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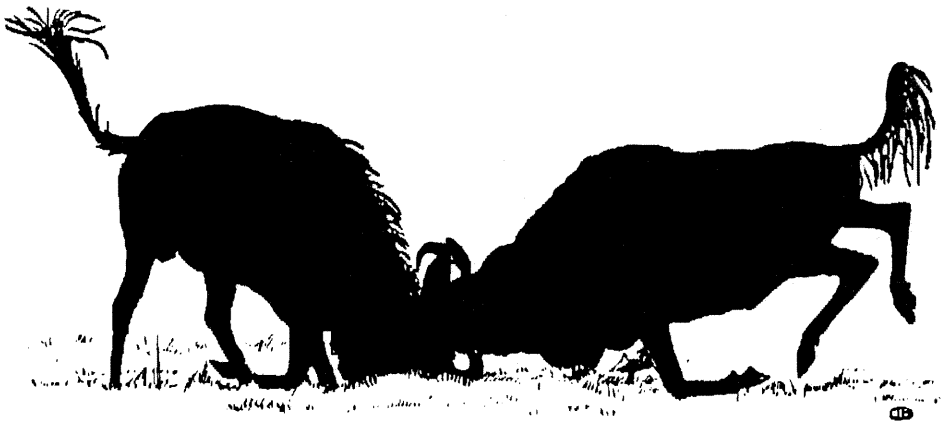
Antelope Specialist Group



GNUSLETTER

In this issue. . .

ASG NEWS

Rod East
1944-2006

Rod died peacefully in the company of his family on August fourth, less than two months after receiving the Peter Scott Award for Conservation Merit (reported in the last *Gnusletter).* That his life was cut short at the age of 62 is tragic. But when you consider his lifetime achievements, you realize that he accomplished more than most people who live into their eighties and beyond. So let us be grateful for all that he has contributed to knowledge and conservation of African and New Zealand ecosystems and celebrate his life even while we mourn his death.

The following obituary was published by the Royal Society of New Zealand - Issue 436 of the *Royal Society Alert*

Dr. Rod East, Former NIWA Deputy Chief Executive

Former NIWA Deputy Chief Executive Dr. Rod East died at his home in Hamilton on 4 August. He was 62.

Dr. East retired from NIWA in 2002 and had fully and actively enjoyed his retirement until last January, when he was diagnosed with cancer. Prior to joining NIWA in 1992, Dr. East spent 20 years at the Ministry of Agriculture and Fisheries' Ruakura Agricultural Centre.

Dr. East was born in Blenheim in 1944, and studied zoology at Canterbury University. After completing a PhD at Lincoln University in 1972, he spent 12 months researching insect population dynamics at Oxford University before joining MAF.

From early childhood, Dr. East maintained an interest in African wildlife, particularly antelopes. He was a long-standing member and co-chair of the Antelope Specialist Group, a voluntary task

force of experts who advise on conservation of antelope for the Species Survival Commission (SSC) of the World Conservation Union (IUCN). During his spare time, he compiled and published key data on all African antelope species and raised funds to protect threatened African antelopes. His contribution to conservation was recognised by the SSC in June, with the Sir Peter Scott Award for Conservation Merit.

Dr. East is survived by wife Christine and three adult children, Angela, Jonathan, and Elizabeth.

Peter Grubb
1942-2006

December 23
Dear Friends and Colleagues,
I am sorry to tell you that my husband Peter Grubb died peacefully in his sleep at 8 o'clock yesterday morning. He had been suffering from cancer of the head for the past two years. Funeral arrangements are yet to be made.
With best regards,
Eileen McGrath-Grubb
Pgrubb35@aol.com

Peter was a dedicated bovid taxonomist, who spent endless hours examining and measuring skulls and bones in various museums, above all the British Museum of Natural History. Among his publications, the most notable are Grubb, P, Groves, C.P, Wilson, V. J. 2005. Revision and classification of the Cephalophinae. In: *Duikers and Rainforests of Africa,* Wilson, V. J. (Ed); and Grubb, P., Jones, T.S. *et al* 1998. *Mammals of Ghana, Sierra Leone and the Gambia.* Trendine Press, St. Ives, UK. [Ed.]

About Gnusletter Vol. 25 No. 2

This is the last issue that will be compiled and edited by me. I've published three and for the last decade two issues a year for a quarter-century. It's high time for a turnover. Beginning with Vol. 26 No. 1, **Steve Shurter** will be the new editor. Besides being Chair of the AZA Antelope Taxon Advisory Group, Steve has recently returned to White Oak Conservation Center, in Yulee, Florida, as International Programs Director of Gilman International Conservation. I have high hopes that the *Gnusletter* will be more informative and reach a wider audience than heretofore.

Camera trap photo of bongo bull in Aberdares NP, 2006

Antelope News

Mountain Bongo Phase 2 News

Extracted from June 2006 report of Lyndon Estes

Research is being conducted through the Rare Species Conservatory Foundation (RSCF), and is additionally supported by the Wildlife Conservation Society (WCS), the Explorers Club Washington Group, and the National Aeronautics and Space Administration (NASA). The work will contribute to satisfying the requirements for a PhD degree for the principal investigator (PI), and an MSc degree for the assistant PI.

Fieldwork is undertaken in conjunction with the established Bongo Surveillance Programme (BSP), which is supported by the Rhino Ark Foundation and run by Mike Prettejohn. Both the BSP and this research are conducted in collaboration with the Kenya Wildlife Service (KWS).

Field data were collected in three separate expeditions into the forests of the Aberdares Conservation Area (ACA) between May 7th and May 31st at the tail-end of the long rainy season. Late-breaking news on recent bongo sightings led to a rearrangement of travel schedules and a fourth expedition from June 5-10.

Methodology

Working again with the experienced trackers and staff of the bongo surveillance team (led by Mike Prettejohn) and with KWS rangers, forests were surveyed for bongo habitat utilization signs

(e.g. feeding, lying, drinking). The trackers searched for bongo tracks, dung, and feeding signs.

Where such signs could be confidently identified, circular plots of 11.3 m radius were centered around these and the following data on forest structure and composition were collected: diameter at breast height (DBH) of trees larger than 7.5 cm, height of 3 highest trees per plot, number of shrubs (< 7.5 cm DBH) intercepted by a horizontally held stick (1.2 m long) in two 22.6 m transects, and percent canopy and ground cover (based on 20 readings for each), as well as slope, aspect, elevation, and landscape position. Species composition in each layer was also recorded. Samples of fresh dung (< 3-4 days old) were collected where encountered and stored in plastic laboratory vials with 95 percent ethanol. DNA extracted from these samples will be used to: 1) confirm the trackers' identification of the species, and 2) estimate population and range size through identification of individual bongo.

The same habitat data were recorded at pre-assigned sample plots located at the center of cells of a 1 km^2 grid laid over the Aberdares range using a geographical information system (GIS). Such points (which are effectively "random" in relation to the landscape) were sampled as the survey team passed within 200 m or less of a given point. Certain days were devoted exclusively to collecting grid point data, in which case the survey team moved as directly as terrain permitted between points.

Survey areas were accessed primarily on foot following an initial approach with the project vehicle, where roads and tracks allowed. During this field season, repeat surveys of two previously sampled areas were made, although the coverage was altered or expanded to include adjacent areas that had not yet been searched. A third area where the surveillance team had recorded bongo in 2005 was also sampled, and the late-scheduled fourth expedition covered terrain adjacent to the area covered during the sixth expedition. The typical expedition lasted for 6-7 days, and consisted of sampling within a several kilometer radius of a base camp. Each base camp was typically used for 1-3 days.

Field Research Results

A total of 24 days was spent in the field over the course of the four expeditions, of which 19 were devoted to field data collection. The remaining five days were consumed by vehicle and foot travel between field sites and base camps. A total of 34 sample plots was recorded, consisting of 18 bongo samples and 16 grid point samples. Fifty dung samples were collected. The numbering of the third season's expeditions follows on from the second season's, which ended with Expedition 8.)

