bongo back in the 1800s and even bred them , but called them by the French name, *Antilope eurycere*, as they came from West Africa. Bongo was a name coined when the Aberdare animals came into the literature."

The world's first births of a bongo calf to a surrogate bongo mother and to an eland surrogate mother took place in the Cincinnati Zoo's Center for Reproduction of Endangered Wildlife (CREW) in 1984. In 1987 the U. S. Department of Agriculture approved the importation by CREW of frozen bongo embryos from the Mt. Kenya Game Ranch in Kenya. Marvin calls such projects "interesting in terms of captive breeding, but I question calling the bongo an endangered species. True, the East African race has a limited distribution but I do not recall anyone asking them to be added to CITES or the U. S . Endangered Species list. Should they?"

The person best-qualified to answer that question is Rod East.

ARCHIVAL INFORMATION ON CAPTIVE MAMMALS

In his letter about the bongo, quoted above, Marvin Jones offers access to his storehouse of information about mammals kept in captivity.

"Over the years I have collected quite a bit of archival information on all kinds of mammals in captivity, in recent years a good bit on ungulates...I...have quite a massive amount of captive data on antelopes for many collections; should you ever have need for any of this, just give a call or a line, and I will do what I can. My data over the years have been used by many studbook keepers as a basis to start from, especially that from some European zoos dating before World War II. My Paris data go back to 1808.

HOW TO ELIMINATE INBREEDING DEPRESSION

The problem of captive-breeding endangered gazelles from small founder populations was discussed by Oliver Ryder in a 1987 issue of *Gnusletter* (6[3]: 4). In the case of Speke's gazelle *(Gazella spekei)*, with a population numbering 7 males and 15 females, founded by one male and three females, Ryder noted that inbreeding depression was manifested by reduced birthweight and neonate viability associated with the degree of consanguinity of the parent.s. According to the introduction to the Speke's Gazelle Studbook, and three articles by Allen Templeton and Bruce Read (the Studbook Keeper), a management program to deal with the effects and try to eliminate deleterious genetic combinations has been largely successful. Excerpts from the studbook introduction and abstracts of these papers, sent in by ASG/Captive Breeding coordinator Karl Kranz, outline the procedures.

"Once the problems of inbreeding were recognized, the St. Louis Zoo initiated a management program to deal with the effects and to try to eliminate deleterious genetic combinations....Selection was introduced to favor the breeding of individuals that were already inbred. This program established goals of equalizing founder contribution, lengthening generation interval, and attempted to minimize inbreeding by avoiding full sib, father/daughter, and mother/son matings.

"We...implemented a breeding program designed to purge the population of genes with deleterious effects caused by inbreeding while simultaneously preserving, as much as possible, the general level of genetic variability in the herd. To select for genes that do well under inbreeding, we favored as parents those individuals which were already inbred but of proven viability. We also insured that their offspring were inbred while avoiding extremely large inbreeding coefficients, because selection is more effective when the inbreeding takes place slowly.

"To preserve genetic variability, we expanded the herd size as much as possible before and during the selection program. In addition, animals were favored as parents that would tend to equalize the genetic representation of the four founding animals...To aid in the creation of more genetic variability through recombination, animals were paired so that their offspring would ideally have genes derived from all four founding animals. Such preservation of genetic variability should also directly facilitate the selection of viable, inbred animals because response to any selection program is determined by the amount of various genes present in the herd.

"As the breeding program proceeded, both viability and birth weights increased. There was, moreover, a significant reduction in the magnitude of the regression slope relating viability to inbreeding coefficient. Thus much, if not all, of the inbreeding depression was eliminated in our selected animals. Consequently, inbreeding depressions do not necessarily imply that captive herds are doomed to extinction; rather, inbreeding depression can be selectively eliminated, making the long-term maintenance of the herd more likely."

REGIONAL RUNDOWN

SIERRA LEONE

Glyn Davies, one of the three anthropologists who has co-authored the Antelope Survey report on Sierra Leone, de-

scribes his survey methods in a letter (2 Sept 88):

"I continue to work in the Golas [forest reserves near the southeastern border with Sierra Leone], now concentrating on antelopes, since the primate scenario is largely known. I have got people raking $1m^2$ grids along survey trails in different habitats, with a view to counting footprints, and am currently trying to work out a more direct method of assessing duiker population densities. Viv Wilson favors transect walks and counting duikers, which requires colossal distances walked, and I hope to do some drives. Needless to say, I am open to any suggestions you may have on how to survey antelopes in thick forest and farmbush vegetation."