Expedition 9: May 7-13. The Hagenia-Hypericum and bamboo forests around the Karameno track were sampled during this seven-day expedition. This section of the ACA was surveyed during the first expedition in June, 2005. During this trip, an area to north of the Karameno track was surveyed that had not previously been visited by the research team (although it had been visited by the surveillance team within the past two years). Surveys were also undertaken further to the southeast in this expedition, down near the ACA fenceline at 2600 m.

Expedition 10: May 17-22
A repeat survey of the Honi Valley area of the Salient was made during this six-day excursion. The primary aim of this trip was to confirm the seasonal variation in bongo distribution detected during the first two expeditions to this area (the fourth and seventh).

Expedition 11: May 26-30 This five day trip, intended to be the last of the field season, was undertaken to cover several patches of *Hagenia* forest on the plateau above Karuru Falls. Matthew Gichuri of the Bongo Surveillance Team led an expedition to this area in late 2005, and found several instances of bongo activity. The goal of this last trip was to collect bongo data from a new location, as well as to record several additional grid points in the lower Salient.

Expedition 12: June 5-10 Information arose during the course of Expedition 11 about recent bongo sightings in the Chebuswa area of the northern Aberdares, which led to the scheduling of an unforeseen 12th expedition. Using the two men who provided this information as guides, six additional days were spent searching for bongo in this area.

Additional Information Obtained

Prior to the commencement of the 9th expedition, the Surveillance Team made an excursion to the area above Wandare Gate to find bongo sign, as well as to record photos in this area. Following this excursion, a second team led by Boniface Nderitu erected the camera trap at the Honi Valley lick where the first bongo photo was captured (see (www.rarespecies.org/bngoII.pdf). The first group found no sign of bongo above Wandare, nor did they capture any photos. Evidence suggested that the bongo had all moved to lower elevations along the Honi Valley. The second team managed to capture a huge number of bongo photos, including several in which four bongos were visible in the frame (see Figure 5) [not included]. Taken together, the total bongo photo record shows nine individual bongo in the Salient area. The actual number is likely to be higher.

Mr. Prettejohn also sent a repeat survey (see www.rarespecies.org/bngoII.pdf for a brief description of the first expedition) to the southern forests of Mount Kenya from May 19-26. The team was again led by Peter Mwangi, and managed to collect 11 additional dung samples from what is presumed to be a resident bongo herd.

The Overall Season

The 18 bongo and 16 grid data points collected during this season bring

the total dataset collected during the three field research seasons to 56 bongo and 94 grid data points. It is anticipated that a number of bongo points will be proven false following the genetics assessment, and that the bongo dataset may be reduced to 30-40 samples (in a worst-case scenario). While such a loss would be painful, the reduced dataset should still allow for valid statistical inference.

The strength of this inference will be increased by the findings of the microsatellite DNA study (if this study proves feasible), which will enable range and population size estimates. With the inclusion of the 50 dung samples from this season, there are now a total of 88 samples from the RSCF led research efforts,

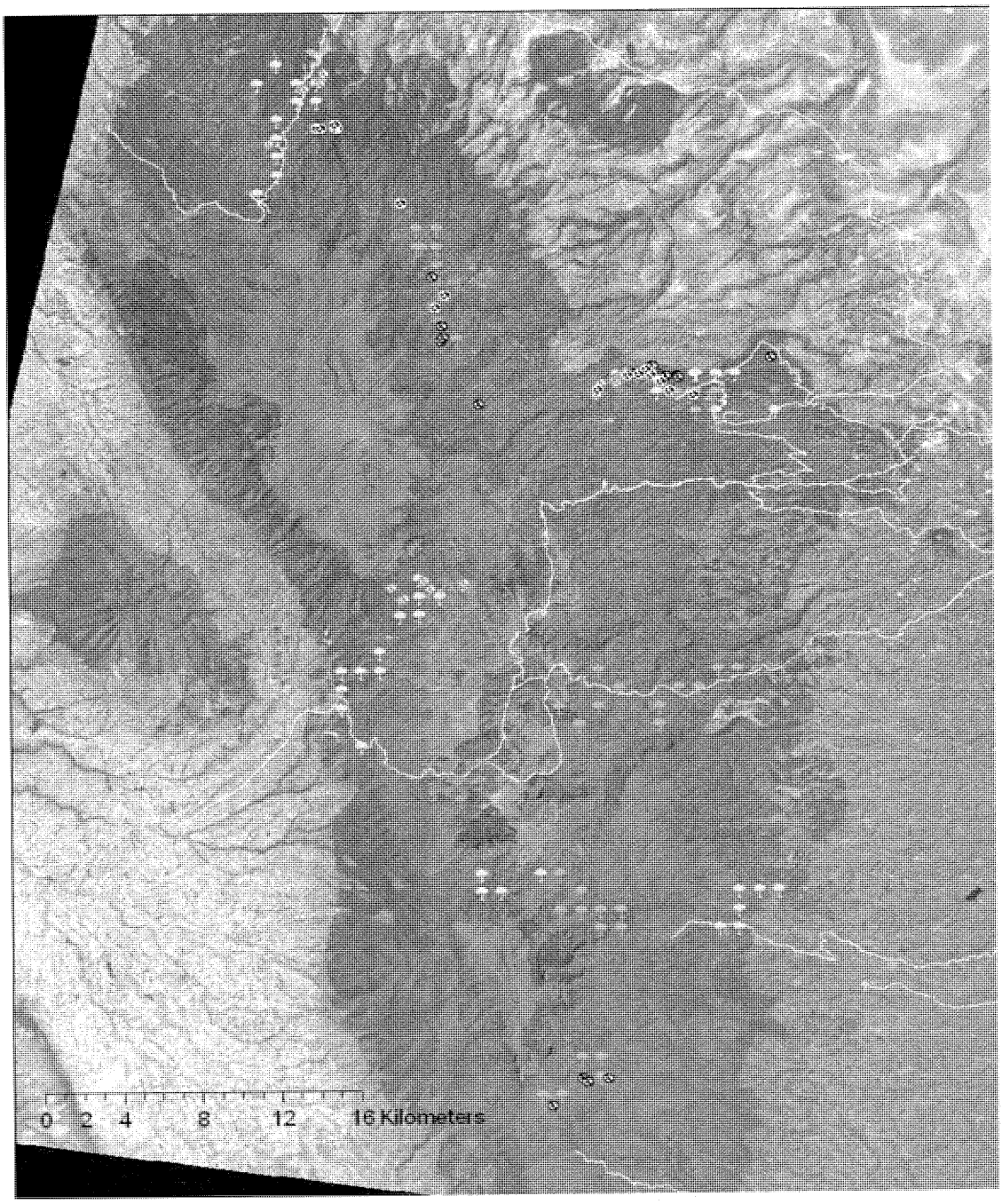


Figure 6: Distribution of data points collected during each of the three field season. Bongo data points are denoted by white antelope heads on black background (3rd field season), green antelope heads on white background (2nd field season), and black antelope head on yellow background (1st field season). Green trees represent 3rd season grid points, blue trees denote 2nd season grid points, and 1st season grid points are marked by orange trees. Yellow lines indicate roads in and around the Aberdares Conservation Area. [Map is reproduced in color on ASG website.]

which brings the total dung sample size to 194 (the additional samples were collected by the Bongo Surveillance Team. It is anticipated that this number will increase prior to the commencement of the genetics assessment in the latter half of 2006.

A major aim of this season was to revisit the Salient in order to confirm the apparent seasonal shift in bongo distribution from higher (dry season) to lower elevations (wet season). Although analysis has yet to be undertaken, the distribution of samples collected appears to confirm this pattern. The temporal distribution of the three expeditions enabled the detection of this elevational migration, as surveys were undertaken during periods representative of the three major seasons experienced in the Aberdares: the mist period (in July and August, following the long rains), the dry season, and the rainy season. This latest field season was commenced at the end of the long rains and prior to the commencement of the misty period. Although the climatic conditions were reminiscent of the dry season, the vegetation remained in a state of greenness from the precipitation received in late March through early May. A notable exception was the conditions experienced on Kanjuiri Hill, where understorey vegetation on exposed sites was dry.

Three areas previously un-surveyed using this methodology were covered during this season. These were the plateau around Karuru Falls, and the Chebuswa and Kanjuiri Hill areas. The bongo "anchor point" found at the eastern base of Kanjuiri Hill is especially significant, and could prove to be a focal area for conservation efforts. Figure 6 details the distribution of sample points collected during this season in relation to those of the previous two research periods.

Data Analysis and Ongoing work

Comprehensive data analysis will commence in July, 2007. The PI will dedicate the remainder of this year to analysis of the remotely sensed imagery, using the collected data to calibrate and assess the derived habitat maps.

An additional three data collection trips will be led by A.G. Mwangi into the Aberdares and Mount Kenya forests. The main aim of this continued fieldwork is to gather additional bongo data in areas yet to be surveyed. The southern forests of Mount Kenya will be among the areas visited, which should provide an independent dataset that can be used to validate the predictive habitat models developed using the Aberdares data. At the time of this report's completion, the first trip to Mount Kenya had been successfully completed, and yielded an additional 5 data points and 18 dung samples.

Following the completion of fieldwork, Mr. Mwangi will commence his GIS analysis of human impacts in the Aberdares. This study, which will earn Mr. Mwangi his MSc degree, should be completed by the end of 2006, and will provide important input for the predictive habitat models. It should also assist KWS in helping to plan management interventions.

The microsatellite DNA study will commence in the second half of this year. Between Rhino Ark, the BSP, and RSCF, funding has been secured to enable the analysis of up to 200 dung samples. After discussions with several universities and the analysis of cost estimates, an agreement has been made with Professor Michael Bruford of Cardiff University to conduct the study pending the results of a free feasibility assessment. This agreement will enable the full participation of a student or professor from a Kenyan University.

The predictive habitat models will be developed following the classification of habitat features using remotely-sensed data, and will incorporate the results of the genetics study following its planned completion in the first half of 2007. The final results will be used to develop recommendations for managing the extant bongo herds, and in identifying suitable areas to reintroduce captively-bred animals on Mount Kenya. This research will also lead to the submission of several articles to relevant peer-reviewed scientific journals.

Update: Mt. Kenya expeditions

A final period of field research comprising three separate excursions was carried out between July and September, led by A.G. Mwangi.. Two of the expeditions focused on the southern forests of Mount Kenya, and one on the previously unsurveyed southwestern area of the Aberdares Salient.

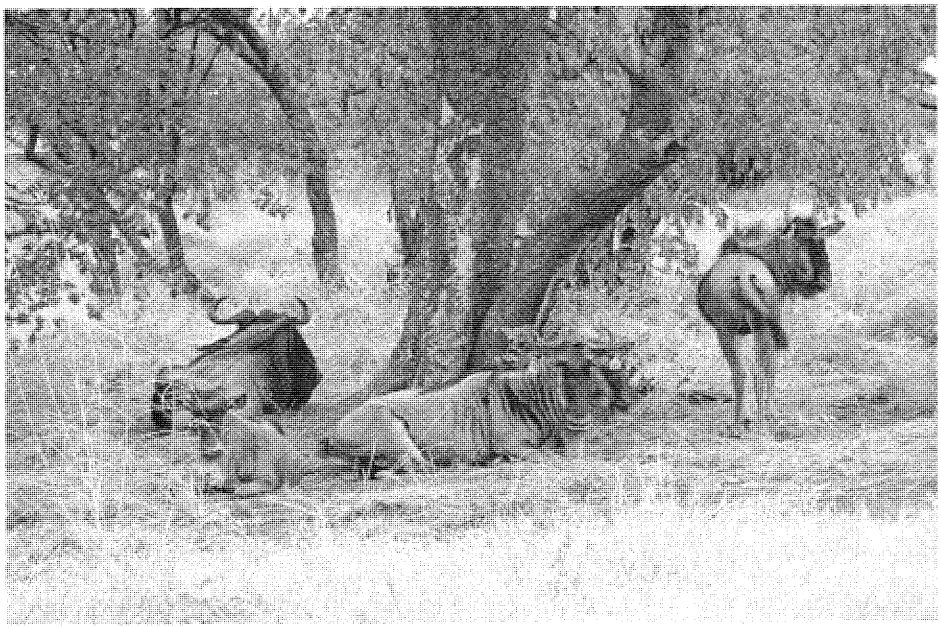
Working together with the trackers and staff of the bongo surveillance team (led by Mike Prettejohn) and with KWS rangers, Mr. Mwangi surveyed forests for bongo habitat utilization sign (e.g. feeding, lying, drinking). Where such signs could be confidently identified, the same kinds of data collected in the Aberdares expeditions were recorded

A total of 18 days was spent in the field, of which 11 were devoted to field data collection. The remaining 7 days were consumed by vehicle and foot travel between field sites and base camps. A total of 13 bongo sample plots were recorded, and 26 dung samples were collected. Expeditions lasted for 6 days and consisted of sampling within a several kilometer radius of a base camp. Each base camp was typically used for 3 days.

On expedition 13: July 3rd - 8th, the forests above Kihari and Ragati Gates on the south-southwestern side of Mount Kenya were sampled during this six-day trip. Evidence that bongo still occur in this area was found during a November, 2005 expedition by a team from Lewa Downs Conservancy, led by William Duckworth-Chad. The BSP made three subsequent trips (in March, May, and June, 2006) to the general area surveyed by Duckworth-Chad, finding evidence of bongo on each occasion. The first two trips resulted in 10 and 21 dung samples, respectively. No dung samples were collected during the June, 2006 trip, although sign of bongo were found at one location.

Tracks followed by the team suggested that at least six animals were present in the area surveyed. Human sign was found at six locations, including evidence of poaching (hunters' camps) and charcoal making. Eighteen dung samples were collected.

The data collected during these three expeditions will serve as validation points for predictive habitat models.



A group of females and young elected not to rejoin the migration when the 30 captive wildebeest were released in February 2004. A wild bull soon joined them. They have been a fixture on Sasawka Hill ever since, unperturbed even by the presence of 3000 workers while the Lodge complex was under construction. There are presently 8 females and young plus the bull (on the left). Note the cow's eartags.

The Causation of Reproductive Synchrony in the Common Wildebeest

S. L. Monfort, PI, R.D. Estes & K. Thompson, Co-PIs

R. D. Estes

Partially funded by the Smithsonian Institution Scholarly Studies Program, combined field and laboratory research was carried out between 2002 and 2007 in order to identify the physiological factors that underlie the extraordinarily tight reproductive synchrony of the common wildebeest (*Connochaetes taurinus)*. Despite 50 years of ecological and behavioral research on this keystone species, knowledge of its reproductive physiology was very limited. For instance, it was unknown whether females are spontaneous ovulators capable of polyestrous cycling, and whether they keep cycling during the breeding season until pregnant. How it happens that some 80 percent of adult females in a wildebeest population come into estrus and are bred within the space of three weeks was the biggest unknown.

What triggers estrus? Ever since 1964, while doing my dissertation research on the Ngorongoro Crater and Serengeti populations, I had suspected that the calling and furious activity of thousands of bulls, which grew in volume in the buildup to the rutting peak into what I called the Big Hum, stimulated ovulation in the cows. Finally, the opportunity to test this hypothesis had come to pass.

The field work was carried out in the Grumeti Reserve, which abuts the northern border of Serengeti NP along the Western Extension. Allison Moss, a PhD candidate at George Mason University, lived on site (in a tented camp) and managed the project, with the advice and occasional participation of the PIs. Permission to conduct the research in the Grumeti Reserve, together with financial support, were given by the proprietor, Paul Tudor Jones, and the day-to-day operation would have been impossible without the logistical support and cooperation of the Reserves and lodge management.