Readers who have experience in this area and care to write Glyn direct will find his address in the inserted list of ASG members.

NIGER

John Newby reports (in lit. to Rod East, 22 Sept 88) that 1987 and especially 1988 brought good rains to Niger. The Air and Tenere National Nature Reserve (77,360 km^2) was officially established on 22 January, 1988. It includes a 12,806 km^2 Strict Nature Reserve specifically for addax conservation.

Included with John's letter is a table showing the current conservation status and population estimates of Niger's principal animals (including crocodile, ostrich and greater bustard, the rest mammals ranging in size from jackal and vervet monkey to elephant). Of the 35 listed species, 3 are extinct, including scimitar-horned oryx, wild dog, and leopard; 16 (46%) are highly endangered, including 4 of the 13 surviving antelope species (addax [<200], topi [<100], dama gazelle [<1000], red-flanked duiker [<100]), elephant, hippopotamus, giraffe, buffalo, lion cheetah, striped and spotted hyenas, otter, manatee, ostrich, and crocodile.

TCHAD

G. Sournia, IUCN Representative for West Africa, writes (in lit. to Rod East, 7 Oct 88), "Concerning Chad and surveys in the Ouadi Rémé-Ouadi Achim Reserve, I inform you that the Unité Sahel and the Délégation Régionale de Dakar consider them [the surveys] of the greatest importance. In a little more than a month, we are going to make an official visit to Tchad, among other things, to launch the National Conservation Strategy; the problem of Ouadi Rémé-Ouadi Achim will be incontestably at the center of our discussions. We shall keep you informed."

The difficulties Chad's Ministry of Tourism and the Environment have experienced in finding funds to reinstitute wildlife conservation and management have been noted in previous issues of *Gnusletter* (vol. 7 nos. 2 & 3). The survey of the Ouadi Rémé-Ouadi Achim Reserve is considered of particular importance and urgency by the ASG, as it is practically the last place where a naturally occurring population of scimitar-horned oryx might be preserved.

CENTRAL AFRICAN REPUBLIC

Mike Fay, who has managed to gather lots of information about CAR antelopes while carrying out his Dzanga-Sangha Lowland Gorilla Project (see May, 1987 *Gnusletter),* and is also co-author, with Clive Spinage, of the CAR chapter of the Antelope Survey, is back from another two-year stint in the field. He writes (in lit. 8 Jan 89):

"Just returned to the US and thought I would drop you a line. I was happy to see that the duiker letter reached you [reported in *Gnusletter* 7(2):7]. You never know what happens to a letter when it leaves camp in a dugout canoe.

"Things went pretty well in the CAR. It seems that I probably have enough data to get my PhD, so that will be nice. I collected about 50 duiker skulls during my stay as well as some ecological notes. P. Grubb and I will be publishing the results together. I have applied for an export permit. The skulls should arrive in London sometime in the coming months. I hope to get the publication out in the next six months."

ETHIOPIA

Chris Hillman, whose role as official advisor to the Ethiopian Government on wildlife conservation and management is rewarding but keeps him from the field work he loves, has passed on these news items about wildlife conservation in Ethiopia (in lit. 28 Oct 88):

"Joe Mattravers is progressing with his Swayne's hartebeest study in Senkelle, with no help whatsoever from the international conservation community...He is very keen to make efforts to create another conservation area at Maze for the subspecies. [This is] an area that has apparently no human pressure on it at present, and where there is a reasonable population still. Senkelle is under incredible pressure from all sides.

"Ethiopia is about to join CITES.

"Our aircraft is almost up and running, thanks to FZS [Frankfurt Zoological Society], so we [can] begin doing aerial surveys and can then produce some up to date population information, instead of relying on data over 10 years old."

TANZANIA

Rolf D. Baldus, PhD, in charge of the Selous Conservation Programme, in writing (11 Dec 88) for a subscription to *Gnusletter*, included the following article from the Tanzania *Daily News* of 9 Mar 88 describing the creation of this promising new development.

"The Federal Republic of Germany (FRG) will support Tanzania's Selous Game Reserve, the largest animal concentration area in Africa, to protect it from poachers.