Because of various unforseen delays, capture operations had to be put off until November of 2002, when the migration that had visited our study area in May and June came through on the return journey to the Serengeti Plains. Eighteen cows were darted with M99 and transported to a 30 ha fenced enclosure of typical acacia savanna. The following January and February 12 of them produced calves. By then they had become so tame that the presence of people inside the enclosure created little to no disturbance. These animals were kept in captivity until February of 2004, when all were released to rejoin the migratory hordes. By then their numbers had increased to 30 cows, yearlings and calves, and one bull.

Baseline data on the reproductive physiology of the captives were gathered by collecting and preserving the dung of each cow (all identified with ear tags) three times a week. In March of 2003, the herd was divided into three groups which were transferred to three smaller bomas in preparation for the test of the hypothesis that the calling of the bulls synchronizes female estrus cycles. For three weeks in May (a month before the peak rut), the recorded calls of rutting

bulls were broadcast continuously over loudspeakers to two groups, one of which was penned with an adult bull captured to provide a male presence. The third, control group, was kept isolated from sound, smell, or sight of other wildebeest.

Although there were some behavioral signs that cows were responding to the calls, the reproductvie hormones in the thousands of dung samples had to be extracted and analysed before anything definite could be said. This huge labor was carried out by Allison between 2004 and late 2006 in Steve Monfort's specialized laboratory in the Smithsonian Research and Conservation Center at Front Royal, Virgina. While the full results will only become available in 2007 when Allison submits her dissertation, she has kindly offered these preliminary findings for publication in my last issue as editor of the *Gnusletter*.

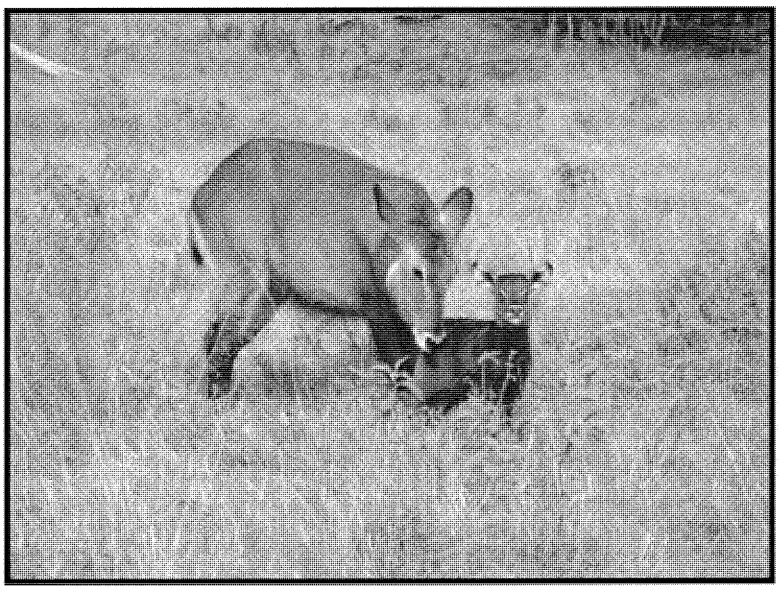
Preliminary Results reported by Allison Moss

I've been analyzing the pregnane data (that's the progesterone metabolite we're looking at). There are several effects of hearing the recordings of the males which are emerging. First, the two groups which heard the recordings had less variance within their herds in when they began cycling; in other words they were indeed more synchronized.

However, there also appear to be some additional profound effects of the exposure to vocalizations: Average pregnane values were higher following the recordings, suggesting more robust luteal function (which could translate into increased fertility); the groups hearing the recordings also had a longer period of ovarian activity before apparent seasonal anestrus took effect, and experienced more estrous cycles during this active period than the control group.
The sum effect is a distinct improvement in reproductive function as a result of exposure to male vocalizations.

In addition, the hormone data have elucidated some basic reproductive parameters in the species, including estrous cycle duration, luteal phase duration, and duration of gestation (slightly shorter than previous estimates). As for species characteristics, they do appear to be seasonal, polyestrous, spontaneous ovulators. In fact 3 or the 4 cows which became pregnant in the course of the study did not conceive during their first cycle, and unmated cows exposed to the vocalizations had as many as 14 consecutive cycles. I'm currently working on integrating the behavioral and endocrine data, which also promise some interesting results!

N.B. An explanation of the very unusual wildebeest reproductive system can be found in my article on the wildebeest in the September 2006 issue of *NaturalHistory* magazine, available on the web at www.nhmag.com. RDE.



Defassa cow with newborn calf, Maasai Mara Reserve. Photo RDE

Hybridization between waterbuck ssp is confirmed by genetic analysis

Eline Lorenzen
Department of Evolutionary Biology
Institute of Biology, University of Copenhagen

Two subspecies of waterbuck are recognised based on differences in geographical distribution, coat colour and rump pattern. The defassa waterbuck[1] has a solid white rump patch and is found in west and central Africa. The common waterbuck[2] has a distinctive white ring around the rump and occurs in East and southeast Africa. A previous study revealed that common and defassa waterbuck had fixed differences in their chromosome numbers. As that study was carried out on captive populations, genetic research directed towards natural wild populations of waterbuck throughout their distribution range was warranted.

Information on the genetic structuring of a species can yield important insights into species evolutionary history, historical migration patterns, and distinct populations for conservation and management. Both waterbuck subspecies are considered lower risk, conservation-dependant by the IUCN, noting the dependency of the species on protected areas.

For most of their geographical distributions, the common and defassa water-

buck have contiguous but non-overlapping ranges. However, they do overlap in Kenya and northeast Tanzania. Due to the presence of populations that physically appear to be a mix of the two, hybridization between subspecies is believed to occur in these areas.

In the present study, defassa waterbuck from Ghana, Uganda, Kenya and Tanzania, and common waterbuck from Kenya, Tanzania, Zimbabwe and South Africa were analysed. From the area of range overlap in Kenya, Nairobi and Samburu National Parks were sampled. Due to the presence of individuals with intermediate rump patterns in the two populations, they were assumed to be hybrids. However, this was a physical classification, and did not mean that they were genetically admixed.

A combination of DNA markers was used to estimate the genetic structuring of waterbuck populations to:
a) assess the genetic differentiation of subspecies
b) determine if there was genetic evidence of hybridization between waterbuck subspecies in Kenya
c) infer the evolutionary history of the species

A high degree of genetic differentiation between subspecies

In accordance with their physical differences, the genetic data showed that the waterbuck subspecies were highly genetically differentiated. The common subspecies is the most restricted in distribution and least numerous of the two, despite its name. The relative size of the subspecies populations was supported by estimates of the level of *genetic drift*. This is the process whereby random mutations arise in isolated populations, allowing them to drift apart genetically. The level of drift was higher in the common than in the defassa waterbuck. As mutations become fixed at a faster rate in small populations, the higher degree of drift observed in the common subspecies suggests the size of the common population has been smaller over evolutionary time than that of the defassa population.

Hybridization between subspecies

Individuals with intermediate rump patterns were sampled in Nairobi NP in Kenya, and all analyses suggested the population is the result of hybridization between subspecies. The data suggested hybridization was a very recent event, perhaps within the past few centuries -- or perhaps it is still ongoing.

Two individuals from Nairobi did not genetically resemble any of the other individuals sampled from the population. Our study suggested they were immigrants, as waterbuck from other parts of Kenya could have been released into the park. Unfortunately, it was not possible to obtain any records of this from Kenya Wildlife Services.

The potential for understanding population structure across a landscape has greatly increased with the use of genetic data. Although all the individuals analysed from Samburu NP physically resembled common waterbuck, intermediate rump patterns have been reported in the area. The hybrid origin of the population was revealed by our data, which suggested a large degree of genetic input from the defassa waterbuck.