"With an area of 50,000 sq km, the game reserve will get an FRG support of...DM 2.5 million to improve its protection strategies as well as assisting people living around the area, a statement by the FRG embassy here said yesterday.

"The project, agreed at the just-ended Tanzania-German annual consultations in Bonn, will be for two years and will also receive additional support in the form of clothing, shoes, backpacks....by FRG armed forces to the game wardens. The project was initiated by an FRG Parliamentary State Secretary for Economic Cooperation, Vokmar Koehler, who visited the game reserve last January. The Selous Game Reserve...in 1982 was listed as part of the world heritage.

"The project also aims to win the support of people living in the area to

prevent poaching. Poachers usually enter the reserve for elephants and rhinos, for which a kilogramme of rhino horn fetches up to U. S. $6,000, the statement said.

"The Selous...Project is said to be the largest Bonn has ever supported in connection with the protection of ecosystems in Africa."

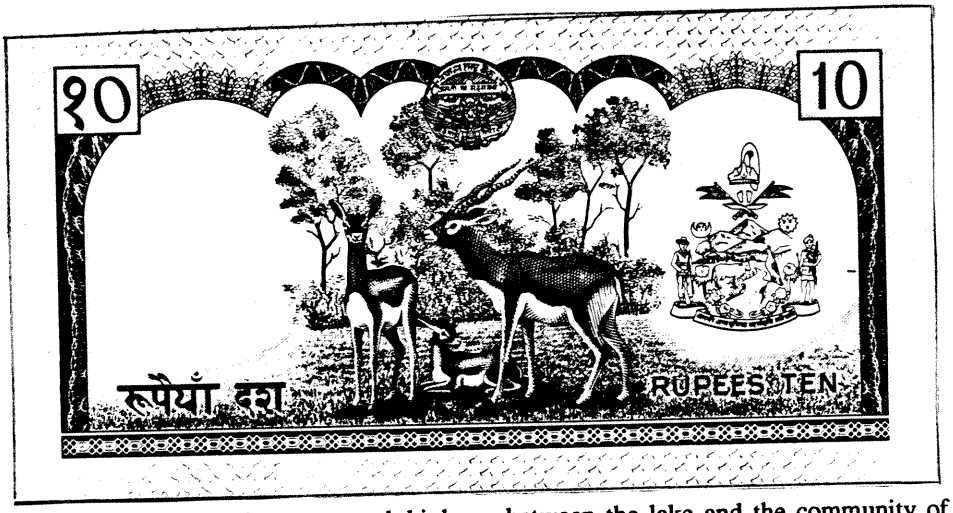
Wonderful news, indeed. But it would have been even more wonderful had it happened 10 years ago, when rhinos were still plentiful in the Selous and there were 100,000 elephants, instead of half that number which have survived the wholesale poaching of the past decade.

ASIA

NEPAL

Bill Clark, ASG member from Israel and the Muséum National d'Histoire Naturelle of Paris, talks about antelopes he saw or heard about during his travels in Nepal and China (under that heading) in a recent letter (9 Dec 88):

"I've recently returned from Nepal where I was working on some CITES business as well as breeding programmes for Asian elephants and gharial. Nevertheless, I've picked up a few antelope rumors. It seems their blackbuck population has been very low for many years despite complete protection. A survey suggested that they lacked habitat, and, after some extensive negotiations, the national parks department has persuaded the government to move some villages located in prime blackbuck habitat. I understand the villagers are now in the process of moving to new locations provided by the government, and once this is accomplished, the antelope will have substantially larger areas, and hopefully,will breed better. If you want more detailed information, I can acquire it for you. Meanwhile, I enclose a Nepali 10 rupee note which may be of interest to you because of the blackbuck on the reverse side." (See illustration)



TIBET

George Schaller has now traveled most of the vast country of Tibet in carrying out a wildlife survey commissioned by the Government of China, accompanied by Chinese botanists, foresters, and biologists. Excerpts from his Report No. 8, about two surveys he made between last August and October, are presented below (see accompanying map). Whenever possible the surveys followed tracks and roads accessible by vehicle, but one 510-km cross-country trip was made in northwestern Tibet. Large ungulates were counted in a 2-km transect strip, 1 km on either side of the vehicle. Almost the whole region covered by the survey comprises rolling to hilly grassland used at least seasonally by yak and sheep pastoralists.

Western Tibet, August 14-29. Total distance covered c. 1925 km.

"Most grasslands along our route were devoid of wildlife except for a rare Tibetan antelope *[Pantholops hodgsoni]*, a few Tibetan wild ass *[Equus hemionus kiang]*, and occasional Tibetan gazelle *[Procapra picticaudata]*. The last-named tend to occur in clusters, small populations separated by many kilometers during which none are seen.

"Cross-country travel began near Domar. We headed east up a broad valley across a plateau and over a low pass into a basin, and then over a second pass and into another valley. In 140 km the only wild ungulates observed were four Tibetan antelope. Not until we reached Lumajandong Co [Co means lake] was wildlife (antelope, ass) moderately abundant. A major concentration of animals was found in the basin of Aru Co and Memar Co. Antelope and wild ass also occurred in fair numbers in the hills and plains south of Aru Co, but then ceased rather abruptly about halfway between the lake and the community of Yanhu...Thus, wildlife tends to be localized and large areas of suitable terrain are devoid of animals or almost so..."

"Strip censuses...revealed that wildlife densities in the Aru Co region were considerably higher than elsewhere..., with densities ranging from 1.1-3.7 plains ungulates per km^2. Tibetan antelope were generally most abundant, followed by wild ass and gazelle. Wild yak had concentrated near the western shore of Aru Co, making it locally the most numerous species. Argali *[Ovis ammon hodgsoni]* were rare. Blue sheep *[Pseudois nayaur]* were not included in the transect results because they frequent rugged terrain which is not easily surveyed by car."

North-Central Tibet, September 10-October 16. Distance traveled c. 3700 km.

The surveys in north-central Tibet had two purposes: a) to determine the status of the plains ungulates in the huge expanse of grasslands that extends west and north of Nam Co past Seling Co to the northern limit used by pastoralists near Garco (Shuanghu), and east of Nam Co past Nagqu to the western limit of forest; and b) to determine the status of snow leopard in north-central Tibet, especially in the mountains north and east of Lhasa."

"In sum, the area we surveyed south and east of Seling Co comprises a tract of grassland of over 70,.000 km^2 in size in which gazelle, antelope, wild ass, and argali have been almost exterminated. Only north of Seling Co where the population of herdsmen with their livestock is still relatively small is there much hope of

preserving the plains wildlife."

"The large herbivores on the grasslands of the Tibetan plateau — the Tibetan gazelle, Tibetan antelope, Tibetan wild ass, Tibetan argali sheep, and wild yak — are unique to these highlands. Most occur in the Tibet Autonomous Region. And it is, therefore, the responsibility of Tibet to preserve this natural heritage not only for its own people, but also for those in the rest of China and the world. Properly protected and ultimately managed, these animals represent an important cultural resource and potentially also an economic resource.

"In recent decades the animals on these grasslands have been decimated or exterminated over large tracts. They are almost gone from southern Tibet. Those in the central and western part have been greatly reduced, often to small, scattered populations, or, as in the region around Naggu, eliminated. I predict that in the future all antelope, ass, argali and others will disappear from the grasslands of this region.

"There is only one region left in Tibet where the plains wildlife survives in moderate numbers: in the northwest, the Qian Tang. Herdsmen occur only around the periphery of this region. However, hunting is on the increase. Rumor has it that antelope wool is being illegally exported to Nepal. **The only way that Tibet can assure the survival of antelope, ass, wild yak, argali, and gazelle is to create a huge reserve in the Qian Tang** (see proposed boundary... [on map]). A reserve must be large because antelope and ass and perhaps others migrate long distances, although the actual extent of movement of each population remains unknown. Furthermore, yak and argali—both seriously threatened species—occur in discrete, scattered populations which cannot retain contact unless part of a very large reserve.

"There is urgent need to protect the area now. Qian Tang represents the number one conservation priority for Tibet."

"Conservation initiatives are usually made too late, in response to crises. In the Qian Tang, China has an unequalled opportunity to protect a large area and plan for the wise use of its resources before these have been damaged."

CHINA

The second part of Bill Clark's letter (see under Nepal, above) describes his trip to China.