The evolutionary history of the waterbuck

The genetic and physical differences between waterbuck subspecies indicate that their evolutionary histories have been influenced by a period of separation during which they diverged. This is supported by the fact that the subspecies have different chromosome numbers. The common and defassa waterbuck have 2N of 50–52 and 53–54 chromosomes, respectively.

Major African refuges are suggested to have influenced the development and divergence of African antelopes during the climatic fluctuations of the Pleistocene (0.1–1.6 million years ago). These isolated refuges harboured persistent savannah habitat, where populations evolved independently of others. We propose defassa and common waterbuck survived in refuges in West and Southern Africa, respectively. Subsequent dispersal during favourable times has led to their present-day distribution. The two subspecies can hybridize, which suggests they were not separated for a period sufficient to result in complete reproductive isolation. On the other hand, hybridization is limited to Kenya and northeast Tanzania, which could be due to the chromosomal differences hindering gene flow between them. In effect, a reproductive barrier is in emergence.

Conservation and management of the species

Conservation efforts should be aimed not only at preserving the biodiversity of species, but also at preserving the diversity within species. To aid in the informed management of species in the wild, it is essential to define the presence and distribution of distinct populations. The genetic, chromosomal and physical differences distinguishing the common and defassa waterbuck reflect a period of isolation and distinct evolutionary histories. We suggest that conservation and management efforts be directed separately at the two subspecies—in both wild and captive populations.

Contact

For further information, or if you would like a copy of the original paper published in the journal *Molecular Ecology*, please contact Eline Lorenzen on edlorenzen@bi.ku.dk.

[1]*Kobus ellipsiprymnus defassa*
[2]*K. e. ellipsiprymnus*

Winter 2006/07 issue of Saiga News

Alexander Esipov & Elena Bykova
<esip@tkt.uz>

The Winter 2006/07 issue of Saiga News is published and available for download on

the Saiga Conservation Alliance web site, http://www.iccs.org.uk/saiganews.htm, as well as the web site of the Centre for Biodiversity Conservation, http://saigak.biodiversity.ru/publications.html.

This issue focuses on one of the most important event of 2006: the First Meeting of the CMS Signatory States of the Memorandum of Understanding on the Conservation and Management of the Saiga Antelope. You will also find a very interesting article on saiga radio-collaring in Mongolia as well as recommendations for the restoration of Mongolian saiga; information about the status and migratory routes of a transboundary population of saiga in Ustyurt Plateau; results of development of non-invasive methods of monitoring the reproductive status of saiga in the North-Western Caspian region. Also you can find information on the successful use of a saiga school book as a tool for saiga conservation; other exciting international and regional activities for saiga conservation in the last half-year; a summary of press coverage in the range states; useful information on current projects; and review of recent saiga publications.

The Bulletin comes out twice a year - summer and winter - and we hope that it will facilitate a wide exchange of information about saigas among all interested parties. Currently, you can receive Saiga News 4 in Russian and English in pdf format and in hard copy on request. The Chinese, Kazakh, Mongolian and Uzbek versions of the bulletin will appear in the near future.

London Hunting and Conservation Symposium & Workshop

Robin Sharp, Chair, European SUSG

Organised by the IUCN Species Survival Commission Sustainable Use Specialist Group (SUSG) and attended by over 200 people, the Symposium, Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice, took place at London's Zoological Society on 12 & 13 October. Opening the meeting SUSG Chair Jon Hutton said, "This meeting breaks new scientific ground because for the first time we have brought together leading experts and practitioners from around the world to examine in depth the claims that recreational hunting makes a significant contribution to conservation and rural livelihoods."

For the purposes of the Symposium, recreational hunting was given a working definition of "hunting where the hunter or hunters pursue their quarry primarily for recreation or pleasure". From an economic perspective it was recognised that there are two broad but not exclusive types: local hunting, where the hunter originates locally to the hunting area, and hunting tourism, where the hunter travels a considerable distance, often abroad, and pays a substantial amount of money for the hunting experience.

Some 35 contributors made 26 presentations which ranged from the origins of modern conservation in the initiatives taken by some famous hunters, through global overviews of recreational hunting, angling and falconry to regional models from North America and Southern Africa; scientific studies of the effect of trophy offtakes on population dynamics for species such as lion, red deer and bighorn sheep; and the interactions of game management and agricultural policy. Case studies demonstrated how controlled hunting involving decision making by local people had assisted the acceptance of restored populations of wood bison in the Yukon, had played a critical role in the recovery of markhor goat and urial sheep numbers in the Torghar area of Pakistan, and provided vital incentives for the revival of the Lake Mburo Park in Uganda.

Other presentations identified the circumstances allowing or inhibiting photographic and hunting tourism to be combined in relatively small protected areas in South Africa, examined what rights and benefits villagers in Zambia and Namibia see as important to their own well-being in relation to hunting tourism by foreigners and the application of the Nunavut "IQ" (all inherited, present and future knowledge of the community) to wildlife management and hunting by themselves and others. Cases were presented of over-exploitation by hunting of antelopes in African arid lands and of corruption by a few key individuals preventing the revenues from tourist hunting being maximised for conservation and community benefit. The need for good governance at all levels was a theme echoed by many speakers.

The application of the CITES regime to import and export of hunting trophies was outlined. When examining new approaches to improving the governance of hunting, various initiatives defining principles, guidelines, criteria and indicators for sustainable hunting in Europe were described, as was an outline code of conduct derived from an analysis of sport hunting in Southern Africa. Possibilities for certifying hunting at a local level on the lines of forestry schemes were considered, but something much simpler was advocated. In her concluding remarks to the Symposium, SSC Chair Holly Dublin set out the challenges of a rapidly evolving international agenda, while affirming that " a common passion for conserving wildlife unites everyone who has taken part in this meeting".

Immediately following the Symposium, on 14 & 15 October the SUSG held a workshop attended by some 70 people to examine a range of possible tools for enhancing the sustainability of recreational hunting, including standards, certification, principles, codes and charters, and to determine whether there were topics on which it could work within IUCN, as well as those managing and participating in recreational hunting. Among the outcomes to be further considered by the SUSG are work on broad principles of global relevance and

examples of best practice relating to them, as well as the need for wider understanding of the contribution which hunting makes to pro-biodiversity land management and livelihoods.

Regional Rundown

SOMALIA

Commercial trade threatens Somalia's antelopes

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Somalia's fauna is rated among the most interesting in Africa, owing to its high species richness and level of endemism. This reflects the high diversity of ecosystems and wildlife habitats in the country, which exist because this part of Africa had rather stable climate conditions during periods of otherwise significant continental climatic changes. Among the regional hotspots under evolutionary aspects are the Goolis range, the Haud Plateau and the Hobia grassland. These hotspots are very important for the conservation of Somalia's biodiversity.

During the post-colonial period, hunting in Somalia required authorization by the Secretary of State for Forests and Game (Law no. 65 of 13 October 1971). However, illegal hunting continued in many parts of Somalia, sometimes causing cross-border problems with neighbouring countries. During that time, commercialisation of wildlife products focused mainly on elephant ivory, although subsistence hunting prevailed in some rural areas. Bow and arrow were the most widely used traditional hunting weapons, but small antelopes such as duikers and dikdiks were also trapped with nets.

The situation of hunting methods and illegal trade of wildlife has changed completely over the last two decades of civil war, as automatic guns became available for everyone and everywhere in the country, thereby strongly increasing both the number of hunters and illegal wildlife traders. In addition, many hunters adopted new hunting and trapping techniques, and learned to care and handle live animals bound to be sold in foreign countries (Photograph 1). Transportation methods such as wooden boxes – which are new in Somalia's hunting history – were also employed and adjusted for their needs.

A survey was carried out on request of the Northeast African Regional Subgroup of the IUCN/SSC/Antelope Specialist Group on wildlife trade in southern Somalia in mid 2006. It revealed a very high level of partly illegal trade of various species at local markets and for export purposes. The country harbours about 22 species of antelopes and many have been suffering severely from habitat destruction and overexploitation since the arrival of pastoral societies in the Horn of Africa.

The frequently traded antelope species comprise lesser kudu (*Tragelaphus imberbis imberbis*), gerenuk (*Litocranius walleri*) and dikdiks (*Madoqua guentheri, M. kirkii, M. saltiana* and *M. piacentinii*). Further target species can be Speke's gazelle (*Gazella spekei*), dibatag (*Ammodorcas clarkei*), Soemmerring's gazelle (*Gazella soemmerringii*) and beira (*Dorcatragus megalotis*).

The main centres for the antelope trade are the markets of Jimbiley, Sharey, near Belidoogle airport, and Embressomudul, along the road between Marka and Jilib, where antelope meat is offered in local restaurants. It has also been reported that processed and deep-frozen dikdik meat is exported to the UAE, along with deep-frozen goat and sheep meat, which has been exported since 1991. Information given by an intermediate broker mentioned that live dikdiks are also sent to Dubai by airplane. According to one report, 6 out of 15 individuals died during the transport to Beledoogle airport, and only 2 individuals eventually arrived at Dubai airport in a healthy state.

The survey revealed that there are large numbers of captive antelopes in Mogadishu and other parts of southern Somalia. Health conditions of these captive animals are usually poor because of the lack of proper feeding and adequate veterinary treatment. Furthermore, there are currently no rescue centres that would allow local authorities to confiscate captive wild animals and release them to their original habitats. Besides, the survey has also shown that there is an urgent need of more detailed field work to assess the present status of nationally and internationally important antelopes in Somalia. Available data generated by A.M. Simonetta during his field work between 1979-80 are now only of historic value, since the country has plunged into political turmoil and experienced civil war as well as lawlessness over the past two decades.

The uncontrolled wildlife trade might exert great pressures on the endangered antelopes in Somalia and their future survival seems very bleak. Endemic antelopes further face strong competition with an ever-increasing livestock population. In addition to that, many gallery forests and woodlands suitable for antelopes are cleared daily for charcoal production. Vast areas of bush have been depleted to feed an enormous appetite for charcoal in Saudi Arabia and the Gulf States. Most of the charcoal is made in southern Somalia, between Brava and Kismayo. Such indiscriminate clearing further opens new areas for livestock expansion and shifting farm practices.

Most Somali antelopes have been overexploited and many of them now exist in fragmented populations and others declined in their range drastically, such as lesser kudu, beisa oryx (*Oryx beisa beisa*), Speke's gazelle, Soemmerring's gazelle and gerenuk. Shrinking ranges are

Captive lesser Kudu waiting for export

also likely for bushbuck (*Tragelaphus scriptus delameri*), waterbuck (*Kobus ellipsiprymnus pallidus*), topi (*Damaliscus lunatus topi*), hirola (*Beatragus hunteri*), Pelzeln's gazelle (*Gazella dorcas pelzelni*), Grant's gazelle (*Gazella granti*), dibatag, oribi (*Ourebia ourebi haggardi*), beira, silver dikdik (*Madoqua piacentinii*), klipspringer (*Oreotragus oreotragus somalicus*), Harvey's red duiker (*Cephalophus harveyi bottegoi*) and grey duiker (*Sylvicapra grimmia deserti*).

It is very difficult to assess the status of Guenther's, Kirk's and Salt's dikdiks, because of overlapping distribution patterns and lack of detailed information. However, there has been a substantial increase in offtake by subsistence hunting and export activities during the two decades of civil war.

Most of Somalia's wildlife is exported to the Gulf region and to Southeast Asia via air, land and sea. During the rule of the dictator Siad Barre, the country had only three international airports, namely Mogadishu, Hargeisa and Kismayo, and these exit posts for goods were controlled effectively by customs authorities. However, during the civil war a range of new small airstrips was established. These are operated by private people and entrepreneurs and lack any effective control of the import and export of the type and quantity of goods.

Several visits were organized to privately owned airstrips to investigate wildlife trading activities. These included Cesiley (19 May 2006), Dayniile (20 May), Km 50 (21 May) and Beledogle (29 May), which are all located in the vicinity of Mogadishu. Earlier the author visited the airports of Dubai (3 and 6 April) and Sharjah (16 and 19 April) in the UAE, as representatives of an importing country. There are further reports that large numbers of traded antelopes are leaving the country with private dhows and depart from the scattered small ports along the Indian Ocean and Red Sea. It was not possible during the survey to collect quantitative data on the total number of antelopes exported or provided to local markets. Because of the sensitivity of the wildlife trading business, dealers are not willing to disclose the business routes and export destinations.

In conclusion, the majority of the Somali population covers its protein demand from livestock; few people depend on wildlife for their subsistence. However, antelopes are hunted during drought periods or in other environmentally adverse situations. There is a profound lack of national awareness of Somali's rich variety of flora and fauna and of its international importance. The continued and uncontrolled trade along with the loss of important wildlife habitats threaten the survival of certain restricted species, some of which risk drifting into a bottle-neck situation. The transitional federal government (TFG) of Somalia or the new Islamic court union (ICU), which now controls most of the central and southern regions, lack both the capacity and the resources needed to tackle these problems. Therefore, the international donor community should give high priority to the conservation of the threatened antelopes of Somalia, assist in sensitization, help establish a protected area system, and assist in curtailing the illegal wildlife trade.

It is strongly recommended to establish without further delay a network of small reserves to protect the most seriously threatened species, such as dibatag, beira, Speke's gazelle and silver dikdiks, to support local NGOs working in the field of natural resource management, and to promote more sustainable ways to generate income from wildlife (e.g. ostrich and crocodile farming and, in more peaceful times to come, ecotourism).

Somalia's outstanding biodiversity is a natural heritage in the first place, yet in a wider sense it is a common heritage of mankind. Thus, the loss of endemic fauna would impoverish not only Somalia but the world in general.

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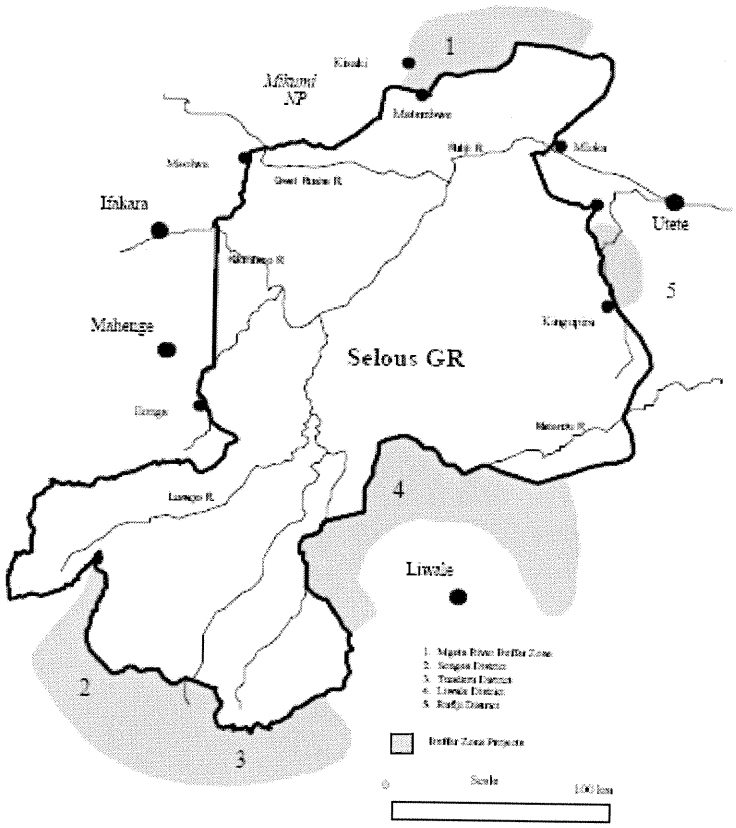
TANZANIA

The Crucial Role of Governance in Ecosystem Management - Conclusions from the Selous Conservation Programme

Rolf D. Baldus



Selous Game Reserve showing village wildlife management areas

Excerpts from a paper presented at Information Sharing and Best Practice Workshop, Serengeti National Park, 25-28 May 2006

The Selous Game Reserve (SGR) is a World Heritage Site and protected area of exceptional conservation value. With an area of approximately 48,000 km² — representing more than 5% of Tanzania's land surface — it is the largest uninhabited protected area in Africa. The Reserve encompasses a wide variety of wildlife habitats, including open grasslands, Acacia and Miombo woodlands, riverine forests and swamps. It contains some of the largest and most important populations of elephants, buffaloes, antelopes, cats and wild dogs in Africa. Furthermore, with its extensive area of woodland, the SGR is one of the largest continuous forest areas under protection.