"Last August I visited west China (Xinjiang Province) with Hans Klingel (former?) [yes] chair of the SSC Equid S. G. We were primarily interested in their Przewalski horse project and in finding some wild dzegettai—*Equus hemionus hemionus*—which we did. But we also saw some *Gazella subgutterosa*, which I thought you might want to note for your records. "Although we travelled several hundred kilometers by jeep across the province, the only signs of gazelles we found were in the Kaleimalei Mountains nature reserve, northeast of Urumqi. In two days there, I saw a total of 76 gazelles, in seven groups of 14, 3, 2, 20, 4, 16 and 17 animals, respectively. I would count these gazelle populations as being quite small, and the habitat likely has a much greater carrying capacity. I make this comment not after any scientific study, but merely a reflection after my experience with *Gazella dorcas* and *Gazella gazella* in Israel where populations experience a much greater density in roughly similar habitat. The Chinese gazelles are preyed upon by wolves, and I found wolf feces with conspicuous amounts of gazelle bones and hair. The Israeli gazelles contend with the same predator.

"I suspect that the Chinese gazelles have experienced substantial hunting pressure. They run in panic from any motor vehicle immediately upon detection — even if the vehicle is more than a kilometer away. The Kalameili Mountains nature reserve is located at about 1450 meters elevation some 140 km north of the town of Chitai. It measures roughly 60 km east-west, and 330 km north-south. Coordinates 45°25' N and 89°25' E mark our campsite, roughly in the center of the reserve. Elevation there was 1030 m."

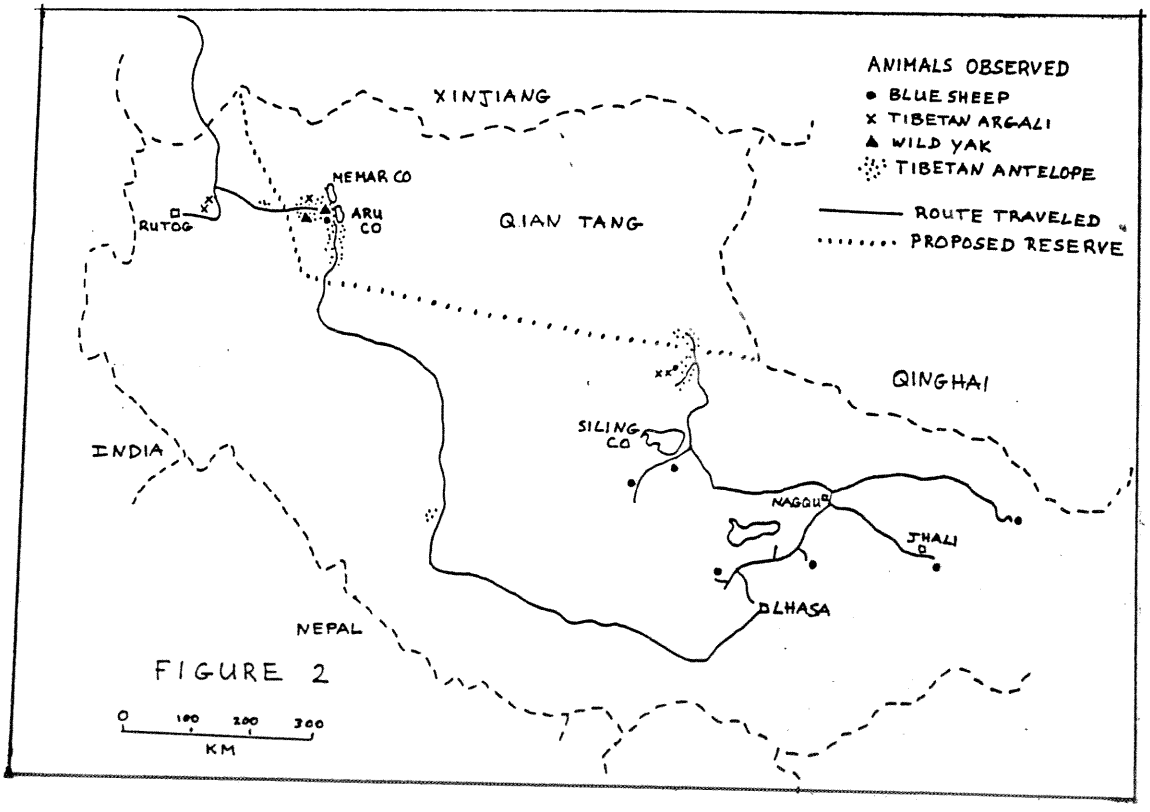


FIGURE 2