During the 1980s Tanzania, and much of Africa, was characterised by widespread elephant and rhino poaching, and the SGR, holding around 60% of Tanzania's elephant population, was no exception. The Reserve's elephant population, estimated to be at 110,000 in 1976, had been reduced to approximately 55,000 ten years later; the rhino population had been similarly decimated, from around 3,000 in the 1970s to less than 100 today. The management system of the Reserve had more or less broken down. There were two Landrovers operational and in 1987, the annual budget amounted to approx. US$3 per km².

Governance was at the core of the problem. More than half of the poaching originated from the official wildlife staff, and it was often done on orders of superiors, higher authorities and politicians. With very few exceptions nobody responsible was ever taken to court. The main problems in the Selous were poaching, an insecure financial basis, and insufficient community involvement in the management of the buffer zones.

By 1987 government investment in the SGR was at an alltime low and the game scout force was ill equipped, unmotivated and ineffective. In response to these increasing pressures, the Tanzanian and German Governments jointly implemented the Selous Conservation Programme (SCP) between 1987 and 2003. This project was an ecosystem-centred development cooperation programme designed to enhance the long-term conservation and sustainable use of the natural resources in the SGR and its environs. The project's main objectives were to rehabilitate the SGR, and to involve the communities in the buffer zones by allowing them to manage wildlife and benefit from the sustainable use of natural resources on village land.

Selous Conservation Project results

The SCP as a joint Tanzanian-German initiative came to a planned end in December 2003. At the end of the project, the results as far as the Selous Game Reserve itself was concerned were excellent: The overall level of management was satisfactory; trophy poaching was insignificant, and a secure and long-term financial foundation was in place (US$2.8 million retention per year). Community involvement was well developed and practised around the Selous, albeit only on a pilot basis. The Tanzanian Government had further developed the concept and had made it a national programme under the name "Community-

based Conservation" (CBC). The approach became a major pillar of the Wildlife Policy of 1998. It saw countrywide application in 16 pilot areas. In order to facilitate the programme, CBC Guidelines were developed in a countrywide process of popular participation between 1999 and 2003. Thereafter a revised and modernised draft of a new Wildlife Act was prepared, which also contained the CBC concept. This draft is still with Parliamentary Committees. Despite this good initial progress, subsequent achievement in moving CBC beyond the pilot phase has been extremely slow. It is argued that this is due to poor governance in the Wildlife Sector (see below).

Some major results of the SCP can be summed up as follows:

Community-based Conservation (CBC)

From 15 villages in 1990 to 51 villages; more would join, if they were allowed;

8,600 km² under village management

300 village game scouts on duty

Functioning self-administration at village level

A wildlife corridor to Mozambique in the making

Rehabilitation of the Reserve

Tourism turnover significantly increased, mainly sustainable

Selous income around US$ 5.6 million, out of which 2.8 million were channelled back into the reserve as "retention"; additionally salaries were paid from the budget •

Expenditure per km² was US$ 65 (up from US$ 2)

Reserve finance is sustainable, if retention scheme stays and if it remains well administered

Management plan/system in place

Infrastructure developed and satisfactory, with good maintenance

Performance of sector management and game scout force satisfactory, but in danger of declining (scout force declining and too small: 1 scout/160 km²)

Biodiversity Status in 2003

Elephant poaching from more than 3,000/year in the 1980s to less than 50 in 2002/3. Elephant numbers up to more than 60,000

Rhinos breeding, but numbers remain very low and vulnerable

Other wildlife populations at natural levels, mainly on the high side; natural fluctuations; protection in buffer-zones greatly increased

Other natural resources (forests and rivers) fully protected inside the reserve.

Fish: illegal use going on, but mainly sustainable

Biodiversity in general reconstituted and maintained

The analysis of the SCP and its long-term results proves that it is possible to install a proper and successful ecological, social and economic management of a large ecosystem, but that the long-term survival and sustainability of the ecosystem is ultimately dependent upon the governance of the area. The deep crisis of the Selous in the eighties was mainly the result of what is nowadays called "bad governance".

If good governance cannot be quickly installed into the management of the natural resource base, and in particular the hunting industry in Tanzania, the Selous could still fall back to where it was in the eighties. The major problem for the Selous during the time of the SCP was not to raise the Reserve's management to satisfactory levels, but rather that many relevant decisions, e.g. on hunting quotas, allocation of hunting blocks and tourist lodge sites, and on the Reserve's budget, remained with Central Government. These important decisions were taken without the involvement of the Selous administration and other stakeholders, such as the districts and communities concerned.

Upon the request of GoT and with financing from Germany, a major reform of the technical administration (database, computerisation) of tourist hunting was prepared and put in place during the time of the SCP, but this was never implemented. Equally, an officially accepted Hunting Policy of 1995 was never implemented.

Only two-and-a-half years after the end of the SCP, the long-term sustainability of the SGR is in jeopardy due to decisions at the top Wildlife Division level. In the first year after the SCP ended, the SGR retention budget (50% of all Reserve revenue) was cut by nearly two thirds, in contravention of the bilateral agreement between GoT and Germany. The budget was increased again in the financial year 2005/2006, but it still suffers from a cut of 30%. The funds at this stage are simply not sufficient for proper operation of the Reserve. Trophy poaching has consequently shown a strong upward trend, and the effectiveness of management is in jeopardy.

The implementation of CBC continues to be delayed despite an apparently strong Central Government commitment. Whether the involvement of communities and their receiving benefits from wildlife use on their land will in the long run maintain the survival of wildlife outside the protected areas is unknown. At the core of the problem lies the administration of wildlife revenues, which comes primarily from hunting (90%) in the Selous. All central decisions (quotas, allocation of blocks, revenues) are taken by the Director of Wildlife. No tender or similar procedures are followed for the allocation of hunting blocks. Instead, hunting blocks with an estimated market value of US$ 80,000 to US$ 150,000 continue to be allocated at the discretion of the Director of Wildlife for an official annual fee of US$ 7,500.

The hunting industry is unanimously opposed to granting communities any decision-making powers or rights to the wildlife on their village lands. This oppo-

sition has been one of the main stumbling factors that have led to the slow progress and limited success in community involvement.

The empowerment of communities in community-based conservation is now well advanced. Despite the persisting delays by the wildlife administration, it will be difficult in the long run to withhold the reforms of the Wildlife Sector, as they have too often been promised by top Government authorities, and as they are part of the official Poverty Reduction Strategy.

The Tanzanian wildlife system has received significant support from foreign Governments and nongovernmental organizations in recent years. The donors have engaged themselves in a constructive policy dialogue with the Ministry and the WD over years. This resulted in many agreements, policies and commitments, but in little tangible improvement in governance on the side of the Government.

There is general agreement that the financial transfers to Africa during the last four decades have achieved very little towards self-sustaining economic growth and development, and that bad governance is one of the roots of the malaise. There is broad agreement that the most important single aspect of bad governance in Africa is corruption.

Tanzania increasingly receives aid in the form of budget support, and it can be hoped that the regulatory framework around the new forms of aid delivery will increase the pressure for governance improvement. However, the pressure to spend public development budgets, coupled with the obvious lack of governance improvement and the persisting hopes and illusions on the side of the donors, may continue to reward those who benefit from bad governance and punish those who want to reform. Bad Governance – or should I better say corruption - pays after all!

Some new threats

The Kidunda Dam project at the north-eastern corner of the Reserve is going ahead despite negative technical and environmental studies and expert agreement that the project is not feasible. This is likely to lead to major ecological damage in the northern (tourist) sector of Selous, and destruction of neighbouring WMAs. In addition, GoT has granted mineral prospecting licenses for Selous, despite an international agreement that no mining can occur in World Heritage Sites. Recently it was also reported in the local press that several oil drilling licences have been granted for the Selous area.

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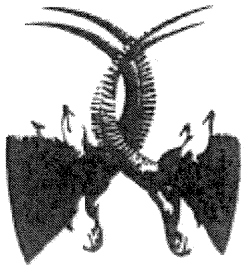
All quoted publications plus additional articles and sources on the Selous, SCP, CBC, tourist hunting etc. can be found in: http://www.wildlife-baldus.com

Disclaimer: The author worked as coordinator of the SCP from 1987 to 1993 and as Government Advisor in the Wildlife Division between 1998 and 2005. [He has also been a long-time member of the Antelope Specialist Group.] *All views and opinions expressed are, however, solely his own and not necessarily those of his former or present employers.*



ANGOLA

Hybridization in Giant Sable: a conservation crisis in a critically endangered Angolan icon

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Angola's national emblem, the Giant Sable (*Hippotragus niger variani*), is facing a crisis from an unexpected source: hybridisation with congeneric Roan (*Hippotragus equinus*).

In the Gnusletter published one year ago (Vol. 24 No.2), a reader of John Walker's November 2005 article in *Africa Geographic* suggested that a young giant sable shown in a camera-trap photo taken in Cangandala National Park looked like a possible roan/sable hybrid. Additional camera-trap pictures, including a long video sequence, have proved that he was right and we were wrong. What happened in Kruger National Park, the only known case of hybridization at the time, has happened in Cangandala – and not just once but repeatedly. The evidence accumulated over time as Pedro Vaz Pinto made the arduous trip from Luanda to Malange and Cangandala NP as often as once a month in his heroic efforts to protect the remnant giant sable population (for which he received the Whittley Fund for Nature award as reported in the last *Gnusletter).* The following account by Pedro is extracted from a paper soon to be submitted to a journal. Ed.

The present study was initiated in 2003. The senior author (PVP) has made repeated visits to Cangandala NP, via the only access from the village of Cangandala. The extremely poor condition of the roads from Luanda to the provincial capital, Malanje, and the even worse state of roads from Malanje to Cangandala, exacerbated by the collapse of makeshift log bridges across the streams along the Park

boundary, make visits a frustratingly slow and costly exercise. Despite the extreme logistic difficulties, and the lack of roads within the Park, it has been possible to establish the presence of sable in several areas of the Park with the help of local villagers, who have been recruited as "Pastores das Palancas" (Sable Shepherds) and through modest incentives have become true guardians of the last known population of the sub-species.

In September 2004 an expedition was also carried out into Luando Reserve and from fresh tracks and dung, it was confirmed that there were still some sable surviving in this reserve.

Repeat visits have since been made to the key points in the animals' home ranges in Cangandala, principally around the natural "salt licks" which have been used by various species over long periods. The salt licks occur in the extensive woodlands as nutrient islands, with a distinctive flora, in the nutrient poor soils of the *Brachystegia/ Julbernardia /Uapaca* miombo of Central Angola.

Due to their extreme timidness and low population density, direct sightings of sable were not made during the first dozen visits. In order to verify the identification of regular observations of hoof prints, dung and hair samples found on the hundreds of kilometres covered in foot surveys were collected in both reserves and sent to two laboratories for DNA analysis. Results from these analyses seem to prove the presence of giant sable (Pitra et al., 2005) but they were also inconsistent and confusing. Species such as blue wildebeest in Luando, and puku in Cangandala, were also identified by the laboratories, yet neither species was previously recorded in the areas.

In October 2004, 6 infrared triggered trap cameras (TrailMaster models 1500 and 1550) were placed at two salt licks in Cangandala. Difficulties with faulty equipment, poor battery life and infestation of the units by ants, resulted in a succession of frustrating exercises, while we fine-tuned the system.

	Sable fem.	Sable male	Roan fem.	Roan male	Hybrid fem.	Hybr. male
Adult	7	0	0	1	0	0
Subadult	2	0	0	0	3	1
Yearlings	1	3	1	0	0	0
Calves	1		0		0	

Table 1. Classification of sable and roan antelopes seen or photographed in 2006

Perseverance was rewarded when, in February 2005, the first photographic evidence of Giant Sable since 1982 was provided by a series of photos taken with the trap cameras set at Salt Lick 2. Over the following 18 months and 15 visits, a total of 23 sable and roan have been recorded on the still-photo series. In addition to these, warthog, bushbuck, common duiker and greater galago have been photographically recorded.

In June 2006, a new series of recordings was initiated with a video trap camera with movement and heat detector sensors (TrailMaster 700v RT) system, which has provided on a monthly basis a video series on various groupings of sable and other species. Using these data, a photographic identification profile for most of the individual animals has been compiled.

In January 2006 the first visual sightings of a group of sable were made by Pedro Vaz Pinto, and more observations were made in September 2006 at Salt Lick 3. One roan calf had been observed earlier in October 2005.

Evidence of Hybridization

Analysing the growing series of photographs of the Cangandala population, we were aware that a few sable had unusually long, floppy ears and uncharacteristic facial markings. But it wasn't until January 2006 when Pedro Vaz Pinto observed a roan bull leading the sable herd, that we became more concerned. In correspondence with the co-authors, it was suggested that there might have been cross-breeding between the single roan bull and the sable cows. This could have been caused by the absence of a mature sable bull and/or lack of roan cows. Until now, our attempts to find an adult sable bull have proved unsuccessful, and the roan population seems to be reduced to one bull roaming with the sable and one single yearling female, recorded now on six independent occasions and always found alone.

From the repeat sightings of the *Hippotragus* population, the composition of the observed and/or photographed animals during 2006 are shown in Table 1.

Roble subadult male (rt)

This record also shows a very unbalanced group, in which comparatively few young have been produced over the last few years, clearly suggesting a declining population.

As the photographic record has expanded, the presence of other Roan-like features in the presumed hybrids, such as the clown-like white eye markings in Roan, and the white malar band descending from the nose to the mid-jaw instead of the characteristic triangular and pointed shape in sable, all tended to confirm that the other peculiarities of several of the young members of the Cangandala population are indeed the progeny of the lone Roan bull and the sable cows. In the case of the "hybrid" male, it was noted that from an early age it showed the clown-like mask and a very black face contrasting with an unusually pale body colour (see photo). Now at the age of four, this male has very curved horns and is still brown in colour.

Of further concern is the fact that some of the "hybrid" cows have shown signs of pregnancy, and in August 2006 the "hybrid" young bull was leading the sable herd and behaving as the "herd master".

That such hybridisation is possible is confirmed by a well known sable/roan cross in the Kruger National Park, named as roble (Whyte, pers comm.) and recently reported dead at the age of 19 by Richard Estes (*Africa Geographic*, 2006). This hybrid had its DNA analysed for the compatibility of such interspecific crossing (Robinson & Harley, 1995). While it is necessary to verify the suggestion of roan/sable interbreeding in the Cangandala specimens through DNA analysis, the likelihood of such DNA material becoming available in the near future is low. In the meantime, accelerated surveys, research, and conservation action for the Giant Sable in Angola is an urgent priority.